



Technical catalog | June 2013

Tmax T generation

Molded case circuit breakers

Power and productivity
for a better world™



Tmax Molded Case Circuit Breakers

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Introduction and main characteristics

Molded Case Circuit Breakers

Overview of the Tmax family

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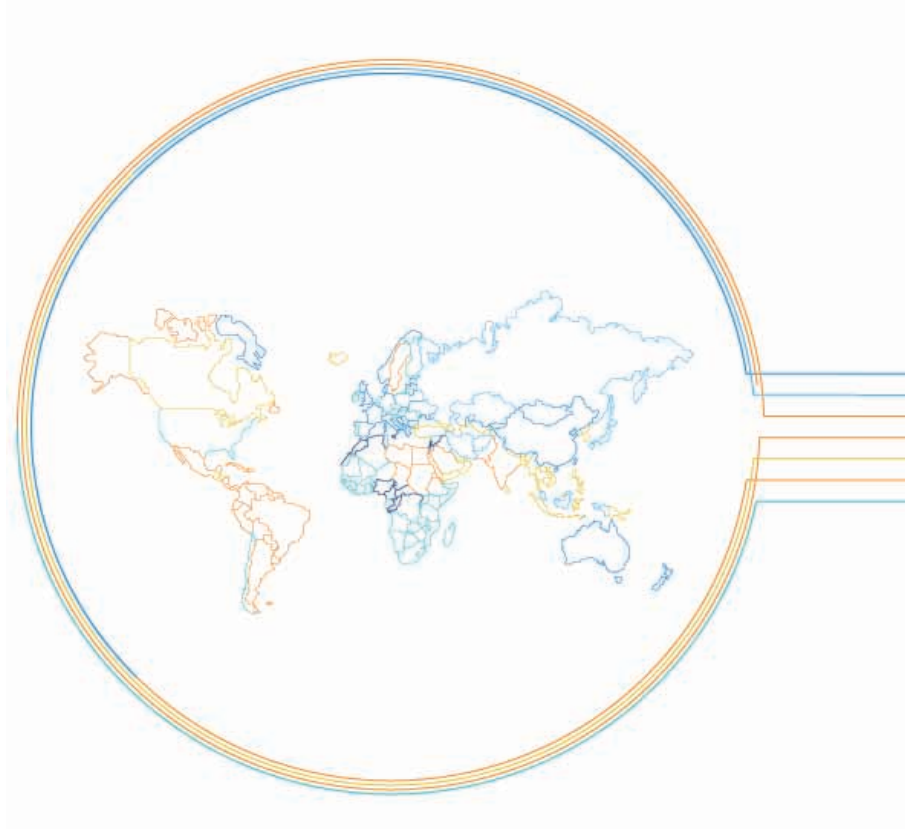
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Introduction and main characteristics

Molded Case Circuit Breakers

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T Generation

Tmax. Adaptability and versatility

Tmax is freedom. Freedom now reaching up to 3000 A with the new Tmax T7 and T8 circuit breakers. There's a boundless and highly diversified world of differing types of installations, requirements, needs and problems from 15 to 3000 A. With the T Generation everything becomes simple and rational – nine sizes to find the solutions you're looking for.

BE FREE TO SIZE ANY TYPE OF INSTALLATION IN AN IDEAL WAY AT ALL TIMES.

Thanks to the nine sizes and a complete series of magnetic only, thermal magnetic and electronic trip units. Also a wide range of accessories are available together with the possibility of selecting dedicated families for all market applications, even the most specific and advanced.

BE FREE TO INSTALL ALL SIZES WITHOUT DIFFICULTY.

T Generation is undeniably the family of molded case circuit breakers with the best performance/size ratio available on the market. This means there is more space there is for cabling and simpler installation. There is also a reduction in the dimensions of the switchboard.

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BE FREE TO RIDE THE MOST ADVANCED TECHNOLOGY.

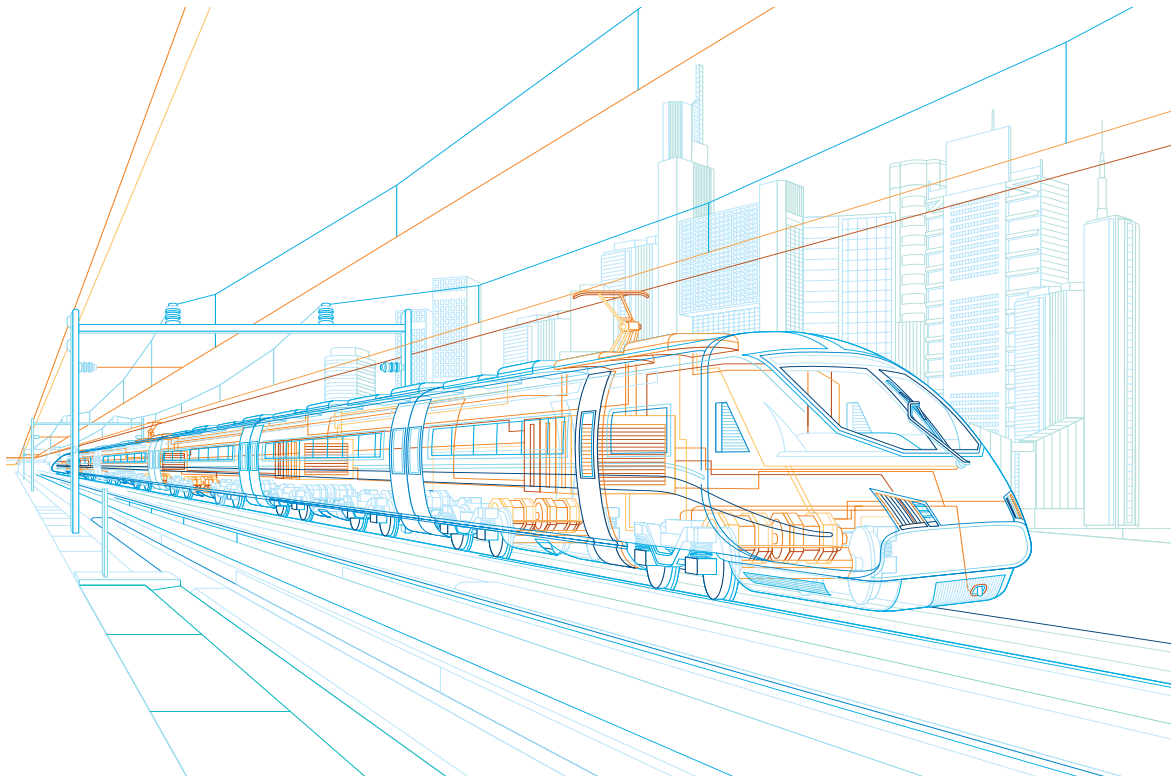
It is thanks to this technology that T Generation now offers performance levels that were previously out of the question in circuit breakers with these dimensions. There are also some exclusive technical solutions which only ABB can offer you, such as the brand new UL489 / CSA C22.2 No.5 supplement electronic trip units designed for the new Tmax T7 and T8 or the new rapid accessory fitting system.

