

Annex to the
technical catalogue

Tmax T6.

New PR223EF and PR223DS
electronic releases

Preliminary - 1SDC210012D0201



ABB

OVERVIEW



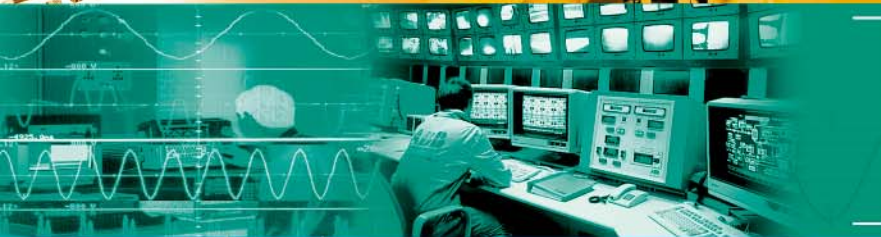
THE RANGES

1/1



ACCESSORIES

2/1



CHARACTERISTIC CURVES AND TECHNICAL INFORMATION

3/1



WIRING DIAGRAMS

4/1



OVERALL DIMENSIONS

5/1



ORDERING CODES

6/1

T4 T5 T6



THE T GENERATION HAS GROWN.

With the new T6 circuit-breaker, the Tmax family has been enlarged to offer an even more complete series of extremely compact, technologically advanced moulded-case circuit-breakers with top performances. Find out how well the family has grown.

NEW TMAX T6. PERFORMANCES YOU DIDN'T EXPECT.

The new Tmax T6 is the first 1000 A size circuit-breaker to combine high performances with extremely limited dimensions. Tmax T6 has the same depth as the T4-T5 sizes and most of the accessories are in common with the other Tmax family sizes, such as the service releases and the auxiliary contacts.

State-of-the-art electronics

Apart from the PR221DS and PR222DS/P already

TMAX T6. THE TMAX FAMILY GROWS. THE PERFORMANCES GROW.



available, Tmax T4, T5 and T6 circuit-breakers can be equipped with the following new revolutionary electronic releases:

- PR223DS: release for power distribution circuit-breakers;
- PR223EF: release built for specific needs requiring high selectivity values.

The evolution is completed by dedicated accessories for these new electronic releases, which make Tmax a decidedly avant-garde circuit-breaker:

- The VM210 device is able to provide the voltage and power measurements without the use of traditional VTs;
- The front display unit - FDU, which makes it possible to display a wide range of information about the circuit-breaker and about the measurements available;
- The IM210 interlock module guarantees extension of ABB moulded-case circuit-breakers zone selectivity to air circuit-breakers.

Tmax. **T** Generation.

EFDP



NEW PR223EF RELEASE. FREE THE INSTALLATIONS, WITH LEVELS OF SELECTIVITY NEVER ACHIEVED BEFORE.

With the new T6 a new range up to 1000 A is born, for specific needs requiring high selectivity values.

- The new PR223EF, available on T4, T5 and T6 in the L version for use in alternating current, can isolate any fault in the network in decidedly shorter times than that of “traditional” selectivity systems.
- The PR223EF release integrated in the Tmax circuit-breakers allows extremely high limitation of the fault energy.

Advanced zone selectivity

- Thanks to extremely rapid discovery and elimination of the short-circuit, the moulded-case circuit-breakers equipped with the PR223EF release are selective up to and above 100 kA and are not subject to any limits regarding the number of hierarchical levels in the distribution system.
- The information regarding a circuit-breaker trip is saved permanently inside the release. Up to 10 events are recorded.

Savings in the costs of the installation

- Apart from the technical advantages already mentioned,

NEW ELECTRONIC RELEASES. GREATER IN SELECTIVITY AND CONTROL.



using circuit-breakers equipped with the PR223EF release allows significant simplification of circuit-breaker selection within the installation.

- The zone selectivity implemented makes it possible to reduce the size of the circuit-breakers with consequent reduction in the costs of the installation.

NEW PR223DS ELECTRONIC RELEASE. FREEDOM OF CONTROL.

The new PR223DS release, available for T4, T5 and T6, was conceived and built for power distribution circuit-breakers.

- The PR223DS release also offers the possibility of measuring the different electrical values of the installation.
- The measurement functions of the PR223DS release mean that the traditional multimeters can be replaced. The following measurements are available: current, voltage, power, power factor, peak factor, frequency and energy.
- There are LEDs available on the front of the release which signal some configuration settings and the presence of alarms (overload, incorrect connections and malfunction of the electronics).

Panorama of the Tmax family



Power distribution circuit-breakers

I_u	[A]	
I_n	[A]	
Poles	[No]	
U_e	[V]	(AC) 50 - 60 Hz
	[V]	(DC)
I_{cu} (380-415 V AC)	[kA]	B
	[kA]	C
	[kA]	N
	[kA]	S
	[kA]	H
	[kA]	L
	[kA]	V



Circuit-breakers for advanced zone selectivity

I_u	[A]	
Poles	[No]	
U_e	[V]	(AC) 50 - 60 Hz
PR223EF electronic release		



Circuit-breakers for motor protection

I_u	[A]	
Poles	[No]	
U_e	[V]	(AC) 50 - 60 Hz
Magnetic only release, IEC 60947-2		
PR221DS-I electronic release, IEC 60947-2		
PR222MP electronic release, IEC 60947-4-1		



Circuit-breakers for applications up to 1000 V

I_u	[A]	
Poles	[No]	
I_{cu} max	[kA]	1000 V AC
	[kA]	1000 V DC 4 poles in series



Switch-disconnectors

I_{th}	[A]	
I_e (AC23)	[A]	
Poles	[No]	
U_e	[V]	(AC) 50 - 60 Hz
		(DC)
I_{cm}	[kA]	
I_{cw}	[kA]	

* For I_n 16 A and I_n 20 A: I_{cu} @ 220/230 V AC = 16 kA

Note: ABB SACE's moulded-case circuit-breakers are also available in the versions according to UL Standards (see catalogue "ABB SACE moulded case circuit-breakers - UL 489 and CSA C22.2 Standard").

**T1 1p****T1****T2****T3****T4****T5****T6**

160	160	160	250	250/320	400/630	630/800/1000
16...160	16...160	1,6...160	63...250	20...320	320...630	630...1000
1	3/4	3/4	3/4	3/4	3/4	3/4
240	690	690	690	690	690	690
125	500	500	500	750	750	750
25* (220/230 V AC)	16	16				
	25	25				
	36	36	36	36	36	36
		50	50	50	50	50
		70		70	70	70
		85		120	120	100
				200	200	

T4**T5****T6**

250/320	400/630	630/800/1000
3/4	3/4	3/4
690	690	690
■	■	■

T2**T3****T4****T5****T6**

160	250	250/320	400/630	630/800/1000
3	3	3	3	3
690	690	690	690	690
■	■	■	■	■
■		■	■	■

T4**T5****T6**

250	400/630	630/800
3/4	3/4	3/4
20	20	12
40	40	40

T1D**T3D****T4D****T5D****T6D**

160	250	250/320	400/630	630/800/1000
125	200	250/250	400/400	630/800/800
3/4	3/4	3/4	3/4	3/4
690	690	690	690	690
500	500	750	750	750
2.8	5.3	5.3	11	30
2	3.6	3.6	6	15

Index

Tmax circuit-breakers for power distribution

Electrical characteristics	1/2
General characteristics.....	1/4
Thermomagnetic releases	1/5
Electronic releases	1/6

Circuit-breakers for advanced zone selectivity

Electrical characteristics	1/10
General characteristics.....	1/11

Circuit-breakers for motor protection

Electrical characteristics	1/14
Integrated protection: PR222MP.....	1/16

Tmax circuit-breakers for applications at 1000 V

Electrical characteristics	1/18
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Switch-disconnectors

Electrical characteristics	1/20
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Circuit-breakers for power distribution

Electrical characteristics

		Tmax T1 1P		Tmax T1		Tmax T2			
Rated uninterrupted current, I_u [A]	[A]	160		160		160			
Poles	[Nr]	1		3/4		3/4			
Rated service voltage, U_e	(AC) 50-60 Hz	[V] 240		690		690			
	(DC)	[V] 125		500		500			
Rated impulse withstand voltage, U_{imp}		[kV] 8		8		8			
Rated insulation voltage, U_i		[V] 500		800		800			
Test voltage at industrial frequency for 1 min.		[V] 3000		3000		3000			
Rated ultimate short-circuit breaking capacity, I_{cu}		B	B	C	N	N	S	H	L
	(AC) 50-60 Hz 220/230 V	[kA] 25*	25	40	50	65	85	100	120
	(AC) 50-60 Hz 380/415 V	[kA] -	16	25	36	36	50	70	85
	(AC) 50-60 Hz 440 V	[kA] -	10	15	22	30	45	55	75
	(AC) 50-60 Hz 500 V	[kA] -	8	10	15	25	30	36	50
	(AC) 50-60 Hz 690 V	[kA] -	3	4	6	6	7	8	10
	(DC) 250 V - 2 poles in series	[kA] 25 (at 125 V)	16	25	36	36	50	70	85
	(DC) 250 V - 3 poles in series	[kA] -	20	30	40	40	55	85	100
	(DC) 500 V - 2 poles in series	[kA] -	-	-	-	-	-	-	-
	(DC) 500 V - 3 poles in series	[kA] -	16	25	36	36	50	70	85
	(DC) 750 V - 3 poles in series	[kA] -	-	-	-	-	-	-	-
Rated service short-circuit breaking capacity, I_{cs}	(AC) 50-60 Hz 220/230 V	[%I _{cu}]	75%	100%	75%	100%	100%	100%	100%
	(AC) 50-60 Hz 380/415 V	[%I _{cu}]	-	100%	100%	75%	100%	100%	75% (70 kA)
	(AC) 50-60 Hz 440 V	[%I _{cu}]	-	100%	75%	50%	100%	100%	100%
	(AC) 50-60 Hz 500 V	[%I _{cu}]	-	100%	75%	50%	100%	100%	75%
	(AC) 50-60 Hz 690 V	[%I _{cu}]	-	100%	75%	50%	100%	100%	75%
	Rated short-circuit making capacity, I_{cm}	(AC) 50-60 Hz 220/230 V	[kA]	52.5	52.5	84	105	143	187
(AC) 50-60 Hz 380/415 V		[kA]	-	32	52.5	75.6	75.6	105	154
(AC) 50-60 Hz 440 V		[kA]	-	17	30	46.2	63	94.5	121
(AC) 50-60 Hz 500 V		[kA]	-	13.6	17	30	52.5	63	75.6
(AC) 50-60 Hz 690 V		[kA]	-	4.3	5.9	9.2	9.2	11.9	13.6
Opening time (415 V)		[ms]	7	7	6	5	3	3	3
Utilisation category (IEC 60947-2)		A		A		A			
Isolation behaviour		■		■		■			
Reference Standard		IEC 60947-2		IEC 60947-2		IEC 60947-2			
Releases:	thermomagnetic	■		■		■			
T fixed, M fixed	TMF	■		-		-			
T adjustable, M fixed	TMD	-		■		■			
T adjustable, M adjustable (5...10 x In)	TMA	-		-		-			
T adjustable, M fixed (3 x In)	TMG	-		-		-			
T adjustable, M adjustable (2.5...5 x In)	TMG	-		-		-			
electronic	PR221DS-LS/I	-		-		■			
	PR221DS-I	-		-		■			
	PR222DS-LSI	-		-		-			
	PR222DS-LSIG	-		-		-			
	PR222DS/PD-LSI	-		-		-			
	PR222DS/PD-LSIG	-		-		-			
	PR223DS	-		-		-			
Interchangeability		-		-		-			
Versions		F		F		F-P			
Terminals	fixed	FC Cu		FC Cu-EF-FC CuAl-HR		F-FC Cu-FC CuAl-EF-ES-R			
	withdrawable	-		-		F-FC Cu-FC CuAl-EF-ES-R			
	plug-in	-		-		-			
Fixing on DIN rail		-		DIN EN 50022		DIN EN 50022			
Mechanical life	[No. operations]	25000		25000		25000			
	[No. Hourly operations]	240		240		240			
Electrical life @ 415 V AC	[No. operations]	8000		8000		8000			
	[No. Hourly operations]	120		120		120			
Basic dimensions - fixed version	W [mm]	25.4 (1 pole)		76		90			
	4 poles W [mm]	-		102		120			
	D [mm]	70		70		70			
	H [mm]	130		130		130			
Weight	fixed	3/4 poles	[kg] 0.4 (1 pole)	0.9/1.2		1.1/1.5			
	withdrawable	3/4 poles	[kg] -	-		1.5/1.9			
	plug-in	3/4 poles	[kg] -	-		-			

KEY TO TERMINALS
F = Front

EF = Front extended
ES = Front extended spread

FC Cu = Front for copper cables
FC CuAl = Fron for CuAl cables

R = Rear orientated
MC = Multicable

F = Fixed circuit-breaker
P = Plug-in circuit-breakers



Circuit-breakers for power distribution

General characteristics

General characteristics

The new Tmax series of moulded-case circuit-breakers, complying with the IEC 60947-2 Standards, is widened with the new T6 size, which extends the range of application from 630 A up to 1000 A with breaking capacities from 36 kA to 100 kA (at 380/415 V AC).

For the first time ABB SACE has developed a moulded-case circuit-breaker with rated current of 1000 A which offers an alternative and more compact solution than a circuit-breaker of a larger size.

Dimensionally the new T6 has the same depth as T4 and T5 (D = 103.5 mm) therefore guaranteeing a high level of standardisation of the metalwork structures, whereas a pole pitch of 70 mm makes connection of the circuit-breaker terminals inside the switchgear convenient.

The protection releases which can be mounted on T6 to carry out protection of networks in alternating current are as follows:

- TMA thermomagnetic releases with adjustable thermal threshold ($I_1 = 0.7...1 \times I_n$) and adjustable magnetic threshold ($I_3 = 5...10 \times I_n$)
- PR221DS, PR222DS/P, PR222DS/PD electronic releases
- the new PR223DS and PR223EF releases.

The range of use in alternating current of the Tmax series varies, with T6 from 630 A up to 1000 A with voltages up to 690 V.

The Tmax T6 circuit-breakers equipped with TMA can also be used in direct current installations, with an application range from 630 A to 800 A and a minimum operating voltage of 24 V DC according to the suitable wiring diagrams.

1

Interchangeability

The Tmax T6 circuit-breakers can be fitted either with TMA thermomagnetic releases or PR221DS, PR222DS/P, PR222DS/PD, PR222MP and

PR223DS electronic releases. In fact, thanks to assembly simplicity, the type of release can be rapidly replaced by the end customer as well, according to

their needs and requirements: in this case, correct assembly remains the responsibility of the customer. Above all, this means increased flexibility of use of the

circuit-breakers, with considerable savings thanks to better rationalisation of stock management.

Circuit-breakers	Releases														
	TMA		PR221DS-LS/I or I			PR222DS/P-LSI or LSI G			PR222DS/PD-LSI or LSI G			PR223DS			PR222MP
In (A)	630	800	630	800	1000	630	800	1000	630	800	1000	630	800	1000	630
T6 630	■		■			■			▲			■			
T6 800		■		■			■			▲			■		■
T6 1000					■			■			▲			■	

■ = Complete circuit-breaker already coded
▲ = Circuit-breaker to be assembled (separate codes for the circuit-breaker and release)

Range of application of the circuit-breakers in alternating current and in direct current		
	Release	Range (A)
AC		
T6 630/800/1000	TMA	630...800
	PR221DS	630...1000
	PR222DS/P	630...1000
	PR222DS/PD	630...1000
	PR223DS	630...1000
DC		
T6 630/800	TMA	630...800
TMA = thermomagnetic release with adjustable thermal and magnetic thresholds PR22_ = electronic releases		



Circuit-breakers for power distribution

Thermomagnetic releases

Thermomagnetic releases

The Tmax T6 circuit-breakers can be equipped with thermomagnetic releases and are used for protection of networks in alternating current and in direct current, with a range of uses from 630 A to 800 A. They allow protection against overloads with a thermal device with adjustable threshold made using the bimetal technique, and protection against short-circuit with a magnetic device with adjustable threshold.

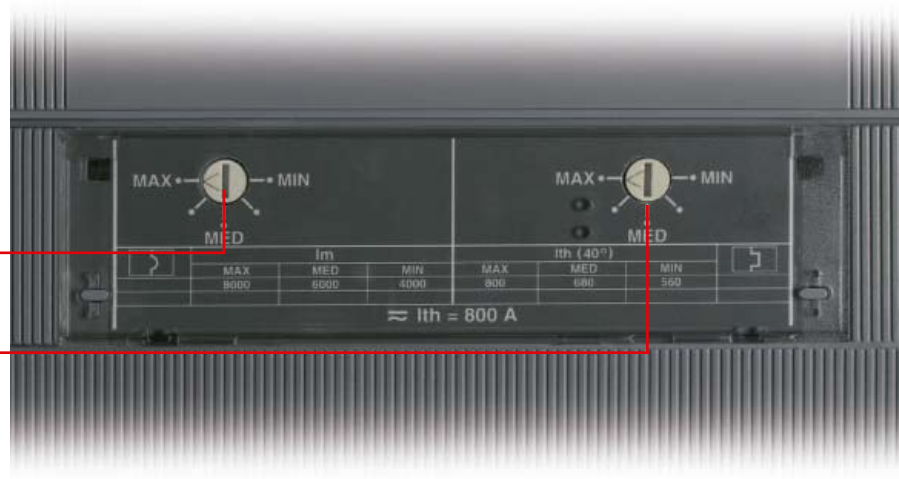
The four-pole circuit-breakers are available with the neutral setting at 50% or at 100% of the phase setting.

1

Thermomagnetic releases TMA (for T6)

Thermal threshold
Adjustable



Thermal threshold
Adjustable from 0.7 to 1 x I_n



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TMA = thermomagnetic release with adjustable thermal threshold (I₁ = 0.7...1 x I_n) and magnetic threshold (I₃ = 5...10 x I_n)

TMA - T6

 I₁ = 0.7...1 x I_n	I _n [A]	630	800
	Neutral [A] - 100%	630	800
	Neutral [A] - 50%	400	500
 I₃ = 5...10 x I_n	I ₃ [A]	3150...6300	4000...8000
	Neutral [A] - 100%	3150...6300	4000...8000
	Neutral [A] - 50%	2000...4000	2500...5000



Circuit-breakers for power distribution

Electronic releases

1

General characteristics

The Tmax T6 circuit-breakers, for use in alternating current, can be equipped with PR221DS, PR222DS (in the version with protection only and with the dialogue function), and PR223DS overcurrent releases constructed using the electronic technique. This allows protection functions to be obtained which guarantee great reliability, trip precision and insensitivity to the electromagnetic components in compliance with the Standards on the matter. The power supply needed for correct operation is supplied directly by the release current transformers and tripping is always guaranteed, even under single-phase load conditions, and in correspondence with the minimum setting.

The protection releases are made up of the current transformers (three or four depending on the number of conductors to be protected), of the PR221DS, PR222DS or PR223DS protection unit in the different versions available, and of an opening solenoid with demagnetisation (SA) which acts directly on the circuit-breaker control group and which is housed in the release box.

The current transformers, housed inside the release box, supply the energy required for correct operation of the protection and to provide the signal needed to determine the current. They are available with primary rated current as shown in the table.

When the protection trips, the circuit-breaker opens by means of the opening solenoid (SA), which changes over a contact (AUX-SA, available on request) for signalling that the release has tripped. Recovery of the signal is of the mechanical type and is carried out by resetting the circuit-breaker operating lever.

The test of the opening solenoid (SA) can be carried out by means of the SACE TT1 test device. A positive outcome of the test coincides with circuit-breaker opening.

Caption

For further in-depth information, please see the "Tmax – Low voltage moulded-case circuit-breakers up to 630 A" technical catalogue.

Characteristics of the PR221DS, PR222DS/P, PR222DS/PD and PR223DS electronic releases

Operating temperature	-25 °C...+70 °C
Relative humidity	90%
Operating frequency	45...66 Hz
Electromagnetic compatibility (LF and HF)	IEC 60947-2 Annex F

Current transformers

	In [A]	630	800	1000
PR221DS	T6	■	■	■
	L	252...630	320...800	400...1000
	S	630...6300	800...8000	1000...10000
	I	630...6300	800...8000	1000...10000
PR222DS/P, PR222DS/PD or PR223DS	T6	■	■	■
	L	252...630	320...800	400...1000
	S	378...6300	480...8000	600...10000
	I	945...7560	1200...9600	1500...12000
	G	126...630	160...800	200...1000

The PR221DS, PR222DS/P and PR222DS/PD electronic releases, which can be mounted on T6, have the same characteristics as the releases for T4 and T5, except for the trip curves times of the L function on the PR222DS/P electronic release (for further in-depth information, please see the "Characteristic curves and technical information" chapter).

PR221DS-LS/I

Protection S
Against short-circuit
with delayed trip

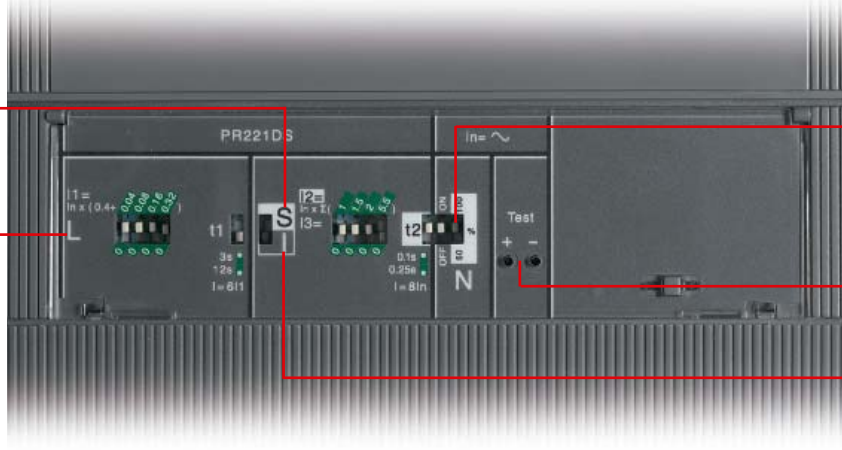
Protection L
Against overload

Dip-switch for
setting the neutral
(only for T4, T5 and T6)

Socket for TT1
test unit

Protection I
Against short-circuit
with instantaneous trip

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PR222DS/P

Protection S
Against short-circuit
with delayed trip

Protection L
Against overload

Socket for test
SACE TT1 test unit

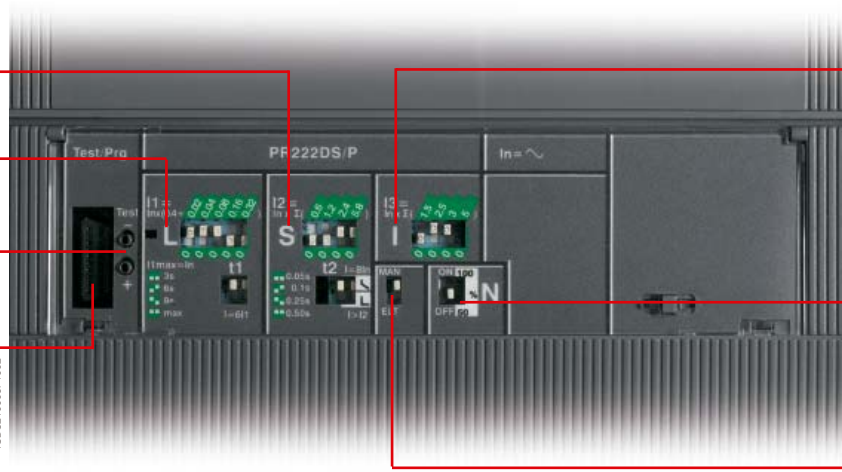
Socket for connection
of SACE PR010/T
test unit

Protection I
Against short-circuit
with instantaneous trip

Dip-switch for
setting the neutral

Selection for electronic
or manual setting

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PR222DS/PD

Protection S
Against short-circuit
with delayed trip

Protection L
Against overload

Socket for test
SACE TT1 test unit

Socket for connection
of SACE PR010/T
test unit

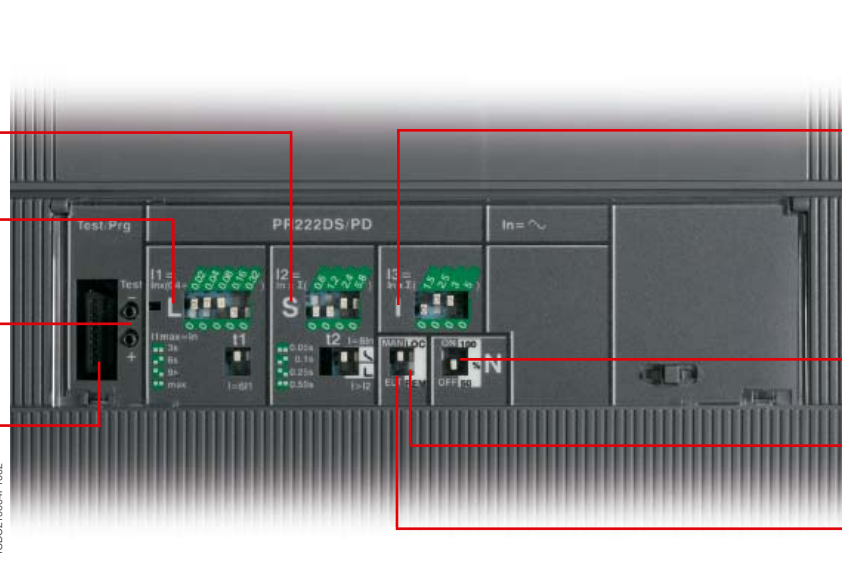
Protection I
Against short-circuit
with instantaneous trip

Dip-switch for
setting the neutral

Selection for electronic
or manual setting

Selection for local
or remote setting

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Circuit-breakers for power distribution

Electronic releases

1

PR223DS

Apart from the traditional L, S, I, and G protection functions, the PR223DS release, available on T4, T5 and T6, offers the possibility of obtaining the voltage values and of displaying the main electrical values by means of the FDU.

Setting the PR223DS release can only be carried out electronically, i.e. using the PR010/T test unit (setting in local mode) or the dialogue function (setting in remote mode). The range and the steps are exactly the same as the PR222DS with electronic setting. Furthermore, by means of the VM210 accessory and without the use of voltage transformers, the voltage values of the single phases can be made available to the user.

The PR223DS, fitted with the VM210 module and the FDU preset with auxiliary power supply, can show the current, voltage, power and energy measurements on the front of the circuit-breaker.

Measurements	With distributed N	Without distributed N
Effective current values	I_1, I_2, I_3, I_n	I_1, I_2, I_3
Effective voltage values	V_1, V_2 and V_3, V_{12}, V_{23} and V_{31}	V_{12}, V_{23} and V_{31}
Apparent powers	S_{tot}, S_1, S_2, S_3	S_{tot}
Active powers	P_{tot}, P_1, P_2, P_3	P_{tot}
Reactive powers	Q_{tot}, Q_1, Q_2, Q_3	Q_{tot}
Power factors	$\cos\varphi$	$\cos\varphi$
Energies (active, reactive, apparent)	E_{TOT}	E_{TOT}
Peak factor	n	n
Frequency	f	f

For the neutral, it is possible to set the protection threshold of the functions to OFF, at 50% and at 100% of that of the phases. Moreover, on the front of the release pre-alarm and alarm signalling of protection L are also available. The value of the pre-alarm threshold is $0.9xI_n$. Again on the front of the release, the LEDs are available, which signal the following information:

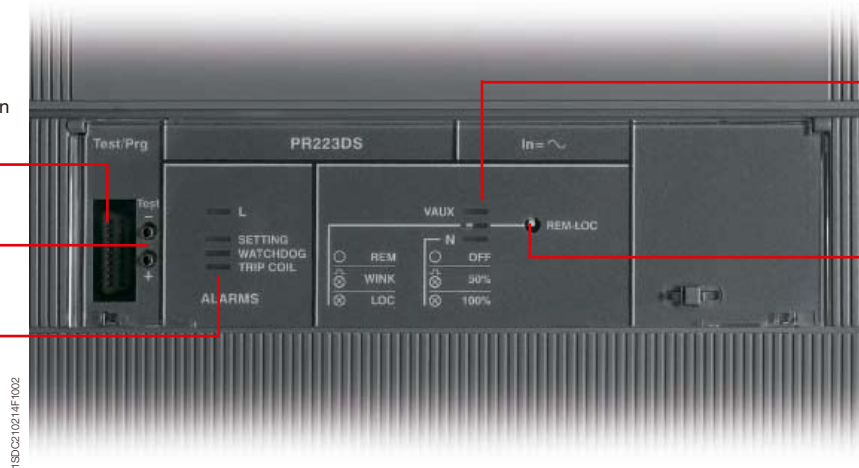
- condition of the opening solenoid connection
- use of the default parameter
- mode (local or remote)
- presence of the auxiliary power supply
- setting of the neutral.

PR223DS

Socket for connection of SACE PR010/T test unit

Socket for test SACE TT1 test unit

LED signalling alarm of the circuit-breaker










LED signalling the status of the circuit-breaker

Pushbutton for the choice of the operational mode (local/remote) and on-board diagnosis system

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PR223DS - Protection functions and parameterisations

Protection functions	Trip threshold	Trip curves ⁽¹⁾
 <p>NOT EXCLUDABLE</p> <p>Against overload with long inverse time delay trip and trip characteristic according to an inverse time curve ($I^2t = \text{constant}$)</p>	 <p>$I_1 = 0.40 \dots 1 \times I_n$ (step $0.01 \times I_n$) Release between $1.1 \dots 1.3 \times I_1$ (IEC 60947-2)</p>	<p>at $6 \times I_1$ $t_1 = 3 \dots 18\text{s}$ (step 0.5s)⁽²⁾ Tolerance: $\pm 10\%$</p>
 <p>EXCLUDABLE</p> <p>Against short-circuit with inverse short time delay trip and trip characteristic with inverse time ($I^2t = \text{constant}$) or definite time</p>	<p>$I_2 = 0.60 \dots 10 \times I_n$ (step $0.1 \times I_n$) Tolerance: $\pm 10\%$</p> <p>$I^2t = \text{cost}$ ON</p>	<p>at $8 \times I_n$ $t_2 = 0.05 \dots 0.5\text{s}$ (step 0.01s) Tolerance: $\pm 10\%$⁽⁴⁾</p>
 <p>EXCLUDABLE</p> <p>Against short-circuit with instantaneous trip</p>	 <p>$I_3 = 1.5 \dots 12 \times I_n$ (step $0.1 \times I_n$)⁽³⁾ Tolerance: $\pm 10\%$</p> <p>$I^2t = \text{cost}$ OFF</p>	<p>$t_2 = 0.05 \dots 0.5\text{s}$ (step 0.01s) Tolerance: $\pm 10\%$⁽⁴⁾</p> <p>instantaneous $\leq 30\text{ms}$</p>
 <p>EXCLUDABLE</p> <p>Against earth fault with inverse short time delay trip and trip characteristic according to an inverse time curve ($I^2t = \text{constant}$)</p>	 <p>$I_4 = 0.2 \dots 1 \times I_n$ (step $0.1 \times I_n$) Tolerance: $\pm 10\%$</p>	<p>$I_4 = 0.1 \dots 0.8 \times I_n$ (step 0.01s) Tolerance: $\pm 20\%$</p>

⁽¹⁾ These tolerances hold in the following conditions:
 - self-powered relay at full power and/or auxiliary supply
 - two or three-phase power supply
 - sinusoidal wave forms with peak factor 1.41
 - peak factor $\left(\frac{\text{peak}}{\text{rms}}\right) = \sqrt{2}$ ($L \geq 3$ in; S, I, G)

⁽²⁾ for T4, $I_n = 320\text{A}$ and T5, $I_n = 630\text{A} \Rightarrow t_1 = 12\text{s}$
⁽³⁾ for T4, $I_n = 320\text{A}$, T5, $I_n = 630\text{A}$ and T6, $I_n = 1000\text{A} \Rightarrow I_{3\text{max}} = 10 \times I_n$
⁽⁴⁾ tolerance: $\pm 10\text{ms}$ up to $t_2 = 0,1\text{s}$



Circuit-breakers for advanced zone selectivity

Electrical characteristics

1

		T4	T5	T6
Rated uninterrupted current, Iu	[A]	250/320	400/630	630/800/1000
Poles	[No]	3/4	3/4	3/4
Rated service voltage, Ue	(AC) 50-60 Hz [V]	690	690	690
	(DC) [V]	750	750	750
Rated impulse withstand voltage, Uimp	[kV]	8	8	8
Rated insulation voltage, Ui	[V]	1000	1000	1000
Test voltage at industrial frequency for 1 min.	[V]	3500	3500	3500
Rated ultimate short-circuit breaking capacity, Icu		L	L	L
(AC) 50-60 Hz 220/230 V	[kA]	200	200	200
(AC) 50-60 Hz 380/415 V	[kA]	120	120	100
(AC) 50-60 Hz 440 V	[kA]	100	100	80
(AC) 50-60 Hz 500 V	[kA]	85	85	65
(AC) 50-60 Hz 690 V	[kA]	70	70	30
Rated service short-circuit breaking capacity, Ics				
(AC) 50-60 Hz 220/230 V	[%Icu]	100%	100%	75%
(AC) 50-60 Hz 380/415 V	[%Icu]	100%	100%	75%
(AC) 50-60 Hz 440 V	[%Icu]	100%	100%	75%
(AC) 50-60 Hz 500 V	[%Icu]	100%	100% ⁽¹⁾	75%
(AC) 50-60 Hz 690 V	[%Icu]	100%	100% ⁽²⁾	75%
Rated short-circuit making capacity, Icm				
(AC) 50-60 Hz 220/230 V	[kA]	440	440	440
(AC) 50-60 Hz 380/415 V	[kA]	264	264	220
(AC) 50-60 Hz 440 V	[kA]	220	220	176
(AC) 50-60 Hz 500 V	[kA]	187	187	143
(AC) 50-60 Hz 690 V	[kA]	154	154	63
Utilisation category (IEC 60947-2)		A	B (400A) - A (630A)	B (630A - 800A) - A (1000A)
Isolation behaviour		■	■	■
Reference Standard		IEC 60947-2	IEC 60947-2	IEC 60947-2
Release: electronic	PR223EF	■	■	■
Versions		F-P-W	F-P-W	F-W
Terminals	fixed	F-FC Cu-FC CuAl-EF-ES-R-MC	F-FC Cu-FC CuAl-EF-ES-R-MC	F-FC CuAl-EF-ES-R-RC
	withdrawable	EF-ES-HR-VR-FC Cu-FC CuAl	EF-ES-HR-VR-FC Cu-FC CuAl	EF-HR-VR
Mechanical life	[No. operations]	20000	20000	20000
	[No. Hourly operations]	240	120	120
Electrical life @ 415 V AC	[No. operations]	8000 (250A) - 6000 (320A)	7000 (630A) - 5000 (800A)	7000 (630A) - 5000 (800A) - 4000 (1000A)
	[No. Hourly operations]	120	60	60
Basic dimensions - fixed version	W [mm]	105	140	210
	4 poles W [mm]	140	184	280
	D [mm]	103.5	103.5	103.5
	H [mm]	205	205	268
Weight	fixed 3/4 poles	[kg] 2.35/3.05	3.24/4.15	9.5/12
	plug-in 3/4 poles	[kg] 3.6/4.65	5.15/6.65	-
	withdrawable 3/4 poles	[kg] 3.85/4.9	5.4/6.9	12.1/15.1

LEGENDA TERMINALI

EF = Front extended
 F = Front
 ES = Front extended spread
 R = Rear orientated
 MC = Multi-cable

F = Fixed circuit-breaker
 P = Plug-in circuit-breaker
 W = Withdrawable circuit-breaker

⁽¹⁾ = 75% for T5 630
⁽²⁾ = 50% for T5 630



Circuit-breakers for advanced zone selectivity

General characteristics

PR223EF

The PR223EF electronic release available on T4, T5 and T6 in the L version for use in alternating current, is able to isolate a fault present in the network much more rapidly than with the zone selectivity currently present on the market: when with typical zone selectivity the extinction times are around a few hundred milliseconds with the PR223EF these are considerably reduced.