FREEDOM FOR TOTALLY SAFE SELECTION.

The safety of knowing that behind Tmax there is ABB's strong and constant commitment to the search for excellence at the base of each product and service. ABB quality.

Introduction and main characteristics

Molded Case Circuit Breakers



Tmax T1, T2, T3 and Ts3

All solutions perfectly coordinated, up to 225 A.

Tmax T1, T2, T3 and Ts3 – the four “little ones” of the Tmax family – were thought up from the beginning to work together. You can select functions and performances which until now could not be found in circuit breakers with these dimensions. Perfect up to 225 A.

There are many characteristics common to the T1, T2 and T3 frames. The single depth 2.76" (70 mm) of the three frames makes installation truly simpler. The new arcing chambers are produced with a gasifying material and an innovative construction system allows the arc extinction time to be reduced.

All three sizes are fitted with standard adjustment of the thermal threshold and have new three-pole and four-poles designed and constructed to optimize space in the switch-

board and simplify coupling with the circuit breaker.

Tmax T1, T2 and T3 have a completely standardized range of accessories.

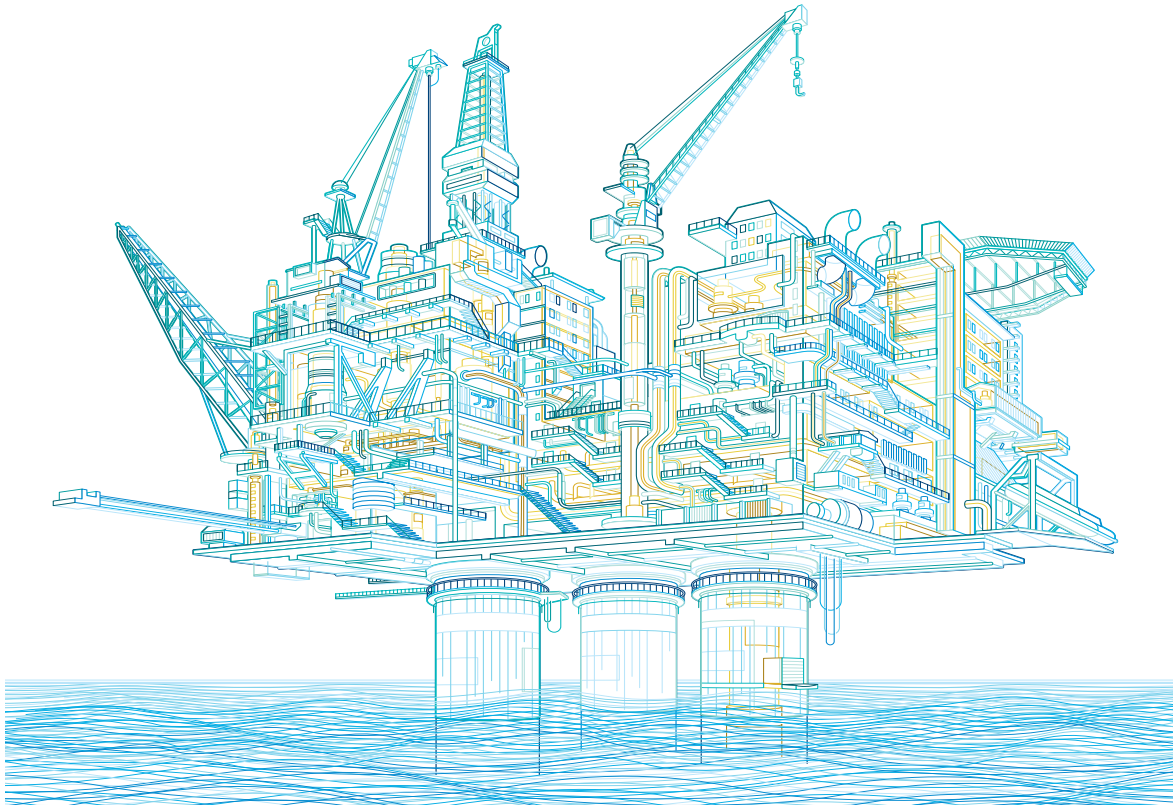
TMAX T1. THE LITTLE ONE THAT'S REALLY BIG.

Thanks to its extremely compact dimensions, Tmax T1 is a unique circuit breaker in its category. Compared to any other circuit breaker with the same performance (100 A – up to 50 kA at 240 VAC), the overall dimensions of the apparatus are notably smaller.

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TMAX T2. INTELLIGENCE AND HIGH PERFORMANCE IN THE PALM OF YOUR HAND.

Tmax T2 is the only 100 A circuit breaker available with such high performances in such compact overall dimensions. A breaking capacity of 150 kA at 240 VAC can be achieved. Tmax T2 can also be fitted with a latest generation electronic trip unit.

TMAX T3. 225 A IN A DEPTH OF 2.76" (70 mm) FOR THE FIRST TIME.

Tmax T3 is the first circuit breaker which carries 225 A in considerably smaller overall dimensions compared to any other similar device – a large step forward for this type of breaker.

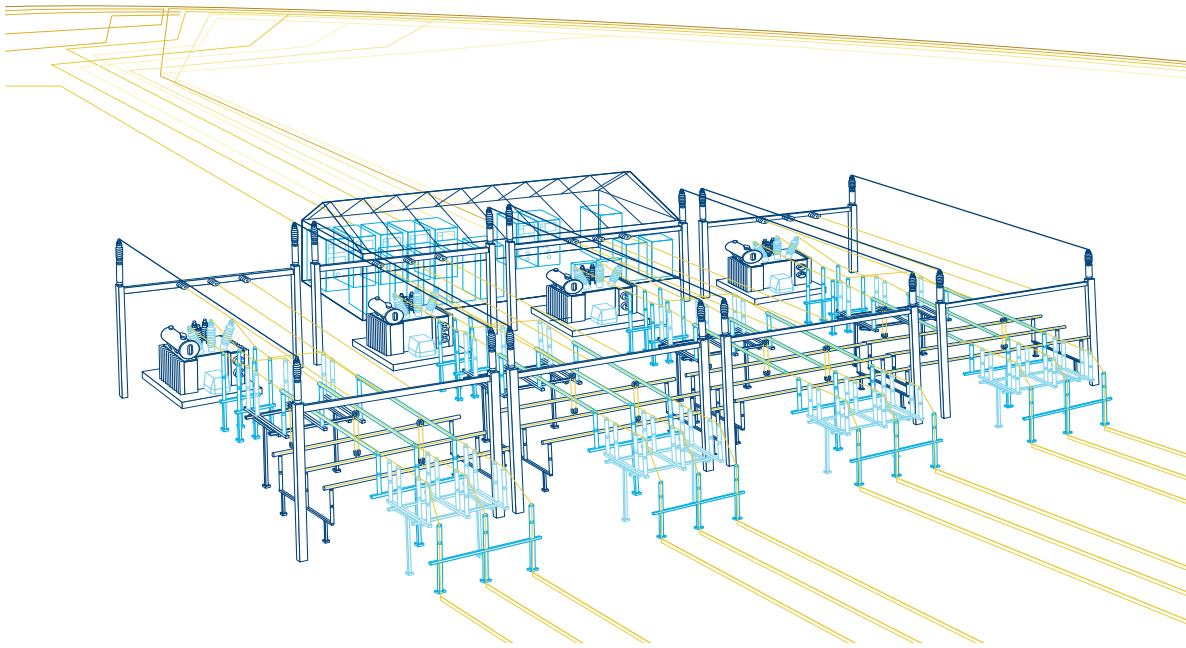
TMAX Ts3

ABB Tmax Ts3 circuit breaker, in the 150 A frame, can be used at 600 VAC providing excellent interrupting rating performance. The possibility of having circuit breakers certified for use at this voltage allows perfect standardization of the apparatus both on the US and the Canadian market, where 600 V is most widely used.

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Tmax T4, T5 and T6

Be free to choose up to 800 A.

Tmax T4, T5 and T6 are the molded case circuit breakers with the best performance/size ratio on the market.

The possibilities are practically unlimited, thanks to their dedicated and specific ranges, advanced electronics, as well as a complete and standardized range of accessories.

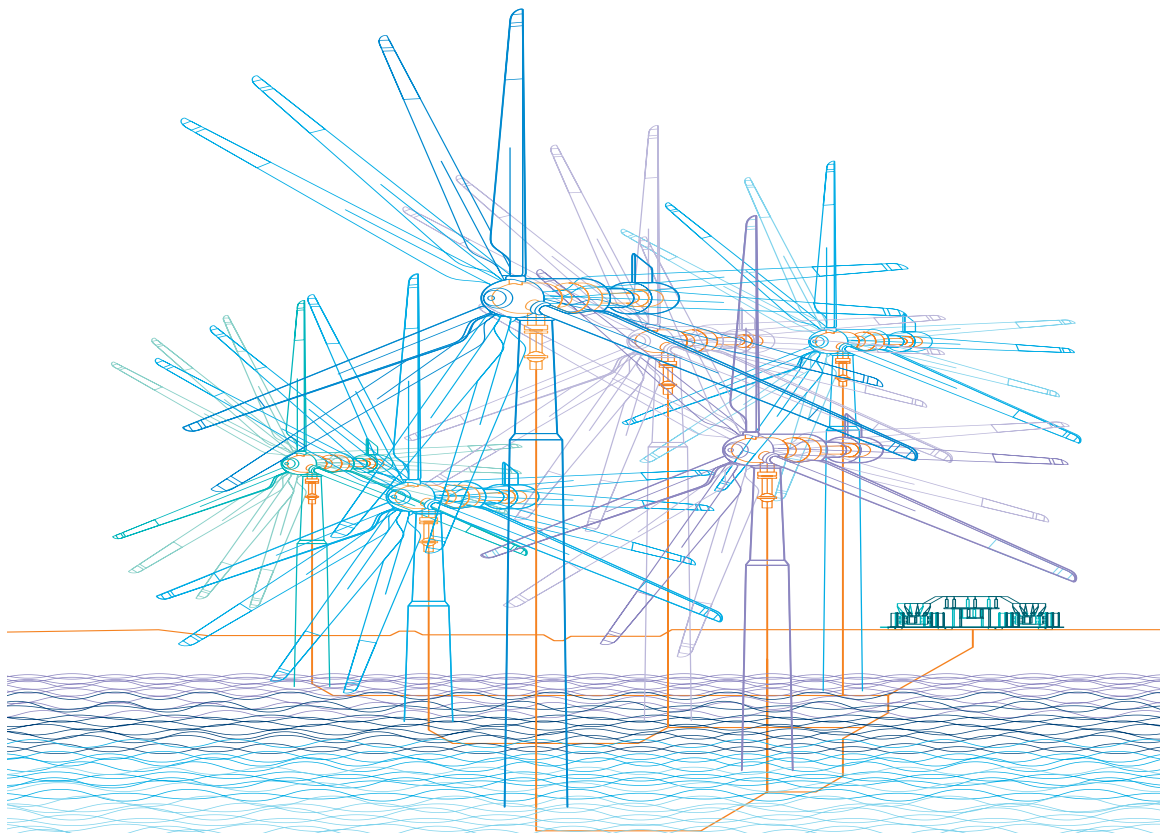
The top quality materials and innovative construction techniques used by ABB mean Tmax circuit breakers can guarantee truly exceptional performance. For example, T4 and T5 have an interrupting capacity up to 150 kA at 480 VAC. The series of electronic trip units, equipped with the latest generation technology, offers solutions exclusive to ABB. T4, T5 and T6 have the same depth, simplifying their

use in switchboards, and also have a complete, standardized and unified range of accessories. This makes the selection easier, more flexible and reduces the stock item count.

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Tmax T7

Freedom to the Nth degree.

The new Tmax T7, available up to 1200 A either with a manual operating mechanism or motor operator, was conceived with a revolutionary design for circuit breakers of this type: advanced electronics, exceptional performance and new installation and accessory solutions.