This performance is made possible thanks to the EFDP (Early Fault Detection and Prevention) algorithm, which is able to detect the short-circuit at its onset, exploiting analysis of the trend of the shunted current in relation to the current. The PR223EF release therefore offers two performances simultaneously which, until today, were antithetic: selectivity and trip rapidity.

Thanks to extremely rapid detection and elimination of the short-circuit, the MCCs equipped with this release are selective up to over 100 kA, and are not subject to any limits regarding the number of hierarchical levels of the installation. Trip rapidity, together with just as rapid transmission of the order to wait, allow a high number of circuit-breakers to be interlocked, making a global selectivity chain in the installation: by using the PR223EF no limitation in topological terms is introduced, with distances between interlocked circuit-breakers reaching up to 300 metres, thereby making the protection system highly flexible.

Zone selectivity is carried out by means of an interlocking protocol (Interlocking, IL). The connection is made by means of a simple screened telephone cable which connects the circuit-breakers fitted with the PR223EF. In the case of a fault, the circuit-breaker immediately to the supply side sends a locking signal to the hierarchically higher circuit-breaker by means of the bus and, before intervening, checks that a similar locking signal has not been reached by the circuit-breakers on the load side. The soundness of the system is controlled by a monitoring function of the interlock channel, guaranteeing the system a very high level of safety. All the protection functions can be programmed remotely using the dialogue function present on the release or locally by means of the PR010/T which can be connected to the serial port on the front of the PR223EF.

The release can be supplied from a 24 V DC auxiliary source or directly through the current transformers (self-supply). In the presence of an auxiliary power supply:

- the device implements the L, S, EF and G protection functions; if the EF is disabled by the user, function I is enabled
 - zone selectivity is implemented on the S, EF and G functions
- If it is under self-supply conditions:
- the release disables the EF, implementing the classic protection functions which also characterise the PR222/DS: L, S, I and G
 - zone selectivity is not enabled.

Connection of the interlock and auxiliary power supply is made by means of the X3 and X4 connectors located on the back of the release.





Circuit-breakers for advanced zone selectivity

General characteristics

For the neutral, it is possible to set the protection threshold of the functions to OFF, at 50% and at 100% that of the phase, by means of the dialogue function or PR010/T. Furthermore, pre-alarm and alarm signalling of protection L is available on the front of the release. The pre-alarm threshold value is $0.9 \times I_n$.

The PR223EF release, just like the PR223DS one, allows storage and display of information regarding a release trip. The information is saved permanently and only when there is an auxiliary power supply. Up to 10 trip events are recorded, which can be acquired by a supervision system using the Modbus protocol or can be displayed locally by means of the FDU or PR010/T unit.

The information recorded is:

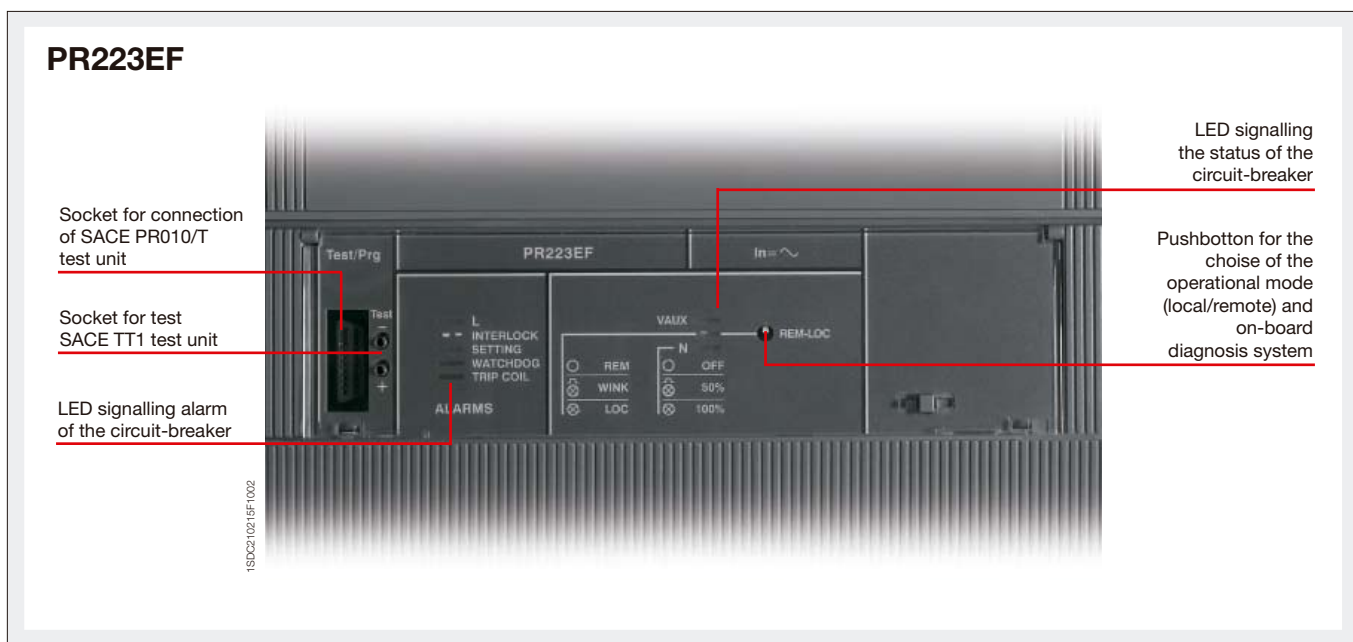
- Currents (L1, L2, L3, N) which caused opening
- Events
- States
- Alarms
- Trips
- Tripped protection
- Parameters of the tripped protection






Signals	By means of	Type
CB state	Dialogue	open, closed, tripped
Reason for opening	FDU, Dialogue, PR010/T	Protection Trip, Trip test
Number of operations	Dialogue	Total number of open/closed operations, number of manual openings, number of openings for protection trip, number openings for other reasons

When there is an auxiliary power supply, the PR223EF, fitted with the VM210 module and the FDU unit, makes it possible to display the installation currents, voltages, powers and energy.

The PR223EF release is an integral part of the circuit-breaker and is therefore not interchangeable with the other protection releases available on T4, T5 and on T6.

Apart from the above-mentioned technical advantages, use of circuit-breakers equipped with the PR223EF release means obtaining significant simplification of selection of the circuit-breakers inside the installation, which is only correlated with the current and breaking capacity. Furthermore, with EFDP zone selectivity, it is possible to reduce the size of the circuit-breakers and optimise cable and busbar sizing, with consequent reduction of plant costs.



Protection functions			
	Not excludable. Enabled with Vaux and with self-supply	$I_1=0.4...1xI_n$ step 0.01xIn	$t = 3...18s^{(1)}$ step 0.5 s
	Excludable. Enabled with Vaux and with self-supply Curve with energy constant ($I^2t = K$) or with time constant ($t = K$)	$I_2=0.6...10xI_n$ step 0.1xIn	$t = 0.05...0.5s$ step 0.01 s
	Enabled with Vaux		
	Excludable. Enabled with Vaux and with self-supply	$I_3=1.5...12xI_n^{(2)}$ step 0,1xIn	Istantaneous $\leq 25ms$
	Excludable. Enabled with Vaux and with self-supply	$I_4=0.2...1xI_n$ step 0.01xIn	$t = 0.1...0.8s$ step 0.01s
Interlock	Connection by means of screened telephone cable		
Zone selectivity interface with Emax releases	By means of IM210 device		
Application	250 A, 320 A, 400 A, 630 A, 800 A, 1000 A MCCs		
Power supply	24 Vcc (aux) – 0.2 x In (self-supply on one phase)		
Operating frequency	45-66 Hz		
Operating temperature	-25 °C...+70 °C		
Storage temperature	-40 °C...+80 °C		
Relative humidity	5%...98%		
Electromagnetic compatibility (LF and HF)	IEC 60947-2 Annex F and J		
Dialogue			
Protocol	Modbus RTU Standard		
Physical means	EIA RS485		
Measurement functions			
Currents	Displayed by FDU, Dialogue, PR010/T		
Voltages, powers, unbalanced phases, energies	Only with VM210. Displayed by FDU, Dialogue, PR010/T		

⁽¹⁾ The top value is limited to 12 s with the following circuit-breakers: T4-320, T5-630.
⁽²⁾ The top value is limited to 10 In with the following circuit-breakers: T4-320, T5-630, T6-1000.

Current transformers									
	In [A]	100	160	250	320	400	630	800	1000
PR223EF	T4	■	■	■	■				
	T5					■	■		
	T6						■	■	■
	L	40...100	64...160	100...250	128...320	160...400	252...630	320...800	400...1000
	S	60...1000	96...1600	150...2500	192...3200	240...4000	630...6300	800...8000	1000...10000
	I	150...1200	240...1920	375...3000	480...3200*	600...4800	945...7560	1200...9600	1500...12000
	G	20...100	32...160	50...250	64...320	80...400	126...630	160...800	200...1000

* For T5 480...3840



Circuit-breakers for motor protection

Electrical characteristics

1

		Tmax T2				Tmax T3		
Rated uninterrupted current, I_u	[A]	160				250		
Rated service current, I_n	[A]	1...100				100...200		
Poles	[No]	3				3		
Rated service voltage, U_e	(AC) 50-60 Hz	690				690		
	(DC)	500				500		
Rated impulse withstand voltage, U_{imp}	[kV]	8				8		
Rated insulation voltage, U_i	[V]	800				800		
Test voltage at industrial frequency for 1 min.	[V]	3000				3000		
Rated ultimate short-circuit breaking capacity, I_{cu}		N	S	H	L	N	S	
	(AC) 50-60 Hz 220/230 V	[kA]	65	85	100	120	50	85
	(AC) 50-60 Hz 380/415 V	[kA]	36	50	70	85	36	50
	(AC) 50-60 Hz 440 V	[kA]	30	45	55	75	25	40
	(AC) 50-60 Hz 500 V	[kA]	25	30	36	50	20	30
	(AC) 50-60 Hz 690 V	[kA]	6	7	8	10	5	8
	Rated service short-circuit breaking capacity, I_{cs}	(AC) 50-60 Hz 220/230 V	[%I _{cu}]	100%	100%	100%	100%	75%
(AC) 50-60 Hz 380/415 V		[%I _{cu}]	100%	100%	100%	75% (70 kA)	75%	50% (27 kA)
(AC) 50-60 Hz 440 V		[%I _{cu}]	100%	100%	100%	75%	75%	50%
(AC) 50-60 Hz 500 V		[%I _{cu}]	100%	100%	100%	75%	75%	50%
(AC) 50-60 Hz 690 V		[%I _{cu}]	100%	100%	100%	75%	75%	50%
Rated short-circuit making capacity, I_{cm}		(AC) 50-60 Hz 220/230 V	[kA]	143	187	220	264	105
	(AC) 50-60 Hz 380/415 V	[kA]	75.6	105	154	187	75.6	105
	(AC) 50-60 Hz 440 V	[kA]	63	94.5	121	165	52.5	84
	(AC) 50-60 Hz 500 V	[kA]	52.5	63	75.6	105	40	63
	(AC) 50-60 Hz 690 V	[kA]	9.2	11.9	13.6	17	7.7	13.6
	Opening time (415 V)	[ms]	3	3	3	3	7	6
Utilisation category (EN 60947-2)		A				A		
Isolation behaviour		■				■		
Reference Standard		IEC 60947-2				IEC 60947-2		
Protection against short-circuit	Magnetic only release	MA	■ (MF up to I _n 12.5 A)				■	
	Electronic release	PR221DS-I	■				-	
Integrated protection (IEC 60947-4-1)	Electronic release	PR222MP	-				-	
	Interchangeability		-				-	
Versions		F - P				F - P		
Terminals	fixed		F - FC Cu - FC CuAl - EF - ES - R - FC CuAl				F - FC Cu - FC CuAl - EF - ES - R - FC CuAl	
	plug-in		F - FC Cu - FC CuAl - EF - ES - R - FC CuAl				F - FC Cu - FC CuAl - EF - ES - R - FC CuAl	
	withdrawable		-				-	
Fixing on DIN rail		DIN EN 50022				DIN EN 50022		
Mechanical life	[No. operations]	25000				25000		
	[No. Hourly operations]	240				240		
Electrical life @ 415 V AC	[No. operations]	8000				8000		
	[No. Hourly operations]	120				120		
Basic dimensions - fixed version	W [mm]	90				105		
	D [mm]	70				70		
	H [mm]	130				150		
Weight	fixed	[kg]	1.1				1.5	
	plug-in	[kg]	1.5				2.7	
	withdrawable	[kg]	-				-	

KEY TO TERMINALS

F = Front
 EF = Front extended
 ES = Front extended spread
 FC Cu = Front for copper cables
 FC CuAl = Front for copper-aluminium cables
 R = Rear orientated
 MC = Multicable
 HR = Rear in horizontal flat bar
 VR = Rear in vertical flat bar

F = Fixed circuit-breaker
 P = Plug-in circuit-breaker
 W = Withdrawable circuit-breaker

(*) I_{cw} = 5 kA
 (1) 75% for T5 630
 (2) 50% for T5 630

Tmax T4					Tmax T5					Tmax T6			
250, 320					400, 630					800			
10...320					320, 400, 630					630			
3					3					3			
690					690					690			
750					750					750			
8					8					8			
1000					1000					1000			
3500					3500					3500			
N	S	H	L	V	N	S	H	L	V	N	S	H	L
70	85	100	200	300	70	85	100	200	300	70	85	100	200
36	50	70	120	200	36	50	70	120	200	36	50	70	100
30	40	65	100	180	30	40	65	100	180	30	45	50	80
25	30	50	85	150	25	30	50	85	150	25	35	50	65
20	25	40	70	80	20	25	40	70	80	20	22	25	30
100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%
100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%
100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%
100%	100%	100%	100%	100%	100%	100%	100%	100% ⁽¹⁾	100% ⁽²⁾	100%	100%	100%	75%
100%	100%	100%	100%	100%	100%	100%	100% ⁽¹⁾	100% ⁽²⁾	100% ⁽²⁾	75%	75%	75%	75%
154	187	220	440	660	154	187	220	440	660	154	187	220	440
75.6	105	154	264	440	75.6	105	154	264	440	75.6	105	154	220
63	84	143	220	396	63	84	143	220	396	63	94.5	105	176
52.5	63	105	187	330	52.5	63	105	187	330	52.5	73.5	105	143
40	52.5	84	154	176	40	52.5	84	154	176	40	46.2	52.5	63
5	5	5	5	5	6	6	6	6	6	10	9	8	7
A					B (400 A) ⁽¹⁾ - A (630 A)					B (630 A - 800 A) - A (1000 A)			
IEC 60947-2					IEC 60947-2					IEC 60947-2			
■					■					■			
■					■					■			
■					■					■			
■					■					■			
F - P - W					F - P - W					F - W			
F - FC Cu - FC CuAl - EF - ES - R - MC					F - FC Cu - FC CuAl - EF - ES - R					F - FC CuAl - EF - ES - R - RC			
EF - ES - R - FC Cu - FC CuAl					EF - ES - R - FC Cu - FC CuAl								
EF - ES - R - FC Cu - FC CuAl					EF - ES - R - FC Cu - FC CuAl					EF - HR - VR			
-					-								
20000					20000					20000			
240					120					120			
8000					7000					5000			
120					60					60			
105					140					210			
103.5					103.5					103.5			
205					205					268			
2.35					3.25					9.5			
3.6					5.15					-			
3.85					5.4					12.1			



Circuit-breakers for motor protection

Integrated protection: PR222MP

The Tmax T6 circuit-breakers in the three-pole version can be used to carry out motor protection. Specifically with T6, motor protection can take place by using the integrated PR222MP protection. This release has the same characteristics as the similar one mounted on T4 and T5 and therefore for further in-depth information please see the "Tmax – Moulded-case low voltage circuit-breakers up to 630 A" technical catalogue.



1

PR222MP

Protection R

Against motor block

Protection L

Against motor overload

Socket for connection of SACE PR010/T test unit

Socket for SACE TT1 test unit

Class

Class of motor starting according to the IEC 60947-4-1 Standards

Selection between:
 - PT⁽¹⁾ temperature sensor input
 - 1/0 generic input

Setting the back-up time

Setting the reset following trip:
 - manual
 - automatic

Protection I
 Against short-circuit with instantaneous trip

Protection U
 Against phase current unbalance or loss of phase

Setting the work methods

Man/Elt
 Release parametrisation methods

1SDC210005F1002

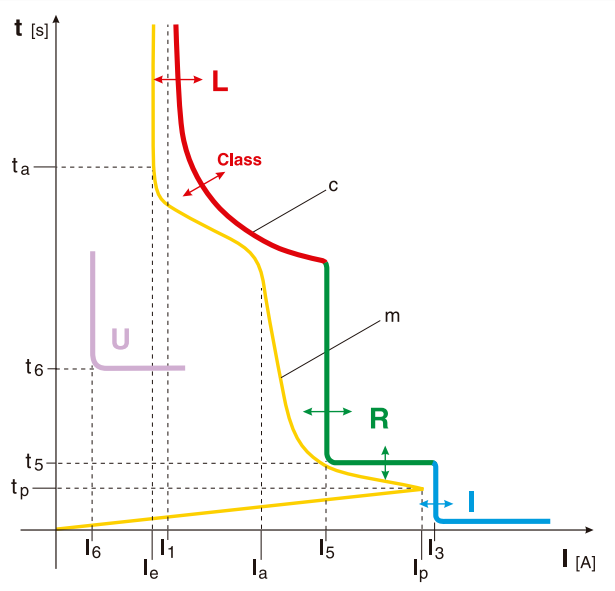
⁽¹⁾ A special input is available to connect a PTC temperature probe, inserted in the motor to be protected

PR222MP - Electronic overcurrent releases

Tmax T6

In [A]	630
T6 800 N,S,H,L	■
L I ₁ [A]	252...630
R I ₅ [A]	3...10 x I ₁
I I ₃ [A]	3780...8190
U I ₆ [A]	0.4 x I ₁

Typical operating characteristic of an asynchronous motor



I₁ = function L trip current
I₃ = function I trip current
I₅ = function R trip current
t₅ = function R trip time
I₆ = function U trip current
t₆ = function U trip time
I_e = rated service current of the motor
I_a = motor starting current
I_p = peak value of the sub-transient starting current
t_a = motor starting time
t_p = duration of the sub-transient starting phase
m = typical motor starting curve
c = example of trip curve of a motor protection circuit-breaker with electronic release
 The different curves of the functions, with numerous threshold and time settings, allow an overall trip curve to be drawn which is really close to the motor starting curve, thereby optimising its protection.



Circuit-breakers for applications at 1000 V

Electrical characteristics

The range of circuit-breakers for applications in direct and alternating current up to 1000 V is also to be found in the panorama of the Tmax proposals.

The typical sectors of use are mine installations, road and railway tunnels, traction and industrial applications in general.

The circuit-breakers are available in the three-pole and four-pole version with TMD or TMA adjustable thermomagnetic releases for use in direct and alternating current, or in the three-pole version with PR221DS and PR222DS/P electronic releases for applications in alternating current.

The dimensions of these circuit-breakers are the same as the standard ones and can be combined with all the accessories available for the Tmax series, except for residual current.

1

Circuit-breakers with electronic release for applications at 1000 V in AC

		Tmax T4		Tmax T5		Tmax T6	
Rated uninterrupted current, Iu	[A]	250		400, 630		630, 800	
Poles	[No]	3		3		3	
Rated service voltage, Ue	(AC) 50-60 Hz [V]	1000		1000		1000	
Rated impulse withstand voltage, Uimp	[kV]	8		8		8	
Rated insulation voltage, Ui	[V]	1000		1000		1000	
Test voltage at industrial frequency for 1 min.	[V]	3500		3500		3500	
Rated ultimate short-circuit breaking capacity, Icu		L	V^(*)	L	V^(*)	L	
(AC) 50-60 Hz 1000 V	[kA]	12	20	12	20	12	
Rated service short-circuit breaking capacity, Ics							
(AC) 50-60 Hz 1000 V	[kA]	12	12	10	10	6	
Rated short-circuit making capacity, Icm							
(AC) 50-60 Hz 1000 V	[kA]	24	40	24	40	24	
Utilisation category (EN 60947-2)		A		B (400 A) ^(*) - A (630A)		B	
Isolation behaviour		■		■		■	
Reference Standard		IEC 60947-2		IEC 60947-2		IEC 60947-2	
Electronic releases		■		■		■	
	PR221DS-LS	■		■		■	
	PR221DS-I	■		■		■	
	PR222DS-LSI	■		■		■	
	PR222DS-LSIG	■		■		■	
Interchangeability		■		■		■	
Versions		F		F		F	
Terminals fixed		FC Cu		FC Cu		F-FC CuAl-R	
Mechanical life							
	[No. operations]	20000		20000		20000	
	[No. Hourly operations]	240		120		120	
Basic dimensions - fixed version							
	3 poles	W [mm]	105	140	210		
		D [mm]	103.5	103.5	103.5		
		H [mm]	205	205	268		
Weight fixed	3 poles		2.35	3.25	9.5		

KEY TO TERMINALS
F = Front
FC Cu = Front for copper cables

(*) I_{cw} = 5 kA
F = Fixed circuit-breakers

(^(*)) The circuit-breaker can only be supplied from above.

PR221DS, PR222DS/P and PR222DS/PD electronic releases for applications up to 1000 V in AC

I _n [A]	630	800
T6	■	■

Circuit-breakers with thermomagnetic release for applications at 1000 V in AC/DC

		Tmax T4	Tmax T5	Tmax T6
Rated uninterrupted current, I_u	[A]	250	400, 630	630, 800
Poles	[No]	4	4	4
Rated service voltage, U_e	(AC) 50-60 Hz [V]	1000	1000	1000
Rated impulse withstand voltage, U_{imp}	[kV]	8	8	8
Rated insulation voltage, U_i	[V]	1000	1000	1000
Test voltage at industrial frequency for 1 min.	[V]	3500	3500	3500
Rated ultimate short-circuit breaking capacity, I_{cu}	V⁽¹⁾	V⁽¹⁾	V⁽¹⁾	L
(AC) 50-60 Hz 1000 V	[kA]	20	20	12
(DC) 1000 V	[kA]	40	40	40
Rated service short-circuit breaking capacity, I_{cs}				
(AC) 50-60 Hz 1000 V	[kA]	12	12	6
Rated short-circuit making capacity, I_{cm}				
(AC) 50-60 Hz 1000 V	[kA]	40	40	24
Utilisation category (EN 60947-2)		A	B (400 A)* - A (630 A)	B
Isolation behaviour		■	■	■
Reference Standard		IEC 60947-2	IEC 60947-2	IEC 60947-2
Thermomagnetic releases	TMD	■	-	-
	TMA	■	■ (up to 500 A)	■
Interchangeability		■	-	■
Versions		F	F	F
Terminals fixed		FC Cu	FC Cu	F-FC CuAl-R
Mechanical life	[No. operations]	20000	20000	20000
	[No. Hourly operations]	240	120	120
Basic dimensions - fixed version	4 poles			
	W [mm]	140	184	280
	D [mm]	103.5	103.5	103.5
	H [mm]	205	205	268
Weight fixed	4 poles	3.05	4.15	12

KEY TO TERMINALS

F = Front



FC Cu = Front for copper cables

(*) I_{cu} = 5 kA

F = Fixed circuit-breakers

⁽¹⁾ The circuit-breaker can only be supplied from above.

Thermomagnetic releases for applications at 1000 V in AC/DC - TMA

	I _n [A]	630	800
	Neutral [A] - 100%	400	500
I ₁ = 0.7...1 x I _n	T6	■	■
	I ₃ = 5...10 x I _n [A]	3150...6300	4000...8000



Switch-disconnectors

Electrical characteristics

The Tmax switch-disconnectors are derived from the corresponding circuit-breakers, of which they keep their overall dimensions, versions, fixing systems and the possibility of mounting accessories unaltered. This version only differs from the circuit-breakers in the absence of the protection releases. The switch-disconnectors are characterised by a rated voltage of 690 V in alternating current and up to 750 V in direct current.

1

			Tmax T1D	
Traditional thermal current, I_{th}		[A]	160	
Rated service current in category AC23, I_e		[A]	125	
Poles		[Nr.]	3/4	
Rated service current, U_e	(AC) 50-60 Hz	[V]	690	
	(DC)	[V]	500	
Rated impulse withstand voltage, U_{imp}		[kV]	8	
Rated insulation voltage, U_i		[V]	800	
Test voltage at industrial frequency for 1 min.		[V]	3000	
Rated short-circuit making capacity, I_{cm}	(min) only isolator	[kA]	2.8	
	(max) with circuit-breaker on supply side ⁽¹⁾	[kA]	187	
Rated short-time withstand current for 1s, I_{cw}		[kA]	2	
Isolation behaviour			■	
Reference Standard			IEC 60947-3	
Versions			F	
Terminals			FCCu - EF - FCCuAl	
Mechanical life		[No. operations]	25000	
		[No. Hourly operations]	120	
Basic dimensions - fixed version	3 poles	W [mm]	76	
	4 poles	W [mm]	102	
		H [mm]	130	
		D [mm]	70	
Weight	fixed	3/4 poles	[kg]	0.9/1.2
	plu-in	3/4 poles	[kg]	-
	withdrawable	3/4 poles	[kg]	-

⁽¹⁾ The maximal possible value according to ABB SACE Coordination Tables.

⁽²⁾ 320 A in AC22

⁽³⁾ 630 A in AC22

⁽⁴⁾ 1000 A in AC22

Coordination with the circuit-breakers [380/415 V AC]												
	T6 630				T6 800				T6 1000			
	N	S	H	L	N	S	H	L	N	S	H	L
I _{cu} [kA]	36	50	70	100	36	50	70	100	36	50	70	100
T6D 630	36	50	70	100								
T6D 800					36	50	70	100				
T6D 1000									36	50	70	100

Applications

They can be used as general sub-switchgear circuit-breakers, as switching and isolating parts for lines, busbars or groups of apparatus, or as bus-ties. They can be part of general isolation devices of groups of machines or of assemblies for switching and protecting a motor.

Isolation

The main function carried out by this apparatus consists of isolating the circuit they are inserted in. Once they are open, the contacts are at a distance which prevents an arc striking, respecting the prescriptions of the standards regarding isolation behaviour. The position of the operating lever corresponds with certainty to the one of the contacts (positive operation).

Tmax T3D	Tmax T4D	Tmax T5D	Tmax T6D
250	250/320	400/630	630/800/1000
200	250/250 ⁽²⁾	400/400 ⁽³⁾	630/800/800 ⁽⁴⁾
3/4	3/4	3/4	3/4
690	690	690	690
500	750	750	750
8	8	8	8
800	800	800	1000
3000	3000	3000	3500
5.3	5.3	11	30
105	440	440	440
3.6	3.6	6	15
■	■	■	■
IEC 60947-3	IEC 60947-3	IEC 60947-3	IEC 60947-3
F - P	F - P - W	F - P - W	F-W
F-FCCuAl-FCCu-EF-ES-R	F-FCCuAl-FCCu-EF-ES-R-MC-HR-VR	F-FCCuAl-FCCu-EF-ES-R-HR-VR	F-FC CuAl-EF-ES-R-RC
25000	20000	20000	20000
120	120	120	120
105	105	140	210
140	140	184	280
150	205	205	103.5
70	103.5	103.5	268
1.5/2	2.35/3.05	3.25/4.15	9.5/12
2.1/3.7	3.6/4.65	5.15/6.65	–
–	3.85/4.9	5.4/6.9	12.1/15.1

Protection

Each switch-disconnector must be protected on the supply side by a coordinated device which safeguards it against short-circuits. The coordination table given in the previous page indicates the Tmax circuit-breaker which can carry out the protection function for each switch-disconnector. This is always apparatus of a corresponding or smaller size than that of the switch-disconnector.

Making capacity

The making capacity I_{cm} is a considerably important performance since a switch-disconnector must be able to support the dynamic, thermal and current stresses which can occur during closing, up to the short-circuit closing conditions.

Withstand in closed position

This identifies the capacity to keep the closed position for short-time overcurrents. It is a significant parameter which qualifies the performances of these pieces of apparatus.



Index

Accessories in common with the other sizes in the Tmax family.....	2/3
Versions and types	2/3
Connection terminals	2/4
Remote control	2/7
Operating mechanisms and locks.....	2/8
Accessories for electronic releases.....	2/9



Accessories

The high level of standardisation characterising the Tmax range also covers the accessories of the T6 size: most of the accessories, which can be mounted on T6, are the same ones available for the smaller sizes. The connection terminals, which can be mounted on T6, are the same as those available on S6, except for the rear terminals, which abandon their cylindrical shape to become uniform with T4-T5 and therefore be orientated flat. Furthermore specific accessories for this size complete the range of accessories for T6.



Accessories in common with other sizes in the Tmax family

Description	Abbreviation	T1	T2	T3	T4	T5	T6
Shunt opening release	SOR - SOR-C				■	■	■
Shunt opening release with permanent operation	PS-SOR - PS-SOR-C				■	■	■
Undervoltage release	UVR - UVR-C				■	■	■
Time delay device for undervoltage release	UVD	■	■	■	■	■	■
Plug socket connectors	-	■	■	■	■	■	■
Loose cable Kit	-	■	■	■	■	■	■
Cabled auxiliary signalling contacts	AUX-C				■	■	■
Auxiliary signalling contacts	AUX	■	■	■	■	■	■
Contact for signalling SA relay trip	AUX-SA						■
Auxiliary position contacts	AUP				■	■	■
Early auxiliary contacts	AUE						■
Adapters	ADP				■	■	■
Testing extensions	-				■	■	■
Front for locks	FLD						■
Switchgear residual current release	RCQ				■	■	■
Test and configuration unit	PR010/T				■	■	■
Signalling unit	PR021/K				■	■	■
EP010	FBP				■	■	■
ATS010 automatic changeover unit	ATS				■	■	■

Caption: For further in-depth technical information about these accessories, please see the "Tmax - Low voltage moulded-case circuit-breakers up to 630A" technical catalogue.

Versions and types

The Tmax T6 circuit-breakers are available in the fixed version with front terminals and also in the withdrawable version for the 630 A and 800 A frames. For the latter version appropriate conversion kits from fixed to moving part of withdrawable are available. This makes management of the product, its versions and warehouse stocks highly flexible as a whole.

In any case, it is always possible to ask for the circuit-breaker in the version desired completely mounted in the factory by ordering, on the same order form line, the fixed circuit-breaker and conversion kit to which the fixed part will then have to be added. By using this ordering method, the front will be loaded automatically, otherwise it will have to be entered manually.



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Version available

	F Fixed	W Withdrawable
T6 630	■	■
T6 800	■	■
T6 1000	■	



Accessories

Connection terminals

The circuit-breaker Tmax T6 in the basic version is supplied with front terminals (F). Furthermore, different types of terminals are available which can be combined with each other in various ways (top of one type, bottom of a different type), allowing the circuit-breaker to be connected to the plant in the most suitable way in relation to installation requirements.

A distinction can be made between:

- **front terminals**, which allow cables or busbars to be connected acting directly from the front of the circuit-breaker
- **rear orientated terminals**, which allow installation of the circuit-breakers in switchgear with rear access to both the cable and busbar connections.

Terminals are available for direct connection of bare copper or aluminium cables and terminals for connection of busbars or cables terminated with cable terminals. The fixed parts can have EF, HR or VR terminals.

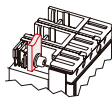
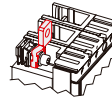
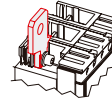
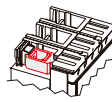
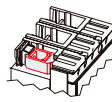
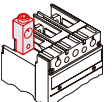
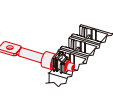
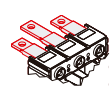
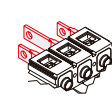
For each type of terminal, the information needed to make the connections is summarised in the table below. For connection with bare cables, the minimum and maximum cable cross-sections which can be tightened in the terminals are indicated, as well as the types of cables (rigid or flexible) and the diameter of the terminal. Flat terminals of different dimensions and composition are recommended for connections with busbars. The torque values to apply to the terminal tightening screws of the terminals for cables and to the screws used to connect the busbars to the flat terminals.

The circuit-breakers can be ordered complete with the required terminals (pre-assembled in the factory), associating the standard version code of the circuit-breaker with those of the terminal kits, or the terminals can be ordered individually in packs of 3 - 4 - 6 or 8 pieces.

To receive the circuit-breaker with mixed terminals, the two terminal half-kits must be specified in the order, indicating the one to be mounted at the top as the first half-kit and, after that, the one to be mounted at the bottom. Moreover, it is very important to remember that if the top terminals are the same as the bottom ones, it is compulsory to order the complete kit (6 or 8 pieces) and not the two half-kits.

To complete the range, high and low terminal covers, protections for high terminal covers and phase separator partitions are also available.

All the terminals which can be mounted on T6, with the sole exception of the rear terminals and of the front terminals, are the same as those mounted on Isomax S6.

	F	EF	ES	FC CuAl	FC CuAl	RC	R	HR	VR
									
	Front terminals	Front extended terminals	Front extended spread terminals	Front terminals for CuAl cables	Front terminals for CuAl cables ⁽¹⁾	Rear terminals for CuAl cables	Rear terminals	Rear flat horizontal terminals	Rear flat vertical terminals
T6 630	F ⁽²⁾	F - W	F	F		F	F	W	W
T6 800	F ⁽²⁾	F - W	F		F	F	F	W	W
T6 1000					F ⁽³⁾		F ⁽³⁾		

⁽¹⁾ House externally
⁽²⁾ Standard supply
⁽³⁾ The T6 1000 A circuit-breaker must mount a type of terminals among those shown in the table
 F = Fixed
 W = Withdrawable

Terminals

Front terminals - F



Allow busbars or cables with cable terminal to be connected

Type	Version	Pieces	Busbars/Cable terminal (mm)				Tightening (Nm)	Terminal covers		Phase separators
			L	H	P	Ø		top	bottom	
T6 630	F	2	40	12	5	2 x 7	9	R	R	R
T6 800	F	2	50	12	5	2 x 7	9	R	R	R

Front extended terminals - EF



Allow busbars or cables with cable terminal to be connected

Type	Version	Pieces	Busbars (mm)			Cable terminal (mm)		Tightening (Nm)		Terminal covers		Phase separators
			L	H	Ø	L	Ø	A	B ⁽¹⁾	top	bottom	
T6 630	F - W	2	40	5	11 ⁽²⁾	40	11 ⁽²⁾	9	18	-	R	R ⁽²⁾
T6 800	F - W	2	50	5	14	50	14	9	30	-	R	R ⁽²⁾

⁽¹⁾ use screws with class 4.8 resistance (not supplied)

⁽²⁾ 14 mm for W

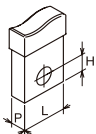
Front extended spread terminals - ES



Allow busbars or cables with cable terminal to be connected

Type	Version	Pieces	Busbars (mm)			Cable terminal (mm)		Tightening (Nm)		Terminal covers		Phase separators
			L	H	Ø	L	Ø	A	B ⁽¹⁾	top	bottom	
T6 630	F	1	80	5	3 x 13	3 x 45	13	9	30	-	-	-
T6 800	F	1	80	8	3 x 13	3 x 45	13	9	30	-	-	-
T6 1000	F	1	80	8	3 x 13	3 x 45	13	9	30	-	-	-

⁽¹⁾ use screws with class 4.8 resistance (not supplied)



A = Tightening the terminal onto the circuit-breaker

B = Tightening the cable/busbar onto the terminal

R = On request

S = Standard

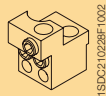
Pieces = number of busbars, cables or cable terminals



Accessories

Connection terminals

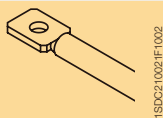
Front terminals for copper/aluminium cables - FC CuAl



Allow bare copper or aluminium cables to be connected directly to the circuit-breaker (solid aluminium cables cannot be used)

Type	Mounting	Version	Pieces	Cable (mm ²)	Tightening (Nm)		Ø clamp (mm)	Terminal covers		Phase separators
					A	B		top	bottom	
T6 630	standard	F	2	2 x 240	5	31	21.5	R	-	R
T6 800	external	F	3	3 x 185	9	43	19	S	-	-
T6 1000	external	F	4	4 x 150	9	43	19	S	-	-

Rear orientated terminals - R

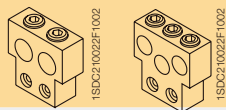


Allow busbars or cables with cable terminal to be connected on the rear. They can be installed in 4 different positions to facilitate cable/busbar connection

Type	Version	Pieces	Busbars (mm)			Tightening (Nm)		Terminal covers		Phase separators
			L	H	Ø	A	B ⁽¹⁾	top	bottom	
T6 630	F	2	40	5	14	18	30	-	S	-
T6 800	F	2	50	5	14	18	30	-	S	-
T6 1000	F	2	50	6	14	18	30	-	S	-

⁽¹⁾ use screws with class 4.8 resistance (not supplied)

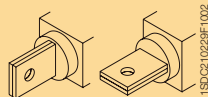
Rear terminals for copper/aluminium cables - RC CuAl



Allow bare copper or aluminium cables to be connected directly to the circuit-breaker

Type	Version	Pieces	Tightening (Nm)		Ø clamp (mm)	Terminal covers	
			A	B		top	bottom
T6 630	F	2	9	43	21	S	-
T6 800	F	3	9	31	17.5	S	-

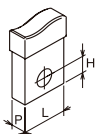
Rear flat terminals for fixed parts - HR/VR



Allow busbars or cables with cable terminal to be connected on the rear. There are rear horizontal or vertical terminals

Type	Version	Pieces	Busbars (mm)			Cable terminal (mm)		Tightening (Nm)	Phase separators
			L	H	Ø	L	Ø		
T6 630	W	2	40	5	14	40	14	30	-
T6 800	W	2	50	5	14	50	14	30	-

⁽¹⁾ use screws with class 4.8 resistance (not supplied)



- A = Tightening the terminal onto the circuit-breaker
- B = Tightening the cable/busbar onto the terminal
- R = On request
- S = Standard
- Pieces = number of busbars, cables or cable terminals

Accessories

Remote control



Stored energy motor operator for T6 - MOE and MOE-E

With the stored energy motor operator, it is possible to control both opening and closing of the circuit-breaker on which it is installed. During opening of the circuit-breaker, the spring system is recharged automatically: the stored energy is exploited in this way to close the circuit-breaker.