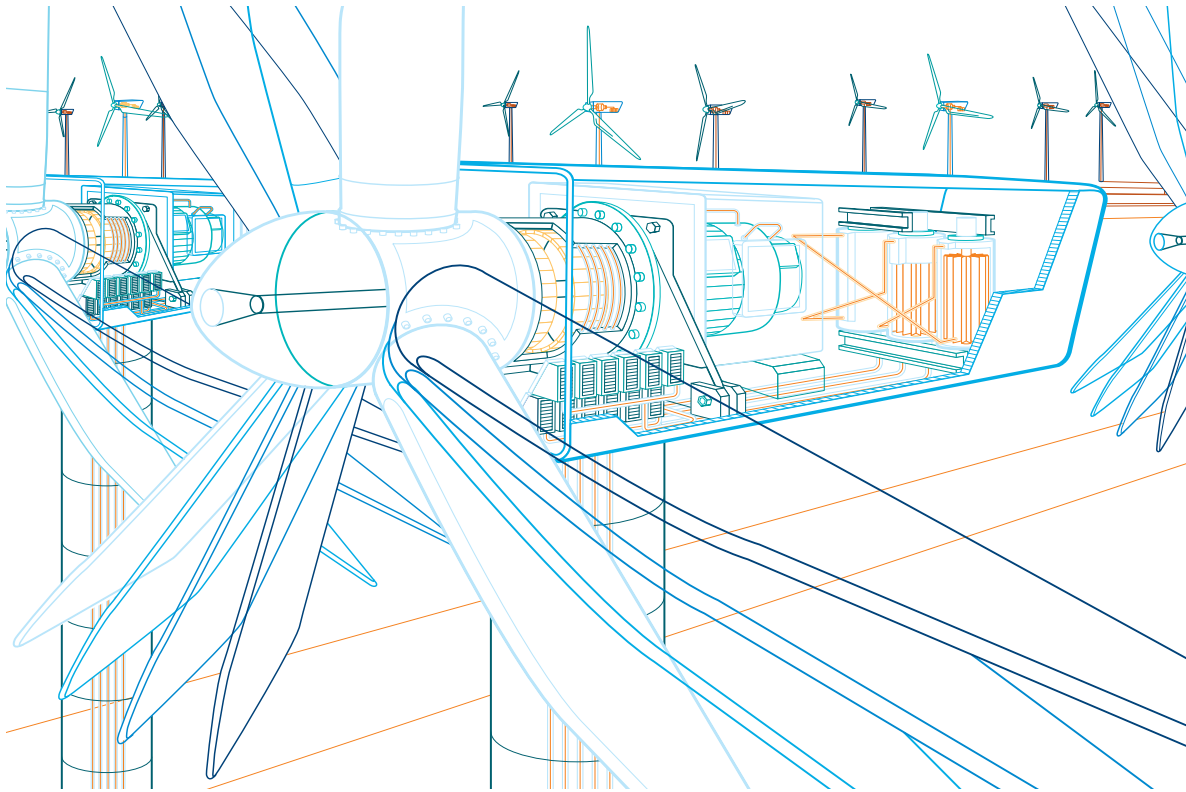
Tmax T7's flexibility is absolutely exceptional: it can be installed both vertically and horizontally (in both fixed and draw out versions) with all types of terminals and a new, faster and safer racking-out system for moving parts. Additionally, cabling is facilitated by the reduced height. The new rapid accessory wiring system is great news. There

are no loose wires inside the circuit breaker. Connection to the external circuit is rapid, simple and safe and no screws for terminating the external power supply cables are needed.

The new cable interlock provides notable benefits in terms of flexible applications. By using this accessory it is possible to interlock two circuit breakers in any position and to interlock a T7 with an Emax power circuit breaker as well.

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Special attention has been paid to the electronics and the results are the PR231, PR232, PR331 and PR332 new interchangeable electronic trip units, with modules and rating-plugs which can be replaced by the customer.

The PR231 and PR232 trip units, with dip-switches for set-

ting the protection thresholds, offer LEDs to signal tripping for each protection function: so the reason for circuit breaker tripping can always be easily found.

The PR332 is decidedly ahead of its time fitted with a large graphic display, it allows all the information needed to be displayed simply and clearly. It also offers advanced protection functions. For example, the exclusive data logger function allows all the events and values before the fault to be recorded for later analysis.



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Molded Case Circuit Breaker (MCCB)													
Breaker type		T1 1p	T1	T2		T3		Ts3			Ts3		
Frame size	[A]	100	100	100		225		150			225		
Number of poles	[No.]	1	3-4	3-4		3-4		2-3-4			2-3-4		
Rated voltage	AC (50-60 Hz) [V]	347	600Y/347	480		600Y/347		600			480		
	DC [V]	-	500	-		500		600			500		
Interrupting ratings	Frame type	B	N	S	H	N	S	N	H	L	N	H	L
	240 V AC [kA]	-	50 ⁽²⁾	65	150	50	65	65	100	150	65	100	150
	277 V AC [kA]	18 ⁽¹⁾	-	-	-	-	-	-	-	-	-	-	-
	347 V AC [kA]	14 ⁽¹⁾	-	-	-	-	-	-	-	-	-	-	-
	480 V AC [kA]	-	22 ⁽²⁾	35	65	25	35	25	50	85 ⁽³⁾	25	50	65
	600Y/347 V AC [kA]	-	10	-	-	10	10	-	-	-	-	-	-
	600 V AC [kA]	-	-	-	-	-	-	14	14	25	-	-	-
	250 V DC (2 poles in series) [kA]	-	25	-	-	25	35	-	-	-	-	-	-
	500 V DC (3 poles in series) [kA]	-	25	-	-	25	35	-	-	-	-	-	-
	500 V DC (2 poles in series) [kA]	-	-	-	-	-	-	35	50	65	20	35	50
600 V DC (3 poles in series) [kA]	-	-	-	-	-	-	20	35	50	-	-	-	
Trip units	TMF	•	•	•		•		•			•		
	TMD/TMA	-	-	-		-		-			-		
	MA	-	-	•		•		•			•		
	Electronic PR221DS	-	-	•		-		-			-		
	Electronic PR222DS/P	-	-	-		-		-			-		
	Electronic PR222DS/PD-A	-	-	-		-		-			-		
	Electronic PR231/P	-	-	-		-		-			-		
	Electronic PR232/P	-	-	-		-		-			-		
	Electronic PR331/P	-	-	-		-		-			-		
Electronic PR332/P	-	-	-		-		-			-			
Dimensions	H [in/mm]	5.12/130	5.12/130	5.12/130		5.9/150		6.7/170			6.7/170		
	W 3p [in/mm]	1/25.4	3/76	3.54/90		4.13/105		4.13/105			4.13/105		
	D [in/mm]	2.76/70	2.76/70	2.76/70		2.76/70		4.07/103.5			4.07/103.5		
Mechanical life	[No. operations]	25000	25000	25000		25000		25000			25000		

(1) In 15A = 10 kA at 277V AC - 10 kA at 347V AC

(2) In 15A = 35 kA at 240V AC - 14 kA at 480Y/277V AC

(3) In 15A up to 30A = 65kA at 480V AC

(1) In 15A = 10 kA at 277V AC - 10 kA at 347V AC

(2) In 15A = 35 kA at 240V AC - 14 kA at 480Y/277V AC

(3) In 15A up to 30A = 65kA at 480V AC

Motor Control Protector (MCP)												
Breaker type		T2		T3		Ts3						
Frame size	[A]	100		225		150 - 200						
Number of poles	[No.]	3		3		2-3-4						
Ratings	[A]	20...100		100...200		3...25	50...150	175...200 ⁽²⁾				
Interrupting ratings	Frame type	S	H	S		L	L	L				
	240 V AC [kA]	65	150	65		50	150	150				
	480 V AC [kA]	35	65	35		25	85	65				
	600Y/347 V AC [kA]	-	-	10		-	-	-				
	600 V AC [kA]	-	-	-		10	25	-				
	500 V DC (3 poles in series) [kA]	-	-	35		65 ⁽¹⁾	65	50				
Trip units	600 V DC (3 poles in series) [kA]	-	-	-		50	50	-				
	Magnetic only adjustable (6...12xIn)	•		•		-		-				
	Magnetic only adjustable (4...12xIn)	-		-		•		-				