The motor operator is always supplied with socket-plug connectors with 1m long cables and is always fitted with a padlock. The connectors, once inserted in the special slot on the left-hand side of the circuit-breaker, extend in relation to the outline of the circuit-breaker itself.

The motor operator can be fitted both with a key lock in the open position (with the same MOL-S keys for groups of circuit-breakers or different MOL-D keys) and with an MOL-M key lock against manual operation: in the former case, the lock in the open position is both of electrical and mechanical type, in the latter case, only of mechanical type, i.e. only closing from the front of the circuit-breaker (remote closing is allowed).

In the case of interlocked circuit-breakers, for safety reasons the key lock against manual operation is required. The motor operator is always fitted with an auxiliary contact to signal "auto" or "manual" (not on changeover).

On request, it can also be fitted with an AUX-MO contact (on changeover), which provides a signal of its state of service: "auto" (remote control of the circuit-breaker) or "manual".

If the circuit-breaker is fitted with the PR222DS/PD or PR223 electronic release, instead of the MOE motor operator, it is possible to use the MOE-E motor operator: for its use, the circuit-breaker must also be fitted with the AUX-E auxiliary contacts.

The MOE-E allows use of the digital signals coming from the supervision and control system, by means of the PR222DS/PD release and the AUX-E contacts, and to convert these into power signals to operate the motor operator. All the characteristics indicated above for the MOE motor operator are also valid for the MOE-E.

The table gives the power supply voltage values U_n [V].

MOE and MOE-E

Rated voltage, U_n	Tmax T6	
	AC [V]	DC [V]
	-	24
	-	48...60
	110...125	110...125
	220...250	220...250
	380	-
Operating voltage [% U_n]	85...110	85...110
Power consumption on inrush P_s	≤ 400 VA	≤ 400 W
Power consumption in service P_c	≤ 150 VA	≤ 150 W
Duration	opening [s]	3
	closing [s]	< 0,1
	resetting [s]	5
Mechanical life [nr. operations]	10000	
Degree of protection, on the front	IP30	
Minimum opening and closing control time [ms]	≥ 150	





Accessories

Operating mechanisms and locks



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Rotary handle operating mechanism - RHD/RHE

The Tmax T6 circuit-breaker can be fitted with a rotary handle operating mechanism. The technical characteristics are the same as the rotary operating mechanisms for T4-T5, with exception of the handle of the direct rotary handle operating mechanism which is distinguished by an articulated joint so that the switchgear door can be opened in the case of an emergency.

Locks

The following table indicates the locks available on T6, T5 and T4 (common accessories).

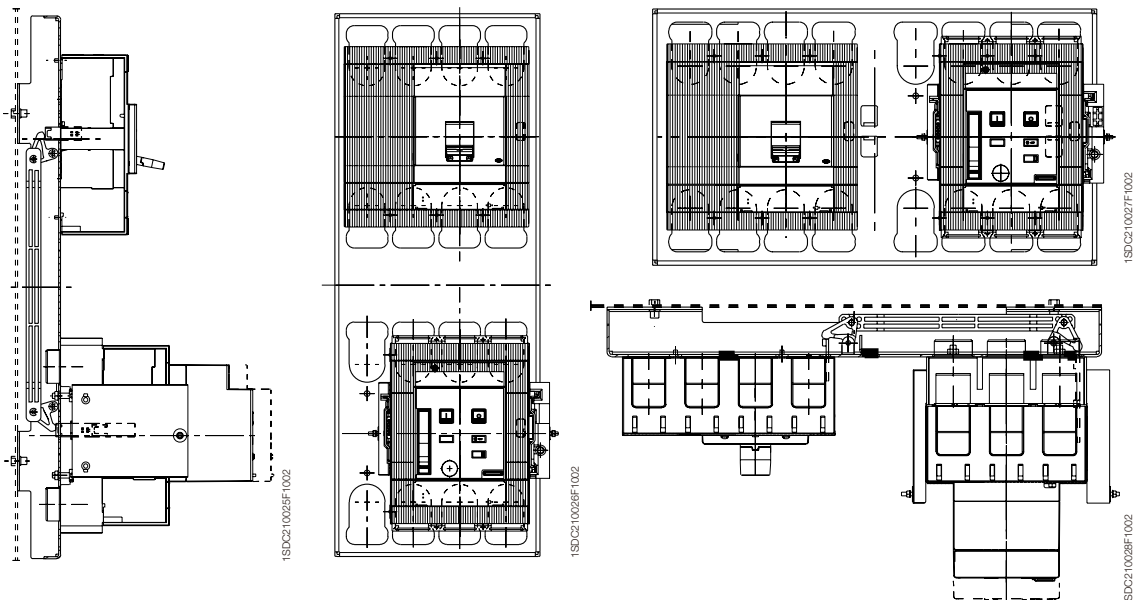
		T4	T5	T6
FDL	Front for lever operating mechanism			■
KLF-D and KLF-S	Key lock for front and rotary handle			■
KLF-FP and PLL FP	Lock in open position for fixed parts	■	■	■
MOL-D and MOL-S	Key lock in open position for MOE and MOE-E	■	■	■
MOL-M	Key lock preventing manual operation for MOE and MOE-E			■

Caption: For further in-depth technical information about these accessories, please see the "Tmax - Low voltage moulded-case circuit-breakers up to 630A" technical catalogue.

Mechanical interlock between two circuit-breakers

This allows installation of two circuit-breakers on a single support and, by means of special lever mechanisms, makes the mechanically interdependent. It prevents operation in parallel of two power supply sources (e.g.: normal - emergency). It consists of a kit of levers and assembly accessories and of a metal support. The circuit-breakers and any control accessories must be ordered separately. The mechanical interlock available for T6 in the version for side-by-side circuit-breakers and for stacked circuit-breakers is the same as the one used to interlock Isomax S6.

To be able to receive the circuit-breakers already mounted on the interlock plate, the code "1SDA050093R1" must be specified as the accessory of the second circuit-breaker (or fixed part) which is to be interlocked.





Accessories

Accessories for electronic releases

Connectors

The X3 and X4 connectors allow connection of the electronic with units or components of external plants. In fact, they are used to make the alarm signal of L, connection of the external neutral, connection to the PR020/K signalling unit, to the PR212/CI contactor control unit or to the PTC motor temperature sensor, available outside, and allow two-way communication between the circuit-breaker fitted with dialogue and the outside or vice versa.

Both the connectors are available both for fixed version circuit-breakers and for plug-in or withdrawable version circuit-breakers.

Connector	Function	Release
X3	PR021/K	PR222DS/PD, PR222MP, PR223DS and PR223EF
	L alarm signalling	PR222DS/P, PR222DS/PD, PR222MP, PR223DS and PR223EF
	Auxiliary power supply	PR222DS/PD, PR223DS and PR223EF
	IM210	PR223EF
	EP 010	PR222DS/PD, PR223DS and PR223EF
X4	External neutral	PR222DS/P, PR222DS/PD, PR222MP, PR223DS and PR223EF
	VM210	PR223DS and PR223EF
	IM210	PR223EF
	PR212/CI	PR222MP
	PTC	PR222MP

2

CT for external neutral

This is applied to the external neutral conductor and makes it possible to realise protection G against earth faults with three-pole circuit-breakers and external neutral.

The circuit-breaker must be fitted with the PR222DS/P, PR222DS/PD and PR223DS releases. The transformer must be connected to the release by means of the specific X4 connectors.

ext. CT	T6 630	T6 800	T6 1000
	[A]	[A]	[A]
	630	800	1000

Interface from front of HMI030 panel

This accessory, suitable for all protection releases, is designed for the installation on the front side of the switchboard. It consists of a graphic display where all the measurements and alarms/events of the release are shown. The user can browse the measurements by using the navigation pushbuttons. Thanks to the high precision level the device can replace the traditional instrumentation, without the need for current/voltage transformers. The HMI030 unit is connected directly to the protection release via a serial line and requires only a 24 V DC power supply.



Accessories

Accessories for electronic releases



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VM210

The VM210 accessory combined with the PR223EF and PR223DS protection devices is able to provide the various measurements of the electrical values of the installation.

VM210 Conditions of use	Values
Power supply	24 V DC±20%
Operating Temp.	-25 °C...+70 °C
Relative humidity	5%...98%
Certifications	
Product	IEC 60068
Electromagnetic compatibility	IEC 61010-1

The VM210 device is able to provide the measurements of up to 5 electronic releases. The connection distance between the module and the release is a maximum of 15 m. Anyway for distances over 1 m a screened multi-core connection cable must be used.

Front display unit FDU

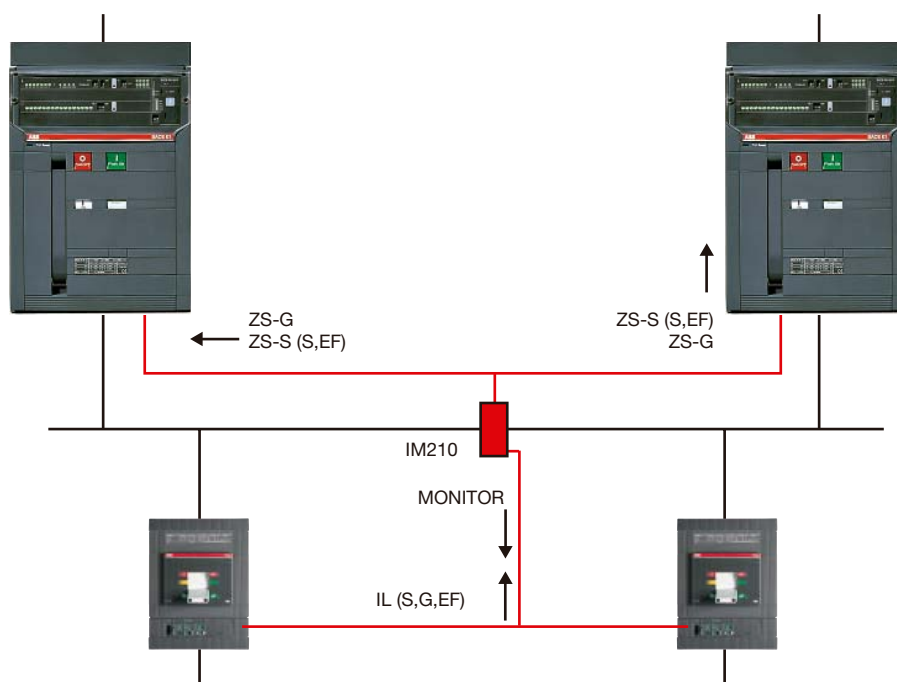
The front display for T6 has the same characteristics as the same device available on T4 and T5. When combined with the VM210 device, the FDU for T6 is able to display a wide range of measurements.

Measurements	With N	Without N
Effective current values	I_1, I_2, I_3, I_n	
Effective voltage values	$V_1, V_2, V_3, V_{12}, V_{23}, V_{31}$	V_{12}, V_{23}, V_{31}
Apparent powers	S_{tot}, S_1, S_2, S_3	S_{tot}
Active powers	P_{tot}, P_1, P_2, P_3	P_{tot}
Reactive powers	Q_{tot}, Q_1, Q_2, Q_3	Q_{tot}
Power factors	$\cos\varphi$	$\cos\varphi$
Active energy	■	■
Reactive energy	■	■
Apparent energy	■	■
Frequency	■	■
Peak factors	n	n
Circuit-breaker state		
Open/closed		
Protection function parameters	■	■
Remote / local control		
Trip warnings and alarms (only with Vaux)	■	■
Phase 1, 2, 3 and N trip current	■	■
Protection tripped (L, S, EF ⁽¹⁾ , I, G)	■	■
Current levels and trip times (L, S, EF ⁽¹⁾ , I, G)	■	■

⁽¹⁾ only PR223EF

IM210

The IM210 interlock module guarantees extension of the zone selectivity from the PR223EF of the Tmax range to the Emax PR122 and PR123 electronic releases. The device makes interfacing between protocol IL of the PR223EF and the zone selectivity ZS of the PR122 and PR123 devices possible. In particular:



IM210 Conditions of use	Values
Power supply	24 V DC \pm 20%
Operating Temp.	-25 °C...+70 °C
Relative humidity	5%...98%
Certifications	
Environmental tests	IEC 60068
Electromagnetic compatibility	IEC 61000

SD-TestBus 2

SD-TestBus 2 is the ABB SACE commissioning and diagnostic software for all Modbus RTU devices. It can be used during system startup, or to troubleshoot an installed network.

SD-TestBus 2 automatically scans the RS-485 bus, detects all connected devices and checks their communication settings. All possible combination of device address, parity and baud rate are checked.

Index

Characteristic curves

Trip curves for distribution

Circuit-breakers with thermomagnetic releases.....	3/2
Circuit-breakers with electronic releases	3/3

Trip curves for advanced zone selectivity

Circuit-breakers with electronic release PR223EF	3/6
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Trip curves for motor protection

Circuit-breakers with electronic release PR221DS-I.....	3/10
Circuit-breakers with electronic release PR222MP.....	3/11

Specific let-through energy curves

230 V	3/13
400-440 V.....	3/13
500 V	3/14
690 V	3/14

Current-limiting curves

230 V	3/15
400-440 V.....	3/15
500 V	3/16
690 V	3/16

Technical information

Temperature performances

Circuit-breakers with magnetic only, electronic releases and switch-disconnectors	3/17
Circuit-breakers with thermomagnetic releases	3/19
Dissipated powers	3/19

Special applications

Use of the apparatus at 16 2/3Hz	3/20
Use of the apparatus in direct current	3/20
Application example of advanced zone selectivity with PR223EF	3/21



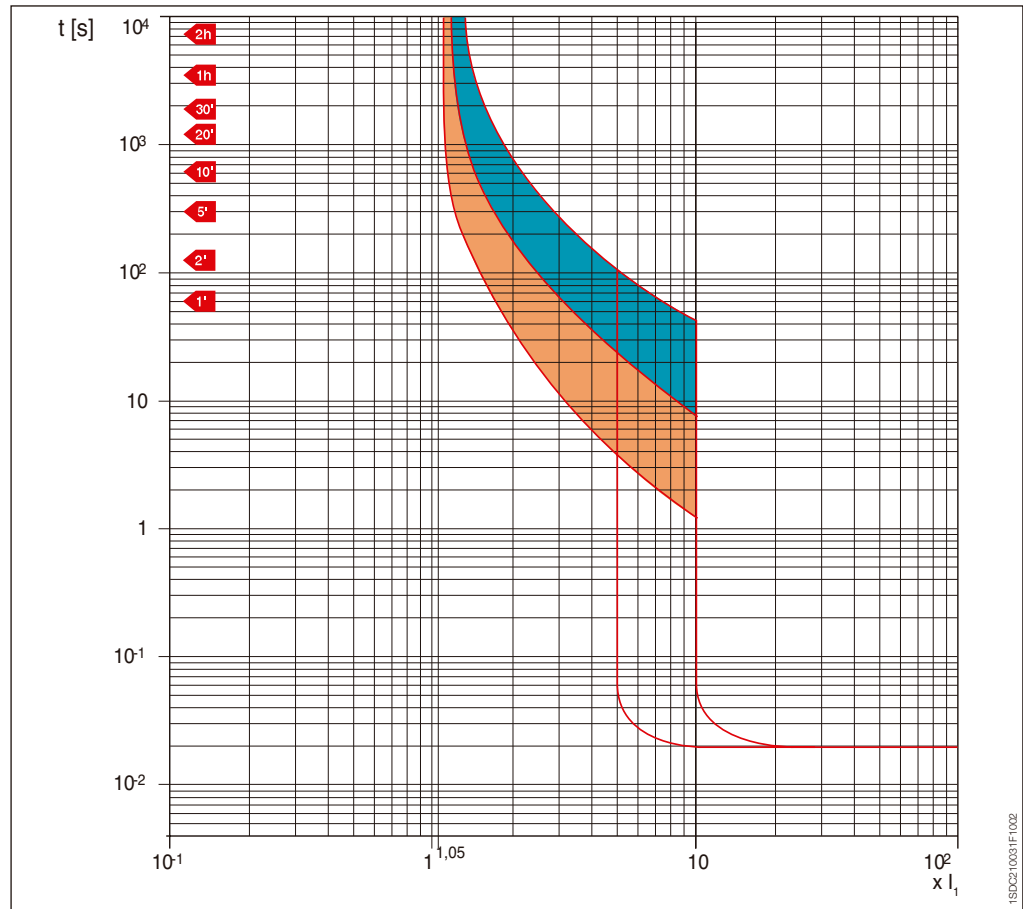
Trip curves for distribution

Circuit-breakers with thermomagnetic releases

T6 630

TMA

$I_n = 630 \text{ A}$



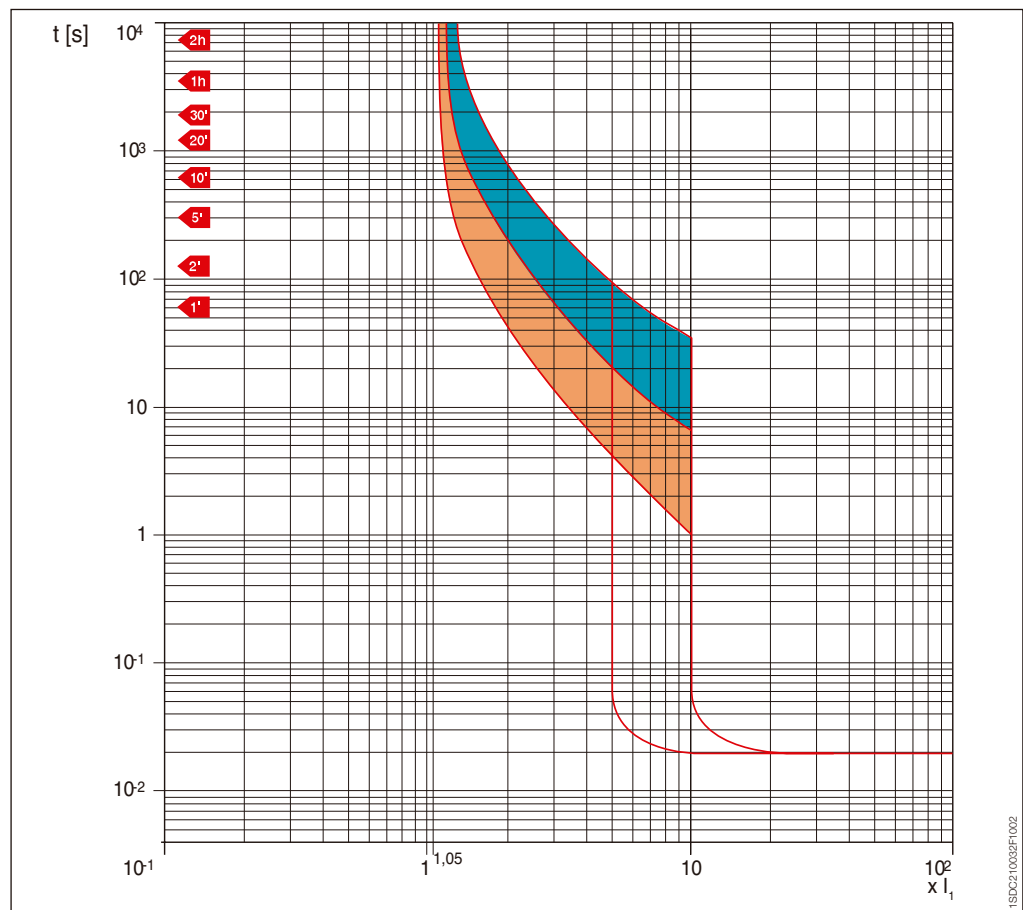
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T6 800

TMA

$I_n = 800 \text{ A}$



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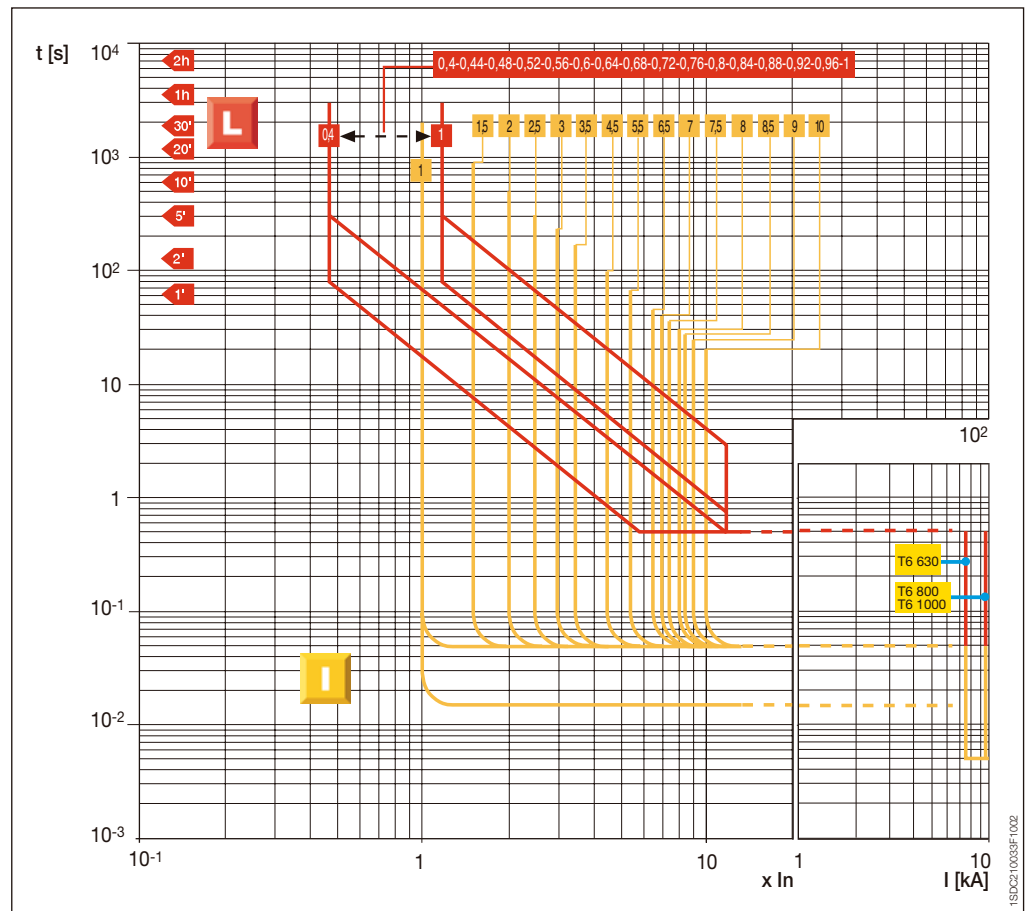
Trip curves for distribution

Circuit-breakers with electronic releases

T6 630/800/1000

PR221DS

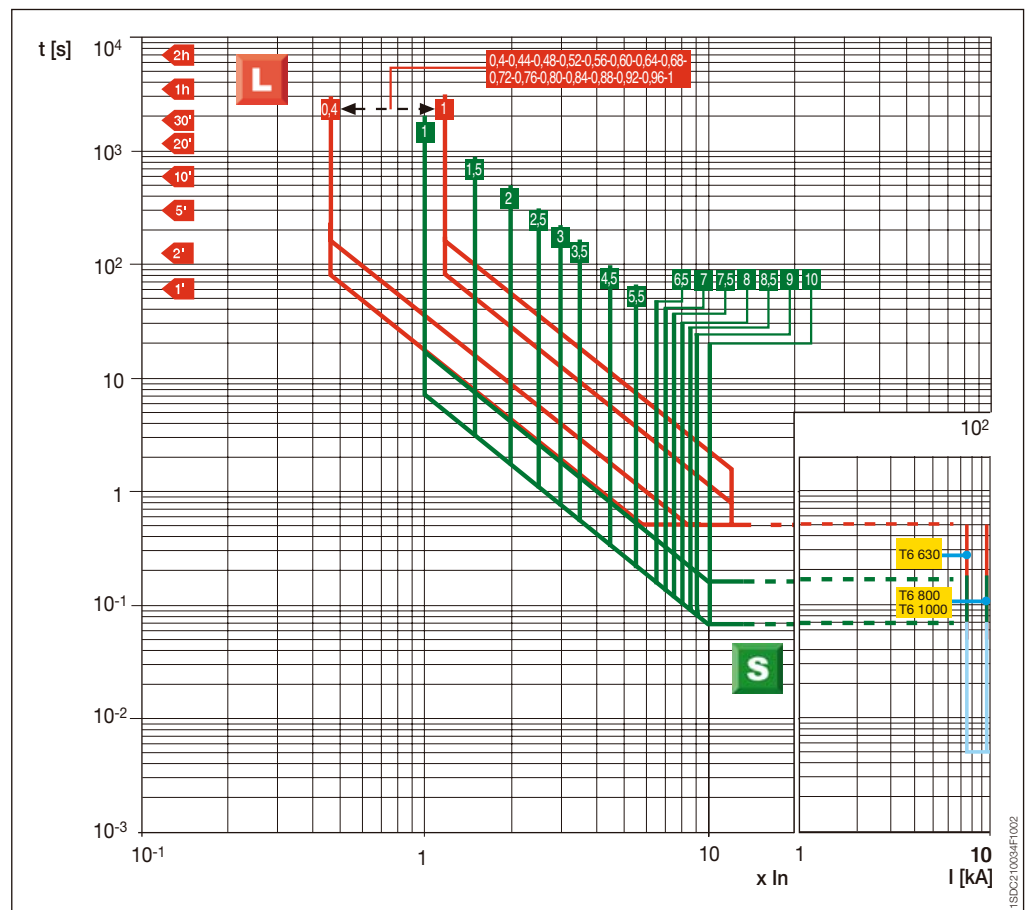
Functions L-I



T6 630/800/1000

PR221DS

Functions L-S





Trip curves for distribution

Circuit-breakers with electronic releases

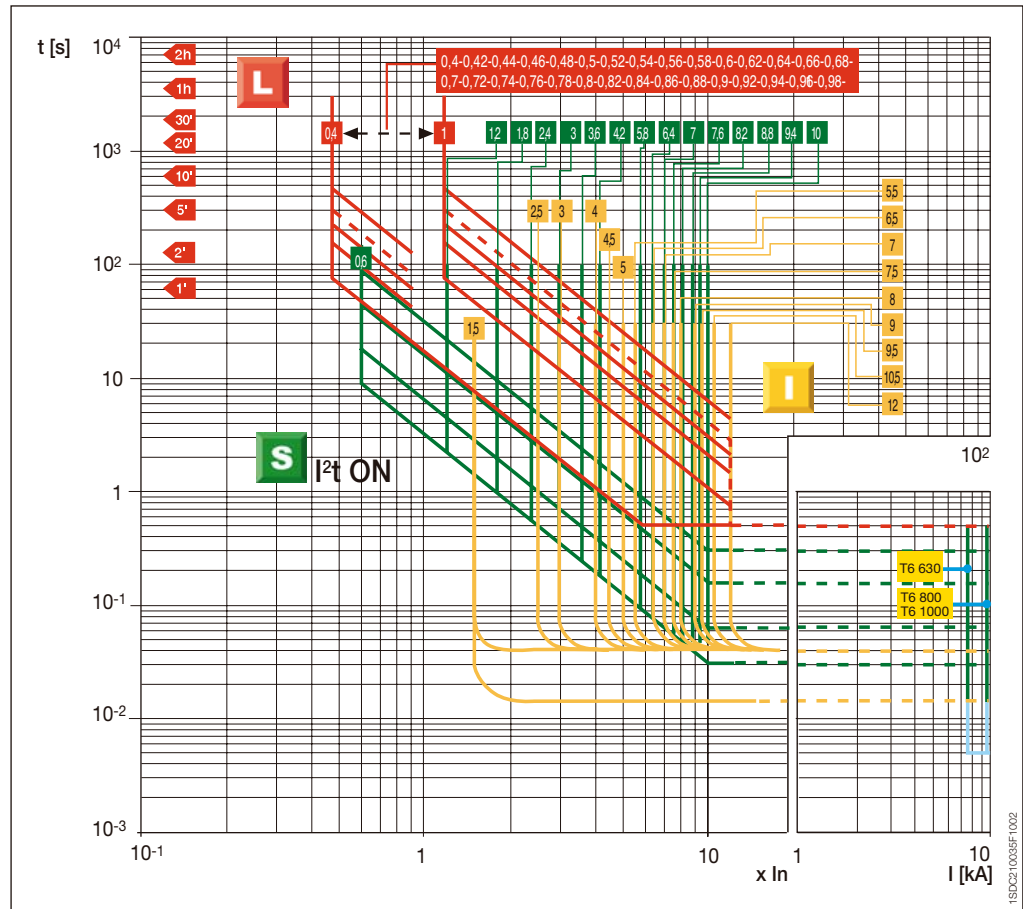
T6 630/800/1000

PR222DS/P PR222DS/PD and PR223DS

Functions L-S-I
(I²t const = ON)

Note

- (1) The electronic settings are available for the PR223DS.
- (2) For T6 In = 1000 A with PR222, the available electronic settings for t1 are: 3s, 6s, 12s and 18s.
- (3) For T6 In = 1000 A ⇒ I_{g,max} = 10 x In.



3

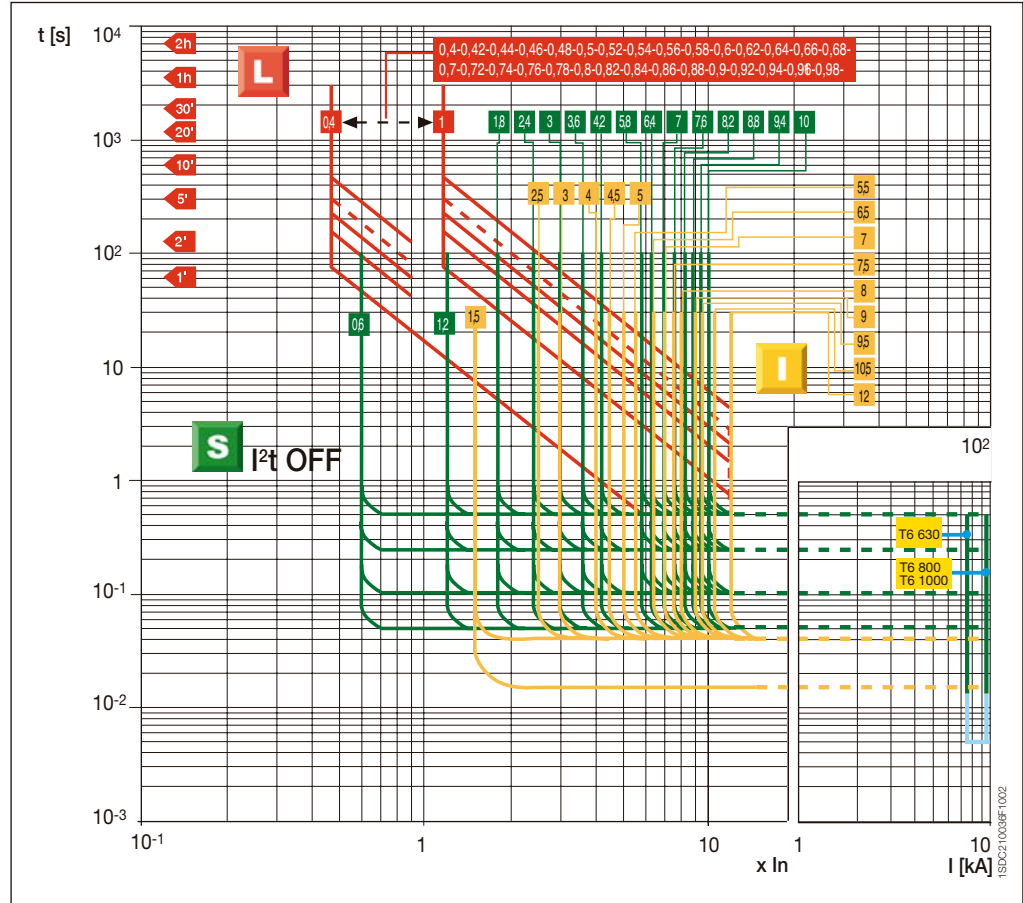
T6 630/800/1000

PR222DS/P PR222DS/PD and PR223DS

Functions L-S-I
(I²t const = OFF)

Note

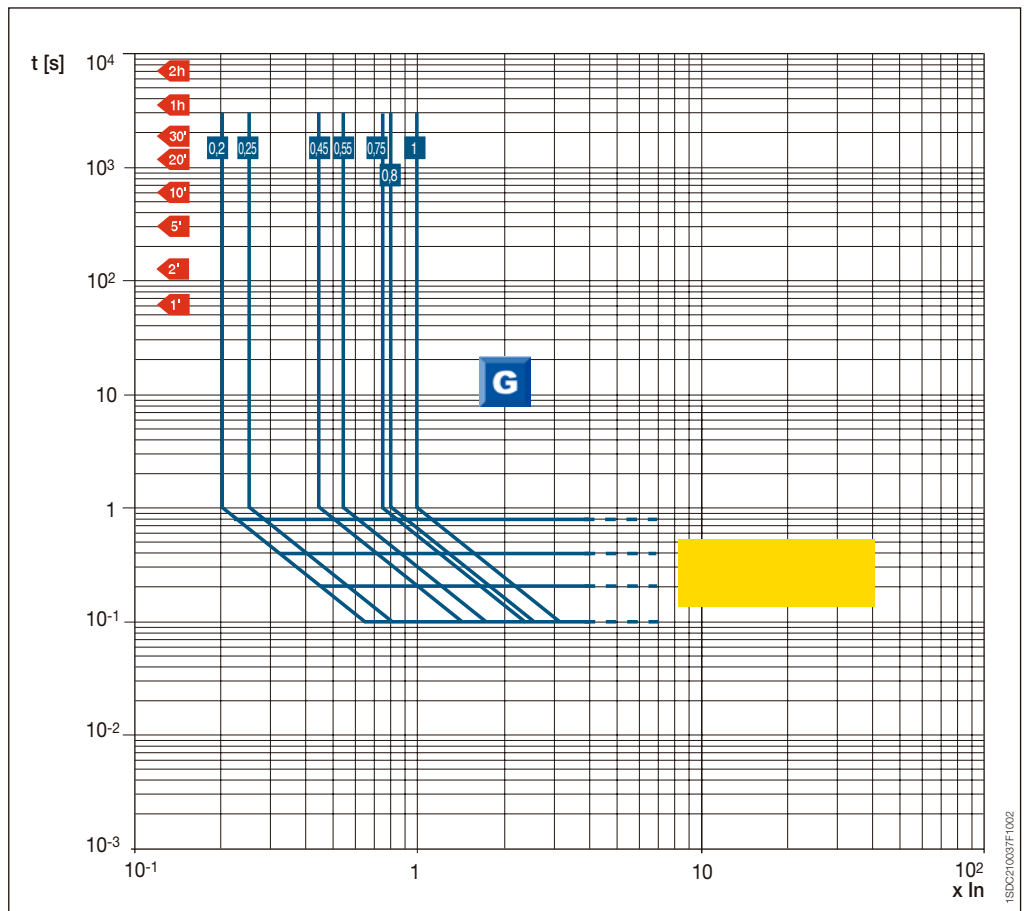
- (1) The electronic settings are available for the PR223DS.
- (2) For T6 In = 1000 A with PR222, the available electronic settings for t1 are: 3s, 6s, 12s and 18s.
- (3) For T6 In = 1000 A ⇒ I_{g,max} = 10 x In.



T6 630/800/1000

**PR222DS/P
PR222DS/PD and
PR223DS**

Functions G



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Trip curves for advanced zone selectivity

Circuit-breakers with electronic release PR223EF

PR223EF

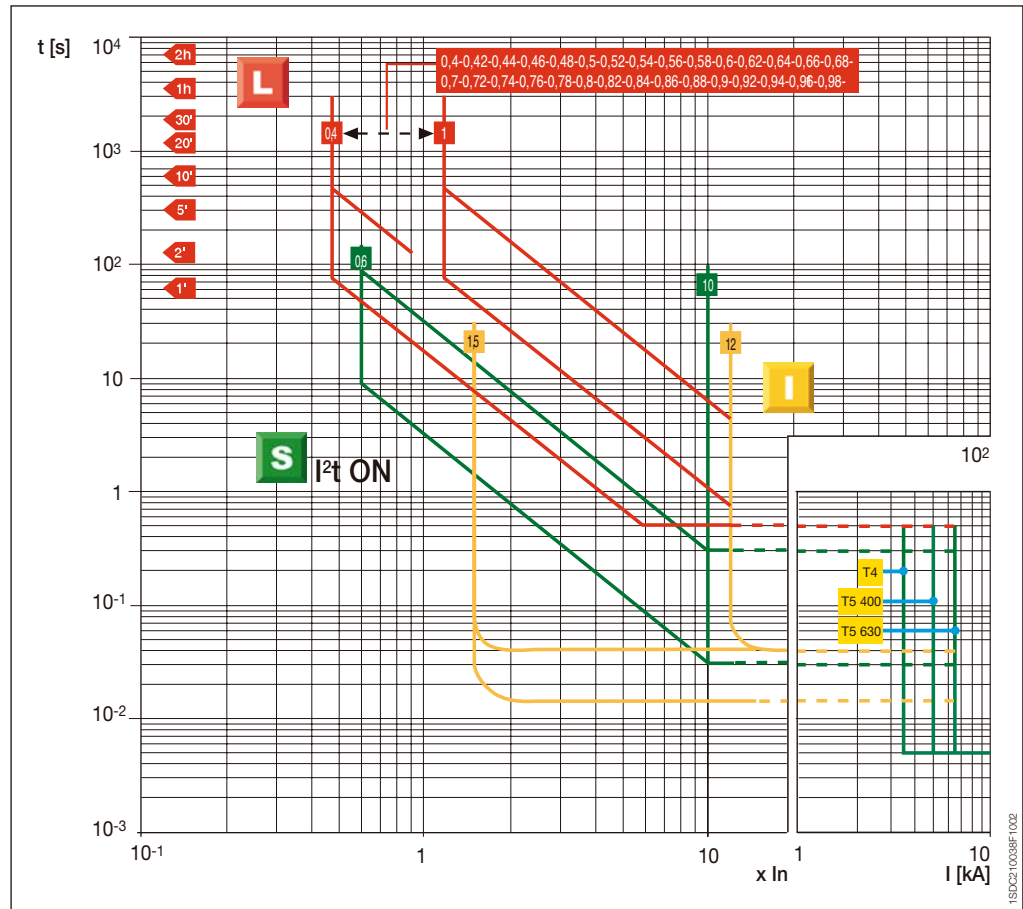
**T4 250/320 –
T5 400/630**

Functions L-S-I
(I^2t const = ON)

With self-supply

Note

For all the CT sizes $t_1 = 18s$, except with 320 A CT (T4) and 630 A (T5) where $t_1 = 12s$.
For T4 In = 320 A and T5 In = 630 A \Rightarrow $I_3 \text{ max} = 10 \times I_n$.



3

PR223EF

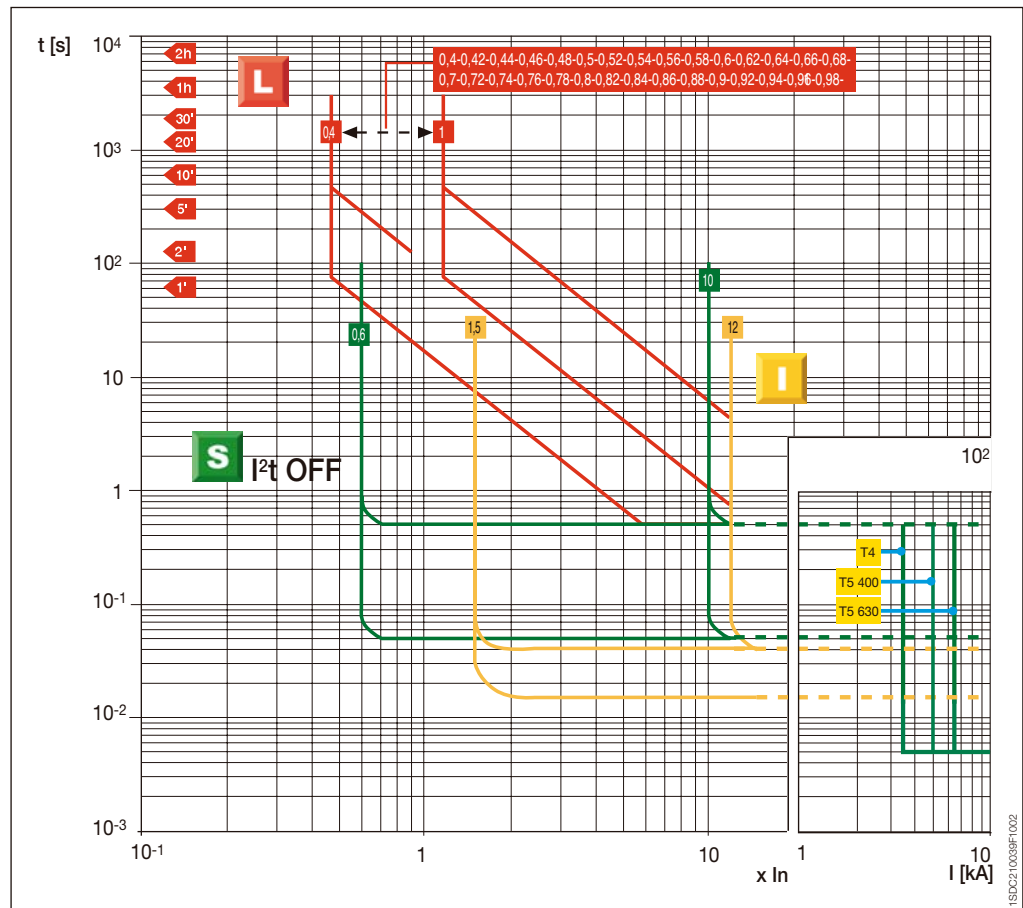
**T4 250/320 –
T5 400/630**

Functions L-S-I
(I^2t const = OFF)

With self-supply

Note

For all the CT sizes $t_1 = 18s$, except with 320 A CT (T4) and 630 A (T5) where $t_1 = 12s$.
For T4 In = 320 A and T5 In = 630 A \Rightarrow $I_3 \text{ max} = 10 \times I_n$.



T6 630/800/1000

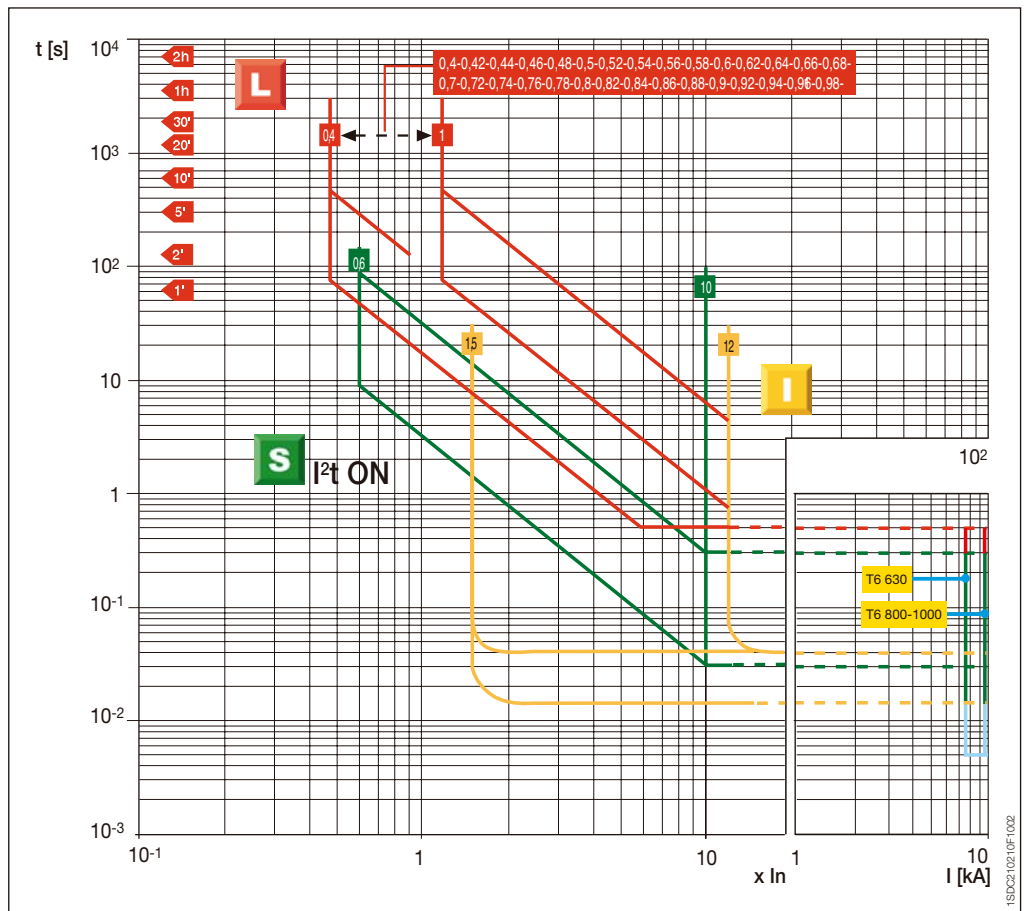
PR223EF

Functions L-S-I
(I^2t const = ON)

With self-supply

Note

For T6 In = 1000 A $\Rightarrow I_3 \text{ max} = 10 \times I_n$.



T6 630/800/1000

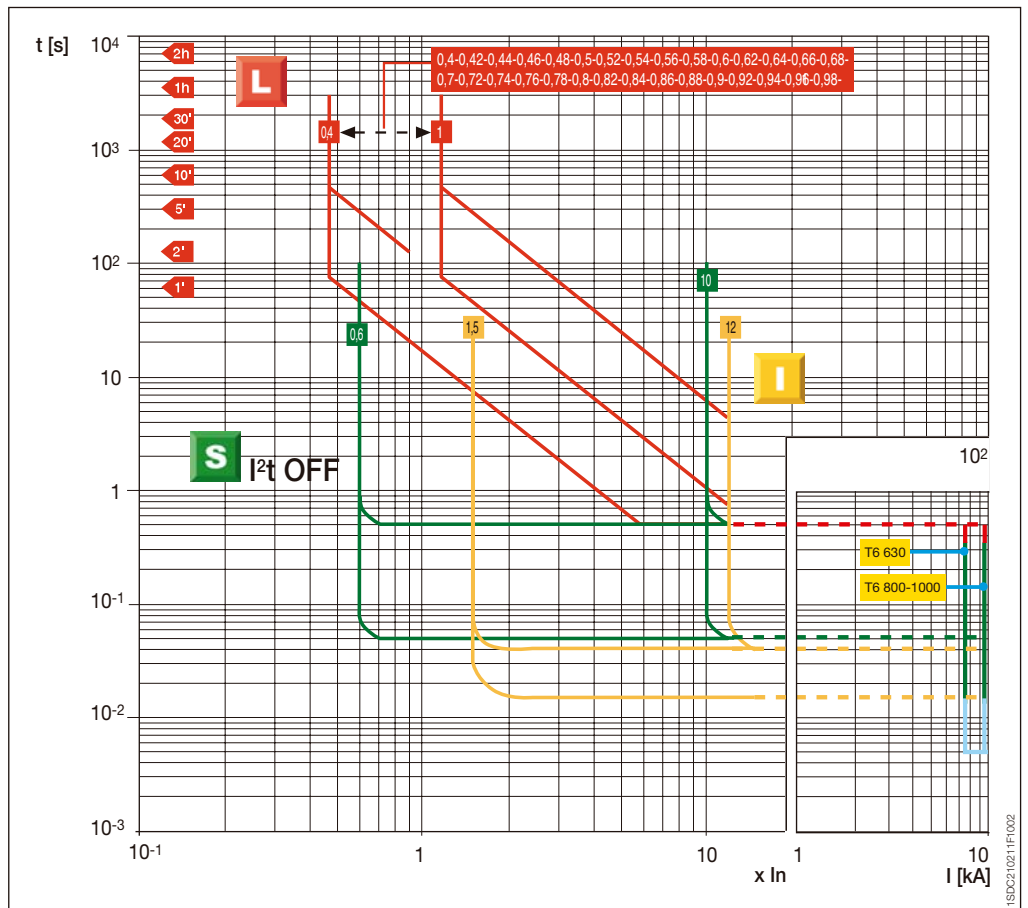
PR223EF

Functions L-S-I
(I^2t const = OFF)

With self-supply

Note

For T6 In = 1000 A $\Rightarrow I_3 \text{ max} = 10 \times I_n$.





Trip curves for advanced zone selectivity

Circuit-breakers with electronic release PR223EF

PR223EF

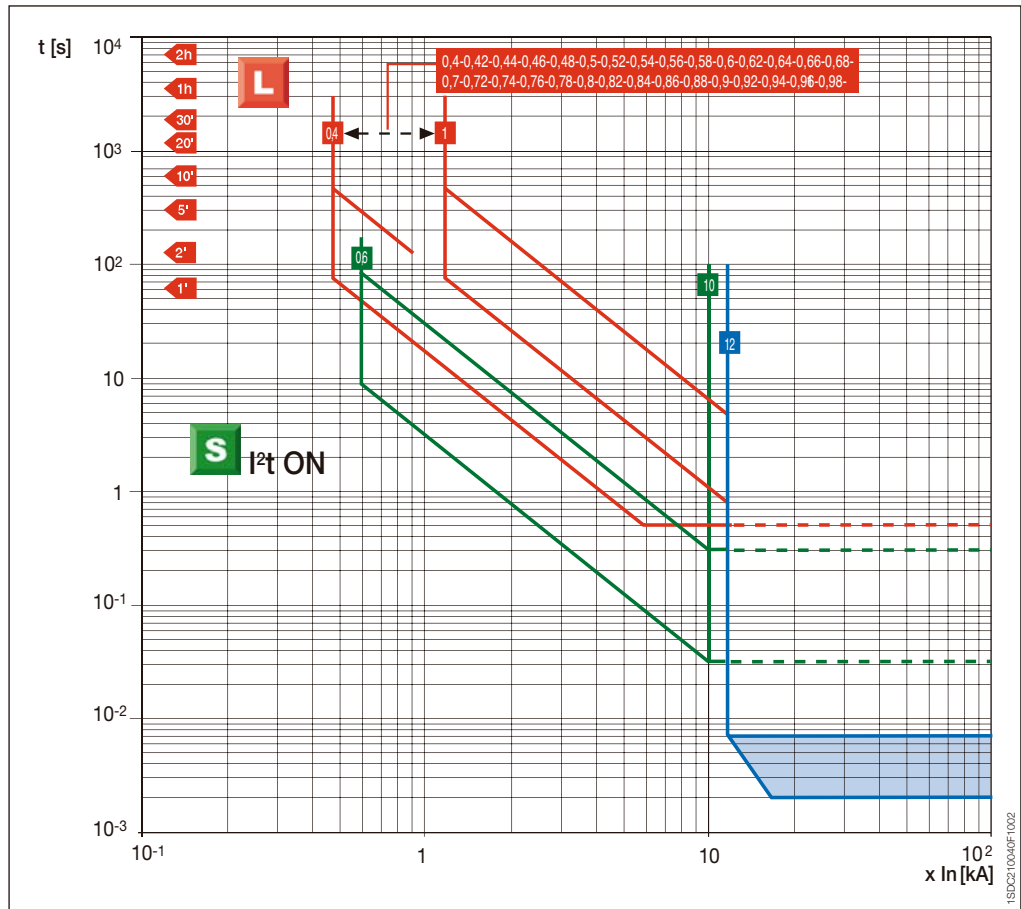
**T4 250/320 –
T5 400/630 –
T6 630/800/1000**

Functions L-S-I
(I²t const = ON)

With auxiliary
power supply

Note

For all the CT sizes $t_1 = 18s$, except with 320 A CT (T4) and 630 A (T5) where $t_1 = 12s$.
For T4 $I_n = 320 A$ and T5 $I_n = 630 A \Rightarrow I_3 \text{ max} = 10 \times I_n$.



3

PR223EF

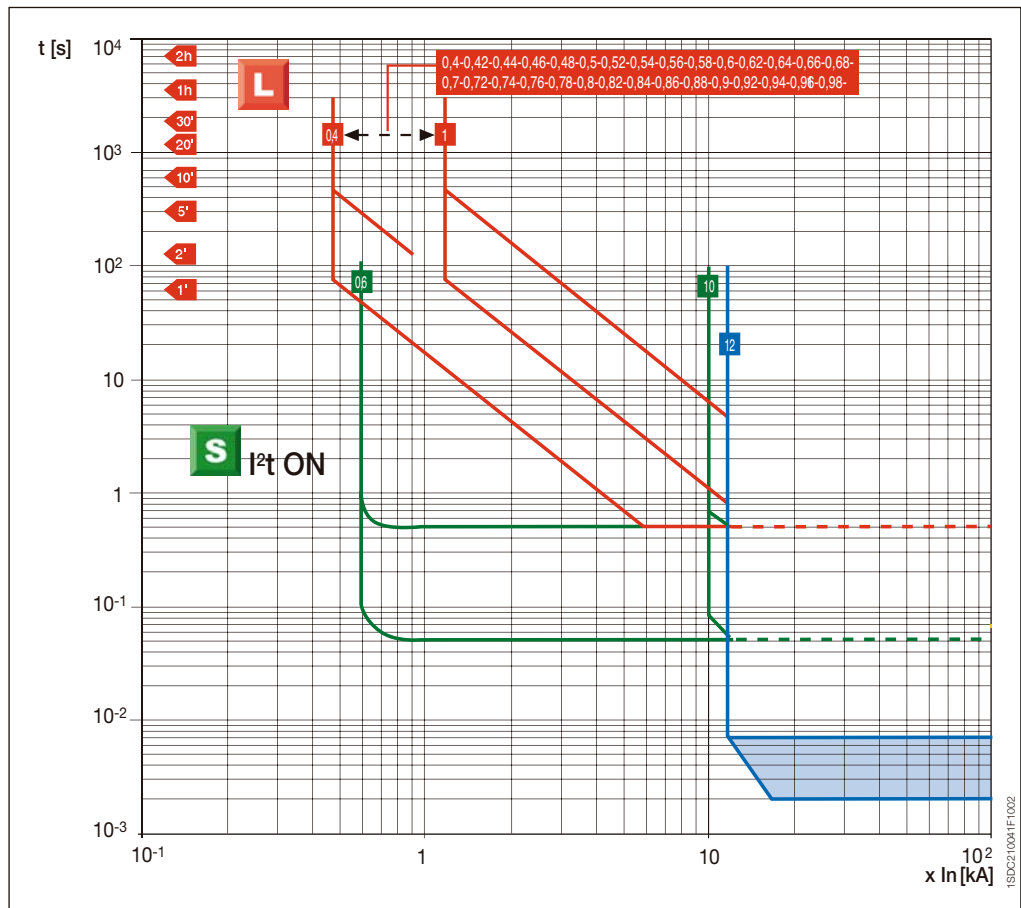
**T4 250/320 –
T5 400/630 –
T6 630/800/1000**

Functions L-S-I
(I²t const = OFF)

With auxiliary
power supply

Note

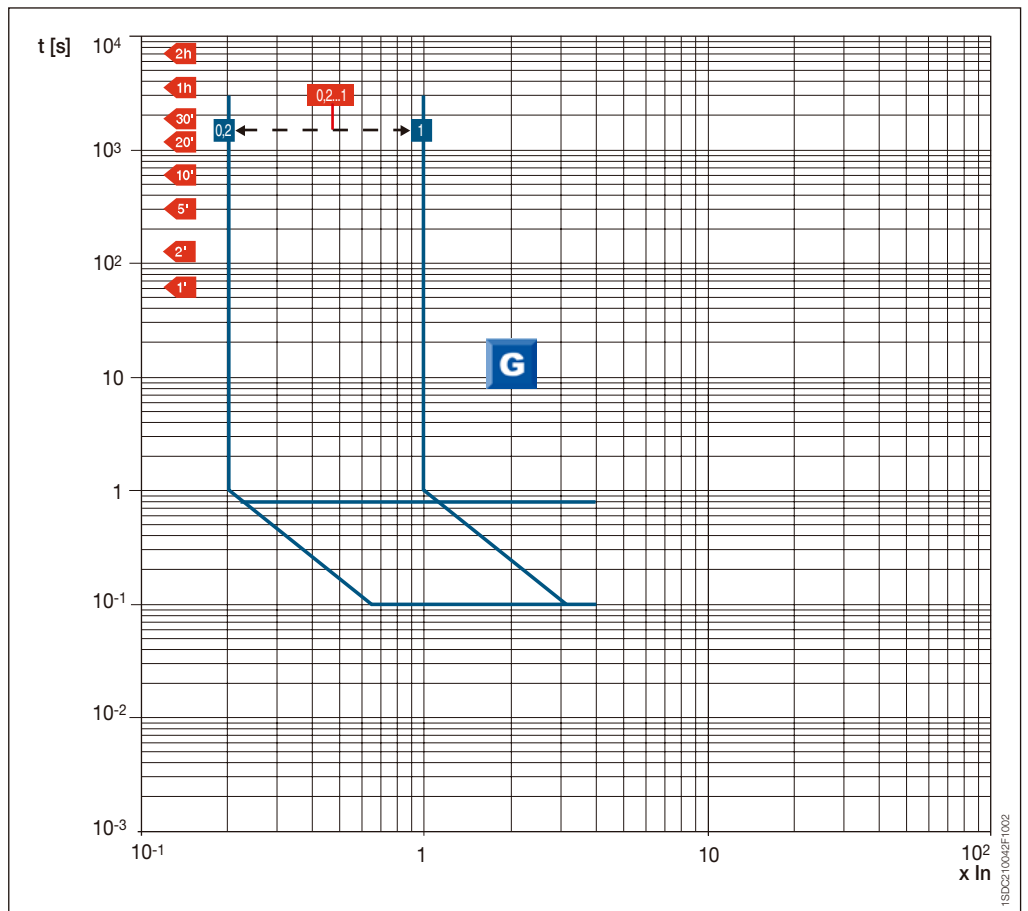
For all the CT sizes $t_1 = 18s$, except with 320 A CT (T4) and 630 A (T5) where $t_1 = 12s$.
For T4 $I_n = 320 A$ and T5 $I_n = 630 A \Rightarrow I_3 \text{ max} = 10 \times I_n$.



PR223EF

T4 250/320 –
T5 400/630 –
T6 630/800/1000

Function G





Trip curves for motor protection

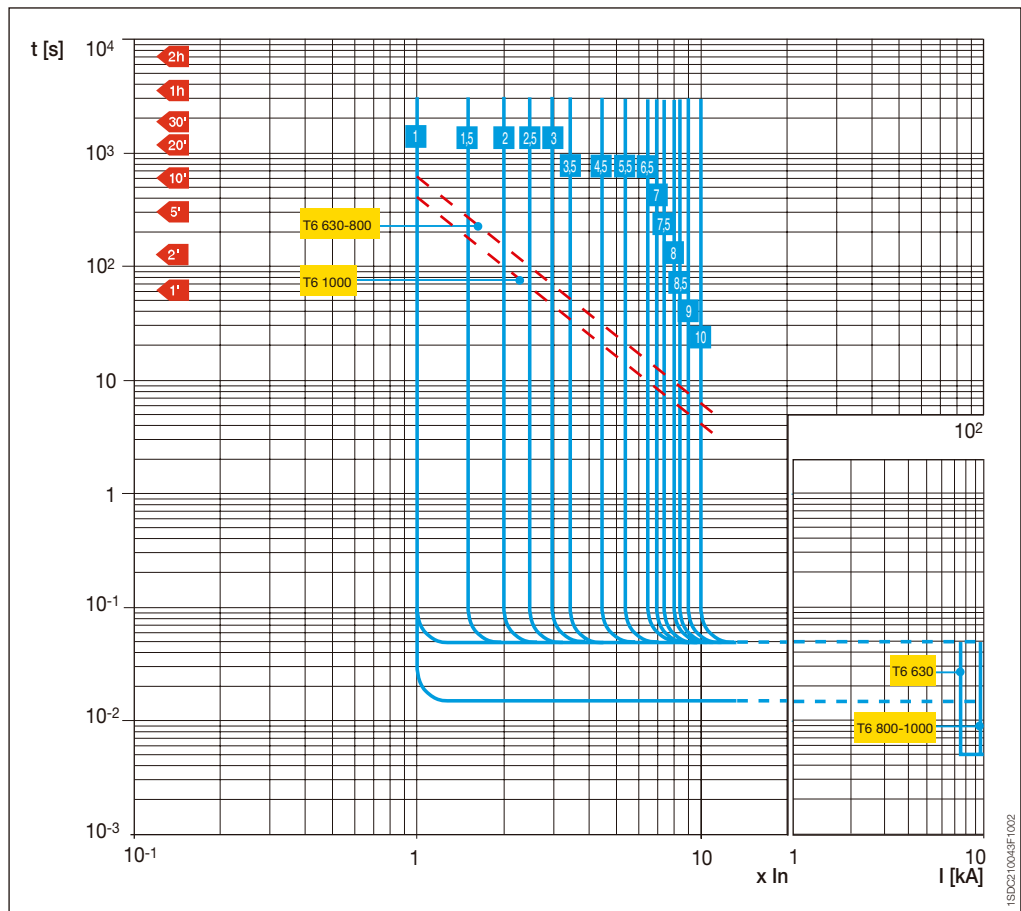
Circuit-breakers with electronic release PR221DS-I

T6 630/800/1000

PR221DS-I

Function I

3





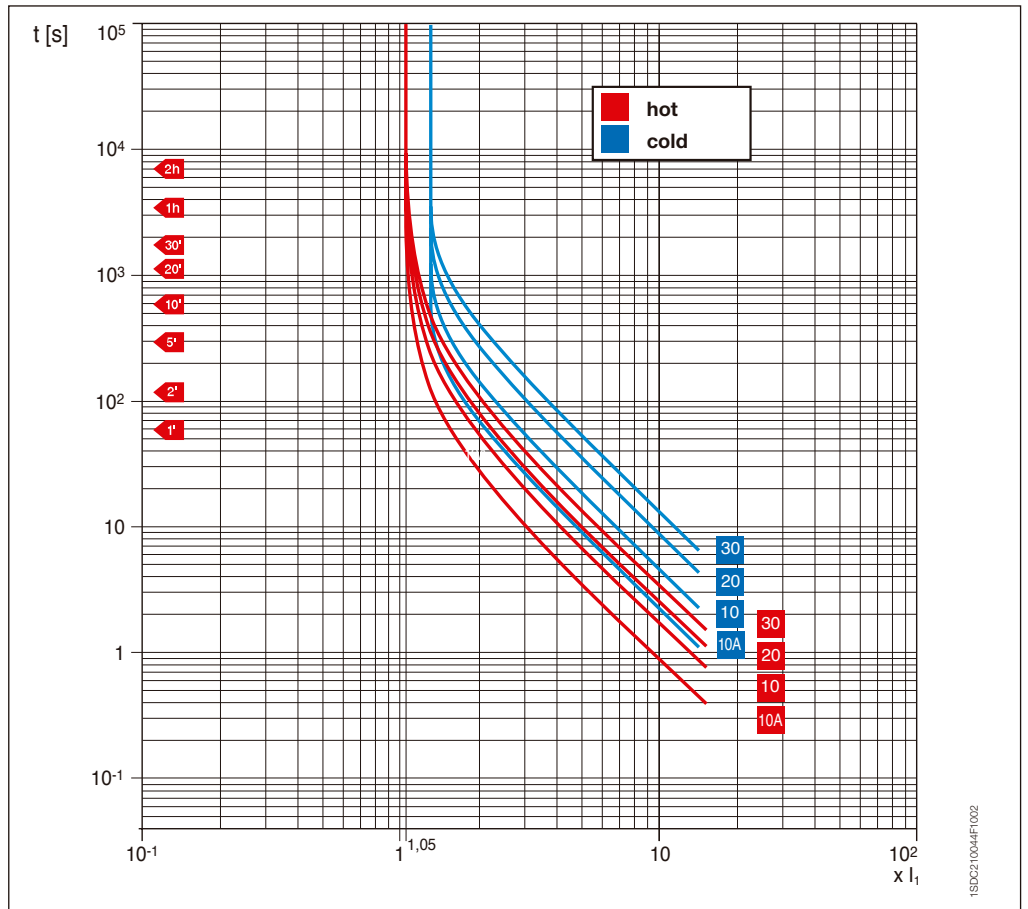
Trip curves for motor protection

Circuit-breakers with electronic release PR222MP

T6 800

PR222MP

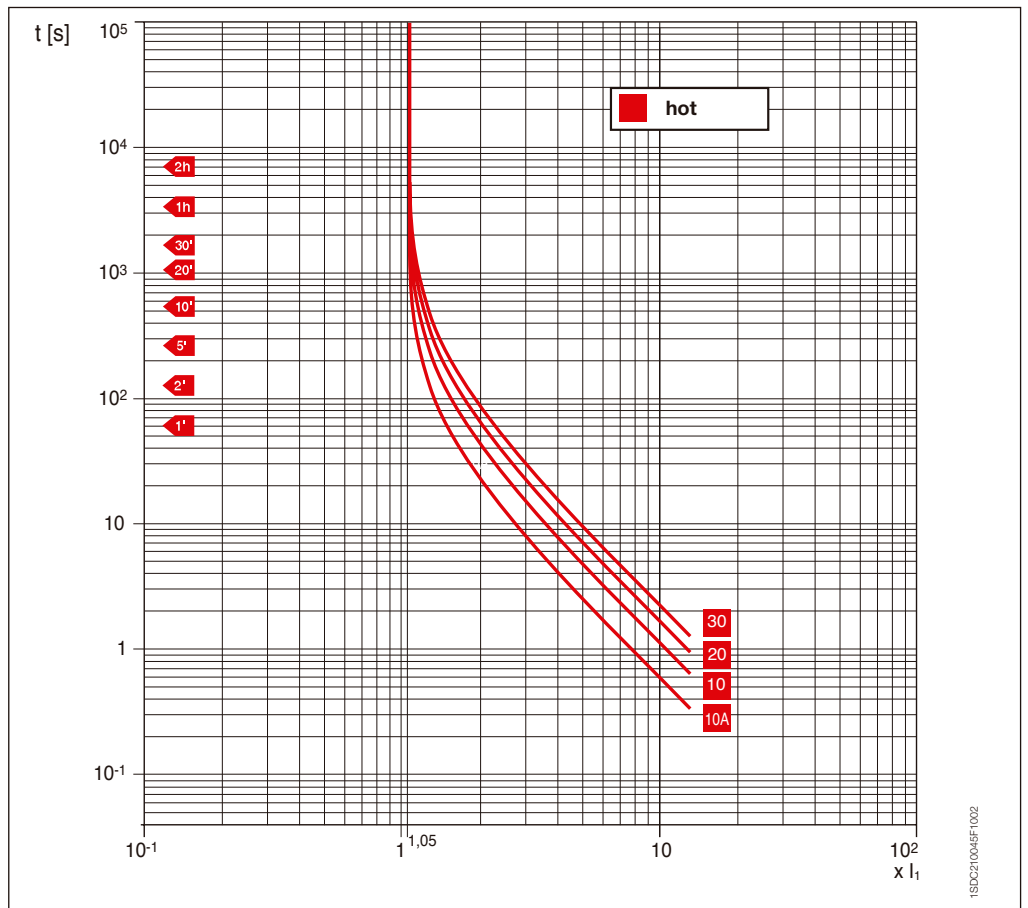
Function L
(hot and cold intervention)



T6 800

PR222MP

Function L
(hot intervention with 1 or 2 phases supplied)