(1) Only for 25A rating

(2) 480V AC / 50V DC max

Molded Case Switch (MCS)												
Breaker type		T1N	T3S	T3S		Ts3H	Ts3H					
Frame size	[A]	100	150	225		150	225					
Number of poles	[No.]	3-4	3-4	3-4		3-4	3-4					
Magnetic override	[A]	1000	1500	2250		1500	2250					
Rated voltage	AC (50-60 Hz) [V]	600Y/347	600Y/347	600Y/347		600	480					
	DC [V]	500	500	500		600	500					

Introduction and main characteristics

Molded Case Circuit Breakers

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Molded Case Circuit Breaker (MCCB)

Breaker type		T4					T5					T6			
Frame size	[A]	250					400-600 ⁽¹⁾					800			
Number of poles	[No.]	2 ⁽²⁾ -3-4					2 ⁽²⁾ -3-4					3-4			
Rated voltage	AC (50-60 Hz) [V]	600					600					600			
	DC [V]	600					600					600			
Interrupting ratings	Frame type	N	S	H	L	V	N	S	H	L	V	N	S	H	L
	240 V AC [kA]	65	100	150	200	200	65	100	150	200	200	65	100	200	200
	277 V AC [kA]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	347 V AC [kA]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	480 V AC [kA]	25	35	65	100	150	25	35	65	100	150	35	50	65	100
	600V/347 V AC [kA]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	600 V AC [kA]	18	25	35	65	100	18	25	35	65	100	20	25	35	42
	250 V DC (2 poles in series) [kA]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	500 V DC (3 poles in series) [kA]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	500 V DC (2 poles in series) [kA]	25	35	50	65	100	25	35	50	65	100	35	35	50	65
	600 V DC (3 poles in series) [kA]	16	25	35	50	65	16	25	35	50	65	20	20	35	50
Trip units	TMF	•					-					-			
	TMD/TMA	•					-					•			
	MA	-					-					-			
	Electronic PR221DS	-					-					-			
	Electronic PR222DS/P	•					•					•			
	Electronic PR222DS/PD-A	•					•					•			
	Electronic PR231/P	•					•					•			
	Electronic PR232/P	-					-					-			
	Electronic PR331/P	-					-					-			
	Electronic PR332/P	-					-					-			
Dimensions	H [in/mm]	8.07/205					8.07/205					10.55/268			
	W 3p [in/mm]	4.13/105					5.51/140					8.26/210			
	D [in/mm]	4.07/103.5					4.07/103.5					4.07/103.5			
Mechanical life	[No. operations]	20000					20000					20000			

(1) T5 600 available with electronic trip units and 3 pole version only.

(2) 2P only available in the N interrupting rating

Motor Control Protector (MCP)

Breaker type		T4				T5				T6			
Frame size	[A]	250				400-600				800			
Number of poles	[No.]	3				3				3			
Ratings	[A]	100-150-250				300-400-600				600-800			
Interrupting ratings	Frame type	N	S	H	L	N	S	H	L	N	S	H	L
	240 V AC [kA]	65	100	150	200	65	100	150	200	65	100	200	200
	480 V AC [kA]	25	35	65	100	25	35	65	100	35	50	65	100
	600V/347 V AC [kA]	-	-	-	-	-	-	-	-	-	-	-	-
	600 V AC [kA]	18	25	35	65	18	25	35	65	20	25	35	42
	500 V DC (3 poles in series) [kA]	-	-	-	-	-	-	-	-	-	-	-	-
Trip units	600 V DC (3 poles in series) [kA]	-	-	-	-	-	-	-	-	-	-	-	-
	Electronic PR221DS-I	•				•				•			

Molded Case Switch (MCS)

Breaker type		T4N-S-H-L-V				T5N-S-H-L-V				T6H			
Frame size	[A]	250				400-600				800			
Number of poles	[No.]	3-4				3-4				3-4			
Magnetic over-ride	[A]	3000				5000				10000			
Rated voltage	AC (50-60 Hz) [V]	600				600				600			
	DC [V]	600				600				600			

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Molded Case Circuit Breaker (MCCB)					
Breaker type		T7			T8
Frame size	[A]	1000-1200			1600-2000-2500-3000
Number of poles	[No.]	3-4			3-4
Rated voltage	AC (50-60 Hz) [V]	600			600
	DC [V]	-			-
Interrupting ratings	Frame type	S	H	L	V
	240 V AC [kA]	65	100	150	125
	277 V AC [kA]	-	-	-	-
	347 V AC [kA]	-	-	-	-
	480 V AC [kA]	50	65	100	125
	600Y/347 V AC [kA]	-	-	-	-
	600 V AC [kA]	25	50	65	100
	250 V DC (2 poles in series) [kA]	-	-	-	-
	500 V DC (3 poles in series) [kA]	-	-	-	-
	500 V DC (2 poles in series) [kA]	-	-	-	-
	600 V DC (3 poles in series) [kA]	-	-	-	-
Trip units	TMF	-	-	-	-
	TMD/TMA	-	-	-	-
	MA	-	-	-	-
	Electronic PR221DS	-	-	-	-
	Electronic PR222DS/P	-	-	-	-
	Electronic PR222DS/PD-A	-	-	-	-
	Electronic PR231/P	•	-	-	-
	Electronic PR232/P	•	-	-	-
Dimensions	H [in/mm]	10.55/268			15/382
	W 3p [in/mm]	8.26/210			16.8/427
	D [in/mm]	6.06/154 (toggle) - 7/178 (motorized)			11.2/282
Mechanical life	[No. operations]	10000			15000

Molded Case Switch (MCS)					
Breaker type		T7			T8
Frame size	[A]	1200			2000-2500-3000
Number of poles	[No.]	3-4			3-4
Magnetic override	[A]	20000			40000
Rated voltage	AC (50-60 Hz) [V]	600			600
	DC [V]	-			-

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Molded Case Circuit Breakers

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Double insulation

Tmax has double insulation between the live power parts (excluding the terminals) and the front of the apparatus where the operator works during normal operation of the device. The placement of each electrical accessory is completely segregated from the power circuit, preventing any risk of contact with live parts and the operating mechanism is completely insulated from the powered circuits.

Furthermore, the circuit breaker has oversized insulation, both between the live internal parts and in the area of the connection terminals. In fact, the distances exceed those required by the IEC Standards and comply with the UL489 / CSA C22.2 No.5 Standard.