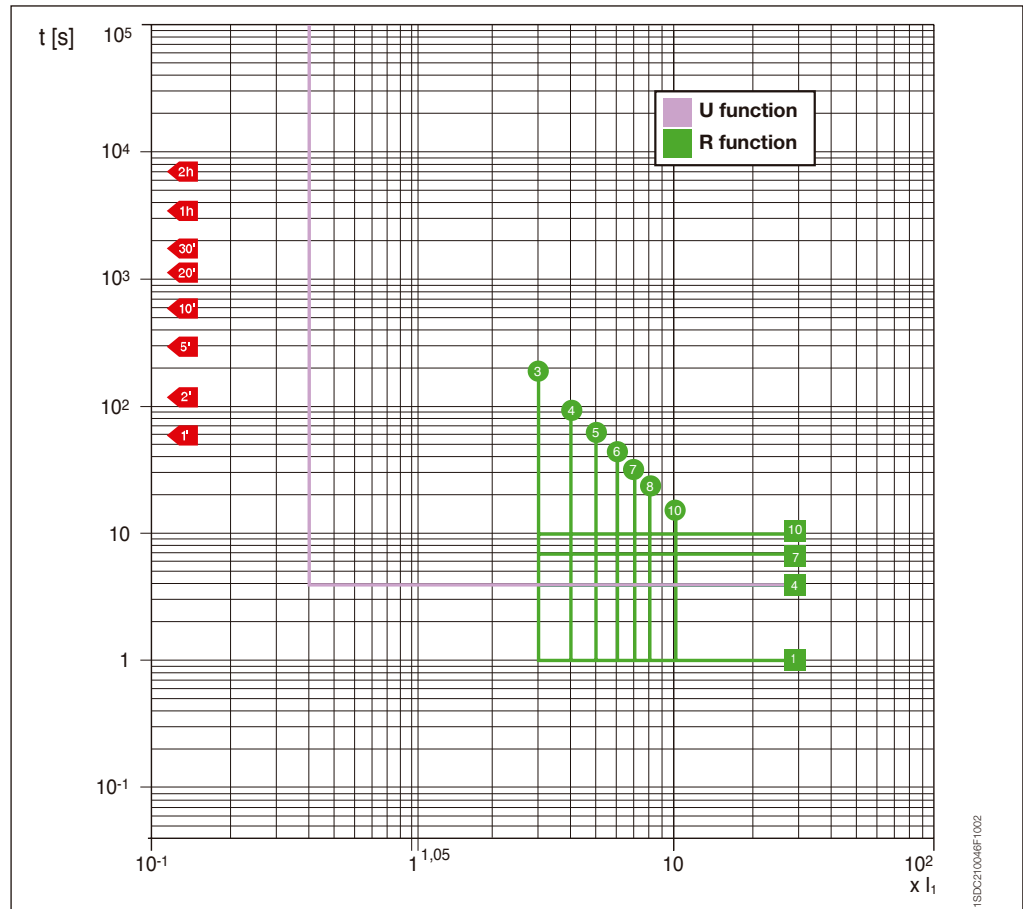


Trip curves for motor protection

Circuit-breakers with electronic release PR222MP

T6 800 PR222MP

Functions R-U

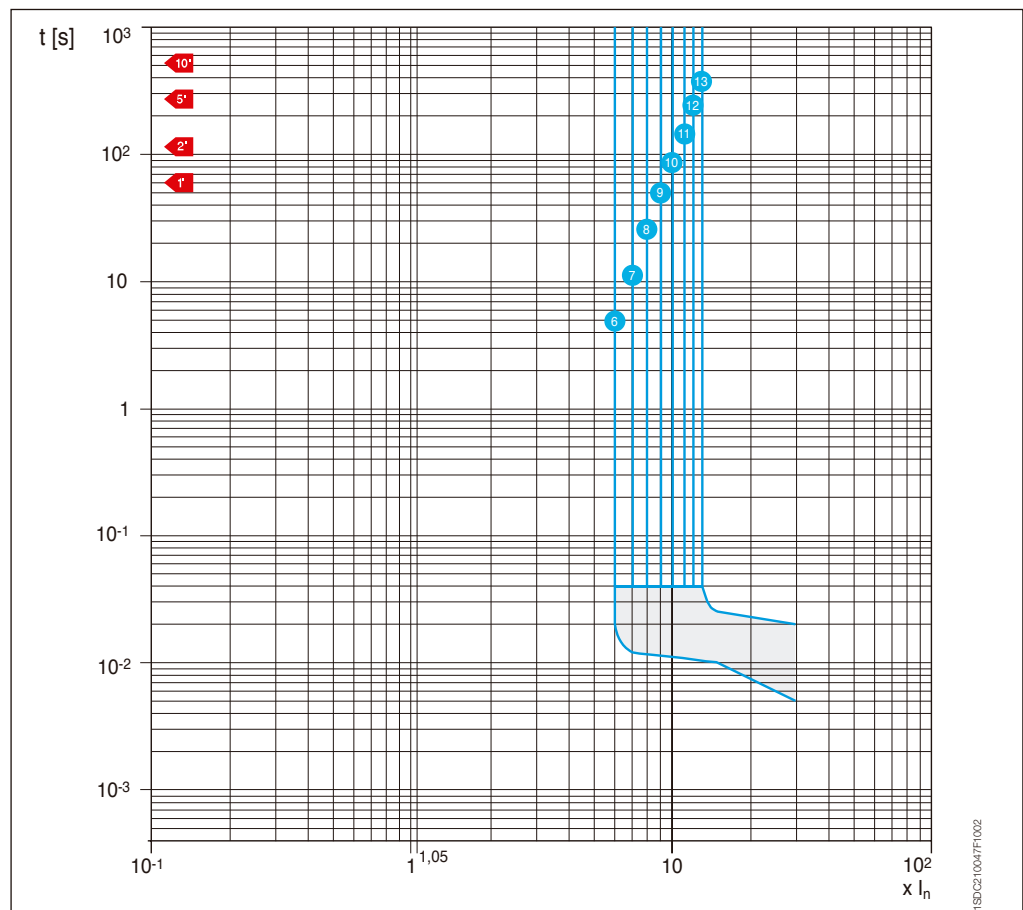


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T6 800 PR222MP

Function I



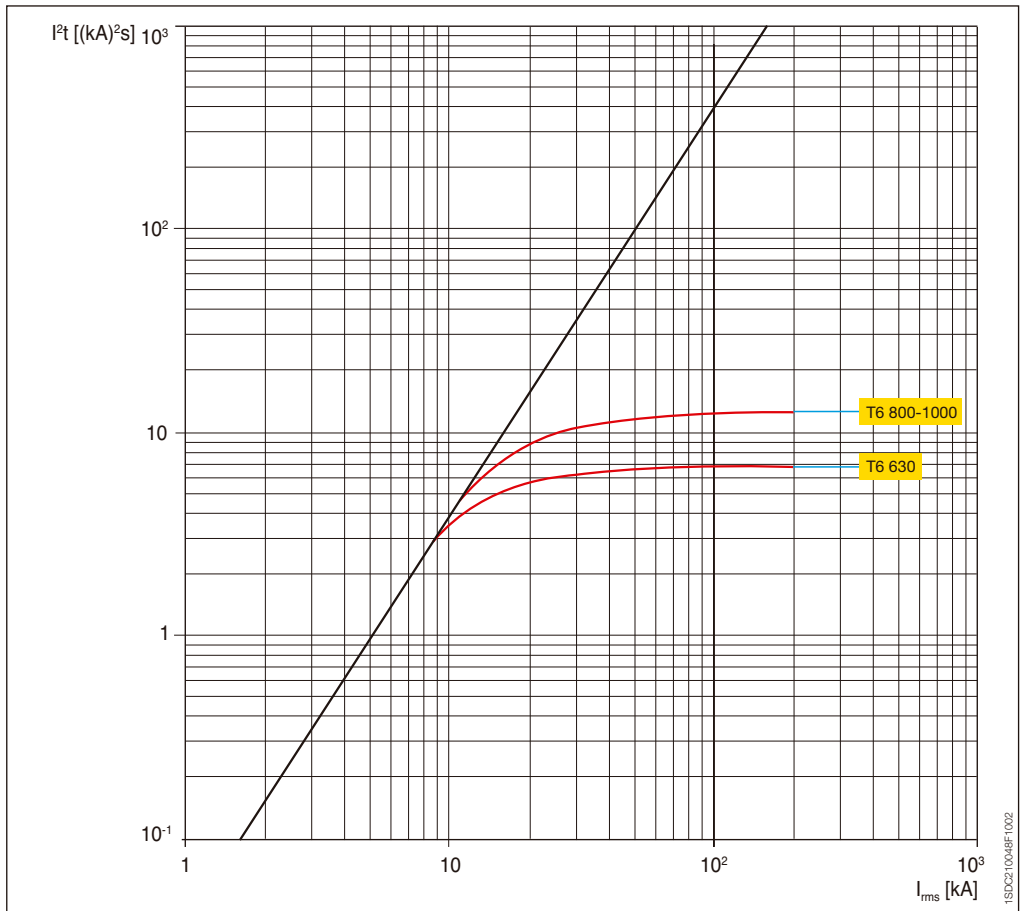
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Specific let-through energy curves

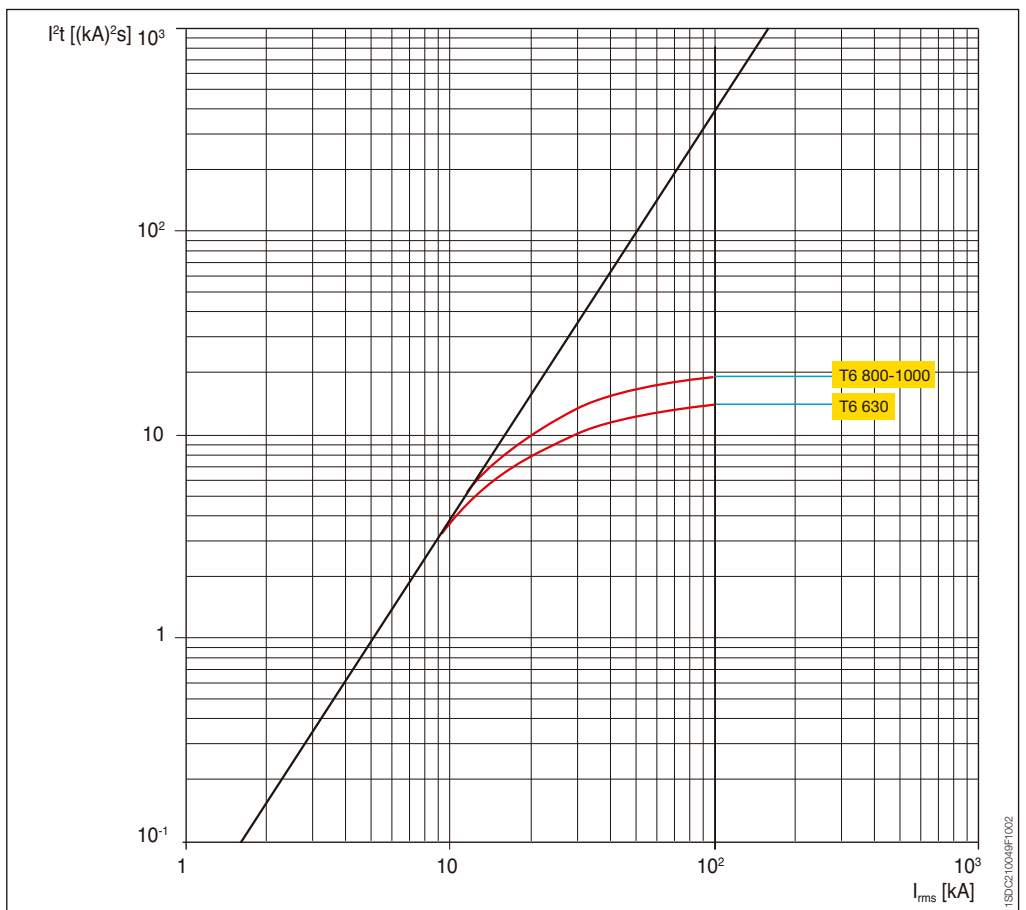
T6 630/800/1000

230 V



T6 630/800/1000

400-440 V

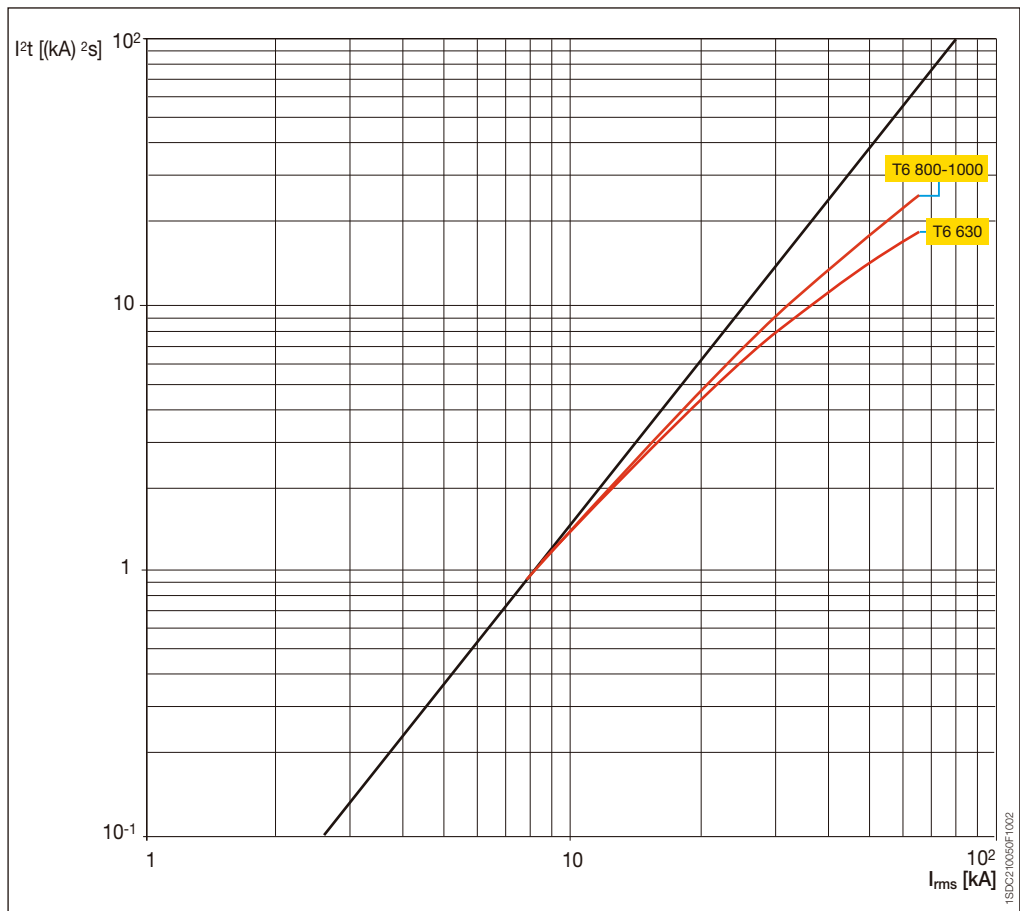




Specific let-through energy curves

T6 630/800/1000

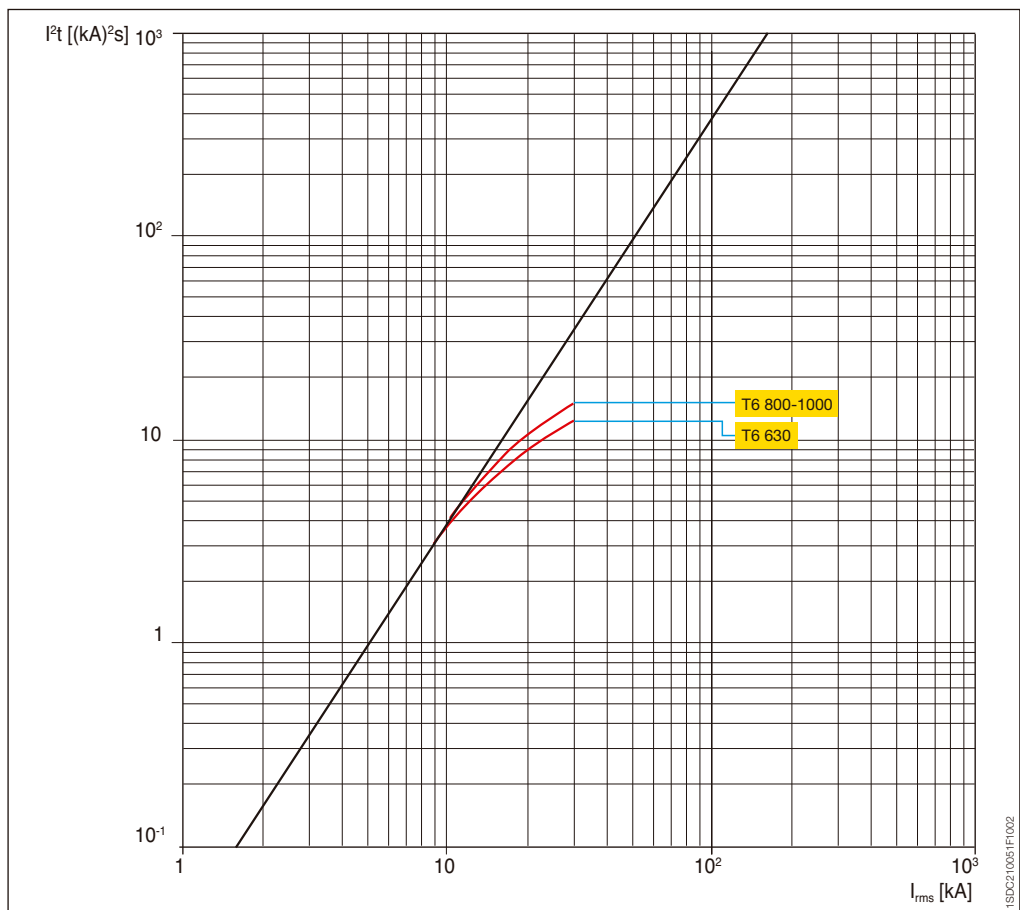
500 V



3

T6 630/800/1000

690 V

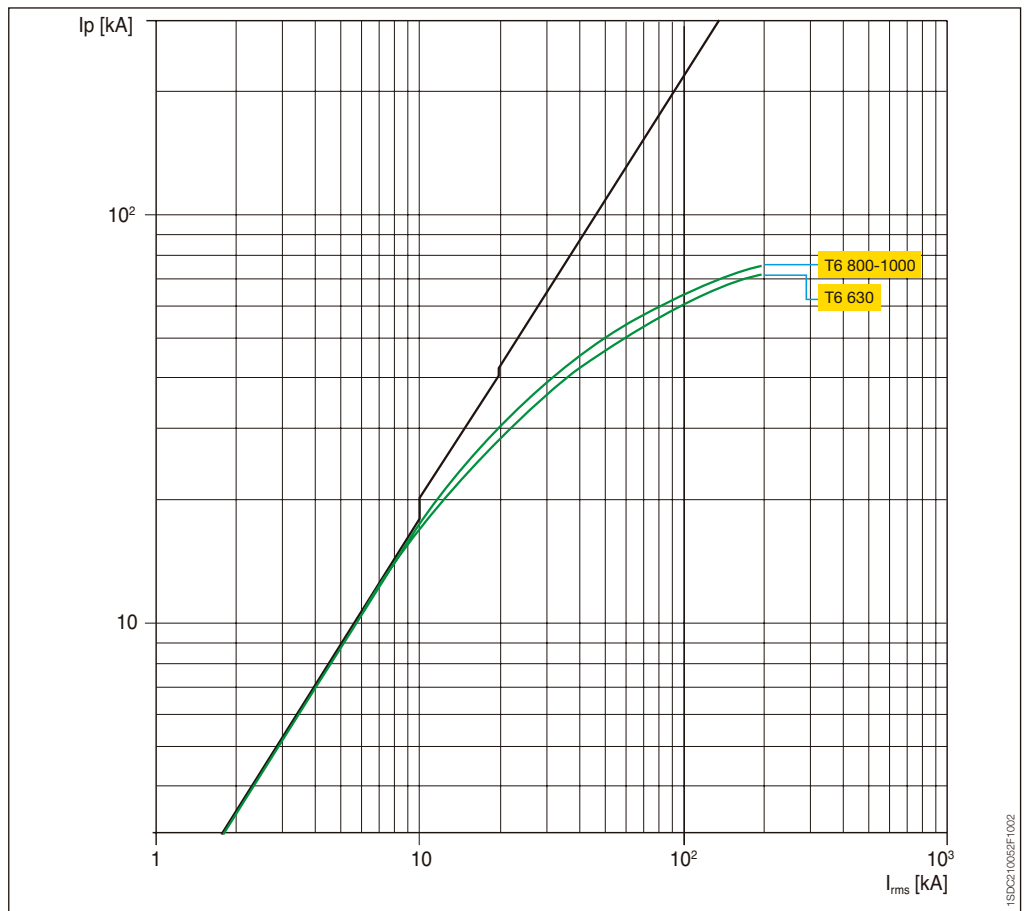




Current-limiting curves

T6 630/800/1000

230 V

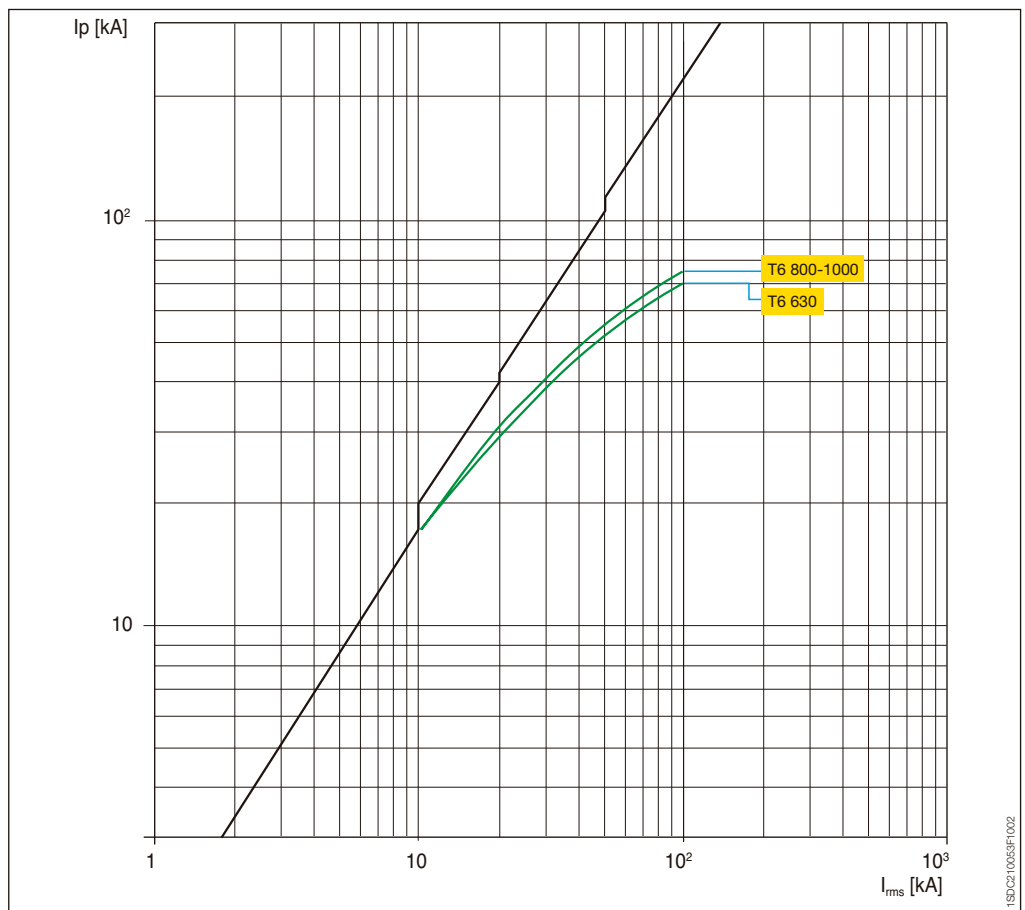


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3

T6 630/800/1000

400-440 V



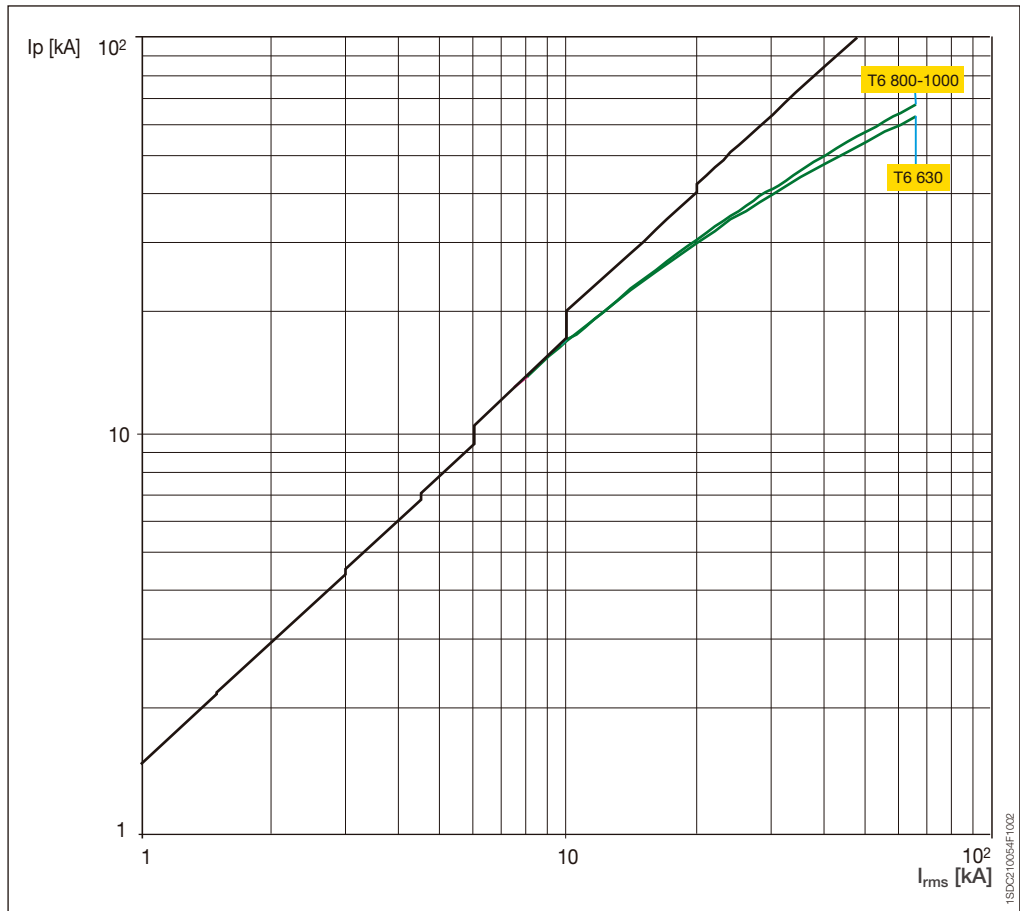
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Current-limiting curves

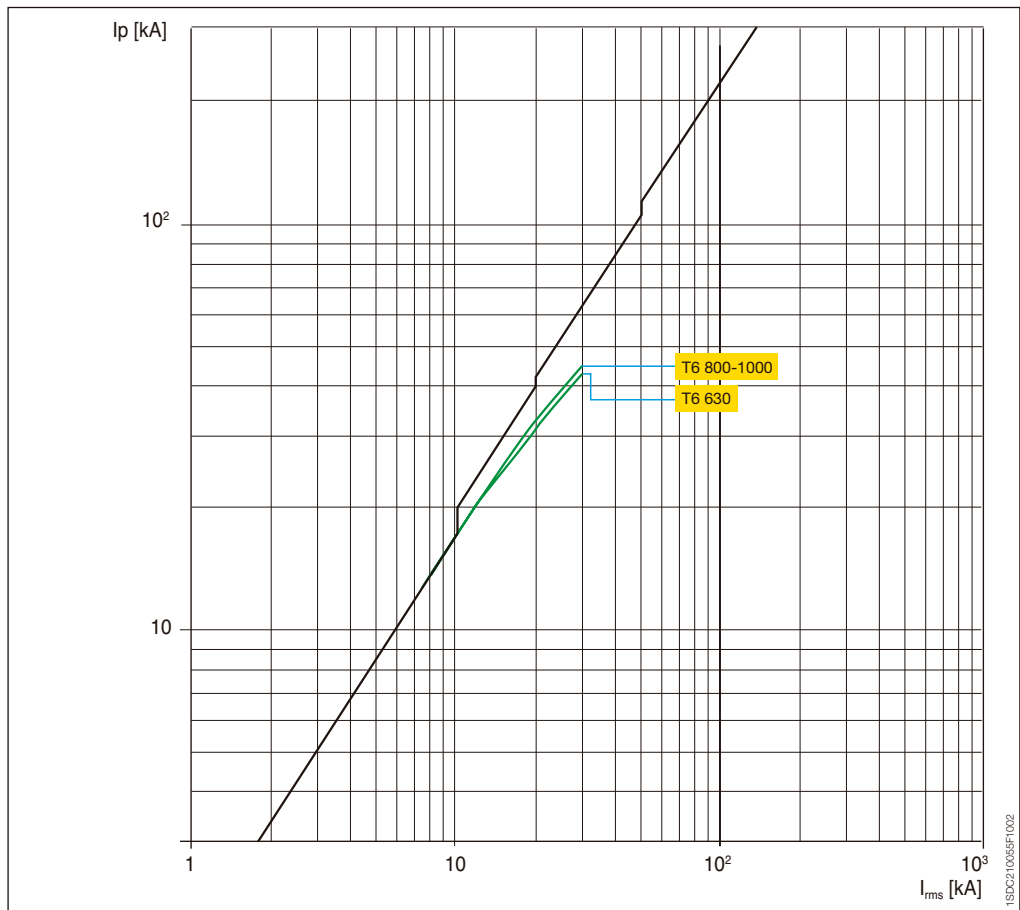
T6 630/800/1000

500 V



T6 630/800/1000

690 V



3



Temperature performances

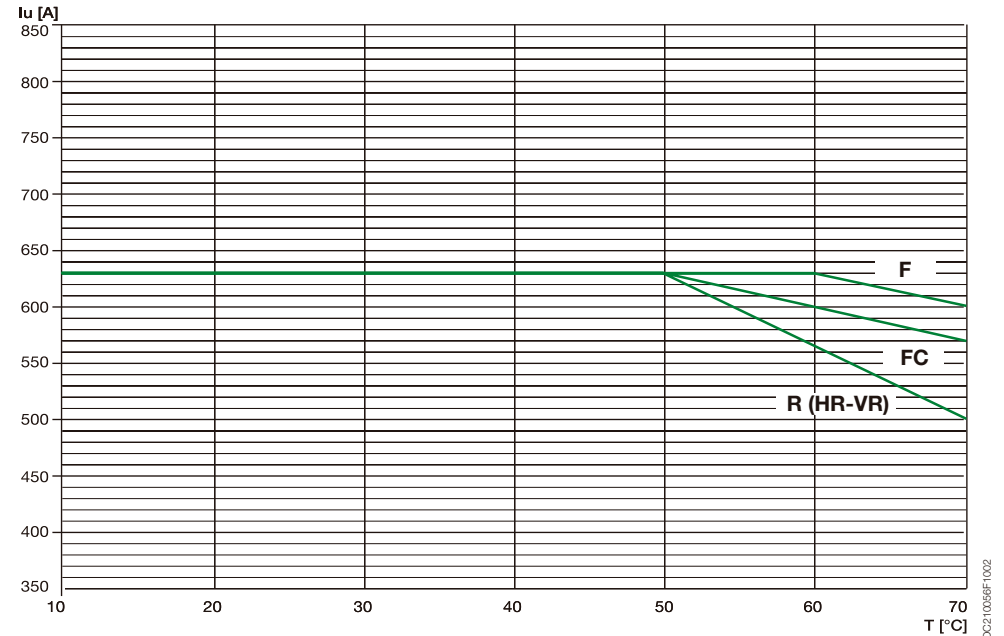
Circuit-breakers with magnetic only, electronic releases and switch-disconnectors

T6 630 and T6D 630

Fixed

	up to 40 °C		50 °C		60 °C		70 °C	
	I_{max} [A]	I_1	I_{max} [A]	I_1	I_{max} [A]	I_1	I_{max} [A]	I_1
F	630	1	630	1	630	1	598.5	0.95
FC	630	1	630	1	598.5	0.95	567	0.9
R (HR-VR)	630	1	630	1	567	0.9	504	0.8

F = Front flat terminals FC = Front terminals for cables R = Rear terminals



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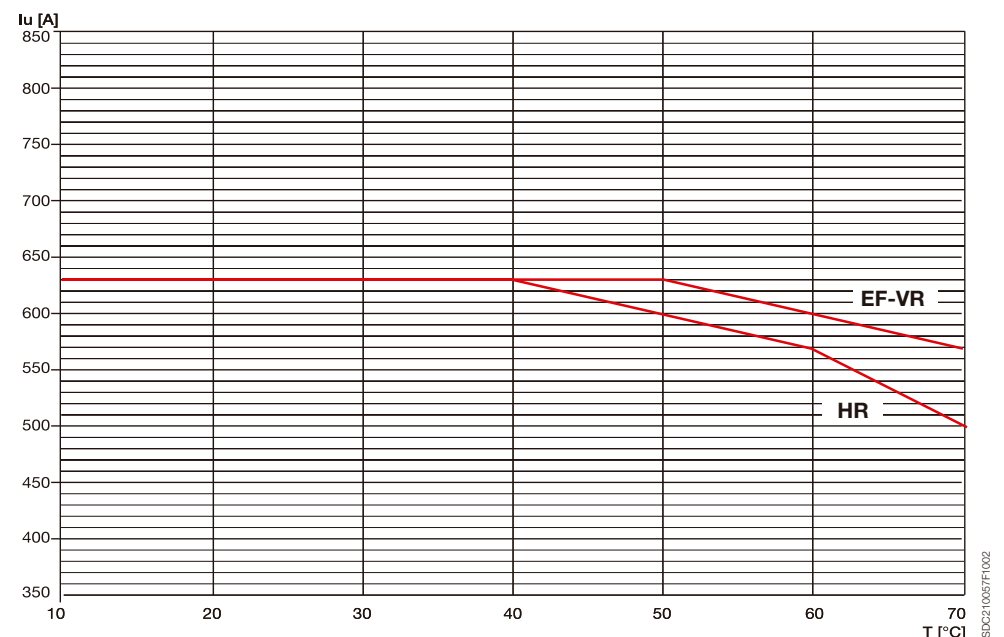
3

T6 630 and T6D 630

Withdrawable

	up to 40 °C		50 °C		60 °C		70 °C	
	I_{max} [A]	I_1	I_{max} [A]	I_1	I_{max} [A]	I_1	I_{max} [A]	I_1
EF	630	1	630	1	598.5	0.95	567	0.9
VR	630	1	630	1	598.5	0.95	567	0.9
HR	630	1	598.5	0.95	567	0.9	504	0.8

EF = Front extended terminals HR = Rear flat horizontal terminals VR = Rear flat vertical terminals



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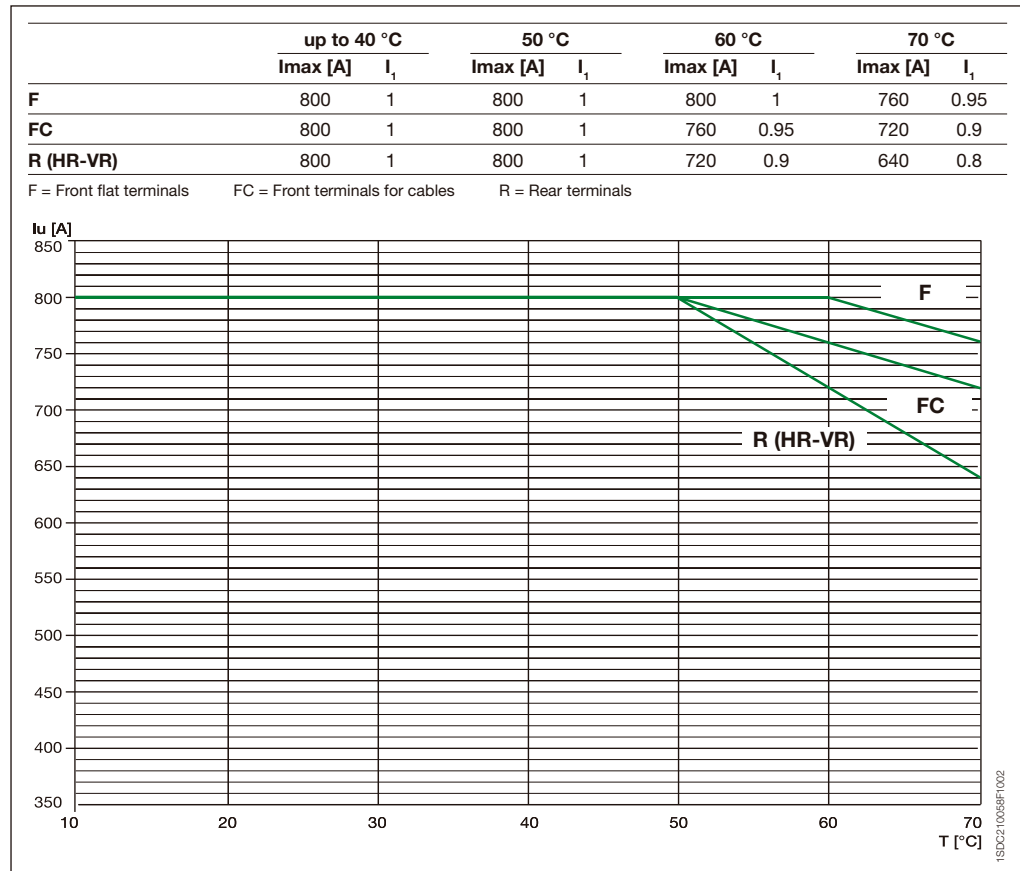


Temperature performances

Circuit-breakers with magnetic only, electronic releases and switch-disconnectors

T6 800 and T6D 800

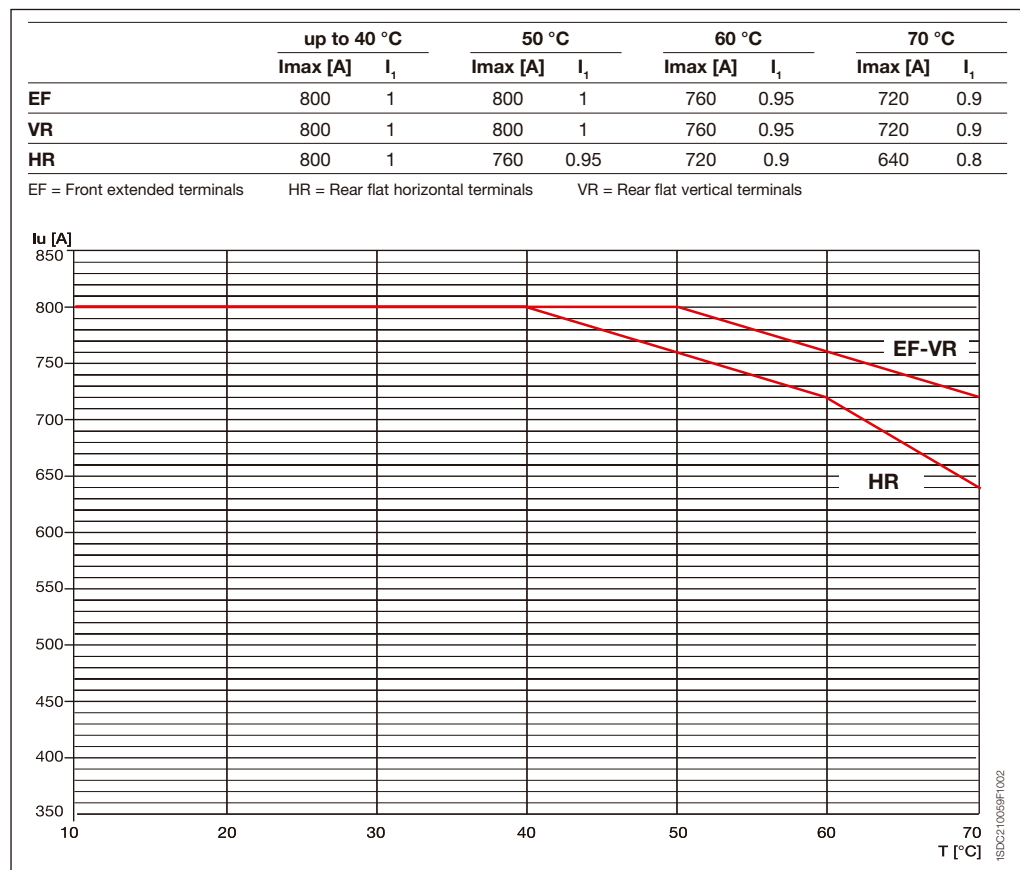
Fixed



3

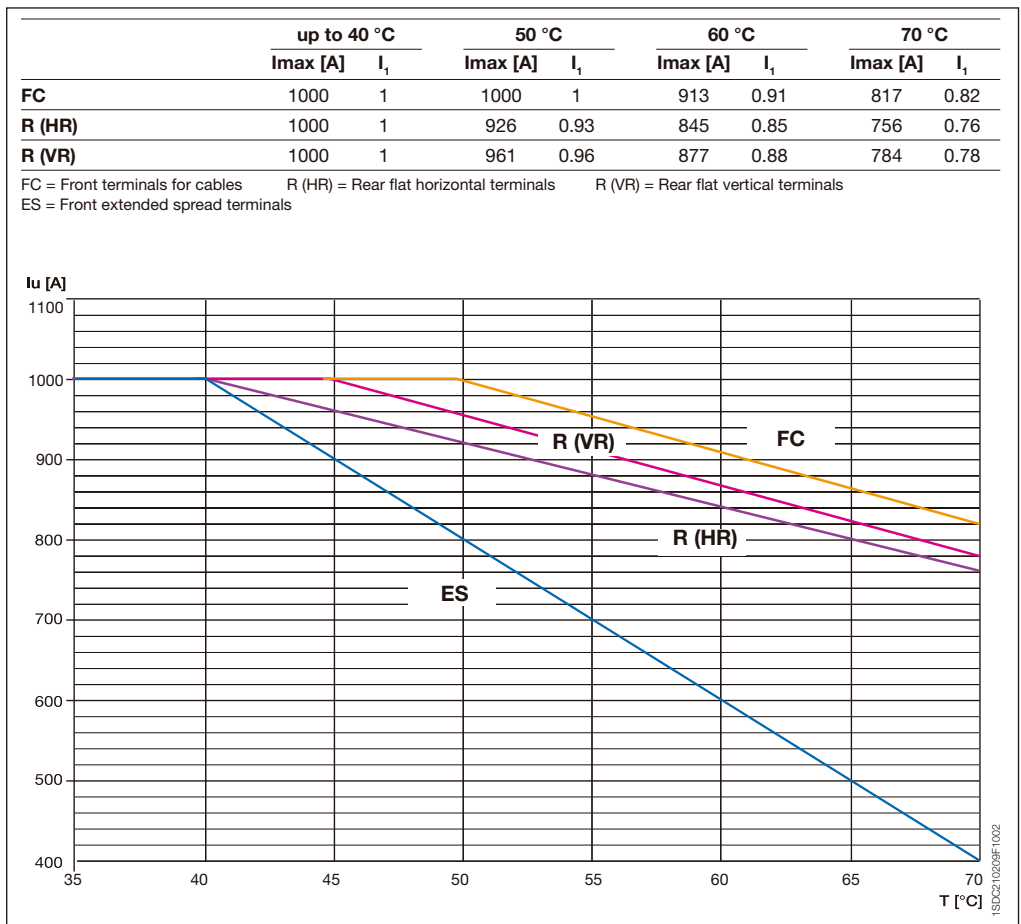
T6 800 and T6D 800

Withdrawable



T6 1000 and T6D 1000

Fixed



3

Circuit-breakers with thermomagnetic releases

Tmax T6	10 °C		20 °C		30 °C		40 °C		50 °C		60 °C		70 °C	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
I_n [A]														
630	520	740	493	705	462	660	441	630	405	580	380	540	350	500
800	685	965	640	905	605	855	560	800	520	740	470	670	420	610

Dissipated powers

Power [W/pole]	T6		
	I_n [A]	F	W
TMA	630	30.6	30
	800	31	39.6
PR221-222-223	630	30	38.3
	800	32	41.6
	1000	50	-



Special applications

Use of the apparatus at 16 2/3Hz

The thermomagnetic Tmax T6 circuit-breakers are suitable for operating at 16 2/3 Hz frequencies, and their most widely used application is in the railway sector.

The electrical performances are given below (Breaking capacity I_{cu}) depending on the voltage and number of poles to be connected based on the electrical connection diagrams.

I _{cu} [kA]	Wiring diagram	T6			
		N	S	H	L
250 V (AC) - 2 poles in series	A	36	50	70	100
500 V (AC) - 2 poles in series	A	20	35	50	70
750 V (AC) - 3 poles in series	B-C	16	20	36	50
1000 V (AC) - 4 poles in series ⁽¹⁾	D	-	-	-	40

⁽¹⁾ Use 1000 V DC version circuit-breakers

Caption

For further information on the electrical circuit diagrams, please see the "Tmax - Low voltage moulded-case circuit-breakers up to 630 A" technical catalogue.

Trip thresholds

The thermal threshold of the circuit-breaker is the same as for the normal version. For the magnetic threshold, a correction coefficient must be used on the protection thresholds as indicated in the table:

Circuit-breaker	Diagram A	Diagram B-C	Diagram D
T6	0.9	0.9	0.9

Use of the apparatus in direct current

The thermomagnetic Tmax T6 circuit-breakers are suitable for operating in direct current.

The table below indicates the correction factor for the magnetic trip threshold (the protection threshold against overload does not undergo any modifications):

Circuit-breaker	Diagram A	Diagram B	Diagram C	Diagram D	Diagram E	Diagram F
T6	1.1	1	1	0.9	0.9	0.9

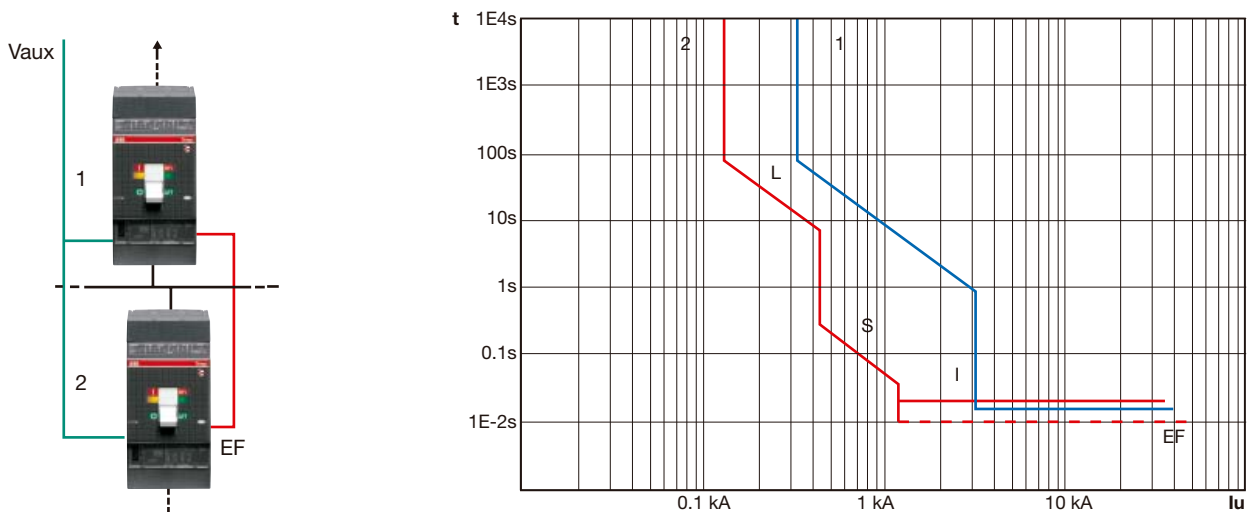
Caption

For further information on the electrical circuit diagrams, please see the "Tmax - Low voltage moulded-case circuit-breakers up to 630 A" technical catalogue.

Application example of advanced zone selectivity with PR223EF

By means of an explanatory example, let us now see operation of advanced zone selectivity carried out by the EF protection available on PR223EF.

We are therefore considering two Tmax T4 100 circuit-breakers equipped with the PR223EF release with the L, S and I protection functions set to obtain the trip curves illustrated in the graph below.



Scenario A – No auxiliary power supply present

In a similar scenario, zone selectivity is disabled. Let us see what is checked as any short-circuit current on the load side of the CB2 circuit-breaker varies:

- $I = 0.2 \text{ kA}$. Timing is activated of L on CB2, which opens after about 50s. Selectivity is guaranteed.
- $I = 1 \text{ kA}$. Timing is activated of S on both the circuit-breakers. The CB2 circuit-breaker opens after about 80 ms and selectivity is guaranteed.
- $I = 10 \text{ kA}$. Both I on the CB1 circuit-breaker and I on the CB2 circuit-breaker intervene. Selectivity is not guaranteed.

Scenario B – Auxiliary power supply present

In this scenario, the releases are supplied with an auxiliary power supply and therefore advanced zone selectivity is activated:

- $I = 0.2 \text{ kA}$. L on the CB2 circuit-breaker intervenes after about 50s. Selectivity is guaranteed.
- $I = 1 \text{ kA}$. Timing is activated of S on both the circuit-breakers and the CB2 circuit-breaker sends the interlock signal. After opening of the CB2 circuit-breaker after about 80 ms, the CB1 circuit-breaker can no longer see the fault and disables timing of S. Selectivity is guaranteed.
- $I = 10 \text{ kA}$. The EF protection of both the circuit-breakers is activated and the CB2 circuit-breaker sends the interlock signal. After opening of the circuit-breaker on the load side, the CB1 circuit-breaker can no longer see the fault and therefore the selectivity is guaranteed.



Index

Wiring diagrams

Information for reading - Circuit-breakers.....	4/2
Electrical circuit diagrams of the Tmax T6 circuit-breakers	4/3
Electrical accessories for Tmax T6	4/4



Wiring diagrams

Information for reading - Circuit-breakers

State of operation represented

The diagram is shown in the following conditions:

- fixed or withdrawable version circuit-breaker, open and racked-in
- contactor for motor starting open
- circuits de-energised
- releases not tripped
- motor operator with springs charged.

Caption

□	= Figure number of the diagram
*	= See note indicated by the letter
A1	= Circuit-breaker applications
A2	= Applications of the solenoid operator or motor operator
A4	= Indication apparatus and connections for control and signalling, outside the circuit-breaker
H	= Signalling lamps
K51	= Electronic release: <ul style="list-style-type: none">- PR223DS and PR223EF type overcurrent release, with the following protection functions:<ul style="list-style-type: none">- L against overload with inverse long time delay- S against short-circuit with inverse or definite short time delay- I against short-circuit with instantaneous trip time- G against earth fault with short time trip
M	= Motor for circuit-breaker opening and circuit-breaker closing spring charging
Q	= Main circuit-breaker
R	= Resistor (see note F)
S1, S2	= Contacts controlled by the cam of the motor operator
S3	= Contact controlled by the key lock of the solenoid operator or motor operator
K51/1...8	= Contacts for electrical signalling of the protection functions of the electronic release
S51/S	= Contact for electronic signalling of overload in progress
S751/1...3	= Contacts for electrical signalling of circuit-breaker in racked-in position (only provided with circuit-breakers in plug-in version)
SC	= Pushbutton or contact for closing the circuit-breaker
SC3	= Pushbutton for motor starting
SO	= Pushbutton or contact for opening the circuit-breaker
SO3	= Pushbutton for stopping the motor
SY	= Contact for electrical signalling of circuit-breaker open due to YO, YO1, YO2 or YU thermomagnetic release trip (tripped position)
TI	= Toroidal current transformer
TI/L1	= Current transformer placed on phase L1
TI/L2	= Current transformer placed on phase L2
TI/L3	= Current transformer placed on phase L3
TI/N	= Current transformer placed on the neutral
W1	= Serial interface with the control system (EIA RS485 interface)
W2	= Interface to the supply side circuit-breaker for the interlock for the logic selectivity
W3	= Interface to the load side circuit-breaker for the interlock for the logic selectivity
X11	= Back-up terminal box
X3,X4	= Connectors for the circuits of the electronic release (in the case of circuit-breakers in the plug-in version, removal of the connectors takes place simultaneously with that of the circuit-breaker)
XA	= Interfacing connector of the PR223DS/P release
XA8	= Six-way connector for contacts operated by the rotary handle or for the motor operator (see note E)
XF	= Interfacing connector of the MOE-E unit
X0	= Connector for the YO1 trip coil
XV	= Terminal boxes of the applications
YO1	= Trip coil of the electronic release

Description of figures

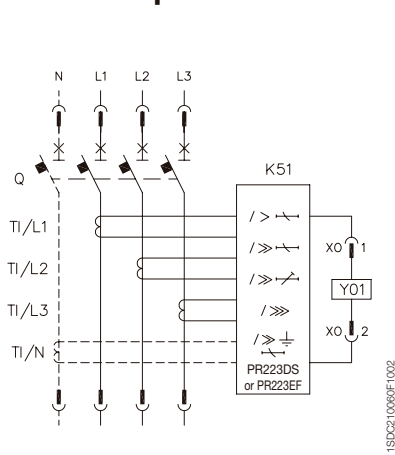
- Fig. 11 = Stored energy motor operator.
- Fig. 12 = One changeover contact for electrical signalling of motor operator locked with key.
- Fig. 32 = Circuit of the current transformer on neutral conductor outside the circuit-breaker (for plug-in version circuit-breaker).
- Fig. 39 = PR223DS electronic release connected with the VM210 voltage measuring device.
- Fig. 40 = PR223EF electronic release connected with the VM210 voltage measuring device.



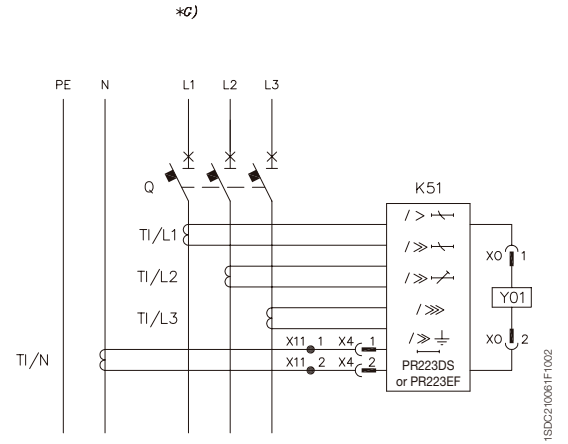
Wiring diagrams

Electrical circuit diagrams of the Tmax T6 circuit-breakers with PR223

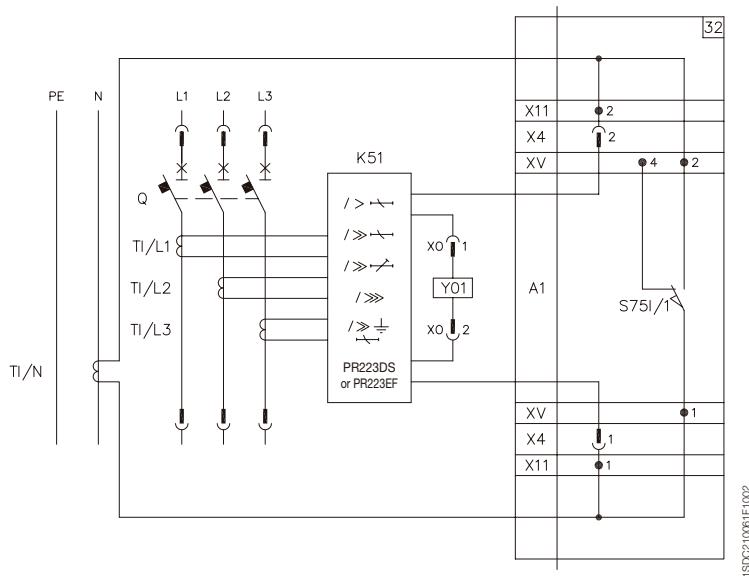
State of operation



Three-pole or four-pole circuit-breaker with PR223DS or PR223EF electronic release



Fixed version three-pole circuit-breaker with current transformer on neutral conductor, external to circuit-breaker



Plug-in or withdrawable version three-pole circuit-breaker with current transformer on neutral conductor, external to circuit-breaker

Caption

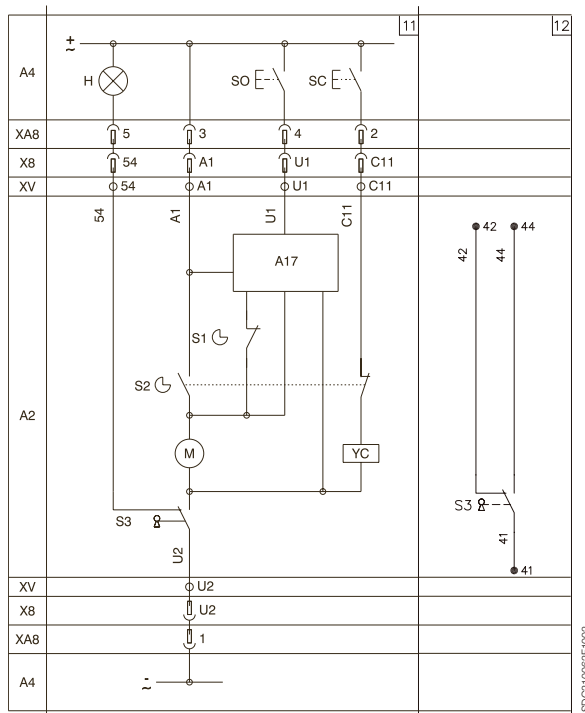
For the circuit diagrams of T6 with PR221, PR222 and PR222MP, please see the diagrams on the "Tmax - Low voltage moulded-case circuit-breakers up to 630 A" technical catalogue.



Wiring diagrams

Electrical accessories for Tmax T6

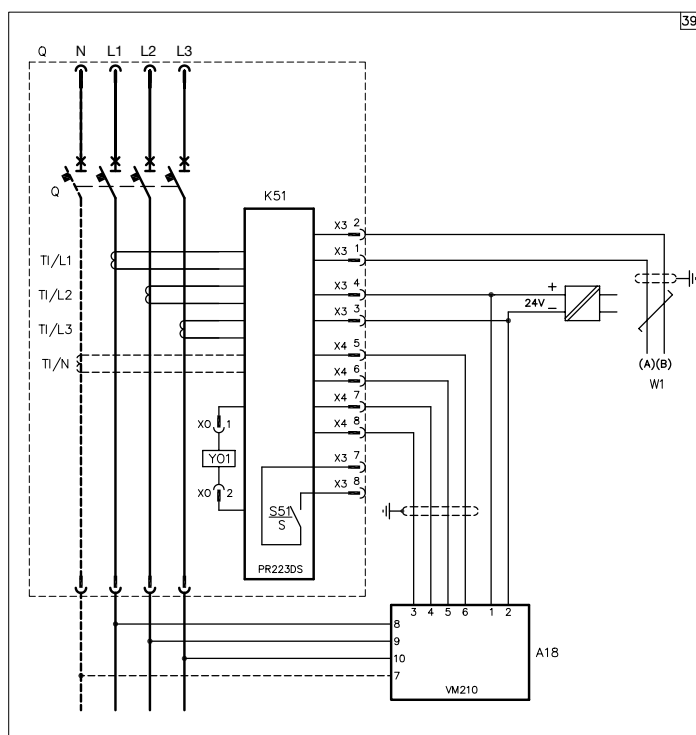
Remote control



1SD0210062F1002

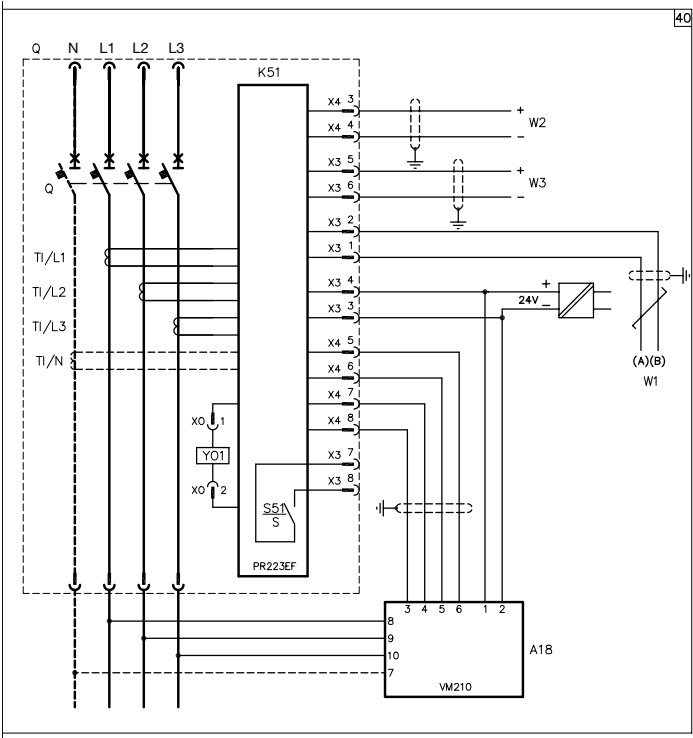
4

PR223DS electronic release connected with the VM210 voltage measuring device



1SD0210063F1002

PR223EF electronic release connected with the VM210 voltage measuring device



Caption

For all the remaining electrical circuit diagrams, please see the "Tmax - Low voltage moulded-case circuit-breakers up to 630 A" technical catalogue. The same electrical circuit diagrams as those for PR222DS/PD are also valid for PR223DS and PR223EF.



Overall dimensions

Index

Overall dimensions

Tmax T6 - Fixed circuit-breaker	5/2
Tmax T6 - Terminals	5/4
Tmax T6 - Withdrawable circuit-breaker	5/7
Tmax T6 - Terminals	5/8
Accessories for Tmax T6	5/9
Distances to be respected	5/14



Overall dimensions

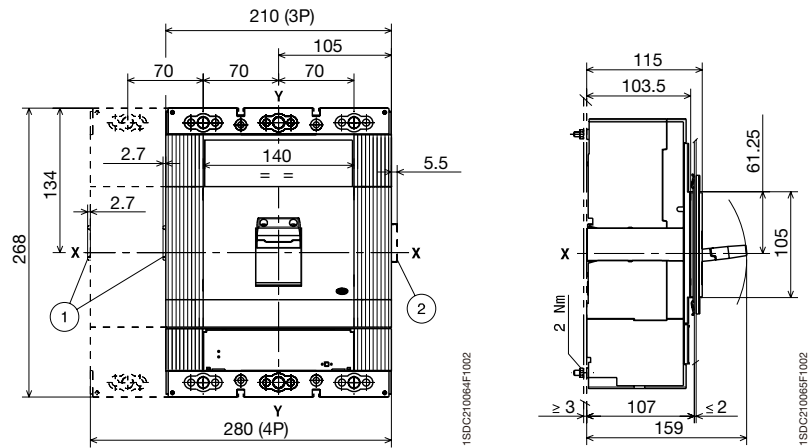
Tmax T6

Fixed circuit-breaker

Caption

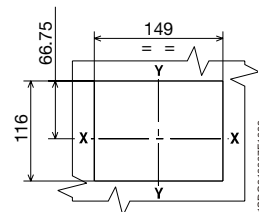
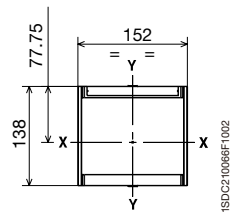
Fixing on sheet

- ① Overall dimensions with cabled accessories mounted (SOR-C, UVR-C)
- ② Overall dimensions with cabled auxiliary contacts mounted (only 3Q 1SY)

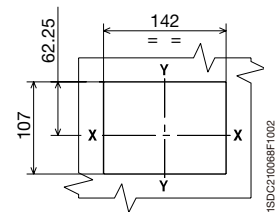


Flange for the compartment door

Drilling templates of the compartment door



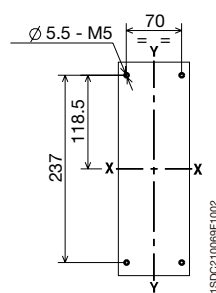
With flange 3-4 POLES



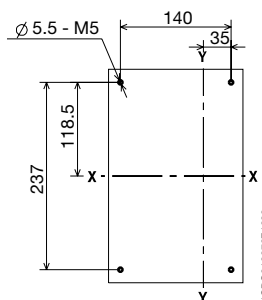
Without flange 3-4 POLES

Drilling templates for support sheet

For front terminals



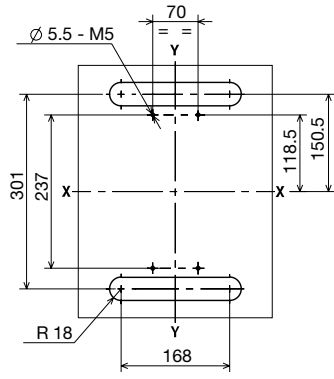
3 POLES



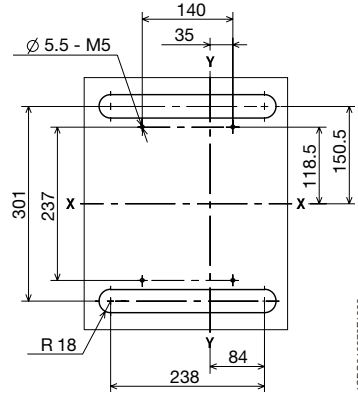
4 POLES

Drilling templates for support sheet

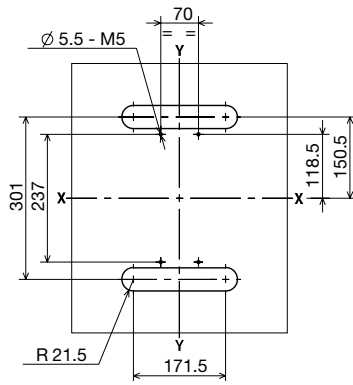
For rear terminals (R) and rear terminals for Cu/Al cables



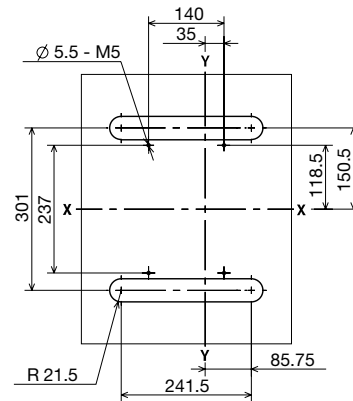
630 A (3 POLES)



630 A (4 POLES)



800 A - 1000 A (3 POLES)



800 A - 1000 A (4 POLES)

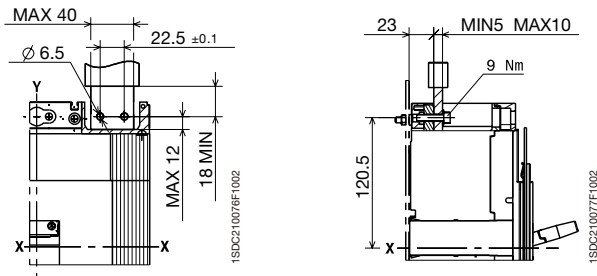


Overall dimensions

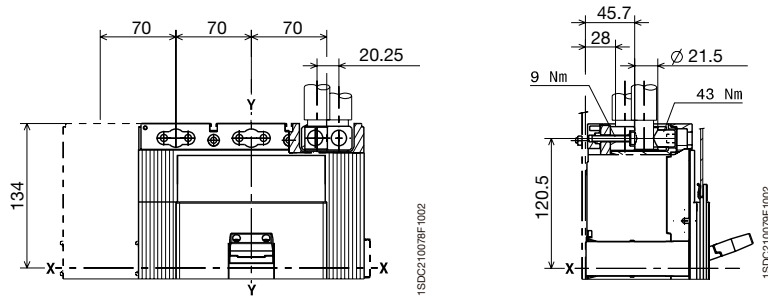
Tmax T6

Terminals

Front - F

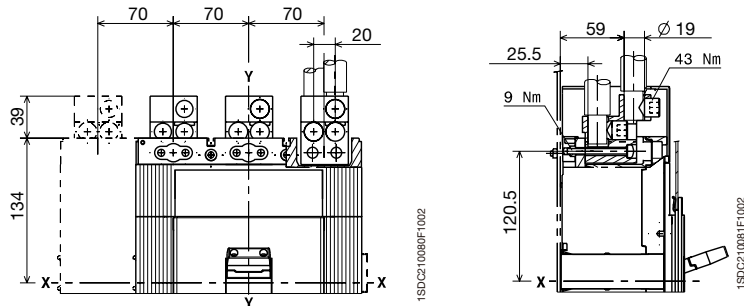


Front for copper/aluminium cables Cu/Al 2x240 mm² FC CuAl



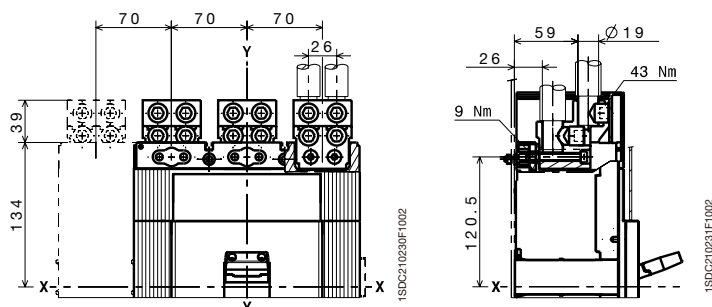
630 A

Front for copper/aluminium cables Cu/Al 3x185 mm² FC CuAl



800 A

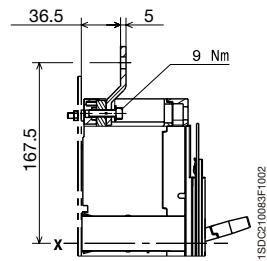
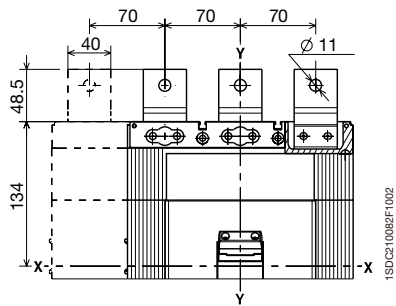
Front for copper/aluminium cables Cu/Al 4x150 mm² FC CuAl



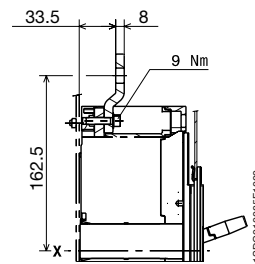
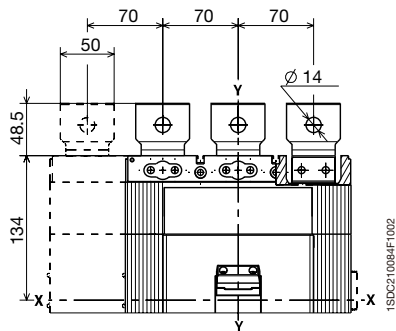
1000 A

5

Front extended - EF

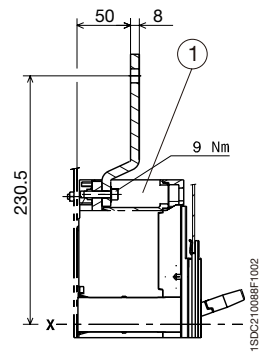
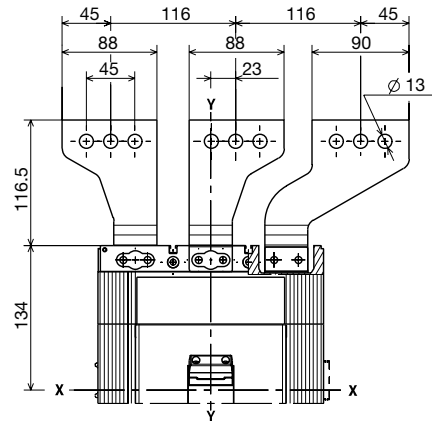
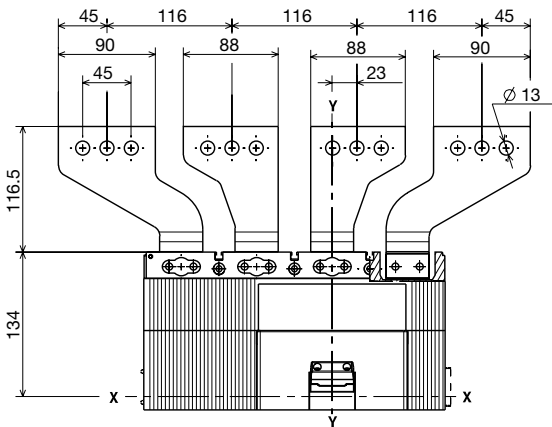


630 A



800 A

Front extended spread - ES



4 POLES

3 POLES

Caption

- ① Insulating barriers between phases (compulsory)

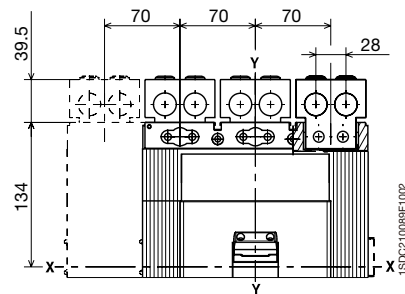


Overall dimensions

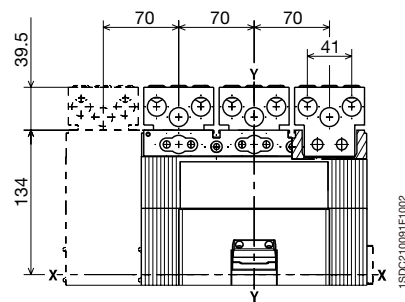
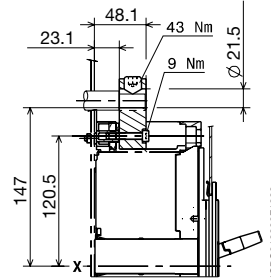
Tmax T6

Terminals

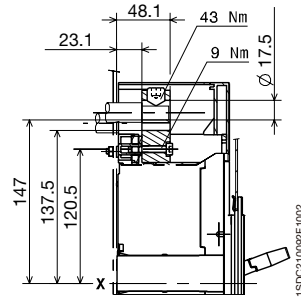
Rear for copper cables Cu/Al - RC CuAl



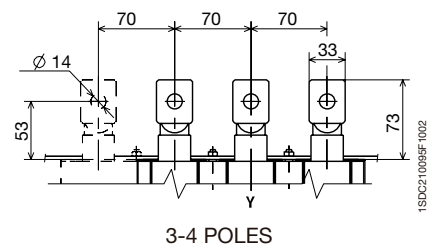
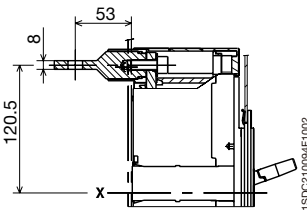
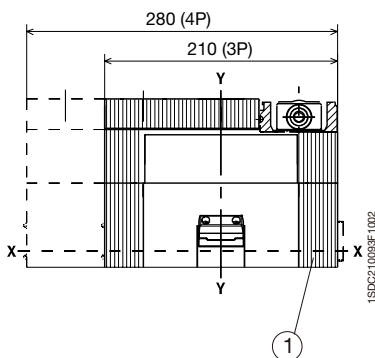
630 A