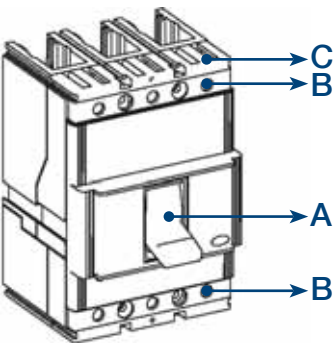
Positive operation

The operating lever always indicates the precise position of the moving contacts of the circuit breaker, thereby providing safe and reliable signals, in compliance with IEC 60073 and IEC 60417-2 Standard (I = Closed; O = Open; yellow-green line = Open due to protection trip). The circuit breaker operating mechanism is trip free regardless of the pressure on the lever. Protection tripping automatically opens the moving contacts: to close them again the operating mechanism must be reset by pushing the operating lever from the tripped position into the reset position.



Isolation behaviour

In the open position, the circuit breaker complies with the IEC 60947-2 Standard. The oversized insulation distances guarantee there are no leakage currents and dielectric resistance to any overvoltages between input and output.



Degrees of protection

The table indicates the degrees of protection guaranteed by the Tmax circuit breakers according to the IEC 60529 Standard:

Type	With front	Without front ⁽²⁾	Without terminal covers	With high terminal covers	With low terminal covers	With IP40 protection kit on the front
A	IP 40 ⁽³⁾	IP 20	–	–	–	–
B ⁽⁴⁾	IP 20	IP 20	IP 20	IP 40	IP 40	IP 40
C	–	–	–	IP 40 ⁽¹⁾	IP 30 ⁽¹⁾	–

⁽¹⁾ After correct installation

⁽²⁾ During installation of the electrical accessories

⁽³⁾ Also for front for lever operating mechanism and direct rotary handle

⁽⁴⁾ Only for T1...T6

The cradles are always preset with IP20 degree of protection. IP54 degree of protection can be obtained with the circuit breaker installed in a switchboard fitted with a rotary handle operating mechanism transmitted on the compartment door and special kit (RHE – IP54).

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Operating temperature

The Tmax circuit breakers can be used in ambient conditions where air temperature varies between -13 °F and +158 °F (-25 °C and +70 °C), and stored in environments with temperatures between -40 °F and +158 °F (-40 °C and +70 °C).

The circuit breakers fitted with thermal magnetic trip units have their thermal element set for a reference temperature of 104 °F (+40 °C). For temperatures other than 104 °F (+40 °C), with the same setting, there is a temperature performance table as shown under section 4 of this catalogue.

The electronic trip units do not undergo any variations in performance as the temperature varies except in cases of temperatures exceeding 104 °F (+40 °C). Then maximum setting for protection against overloads L must be reduced, as indicated in the derating graph beginning on page 4/37, to take into account the heating phenomena which occur in the current carrying copper parts of the circuit breaker.

For temperatures above 158 °F (+70 °C) the circuit breaker performances are not guaranteed. To ensure service continuity of the installations, the temperature must be kept within acceptable levels for operation of the various devices and the circuit breakers by using forced ventilation in the switchboards or in their installation room.

Altitude

Up to an altitude of 6600 ft the Tmax circuit breakers do not undergo any changes in their rated performance. Above this altitude, the atmospheric properties are altered in terms of composition, dielectric resistance, cooling capacity and pressure, requiring the circuit breaker performance to be derated per the table below.

Altitude	[ft]	6600	9900	13200	16500
Rated service voltage, Ue	[V-]	600	522	435	348
Rated uninterrupted current, Iu	%Iu	100	98	93	90



Electromagnetic compatibility

Protection operation is guaranteed by using the electronic trip units and the electronic residual current releases in the presence of interference caused by electronic devices, atmospheric disturbances or electrical discharges. No interference with other electronic devices near the place of installation is generated either. This is in compliance with the IEC 60947-2 Appendix B + Appendix F Standards and European Directive No. 89/336 regarding EMC - electromagnetic compatibility.



Tropicalization

Circuit breakers and accessories in the Tmax series are tested in compliance with the IEC 60068-2-30 Standard, carrying out 2 cycles at 131 °F (55 °C) with the “variant 1” method (clause 6.3.3). The suitability of the Tmax series for use under the most severe environmental conditions is therefore ensured with the hot-humid climate defined in the climatograph 8 of the IEC 60721-2-1 Standards thanks to:

- moulded insulating cases made of synthetic resins reinforced with glass fibres;
- anti-corrosion treatment of the main metallic parts;
- Fe/Zn 12 zinc-plating (ISO 2081) protected by a conversion layer, free from hexavalent-chromium (ROHS-compliant), with the same corrosion resistance guaranteed by ISO 4520 class 2c;
- application of anti-condensation protection for electronic overcurrent releases and relative accessories.



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Resistance to shock and vibration

The circuit breakers are unaffected by vibrations generated mechanically or due to electromagnetic effects, in compliance with the IEC 60068-2-6 Standards and the regulations of the major classification organizations⁽¹⁾:

- RINA
- Det Norske Veritas
- Bureau Veritas
- Lloyd's register of shipping
- Germanischer Lloyd
- ABS
- Russian Maritime Register of Shipping.

The T1-T5 Tmax circuit breakers are also tested according to the IEC 60068-2-27 Standard to resist shock up to 12g for 11 ms. Please ask ABB for details about higher performance in terms of resistance to shock.

⁽¹⁾ Ask to ABB for Tmax certificates of approval.

Versions and types

All the Tmax circuit breakers are available in fixed versions, T2, T3, Ts3, T4 and T5 in the plug-in version and Ts3, T4, T5, T6 and T7 also in the draw out one.

All the circuit breakers can be manually operated by the operating lever or the rotary handle (direct or variable depth), and electrically operated. For electric operation different solutions are available:

- The solenoid operator for T1, T2 and T3
- The direct action motor operator for Ts3
- The stored energy motor operator for T4, T5 and T6
- T7 with the stored energy operating mechanism, gear motor for the charging of the closing springs and shunt opening and closing releases.

Installation

Tmax circuit breakers can be installed in switchboards mounted in any horizontal, vertical or lying down position on the back plate or on rails, without undergoing any derating (excluding T8). Tmax circuit breakers can be easily installed in all types of switchboards, thanks to the possibility of being reversefed.

Apart from fixing on the base plate, T1, T2 and T3 can also be installed on DIN 50022 rails and Ts3 can also be installed on DIN 50023 rails thanks to the special fixing brackets.

Furthermore, the depth of 2.76 inches (70 mm) takes Tmax T3 to the same depth as the two smaller sizes, making assembly of circuit breakers up to 225 A in standard switchboards even simpler. In fact, it is possible to prepare standardized support structures, facilitating the design stage and construction of the switchboard interior.



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Racking-out with the door closed

With Tmax Ts3, T4, T5, T6 and T7 circuit breakers in the draw out version the circuit breaker can be racked-in and out with the compartment door closed, increasing operator safety and allowing realization of low voltage arc proof switchboards.

Racking out can only be carried out with the circuit breaker open (for safety reasons), using a special racking-out crank handle supplied with the conversion kit from fixed circuit breaker to moving part of draw out circuit breaker.