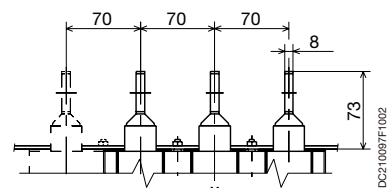
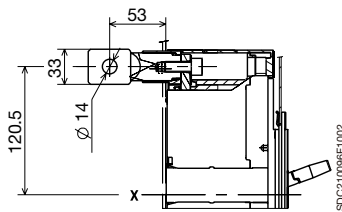
800 A



Rear - R



3-4 POLES



3-4 POLES

Caption

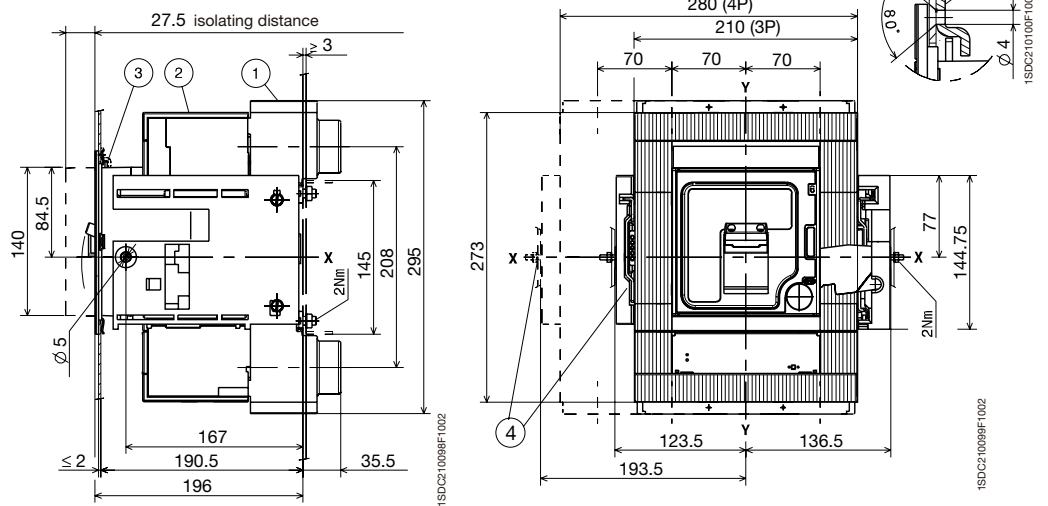
- ① Low terminal covers with degree of protection IP40

Withdrawable circuit-breaker

Caption

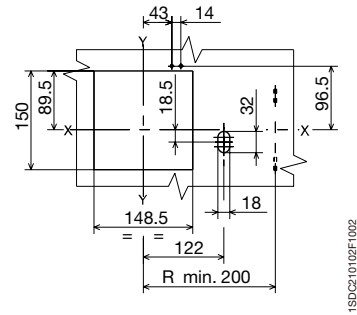
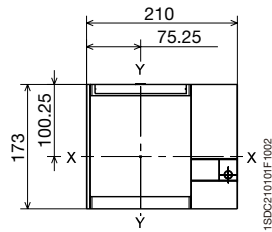
- ① Fixed part
- ② Moving part
- ③ Lock for compartment (available on request)
- ④ Overall dimensions with cabled accessories mounted (SOR-C, UVR-C)

Fixing on sheet

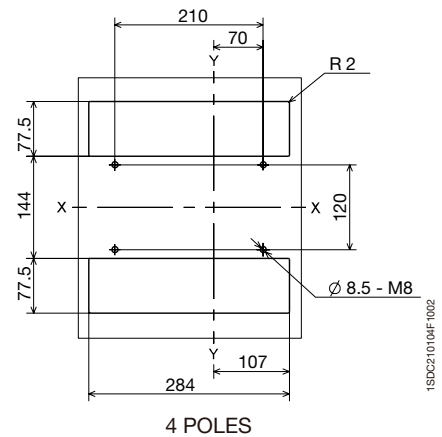
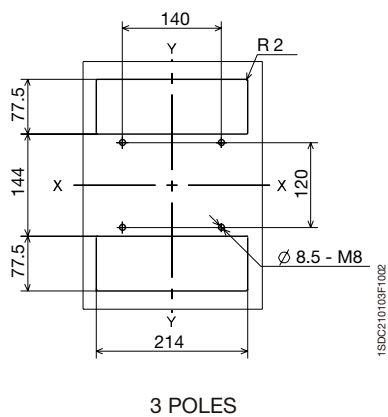


Flange for compartment door

Drilling templates of the compartment door



Drilling templates for support sheet



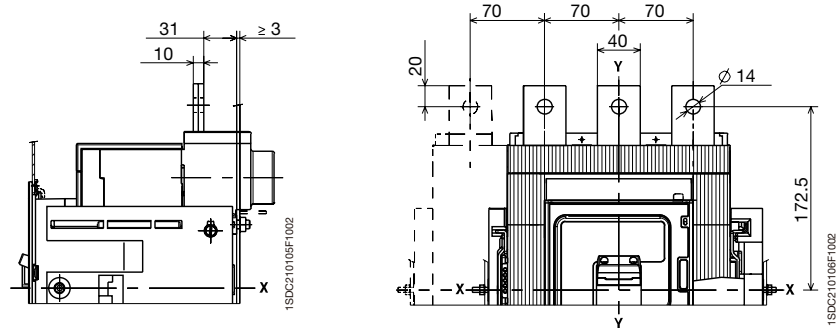


Overall dimensions

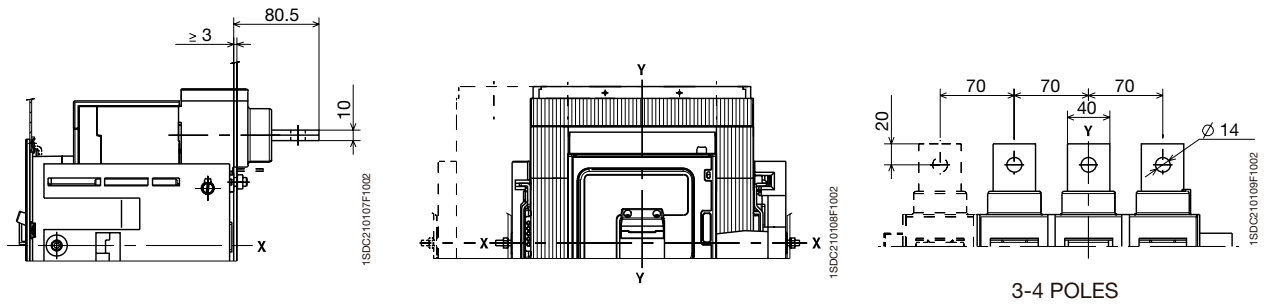
Tmax T6

Terminals

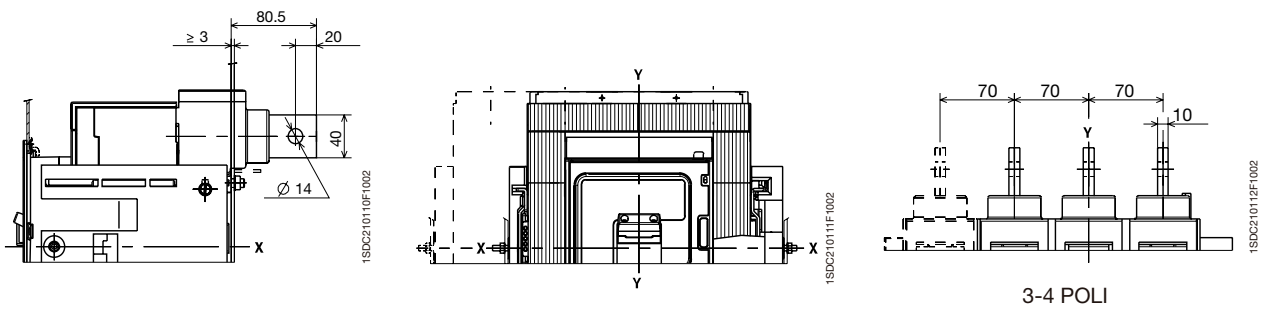
Front extended - EF



Rear flat horizontal - HR



Rear flat vertical - VR



5



Overall dimensions

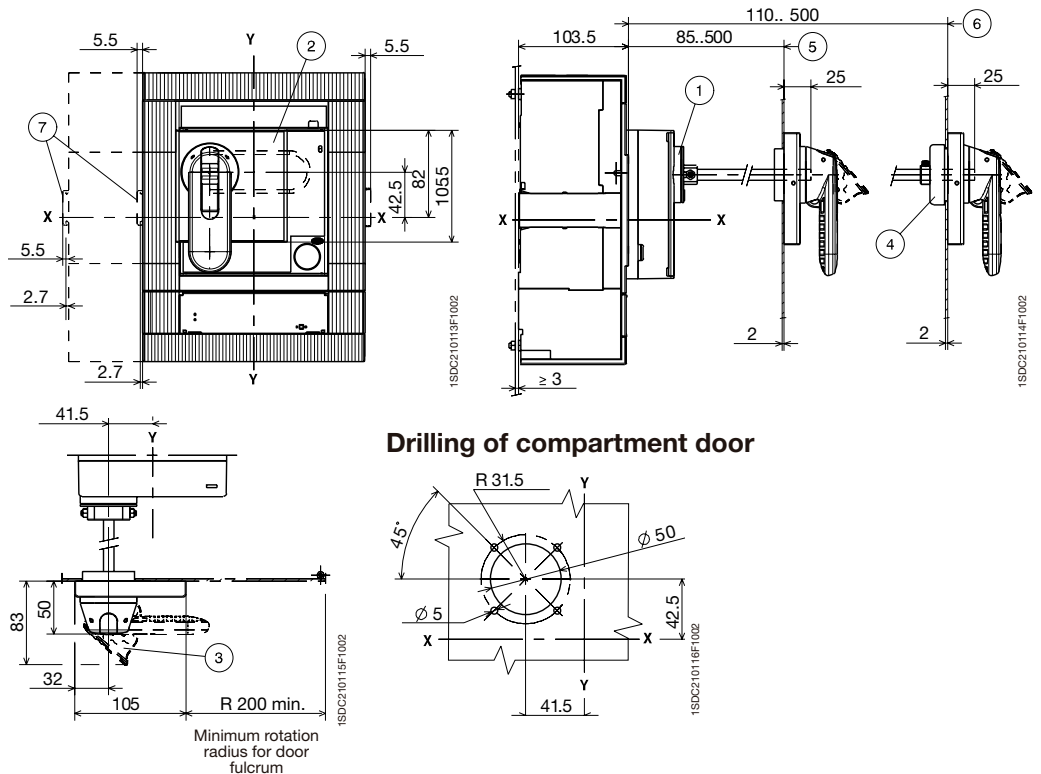
Accessories for Tmax T6

Fixed version

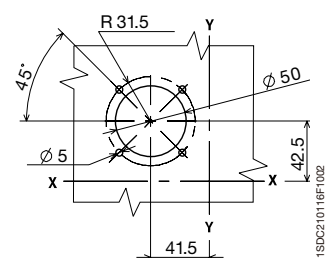
Caption

- ① Transmission unit
- ② Rotary handle assembly with door lock device
- ③ Padlock device for open position (maximum 3 padlocks to be provided by the user)
- ④ IP54 protection (supplied on request)
- ⑤ Min...max distance from the front of the door without accessory ④
- ⑥ Min...max distance from the front of the door with accessory ④
- ⑦ Dimension with AUE connector (early making contact)

Rotary handle operating mechanism on the compartment door



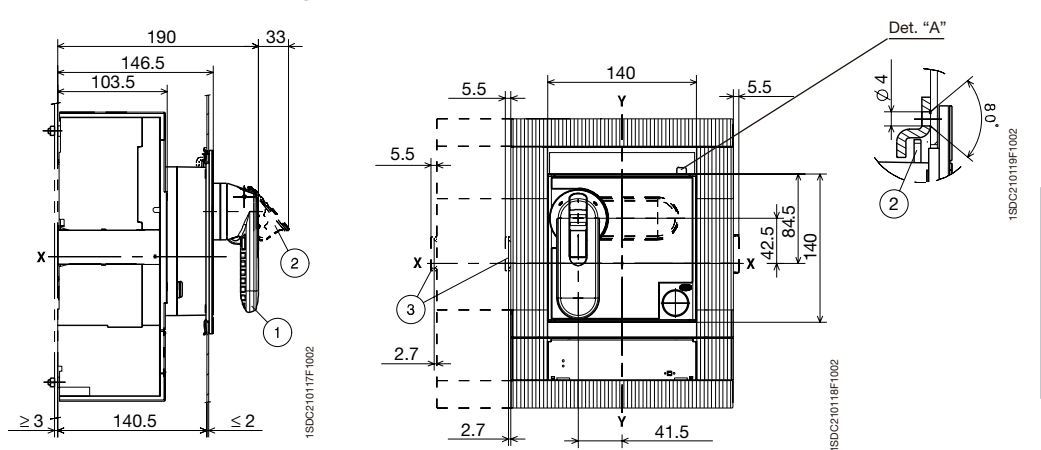
Drilling of compartment door



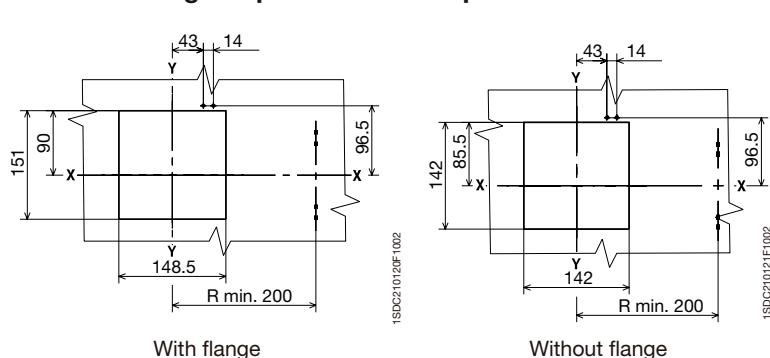
Caption

- ① Rotary handle operating mechanism on circuit-breaker
- ② Padlock device for open position (maximum 3 padlocks to be provided by the user)
- ③ Dimension with AUE connector (early making contact)
- ④ Compartment door lock

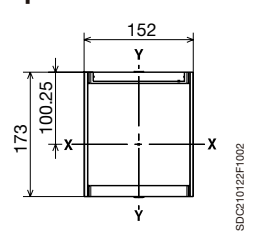
Rotary handle operating mechanism on circuit-breaker



Drilling template of the compartment door



Flange for the compartment door





Overall dimensions

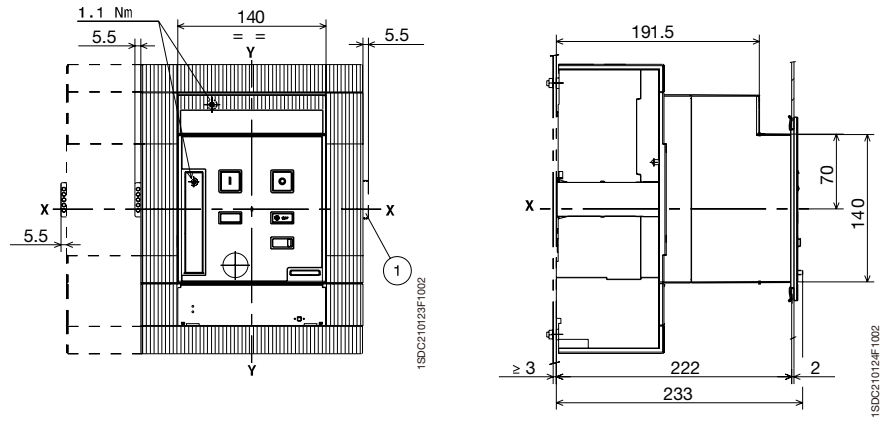
Accessories for Tmax T6

Fixed version

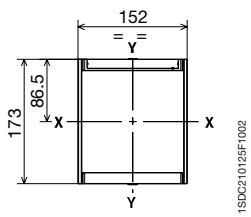
Caption

- ① Overall dimensions with cabled auxiliary contacts mounted (only 3Q 1SY)

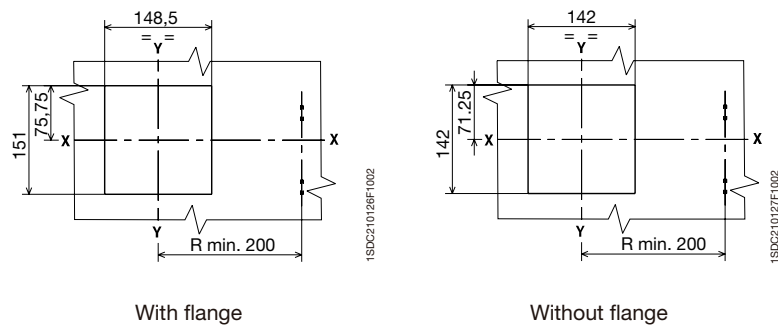
Motor operator



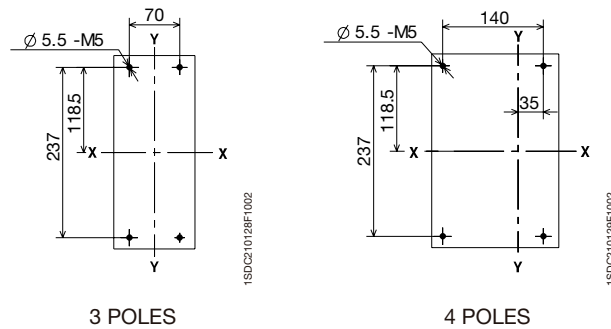
Flange for the compartment door (supplied as standard)



Drilling template of the compartment door



Drilling template for support sheet

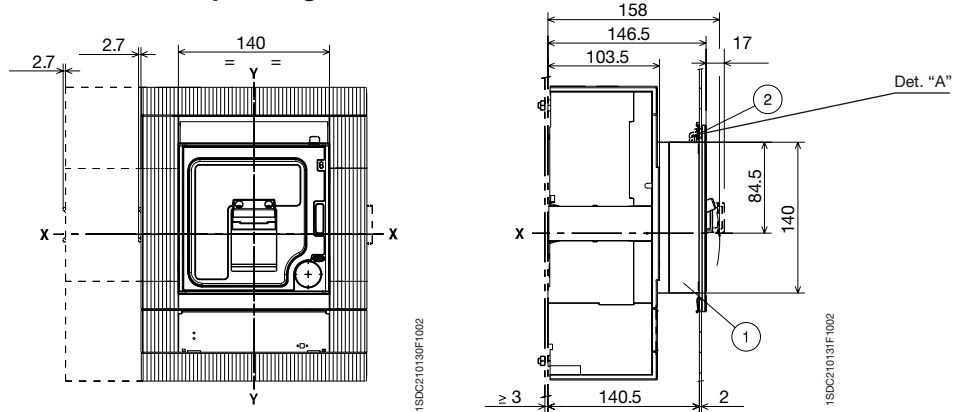


5

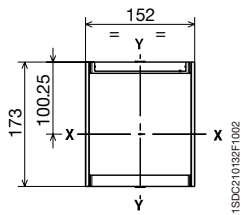
Caption

- ① Front for lever operating mechanism
- ② Lock for the compartment door

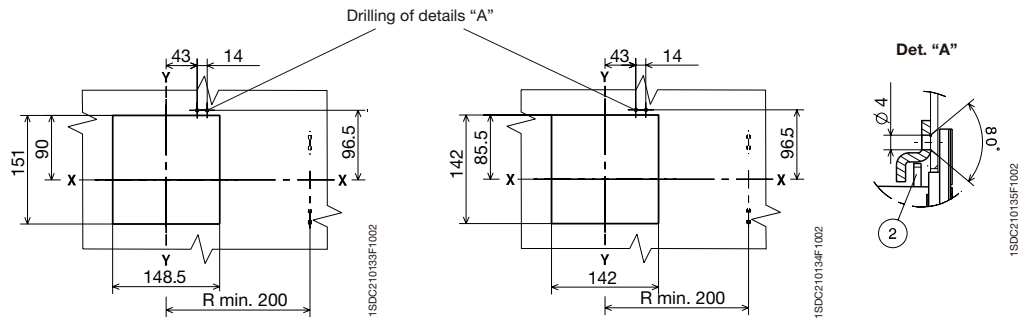
Front for lever operating mechanism



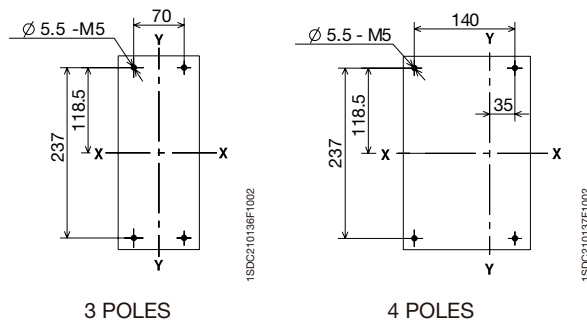
Flange for the compartment door (supplied as standard)



Drilling template for the compartment door



Drilling template for support sheet



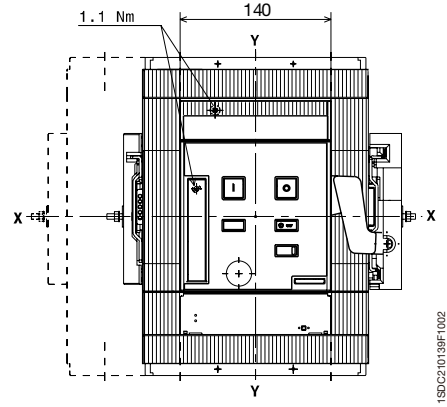
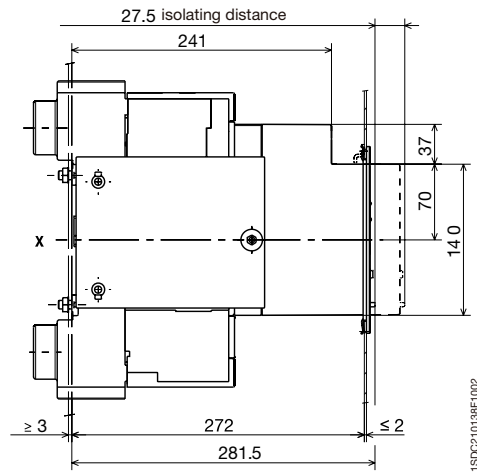


Overall dimensions

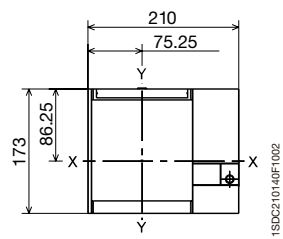
Accessories for Tmax T6

Withdrawable
version

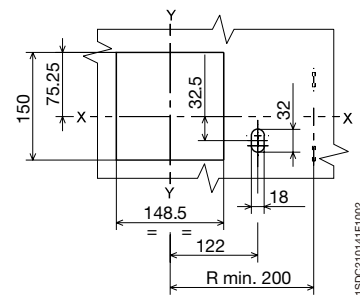
Motor operator



Flange for the compartment door (supplied as standard)



Drilling templates for the compartment door and fitting flange

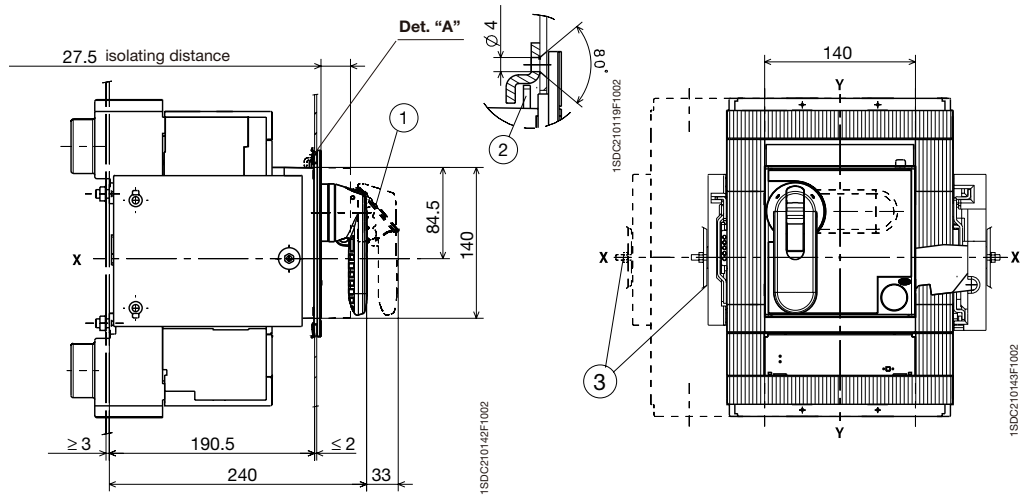


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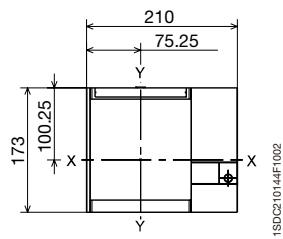
Caption

- ① Padlock device for open position (maximum 3 padlocks to be provided by the user)
- ② Lock for compartment door
- ③ Dimension with AUE connector (early making contact)

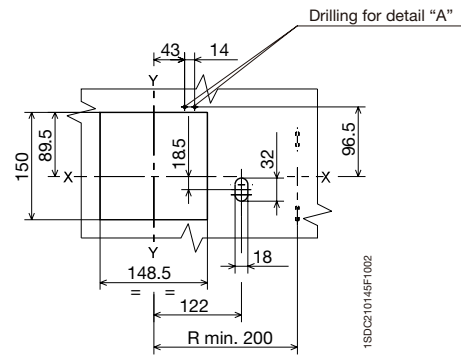
Rotary handle operating mechanism on the circuit-breakers



Flange for the compartment door



Drilling template for compartment door and fitting flange





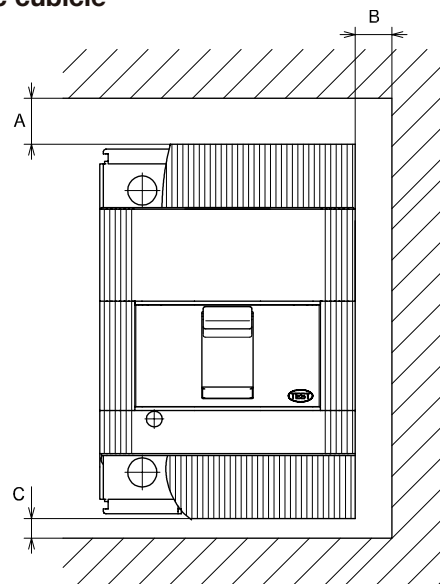
Overall dimensions

Distances to be respected

Insulation distances for installation in metallic cubicle

	A (mm)	B (mm)	C (mm)
T6	35 ⁽¹⁾	25	20

⁽¹⁾ For Ub and T6L all versions: ≥ 440 V: distances A \Rightarrow 100 mm
 Note: For the insulation distances of the 1000 V circuit-breakers, please ask ABB SACE.

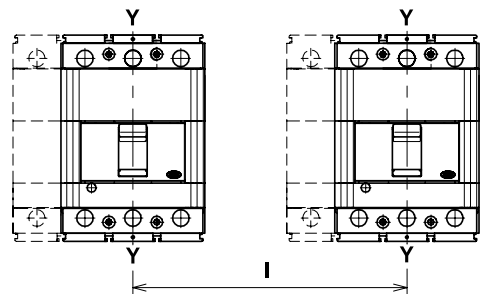


Minimum centre distance between two circuit-breakers side by side or superimposed

For assembly side by side or superimposed, check that the connection busbars or cables do not reduce the air insulation distance.

Minimum centre distance for two circuit-breakers side by side

	Circuit-breaker width (mm)		Centre distance I (mm)	
	3 poles	4 poles	3 poles	4 poles
T6	210	280	210	280



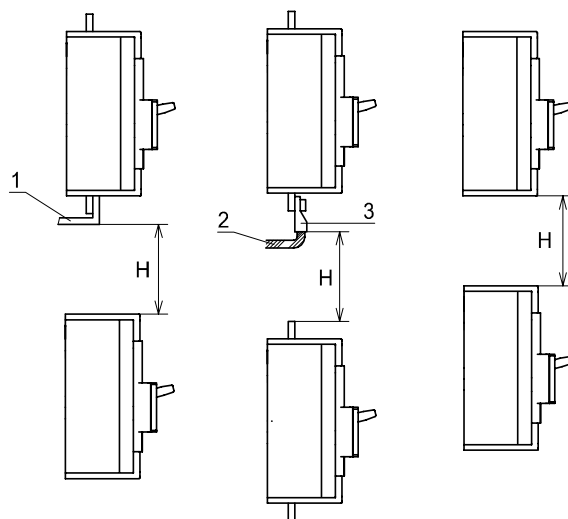
Minimum centre distance for superimposed circuit-breakers

	H (mm)
T6	180

Caption

- ① Connection - not insulated
- ② Insulated cable
- ③ Cable terminal

Note: The dimensions shown apply for operating voltage Ub up to 690 V. The dimensions to be respected must be added to the maximum dimensions of the various different versions of the circuit-breakers, including the terminals.





Index

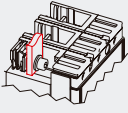
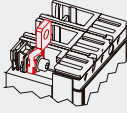
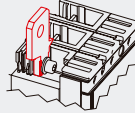
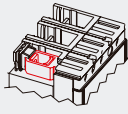
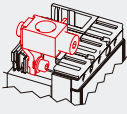
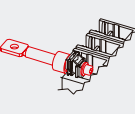
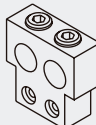
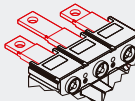
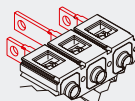
General information	6/2
Circuit-breaker T6 for power distribution	6/3
Circuit-breaker T5 for power distribution	6/7
Circuit-breaker T4 for power distribution	6/9
Circuit-breakers for advanced zone selectivity	6/11
Circuit-breakers for motor protection.....	6/12
Circuit-breakers for applications up to 1000 V	6/13
Switch-disconnectors	6/14
Fixed parts, conversion kits and interruption parts.....	6/15
Accessories	6/16




Ordering codes

General information

Abbreviations used to describe the apparatus

 <p>F = Front terminals</p>	 <p>EF = Front extended terminals</p>	 <p>ES = Front extended spread terminals</p>
 <p>FC CuAl = Front terminals for Cu/Al cables</p>	 <p>FC CuAl = Front terminals for Cu/Al cables (housed externally)</p>	 <p>R = Rear terminals</p>
 <p>RC CuAl = Rear terminals for Cu/Al cables</p>	 <p>HR = Rear flat horizontal terminals</p>	 <p>VR = Rear flat vertical terminals</p>

 **I₃** Magnetic trip current [A]

 **I_n** Rated current of the thermomagnetic release [A]

I_u Rated uninterrupted current of the circuitbreaker [A]

I_{cu} Rated ultimate short-circuit breaking capacity [A]

N= 50% Protection of the neutral at 50% or
N= 100% at 100% of that of the phases

TMA = Thermomagnetic release with adjustable thermal and magnetic threshold

PR22_ = Electronic releases

Ordering codes

Circuit-breaker T6 for power distribution

T6N 630 Fixed (F)

$I_u (40\text{ }^\circ\text{C}) = 630\text{ A} - I_{cu} (415\text{ V}) = 36\text{ kA}$

F = Front terminals			1SDA.....R1	
			3 poles	4 poles
Electronic release				
T6N 630 F F	PR221DS-LS/I	630	060226	060231
T6N 630 F F	PR221DS-I	630	060227	060232
T6N 630 F F	PR222DS/P-LSI	630	060228	060233
T6N 630 F F	PR222DS/P-LSIG	630	060229	060234
T6N 630 F F	PR223DS	630	060230	060235

F = Front terminals			1SDA.....R1	
			3 poles	4 poles
Thermomagnetic release - TMA				
			N = 50%	N = 100%
T6N 630 F F	630	3150...6300	060202	060203 060210

T6N 800 Fixed (F)

$I_u (40\text{ }^\circ\text{C}) = 800\text{ A} - I_{cu} (415\text{ V}) = 36\text{ kA}$

F = Front terminals			1SDA.....R1	
			3 poles	4 poles
Electronic release				
T6N 800 F F	PR221DS-LS/I	800	060268	060273
T6N 800 F F	PR221DS-I	800	060269	060274
T6N 800 F F	PR222DS/P-LSI	800	060270	060275
T6N 800 F F	PR222DS/P-LSIG	800	060271	060276
T6N 800 F F	PR223DS	800	060272	060277

F = Front terminals			1SDA.....R1	
			3 poles	4 poles
Thermomagnetic release - TMA				
			N = 50%	N = 100%
T6N 800 F F	800	4000...8000	060214	060215 060222

T6N 1000 Fixed (F)

$I_u (40\text{ }^\circ\text{C}) = 1000\text{ A} - I_{cu} (415\text{ V}) = 36\text{ kA}$

F = Front terminals			1SDA.....R1	
			3 poles	4 poles
Electronic release				
T6N 1000 F F	PR221DS-LS/I	1000	060537	060542
T6N 1000 F F	PR221DS-I	1000	060538	060543
T6N 1000 F F	PR222DS/P-LSI	1000	060539	060544
T6N 1000 F F	PR222DS/P-LSIG	1000	060540	060545
T6N 1000 F F	PR223DS	1000	060541	060546

Note: The circuit-breaker must be equipped with one of the connection terminals shown at page 2/4.

T6S 630 Fixed (F)

$I_u (40\text{ }^\circ\text{C}) = 630\text{ A} - I_{cu} (415\text{ V}) = 50\text{ kA}$

F = Front terminals			1SDA.....R1	
			3 poles	4 poles
Electronic release				
T6S 630 F F	PR221DS-LS/I	630	060236	060241
T6S 630 F F	PR221DS-I	630	060237	060242
T6S 630 F F	PR222DS/P-LSI	630	060238	060243
T6S 630 F F	PR222DS/P-LSIG	630	060239	060244
T6S 630 F F	PR223DS	630	060240	060245

F = Front terminals			1SDA.....R1	
			3 poles	4 poles
Thermomagnetic release - TMA				
			N = 50%	N = 100%
T6S 630 F F	630	3150...6300	060204	060205 060211



Ordering codes

Circuit-breaker T6 for power distribution

T6S 800

Fixed (F)

I_u (40 °C) = 800 A - I_{cu} (415 V) = 50 kA

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T6S 800 F F	PR221DS-LS/I	800	060278	060283
T6S 800 F F	PR221DS-I	800	060279	060284
T6S 800 F F	PR222DS/P-LSI	800	060280	060285
T6S 800 F F	PR222DS/P-LSIG	800	060281	060286
T6S 800 F F	PR223DS	800	060282	060287

F = Front terminals

In

I₃

1SDA.....R1
3 poles 4 poles

Thermomagnetic release - TMA

N = 50% N = 100%

T6S 800 F F	800	4000...8000	060216	060217	060223
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T6S 1000

Fixed (F)

I_u (40 °C) = 1000 A - I_{cu} (415 V) = 50 kA

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T6S 1000 F F	PR221DS-LS/I	1000	060547	060556
T6S 1000 F F	PR221DS-I	1000	060548	060557
T6S 1000 F F	PR222DS/P-LSI	1000	060552	060558
T6S 1000 F F	PR222DS/P-LSIG	1000	060554	060559
T6S 1000 F F	PR223DS	1000	060555	060560

Note: The circuit-breaker must be equipped with one of the connection terminals shown at page 2/4.

T6H 630

Fixed (F)

I_u (40 °C) = 630 A - I_{cu} (415 V) = 70 kA

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T6H 630 F F	PR221DS-LS/I	630	060246	060251
T6H 630 F F	PR221DS-I	630	060247	060252
T6H 630 F F	PR222DS/P-LSI	630	060248	060253
T6H 630 F F	PR222DS/P-LSIG	630	060249	060254
T6H 630 F F	PR223DS	630	060250	060255

F = Front terminals

In

I₃

1SDA.....R1
3 poles 4 poles

Thermomagnetic release - TMA

N = 50% N = 100%

T6H 630 F F	630	3150...6300	060206	060207	060212
-------------	-----	-------------	--------	--------	--------

T6H 800

Fixed (F)

I_u (40 °C) = 800 A - I_{cu} (415 V) = 70 kA

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T6H 800 F F	PR221DS-LS/I	800	060289	060294
T6H 800 F F	PR221DS-I	800	060290	060295
T6H 800 F F	PR222DS/P-LSI	800	060291	060296
T6H 800 F F	PR222DS/P-LSIG	800	060292	060297
T6H 800 F F	PR223DS	800	060293	060298

F = Front terminals

In

I₃

1SDA.....R1
3 poles 4 poles

Thermomagnetic release - TMA

N = 50% N = 100%

T6H 800 F F	800	4000...8000	060218	060219	060224
-------------	-----	-------------	--------	--------	--------

T6H 1000

Fixed (F)

$I_u (40\text{ °C}) = 1000\text{ A} - I_{cu} (415\text{ V}) = 70\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T6H 1000 F F	PR221DS-LS/I	1000	060561	060566
T6H 1000 F F	PR221DS-I	1000	060562	060567
T6H 1000 F F	PR222DS/P-LSI	1000	060563	060568
T6H 1000 F F	PR222DS/P-LSIG	1000	060564	060569
T6H 1000 F F	PR223DS	1000	060565	060573

Note: The circuit-breaker must be equipped with one of the connection terminals shown at page 2/4.

T6L 630

Fixed (F)

$I_u (40\text{ °C}) = 630\text{ A} - I_{cu} (415\text{ V}) = 100\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T6L 630 F F	PR221DS-LS/I	630	060256	060262
T6L 630 F F	PR221DS-I	630	060257	060263
T6L 630 F F	PR222DS/P-LSI	630	060258	060264
T6L 630 F F	PR222DS/P-LSIG	630	060259	060265
T6L 630 F F	PR223DS	630	060260	060266

F = Front terminals

In

I₃

1SDA.....R1
3 poles 4 poles

Thermomagnetic release - TMA

T6L 630 F F	630	3150...6300	060208	060209	060213
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T6L 800

Fixed (F)

$I_u (40\text{ °C}) = 800\text{ A} - I_{cu} (415\text{ V}) = 100\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T6L 800 F F	PR221DS-LS/I	800	060299	060305
T6L 800 F F	PR221DS-I	800	060300	060306
T6L 800 F F	PR222DS/P-LSI	800	060301	060307
T6L 800 F F	PR222DS/P-LSIG	800	060302	060308
T6L 800 F F	PR223DS	800	060303	060309

F = Front terminals

In

I₃

1SDA.....R1
3 poles 4 poles

Thermomagnetic release - TMA

T6L 800 F F	800	4000...8000	060220	060221	060225
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T6L 1000

Fixed (F)

$I_u (40\text{ °C}) = 1000\text{ A} - I_{cu} (415\text{ V}) = 100\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T6L 1000 F F	PR221DS-LS/I	1000	060574	060580
T6L 1000 F F	PR221DS-I	1000	060575	060581
T6L 1000 F F	PR222DS/P-LSI	1000	060576	060582
T6L 1000 F F	PR222DS/P-LSIG	1000	060577	060583
T6L 1000 F F	PR223DS	1000	060578	060584

Note: The circuit-breaker must be equipped with one of the connection terminals shown at page 2/4.



Ordering codes

Circuit-breaker T6 for power distribution

Releases for T6

F = Front terminals	In	1SDA.....R1			
		3 poles	4 poles		
Electronic release					
PR221DS-LS/I	630	060351	060357		
PR221DS-LS/I	800	060363	060369		
PR221DS-LS/I	1000	060596	060602		
PR221DS-I	630	060352	060358		
PR221DS-I	800	060364	060370		
PR221DS-I	1000	060597	060603		
PR222DS/P-LSI	630	060353	060359		
PR222DS/P-LSI	800	060365	060371		
PR222DS/P-LSI	1000	060598	060604		
PR222DS/P-LSIG	630	060354	060360		
PR222DS/P-LSIG	800	060366	060372		
PR222DS/P-LSIG	1000	060599	060605		
PR223DS	630	060376	060377		
PR223DS	800	060378	060379		
PR223DS	1000	060608	060609		
PR222DS/PD-LSI	630	060355	060361		
PR222DS/PD-LSI	800	060367	060373		
PR222DS/PD-LSI	1000	060600	060606		
PR222DS/PD-LSIG	630	060356	060362		
PR222DS/PD-LSIG	800	060368	060374		
PR222DS/PD-LSIG	1000	060601	060607		
F = Front terminals	In	I ₃	1SDA.....R1		
			3 poles	4 poles	
Thermomagnetic release - TMA				N = 50%	N = 100%
TMA 630-6300	630	3150...6300	060347	060348	060472
TMA 800-8000	800	4000...8000	060349	060350	060473

Ordering codes

Circuit-breaker T5 for power distribution

T5N 400

Fixed (F)

$I_u (40\text{ °C}) = 400\text{ A} - I_{cu} (415\text{ V}) = 36\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T5N 400 F F	PR223DS	320	059529	059530
T5N 400 F F	PR223DS	400	059531	059532

T5N 630

Fixed (F)

$I_u (40\text{ °C}) = 630\text{ A} - I_{cu} (415\text{ V}) = 36\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T5N 630 F F	PR223DS	630	059533	059534
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T5S 400

Fixed (F)

$I_u (40\text{ °C}) = 400\text{ A} - I_{cu} (415\text{ V}) = 50\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T5S 400 F F	PR223DS	320	059535	059536
T5S 400 F F	PR223DS	400	059537	059538

T5S 630

Fixed (F)

$I_u (40\text{ °C}) = 630\text{ A} - I_{cu} (415\text{ V}) = 50\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T5S 630 F F	PR223DS	630	059539	059540
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T5H 400

Fixed (F)

$I_u (40\text{ °C}) = 400\text{ A} - I_{cu} (415\text{ V}) = 70\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T5H 400 F F	PR223DS	320	059541	059542
T5H 400 F F	PR223DS	400	059543	059544

T5H 630

Fixed (F)

$I_u (40\text{ °C}) = 630\text{ A} - I_{cu} (415\text{ V}) = 70\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T5H 630 F F	PR223DS	630	059545	059546
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Ordering codes

Circuit-breaker T5 for power distribution

T5L 400

Fixed (F)

$I_u (40\text{ °C}) = 400\text{ A} - I_{cu} (415\text{ V}) = 120\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T5L 400 F F	PR223DS	320	059547	059548
T5L 400 F F	PR223DS	400	059549	059550

T5L 630

Fixed (F)

$I_u (40\text{ °C}) = 630\text{ A} - I_{cu} (415\text{ V}) = 120\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T5L 630 F F	PR223DS	630	059551	059552
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T5V 400

Fixed (F)

$I_u (40\text{ °C}) = 400\text{ A} - I_{cu} (415\text{ V}) = 200\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T5V 400 F F	PR223DS	320	059553	059554
T5V 400 F F	PR223DS	400	059555	059556

T5V 630

Fixed (F)

$I_u (40\text{ °C}) = 630\text{ A} - I_{cu} (415\text{ V}) = 200\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T5V 630 F F	PR223DS	630	059557	059558
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Releases for T5

In

1SDA.....R1
3 poles 4 poles

Electronic release

PR223DS		320	059567	059568
PR223DS		400	059569	059570
PR223DS		630	059571	059572

Ordering codes

Circuit-breaker T4 for power distribution

T4N 250

Fixed (F)

$I_u (40\text{ °C}) = 250\text{ A} - I_{cu} (415\text{ V}) = 36\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T4N 250 F F	PR223DS	100	059489	059490
T4N 250 F F	PR223DS	160	059491	059492
T4N 250 F F	PR223DS	250	059493	059494

T4N 320

Fixed (F)

$I_u (40\text{ °C}) = 320\text{ A} - I_{cu} (415\text{ V}) = 36\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T4N 320 F F	PR223DS	320	059495	059496
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T4S 250

Fixed (F)

$I_u (40\text{ °C}) = 250\text{ A} - I_{cu} (415\text{ V}) = 50\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T4S 250 F F	PR223DS	100	059497	059498
T4S 250 F F	PR223DS	160	059499	059500
T4S 250 F F	PR223DS	250	059501	059502

T4S 320

Fixed (F)

$I_u (40\text{ °C}) = 320\text{ A} - I_{cu} (415\text{ V}) = 50\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T4S 320 F F	PR223DS	320	059503	059504
-------------	---------	-----	--------	--------

T4H 250

Fixed (F)

$I_u (40\text{ °C}) = 250\text{ A} - I_{cu} (415\text{ V}) = 70\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T4H 250 F F	PR223DS	100	059505	059506
T4H 250 F F	PR223DS	160	059507	059508
T4H 250 F F	PR223DS	250	059509	059510

T4H 320

Fixed (F)

$I_u (40\text{ °C}) = 320\text{ A} - I_{cu} (415\text{ V}) = 70\text{ kA}$

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

T4H 320 F F	PR223DS	320	059511	059512
-------------	---------	-----	--------	--------



Ordering codes

Circuit-breaker T4 for power distribution

T4L 250

Fixed (F)

I_u (40 °C) = **250 A** - I_{cu} (415 V) = **120 kA**

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

Model	PR223DS	100	059513	059514
T4L 250 F F	PR223DS	100	059513	059514
T4L 250 F F	PR223DS	160	059515	059516
T4L 250 F F	PR223DS	250	059517	059518

T4L 320

Fixed (F)

I_u (40 °C) = **320 A** - I_{cu} (415 V) = **120 kA**

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

Model	PR223DS	320	059519	059520
T4L 320 F F	PR223DS	320	059519	059520

T4V 250

Fixed (F)

I_u (40 °C) = **250 A** - I_{cu} (415 V) = **200 kA**

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

Model	PR223DS	100	059521	059522
T4V 250 F F	PR223DS	100	059521	059522
T4V 250 F F	PR223DS	160	059523	059524
T4V 250 F F	PR223DS	250	059525	059526

T4V 320

Fixed (F)

I_u (40 °C) = **320 A** - I_{cu} (415 V) = **200 kA**

F = Front terminals

In

1SDA.....R1
3 poles 4 poles

Electronic release

Model	PR223DS	320	059527	059528
T4V 320 F F	PR223DS	320	059527	059528

Releases for T4

In

1SDA.....R1
3 poles 4 poles

Electronic release

PR223DS	100	059559	059560
PR223DS	100	059559	059560
PR223DS	160	059561	059562
PR223DS	250	059563	059564
PR223DS	320	059565	059566

Ordering codes

Circuit-breakers for advanced zone selectivity

T4L 250 Fixed (F)

$I_u (40\text{ }^\circ\text{C}) = 250\text{ A} - I_{cu} (415\text{ V}) = 120\text{ kA}$

F = Front terminals		In	1SDA.....R1	
			3 poles	4 poles
Electronic release				
T4L 250 F F	PR223EF	100	059475	059476
T4L 250 F F	PR223EF	160	059477	059478
T4L 250 F F	PR223EF	250	059479	059480

Note: Please ask ABB SACE for availability

T4L 320 Fixed (F)

$I_u (40\text{ }^\circ\text{C}) = 320\text{ A} - I_{cu} (415\text{ V}) = 120\text{ kA}$

F = Front terminals		In	1SDA.....R1	
			3 poles	4 poles
Electronic release				
T4L 320 F F	PR223EF	320	059481	059482

Note: Please ask ABB SACE for availability

T5L 400 Fixed (F)

$I_u (40\text{ }^\circ\text{C}) = 400\text{ A} - I_{cu} (415\text{ V}) = 120\text{ kA}$

F = Front terminals		In	1SDA.....R1	
			3 poles	4 poles
Electronic release				
T5L 400 F F	PR223EF	320	059483	059484
T5L 400 F F	PR223EF	400	059485	059486

Note: Please ask ABB SACE for availability

T5L 630 Fixed (F)

$I_u (40\text{ }^\circ\text{C}) = 630\text{ A} - I_{cu} (415\text{ V}) = 120\text{ kA}$

F = Front terminals		In	1SDA.....R1	
			3 poles	4 poles
Electronic release				
T5L 630 F F	PR223EF	630	059487	059488

Note: Please ask ABB SACE for availability

T6L 630 Fixed (F)

$I_u (40\text{ }^\circ\text{C}) = 630\text{ A} - I_{cu} (415\text{ V}) = 100\text{ kA}$

F = Front terminals		In	1SDA.....R1	
			3 poles	4 poles
Electronic release				
T6L 630 F F	PR223EF	630	060261	060267

Note: Please ask ABB SACE for availability

T6L 800 Fixed (F)

$I_u (40\text{ }^\circ\text{C}) = 800\text{ A} - I_{cu} (415\text{ V}) = 100\text{ kA}$

F = Front terminals		In	1SDA.....R1	
			3 poles	4 poles
Electronic release				
T6L 800 F F	PR223EF	800	060304	060310

Note: Please ask ABB SACE for availability

T6L 1000 Fixed (F)

$I_u (40\text{ }^\circ\text{C}) = 1000\text{ A} - I_{cu} (415\text{ V}) = 100\text{ kA}$

F = Front terminals		In	1SDA.....R1	
			3 poles	4 poles
Electronic release				
T6L 1000 F F	PR223EF	1000	060579	060585

Note: Please ask ABB SACE for availability



Ordering codes

Circuit-breakers for motor protection

T6N 800

Fixed (F)

I_u (40 °C) = 800 A - I_{cu} (415 V) = 36 kA

F = Front terminals

In

1SDA.....R1
3 poles

Electronic release for motor protection

T6N 800 F F

PR222MP

630

060311

T6S 800

Fixed (F)

I_u (40 °C) = 800 A - I_{cu} (415 V) = 50kA

F = Front terminals

In

1SDA.....R1
3 poles

Electronic release for motor protection

T6S 800 F F

PR222MP

630

060312

T6H 800

Fixed (F)

I_u (40 °C) = 800 A - I_{cu} (415 V) = 70 kA

F = Front terminals

In

1SDA.....R1
3 poles

Electronic release for motor protection

T6H 800 F F

PR222MP

630

060313

T6L 800

Fixed (F)

I_u (40 °C) = 800 A - I_{cu} (415 V) = 100 kA

F = Front terminals

In

1SDA.....R1
3 poles

Electronic release for motor protection

T6L 800 F F

PR222MP

630

060314

Releases for T6

F = Front terminals

In

1SDA.....R1
3 poles

Electronic release

PR222MP

630

060375

Ordering codes

Circuit-breakers for applications up to 1000 V

T6L 630 Fixed (F)

$I_u (40\text{ °C}) = 630\text{ A} - I_{cu} (1000\text{ V AC}) = 12\text{ kA}$

F = Front terminals

I_n

1SDA.....R1
3 poles

Electronic release

T6L 630 F F	PR221DS-LS/I	630	060319
T6L 630 F F	PR221DS-I	630	060320
T6L 630 F F	PR222DS/P-LSI	630	060321
T6L 630 F F	PR222DS/P-LSIG	630	060322

Note: Please ask ABB SACE for availability

T6L 800 Fixed (F)

$I_u (40\text{ °C}) = 800\text{ A} - I_{cu} (1000\text{ V AC}) = 12\text{ kA}$

F = Front terminals

I_n

1SDA.....R1
3 poles

Electronic release

T6L 800 F F	PR221DS-LS/I	800	060323
T6L 800 F F	PR221DS-I	800	060324
T6L 800 F F	PR222DS/P-LSI	800	060325
T6L 800 F F	PR222DS/P-LSIG	800	060326

Note: Please ask ABB SACE for availability

T6L 630 Fixed (F)

$I_u (40\text{ °C}) = 630\text{ A} - I_{cu} (1000\text{ V AC}) = 12\text{ kA} / I_{cu} (1000\text{ V DC}) = 40\text{ kA}$

F = Front terminals

I_n

I_3

1SDA.....R1
4 poles

Thermomagnetic release - TMA

T6L 630 F F	630	3150...6300	060315
-------------	-----	-------------	--------

Note: Please ask ABB SACE for availability

T6L 800 Fixed (F)

$I_u (40\text{ °C}) = 800\text{ A} - I_{cu} (1000\text{ V AC}) = 12\text{ kA} / I_{cu} (1000\text{ V DC}) = 40\text{ kA}$

F = Front terminals

I_n

I_3

1SDA.....R1
4 poles

Thermomagnetic release - TMA

T6L 800 F F	800	4000...8000	060317
-------------	-----	-------------	--------

Note: Please ask ABB SACE for availability



Ordering codes

Switch-disconnectors

T6D 630

Fixed (F)

I_u (40°C) = 630 A - I_{cw} = 15 kA

F = Front terminals

	1SDA.....R1	
	3 poles	4 poles
<i>Electronic release</i>		
T6D 630 F F	060343	060344

T6D 800

Fixed (F)

I_u (40°C) = 800 A - I_{cw} = 15 kA

F = Front terminals

	1SDA.....R1	
	3 poles	4 poles
<i>Electronic release</i>		
T6D 800 F F	060345	060346

T6D 1000

Fixed (F)

I_u (40°C) = 1000 A - I_{cw} = 15 kA

F = Front terminals

	1SDA.....R1	
	3 poles	4 poles
<i>Electronic release</i>		
T6D 1000 F F	060594	060595

Note: Please ask ABB SACE for availability

Ordering codes

Fixed parts, conversion kits and interruption parts

Withdrawable (W)

Fixed part

	EF = Front extended terminals	1SDA.....R1	
		3 poles	4 poles
T6 W FP EF		060384	060387

Withdrawable (W)

Fixed part

	VR = Rear flat vertical terminals	1SDA.....R1	
		3 poles	4 poles
T6 W FP VR		060386	060389

Withdrawable (W)

Fixed part

	HR = Rear flat horizontal terminals	1SDA.....R1	
		3 poles	4 poles
T6 W FP HR		060385	060388

Conversion

of the version

Type		1SDA.....R1	
		3 poles	4 poles
Kit W MP T6 630 - T6 800		060390	060391

Terminals

for fixed parts

Type		1SDA.....R1	
		3 poles	4 poles
EF		013984	013985
HR		013986	013987
VR		013988	013989

Interruption parts

T6 630

F = Front terminals		1SDA.....R1	
		3 poles	4 poles
T6N 630 Interruption part		060327	060331
T6S 630 Interruption part		060328	060332
T6H 630 Interruption part		060329	060333
T6L 630 Interruption part		060330	060334

T6 800

F = Front terminals		1SDA.....R1	
		3 poles	4 poles
T6N 800 Interruption part		060335	060339
T6S 800 Interruption part		060336	060340
T6H 800 Interruption part		060337	060341
T6L 800 Interruption part		060338	060342

T6 1000

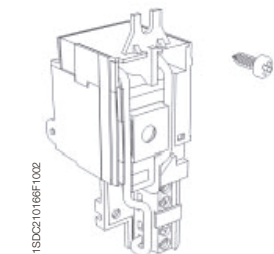
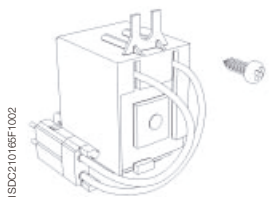
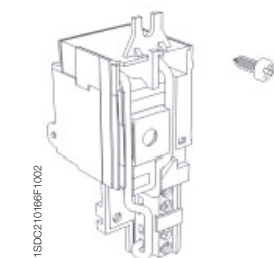
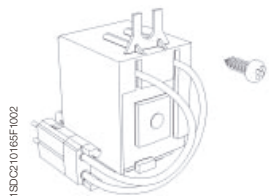
F = Front terminals		1SDA.....R1	
		3 poles	4 poles
T6N 1000 Interruption part		060586	060590
T6S 1000 Interruption part		060587	060591
T6H 1000 Interruption part		060588	060592
T6L 1000 Interruption part		060589	060593



Ordering codes

Accessories

Service releases



Shunt opening release - SOR

Type	1SDA.....R1 T4-T5-T6
uncabled version	
SOR 12 V DC	054862
SOR 24...30 V AC / DC	054863
SOR 48...60 V AC / DC	054864
SOR 110...127 V AC - 110...125 V DC	054865
SOR 220...240 V AC - 220...250 V DC	054866
SOR 380...440 V AC	054867
SOR 480...525 V AC	054868
cabled version	
SOR-C 12 V DC	054869
SOR-C 24...30 V AC / DC	054870
SOR-C 48...60 V AC / DC	054871
SOR-C 110...127 V AC - 110...125 V DC	054872
SOR-C 220...240 V AC - 220...250 V DC	054873
SOR-C 380...440 V AC	054874
SOR-C 480...525 V AC	054875

Undervoltage release - UVR

Type	1SDA.....R1 T4-T5-T6
uncabled version	
UVR 24...30 V AC / DC	054880
UVR 48 V AC / DC	054881
UVR 60 V AC/DC	054882
UVR 110...127 V AC - 110...125 V DC	054883
UVR 220...240 V AC - 220...250 V DC	054884
UVR 380...440 V AC	054885
UVR 480...525 V AC	054886
cabled version	
UVR-C 24...30 V AC / DC	054887
UVR-C 48 V AC / DC	054888
UVR-C 60 V AC/DC	054889
UVR-C 110...127 V AC - 110...125 V DC	054890
UVR-C 220...240 V AC - 220...250 V DC	054891
UVR-C 380...440 V AC	054892
UVR-C 480...525 V AC	054893

Shunt opening release with permanent operation - PS-SOR

Type	1SDA.....R1 T4-T5-T6
uncabled version	
PS-SOR 24...30 V DC	054876
PS-SOR 110...120 V AC	054877
cabled version	
PS-SOR-C 24...30 V DC	054878
PS-SOR-C 110...120 V AC	054879

Note: Please ask ABB SACE for availability

Time delay device for undervoltage release - UVD

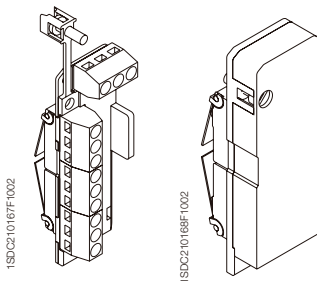
Type	1SDA.....R1 T1...T6
UVD 24...30 V AC / DC	051357
UVD 48...60 V AC / DC	051358
UVD 110...125 V AC / DC	051360
UVD 220...250 V AC / DC	051361

Note: Please ask ABB SACE for availability

Connectors for service releases

Type	1SDA.....R1		
	T1...T3	T1...T6	T6
Socket-plug connectors 12 poles		051362	
Socket-plug connectors 6 poles		051363	
Socket-plug connectors 3 poles		051364	
3-way connector for second SOR-C			060392
Kit 12 cables L=2m for AUX	051365		
Kit 6 cables L=2m for AUX	051366		
Kit 2 cables L=2m for SOR-UVR	051367		

Electrical signals



Auxiliary contacts - AUX

Type	1SDA.....R1		
	T1...T6	T4-T5-T6	T6
uncabled version			
AUX 1Q 1SY 250 V AC/DC	051368		
AUX 3Q 1SY 250 V AC/DC	051369		
AUX 3Q 1SY 24 V AC/DC	054914		
cabled version			
AUX-C 1Q 1SY 250 V AC/DC		054910	
AUX-C 3Q 1SY 250 V AC/DC		054911	
AUX-C 1Q 1SY 400 V AC		054912	
AUX-C 2Q 400 V AC		054913	
AUX-C 3Q 1SY 24 V AC/DC		054915	
cabled contact in electronic version			
AUX-E-C 1Q 1SY		054916	
cabled contact for signalling manual/remote operation			
AUX-MO-C ⁽¹⁾		054917	
cabled contact for signalling trip coil release trip			
AUX-SA 1 S51			060393

⁽¹⁾ For T4-T5-T6 in plug-in/withdrawable versions it is necessary to order a socket-plug connector 3 poles 1SDA051364R1.

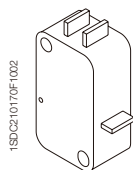
Auxiliary position contacts - AUP

Type	1SDA.....R1	
	T4-T5-T6	T6
AUP-I 24 V DC - 1 contact signalling circuit-breaker racked-in	054920	
AUP-I 400 V AC/DC - 1 contact for signalling circuit-breakers racked-in	054918	
AUP-R 24 V DC - 1 contact for signalling circuit-breakers racked-out	054921	
AUP-R 400 V AC/DC - 1 contact for signalling circuit-breakers racked-out	054919	



Early auxiliary contacts - AUE

Type	1SDA.....R1	
	T6	T6
AUE - 2 early contacts	060394	

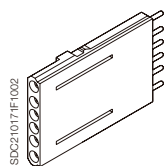




Ordering codes

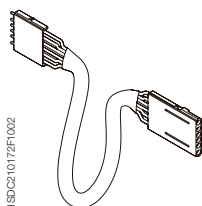
Accessories

Adapters - ADP



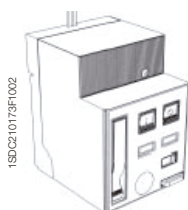
Type	1SDA.....R1 T4-T5-T6
ADP - Adapters 5pin	055173
ADP - Adapters 6pin	054922
ADP - Adapters 12pin	054923
ADP - Adapters 10pin	054924

Testing extension



Type	1SDA.....R1 T4-T5-T6
5-pin checking extension for blank tests on T4-T5-T6 P/W service releases	055351
6-pin checking extension for blank tests on auxiliary contacts, (1+1) service and residual current releases T4-T5-T6 P/W	055063
12-pin checking extension for blank tests on auxiliary contacts (3+1) T4-T5-T6 P/W	055064
10-pin checking extension for blank tests on motor operator and early contacts T4-T5-T6 P/W	055065

Stored energy motor operator - MOE



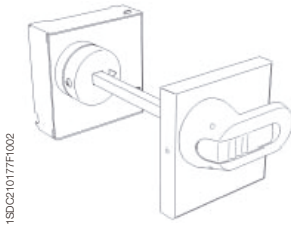
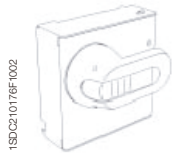
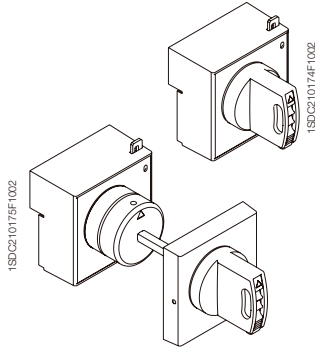
Type	1SDA.....R1 T6
MOE T6 24 V DC	060395
MOE T6 48...60 V DC	060396
MOE T6 110...125 V AC/DC	060397
MOE T6 220...250 V AC/DC	060398
MOE T6 380 V AC	060399

Stored energy motor operator with electronics - MOE-E

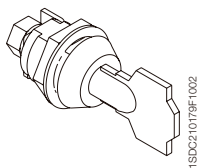
Type	1SDA.....R1 T6
MOE-E T6 24 V DC	060400
MOE-E T6 48...60 V DC	060401
MOE-E T6 110...125 V AC/DC	060402
MOE-E T6 220...250 V AC/DC	060403
MOE-E T6 380 V AC	060404

Note: always supplied complete with the AUX-E-C electronic auxiliary contact.

Rotary handle operating mechanism



Operating mechanism and locks



Direct - RHD

Type	1SDA.....R1 T6
RHD normal for fixed and plug-in	060405
RHD_EM emergency for fixed and plug-in	060406
RHD normal for withdrawable	060407
RHD_EM emergency for withdrawable	060408

Transmitted - RHE

Type	1SDA.....R1 T6
RHE normal for fixed and plug-in	060409
RHE_EM emergency for fixed and plug-in	060410
RHE normal for withdrawable	060411
RHE_EM emergency for withdrawable	060412
Individual components	
RHE_B just base for fixed	060413
RHE_B just base for withdrawable	060414
RHE_S just handle for 500mm for RHE	054932
RHE_H just handle for RHE	060415
RHE_H_EM just emergency handle for RHE	060416

IP54 protection for rotary handle

Type	1SDA.....R1 T4-T5-T6
RHE_IP54 protection kit IP54	054938

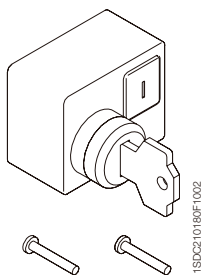
Key lock for front/rotary handle - KLF

Type	1SDA.....R1	
	T4-T5	T6
KLF-D - different key in open position	054939	060658
KLF-S - same key for different groups of circuit-breakers (N. 20005)	054940	060659
KLF-S - same key for different groups of circuit-breakers (N. 20006)	054941	060660
KLF-S - same key for different groups of circuit-breakers (N. 20007)	054942	060661
KLF-S - same key for different groups of circuit-breakers (N. 20008)	054943	060662



Ordering codes

Accessories



1SDC210189F1002

Key lock for motor operator - MOL

Type	1SDA.....R1	
	T4-T5	T6
MOL-D different key	054904	060611
MOL-S - same key for different groups of circuit-breakers (N. 20005)	054905	060612
MOL-S - same key for different groups of circuit-breakers (N. 20006)	054906	060613
MOL-S - same key for different groups of circuit-breakers (N. 20007)	054907	060614
MOL-S - same key for different groups of circuit-breakers (N. 20008)	054908	060615
MOL-M - lock only on manual operation with same key	054909	060616



1SDC210181F1002

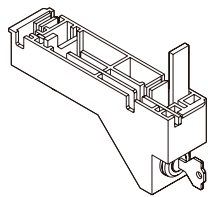
Front for lever operating mechanism - FLD

Type	1SDA.....R1
	T6
FLD - for fixed and plug-in	060417
FLD - for withdrawable	060418

Mechanical interlock MIR

Type	1SDA.....R1
	T6
frame unit horizontal interlock	060685
frame unit vertical interlock	060686

Note: Please ask ABB SACE for availability



1SDC210188F1002

Lock for fixed part of withdrawable circuit-breaker

Type	1SDA.....R1
	T4-T5-T6
KLF-D FP - Different key for each circuit-breaker	055230
KLF-S FP - Same key for different groups of circuit-breakers	055231
PLL FP - Lock padlocks	055232
KLF-D Ronis FP - Lock Ronis type	055233

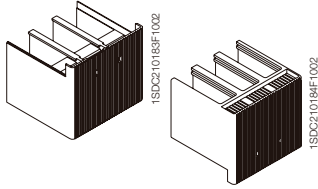
Residual current release

SACE RCQ

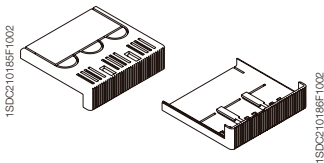
Type	1SDA.....R1
	T1...T6
Relay and closed toroid - diameter 60 mm	037388
Relay and closed toroid - diameter 110 mm	037389
Relay and closed toroid - diameter 185 mm	050542
Relay and toroid which can be opened - diameter 110 mm	037390
Relay and toroid which can be opened - diameter 180 mm	037391
Relay and toroid which can be opened - diameter 230 mm	037392
Relay only	037393
Closed toroid only - diameter 60 mm	037394
Closed toroid only - diameter 110 mm	037395
Closed toroid only - diameter 185 mm	050543
Toroid which can be opened only - diameter 110 mm	037396
Toroid which can be opened only - diameter 180 mm	037397
Toroid which can be opened only - diameter 230 mm	037398

Connection terminals

High insulating terminal covers - HTC

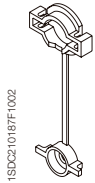


Type	1SDA.....R1	
	3 poles	4 poles
HTC S6-T6	014040	014041



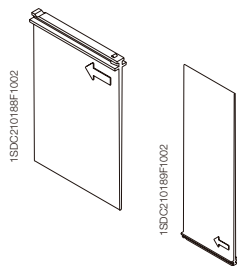
Low insulating terminal covers - LTC

Type	1SDA.....R1	
	3 poles	4 poles
LTC S6-T6	014038	014039



Sealable screws for terminal covers

Type	1SDA.....R1	
	S6...T6	
Sealable screws	013699	



Separating partitions - PB

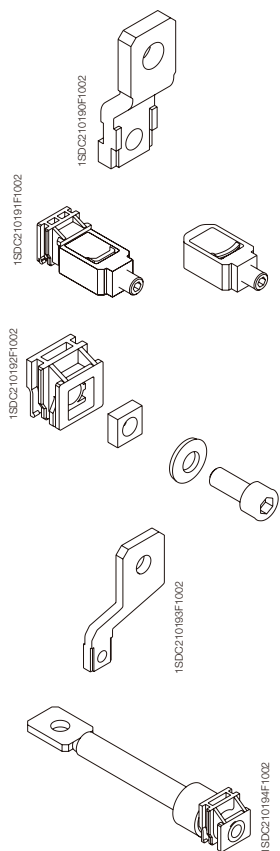
Type	1SDA.....R1	
	S6-S7-T6	
PB - pieces 4 - 3p	050696	
PB - pieces 6 - 4p	050697	



Ordering codes

Accessories

Connecting terminals

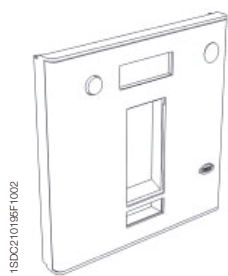


Type	1SDA.....R1			
	3 pieces	4 pieces	6 pieces	8 pieces
EF S6 630 - T6 630	023379	023389	013920	013921
EF S6 800 - T6 800	023383	023393	013954	013955
FC CuAl S6 630 - T6 630 2x240mm ²	023380	023390	013922	013923
FC CuAl S6 800 - T6 800 3x185mm ² - external terminal	023384	023394	013956	013957
FC CuAl T6 1000 4x150 mm ² - external terminal	060687	060688	060689	060690
F T6 630 - T6 800 - Plugs with screws ⁽¹⁾	060421	060422	060423	060424
ES S6 - T6 (1/2 upper kit) 630 - T6 800	050692			
ES S6 - T6 630 - T6 800	050704 ⁽²⁾	050693	050688	050689
R T6	060425	060426	060427	060428
RC S6 630 - T6 630 2x150 mm ²	023381	023391	013924	013925
RC S6 800 - T6 800 3x240 mm ²	023385	023395	013958	013959

⁽¹⁾ To be requested as loose kit

⁽²⁾ 1/2 lower kit

Front display unit - FDU



Type	1SDA.....R1	
	T4-T5	T6
FDU display unit for T6 with PR222 and PR223	055051	060429

Note: Please ask ABB SACE for availability

Automatic transfer switch - ATS010

Type	1SDA.....R1
ATS010 for T4, T5 and T6	052927

Dialogue unit PR222DS/PD

Type	1SDA.....R1 T4-T5-T6
LSI	055066
LSIG	055067

Note: To be specified only in addition to the code of the automatic circuit-breaker, with analogous overcurrent release (PR222DS/P). To order the release separately, see page 6/6.

Accessories for electronic releases

Type	1SDA.....R1 T4-T5-T6
Connector X4 release tripped signal and neutral protection for plug-in or withdrawable with PR222DS or PR223DS	055062
Connector X3 release tripped signal for plug-in or withdrawable with PR222DS or PR223DS	055061
Connector X4 release tripped signal for fixed with PR222DS or PR223DS	055060
Connector X3 release tripped signal for fixed with PR222DS or PR223DS	055059
CT for withdrawable external neutral - T6 630	060430
CT for withdrawable external neutral - T6 800	060431
CT for withdrawable external neutral - T6 1000	060610
TT1 - Test unit	037121
PR010/T - Test and configuration unit with electronic releases PR222DS/P, PR222DS/PD, PR222MP or PR223DS	048964
PR021/K - Signalling unit with electronic releases PR222DS/PD, PR222MP or PR223DS	059146
PR212/CI - Contactor control for PR222MP	050708
EP010 - Interfacing module for PR222/PD	059469
Measuring module VM210 for PR223DS-EF	059602
Interlock module IM210 for PR223EF - PR12x	059603

Note: Please ask ABB SACE for availability

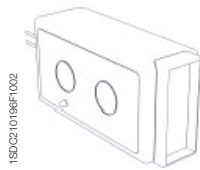




ABB SACE S.p.A

An ABB Group Company

L.V. Breakers

Via Baioni, 35

24123 Bergamo, Italy

Tel.: +39 035.395.111 - Telefax: +39 035.395.306-433

<http://www.abb.com>

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.