Range of accessories

The completeness and installation rationality of the Tmax series is also achieved thanks to innovative solutions in development of the accessories:

- single range of accessories for T1, T2 and T3; one for T4, T5 and T6, and one for T7, characterised by completeness and simplicity for installation. The Ts3 due to its unique characteristics has its own group of accessories. Harmonization of the accessories allows reduction in stocks and greater service flexibility, offering increasing advantages for users of the Tmax series;
- new system of rapid assembly for internal electrical accessories of Tmax T7 without cables for the connections to the terminal box;
- same possibility of equipping with terminals, in terms of connection devices (terminals, terminal covers and phase separators), between fixed circuit breakers and cradles of plug-in circuit breakers for Tmax T2 and T3.

Introduction and main characteristics

Molded Case Circuit Breakers

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Compliance with Standards and company Quality System

The Tmax circuit breakers and their electrical accessories conform to the UL 489 (Underwriters Laboratories Incorporated) and CSA C22.2 No. 5.1 (Canadian Standard Association) North American Standards, and to the international IEC 60947-2 Standards and comply with the EC directive:

- “Low Voltage Directives” (LVD) no. 2006/95/CE (replaces 72/23/EEC and subsequent amendments)
- “Electromagnetic Compatibility Directive” (EMC) no. 89/336 EEC.

Certification of compliance with the above-mentioned product Standards is carried out, in respect of the European EN 45011 Standard, by the Italian certification body ACAE (Association for Certification of Electrical Apparatus), a member of the European LOVAG organization (Low Voltage Agreement Group).

The ABB test laboratory is accredited by SINAL (certificate no. 062/2002).

The ABB Quality System complies with the international ISO 9001 - 2000 Standard (model for quality assurance in design, development, construction, installation and service) and with the equivalent European EN ISO 9001 and Italian UNI EN ISO 9001 Standards.

The independent certifying Body is RINA S.p.A. ABB obtained its first certification with three-year validity in 1990, and has now reached its fourth reconfirmation.

The new Tmax series has a hologram on the front, obtained using special anti-imitation techniques, which guarantees the quality and that the circuit breaker is an original ABB product.

Attention to protection of the environment and to health and safety in the work place is another priority commitment for ABB and, as confirmation of this, the company environmental management system has been certified by RINA in 1997, in conformity with the international ISO 14001 Standard. This certification has been integrated in 1999 with the Management System for Health and Safety in the workplace, according to OHSAS 18001 (British Standards), obtaining one of the first certification of integrated management System, QES (Quality, Environment, Safety) issued by RINA. ABB – the first industry in the electromechanical section in Italy to obtain this recognition – thanks to a revision of the production process with an eye to ecology, has been able to reduce the consumption of raw materials and processing waste by 20%.

ABB's commitment to safeguarding the environment is also shown by the Life Cycle Assessments of its products carried out directly by ABB Research and Development in collaboration with the ABB Research Center. Selection of materials, processes and packing materials is made optimizing the true environmental impact of the product, also foreseeing the possibility of its being recycled.

For your notes

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For your notes

1

Tmax main characteristics

Molded Case Circuit Breakers

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Tmax main characteristics

Molded Case Circuit Breakers

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Power distribution circuit breakers electrical characteristics

Breaker type		T1 1p	T1	T2		T3		Ts3			Ts3		
Frame size	[A]	100	100	100		225		150			225		
Number of poles	[No.]	1	3-4	3-4		3-4		2-3-4			2-3-4		
Rated voltage	AC (50-60 Hz) [V]	347	600Y/347	480		600Y/347		600			480		
	DC [V]	-	500	-		500		600			500		
Interrupting ratings	Frame type	B	N	S	H	N	S	N	H	L	N	H	L
	240 V AC [kA]	-	50 ⁽²⁾	65	150	50	65	65	100	150	65	100	150
	277 V AC [kA]	18 ⁽¹⁾	-	-	-	-	-	-	-	-	-	-	-
	347 V AC [kA]	14 ⁽¹⁾	-	-	-	-	-	-	-	-	-	-	-
	480 V AC [kA]	-	22 ⁽²⁾	35	65	25	35	25	50	85 ⁽³⁾	25	50	65
	600Y/347 V AC [kA]	-	10	-	-	10	10	-	-	-	-	-	-
	600 V AC [kA]	-	-	-	-	-	-	14	14	25	-	-	-
	250 V DC (2 poles in series) [kA]	-	25	-	-	25	35	-	-	-	-	-	-
	500 V DC (3 poles in series) [kA]	-	25	-	-	25	35	-	-	-	-	-	-
	500 V DC (2 poles in series) [kA]	-	-	-	-	-	-	35	50	65	20	35	50
	600 V DC (3 poles in series) [kA]	-	-	-	-	-	-	20	35	50	-	-	-
Version		F	F	F-P		F-P		F-P-W			F-P-W		
Trip units	TMF	•	•	•		•		•			•		
	TMD/TMA	-	-	-		-		-			-		
	MA	-	-	•		•		•			•		
	Electronic PR221DS	-	-	•		-		-			-		
	Electronic PR222DS/P	-	-	-		-		-			-		
	Electronic PR222DS/PD-A	-	-	-		-		-			-		
	Electronic PR231/P	-	-	-		-		-			-		
	Electronic PR232/P	-	-	-		-		-			-		
	Electronic PR331/P	-	-	-		-		-			-		
	Electronic PR332/P	-	-	-		-		-			-		
Dimensions	H [in/mm]	5.12/130	5.12/130	5.12/130		5.9/150		6.7/170			6.7/170		
	W 3p [in/mm]	1/25.4	3/76	3.54/90		4.13/105		4.13/105			4.13/105		
	D [in/mm]	2.76/70	2.76/70	2.76/70		2.76/70		4.07/103.5			4.07/103.5		
Mechanical life	[No. operations]	25000	25000	25000		25000		25000			25000		

(1) In 15A = 10 kA at 277V AC - 10 kA at 347V AC (2) In 15A = 35 kA at 240V AC - 14 kA at 480Y/277V AC (3) In 15A up to 30A = 65kA at 480V AC

F - FIXED
P - PLUG-IN
W - WITHDRAWABLE

Tmax main characteristics

Molded Case Circuit Breakers

2

Power distribution circuit breakers electrical characteristics																
Breaker type		T4					T5					T6				
Frame size	[A]	250					400-600 ⁽¹⁾					800				
Number of poles	[No.]	2 ⁽²⁾ -3-4					2 ⁽²⁾ -3-4					3-4				
Rated voltage	AC (50-60 Hz) [V]	600					600					600				
	DC [V]	600					600					600				
Interrupting ratings	Frame type	N	S	H	L	V	N	S	H	L	V	N	S	H	L	
	240 V AC [kA]	65	100	150	200	200	65	100	150	200	200	65	100	200	200	
	277 V AC [kA]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	347 V AC [kA]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	480 V AC [kA]	25	35	65	100	150	25	35	65	100	150	35	50	65	100	
	600Y/347 V AC [kA]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	600 V AC [kA]	18	25	35	65	100	18	25	35	65	100	20	25	35	42	
	250 V DC (2 poles in series) [kA]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	500 V DC (3 poles in series) [kA]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	500 V DC (2 poles in series) [kA]	25	35	50	65	100	25	35	50	65	100	35	35	50	65	
	600 V DC (3 poles in series) [kA]	16	25	35	50	65	16	25	35	50	65	20	20	35	50	
Version		F-P-W					F-P-W					F-W				
Trip units	TMF	•					-					-				
	TMD/TMA	•					•					•				
	MA	-					-					-				
	Electronic PR221DS	-					-					-				
	Electronic PR222DS/P	•					•					•				
	Electronic PR222DS/PD-A	•					•					•				
	Electronic PR231/P	•					•					•				
	Electronic PR232/P	-					-					-				
	Electronic PR331/P	-					-					-				
	Electronic PR332/P	-					-					-				
Dimensions	H [in/mm]	8.07/205					8.07/205					10.55/268				
	W 3p [in/mm]	4.13/105					5.51/140					8.26/210				
	D [in/mm]	4.07/103.5					4.07/103.5					4.07/103.5				
Mechanical life	[No. operations]	20000					20000					20000				

(1) T5 600 with electronic trip units only and in 3 pole version (2) 2P only available in the N interrupting rating

Tmax main characteristics

Molded Case Circuit Breakers

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Power distribution circuit breakers electrical characteristics

Breaker type		T7			T8
Frame size	[A]	1000-1200			1600-2000-2500-3000
Number of poles	[No.]	3-4			3-4
Rated voltage	AC (50-60 Hz) [V]	600			600
	DC [V]	-			-
Interrupting ratings	Frame type	S	H	L	V
	240 V AC [kA]	65	100	150	125
	277 V AC [kA]	-	-	-	-
	347 V AC [kA]	-	-	-	-
	480 V AC [kA]	50	65	100	125
	600Y/347 V AC [kA]	-	-	-	-
	600 V AC [kA]	25	50	65	125
	250 V DC (2 poles in series) [kA]	-	-	-	-
	500 V DC (3 poles in series) [kA]	-	-	-	-
	500 V DC (2 poles in series) [kA]	-	-	-	-
	600 V DC (3 poles in series) [kA]	-	-	-	-
Version		F-W			F
Trip units	TMF	-	-	-	-
	TMD/TMA	-	-	-	-
	MA	-	-	-	-
	Electronic PR221DS	-	-	-	-
	Electronic PR222DS/P	-	-	-	-
	Electronic PR222DS/PD-A	-	-	-	-
	Electronic PR231/P	•	-	-	-
	Electronic PR232/P	•	-	-	-
	Electronic PR331/P	•	-	-	•
	Electronic PR332/P	•	-	-	•
Dimensions	H [in/mm]	10.55/268			15/382
	W 3p [in/mm]	8.26/210			16.8/427
	D [in/mm]	6.06/154 (toggle) - 7/178 (motorized)			11.2/282
Mechanical life	[No. operations]	10000			15000

Tmax main characteristics

Molded Case Circuit Breakers

General characteristics

The series of Tmax molded case circuit breakers – complying with the UL489 and CSA C22.2No. 5 Standards – is divided into different basic sizes, with an application range from 15 A to 3000 A and breaking capacities up to 150 kA at 480 VAC.

For protection of alternating current networks, the following are available:

- T1B 1p, T1, T2, T3, Ts3 and T4 circuit breakers equipped with TMF thermal magnetic trip units with fixed thermal and magnetic threshold ($I_3 = 10 \times I_n$);
- T4 (30A to 50 A) circuit breaker equipped with TMD thermal magnetic trip units with adjustable thermal threshold ($I_1 = 0.7 \dots 1 \times I_n$) and fixed magnetic threshold ($I_3 = 10 \times I_n$);
- T4, T5 and T6 circuit breakers with TMA thermal magnetic trip units with adjustable thermal threshold ($I_1 = 0.7 \dots 1 \times I_n$) and adjustable magnetic threshold ($I_3 = 5 \dots 10 \times I_n$);
- T2 with PR221DS electronic trip unit;
- T4, T5 and T6 with PR221DS, PR222DS/P and PR222DS/PD-A electronic trip units;
- The T7 circuit breaker, which completes the Tmax family up to 1200 A, fitted with PR231/P, PR232/P, PR331/P and PR332/P electronic trip units. The T7 circuit breaker is available in the two versions: with a manual operating mechanism or a motorized stored energy operating mechanism⁽¹⁾.

– The T8 circuit breaker, considered an insulated case up to 3000 A, fitted with PR232/P, PR331/P and PR332/P electronic trip units. The T8 circuit breaker is only available in the motorized stored energy operating mechanism⁽¹⁾

The field of application in alternating current of the Tmax series varies from 1 A to 3000 A with voltages up to 600 V. The Tmax T1, T2, T3, Ts3, T4, T5 and T6 circuit breakers equipped with TMF, TMD and TMA thermal magnetic trip units can also be used in direct current plants, with a range of applications from 15 A to 800 A and a minimum operating voltage of 24 V DC, according to the appropriate connection diagrams.

The three-pole T2, T3 and Ts3 circuit breakers can also be fitted with MA adjustable magnetic only trip units, both for applications in alternating current and in direct current, in particular for motor protection.

For all the circuit breakers in the series, fitted with thermal magnetic and electronic trip units, the single-phase trip current is defined.

⁽¹⁾ Motor operator not included. To be purchased separately.

Interchangeability

The Tmax T4, T5 and T6 circuit breakers can be equipped either with TMF, TMD or TMA thermal magnetic trip units, MA magnetic only trip units or PR221DS, PR222DS/P, PR222DS/PD-A electronic trip units.

Similarly, Tmax T7 and T8 can also mount the latest generation PR231/P⁽³⁾, PR232/P, PR331/P⁽¹⁾ and PR332/P⁽¹⁾ electronic trip units.

Thanks to their simply assembly, the end customer can change the type of trip unit extremely rapidly according to their own requirements and needs. In this case, correct assembly is the customer's responsibility. Above all, this means into increased flexibility of use of the circuit breakers with considerable savings in terms of costs thanks to better rationalization of stock management.

Breaker type In [kA]	TMF	TMD	TMA				PR221DS-PR222DS/P-PR222DS/PD-A ⁽²⁾				PR231/P ⁽³⁾ -PR232/P ⁽³⁾ -PR331/P-PR332/P					
	15-20	30-50	80-250	300-400	600-800	100-250	300-400	600	800	400-800	1000	1200	1600	2000	2500	3000
T4 250	•	•	•	-	-	•	-	-	-	-	-	-	-	-	-	-
T5 400	-	-	-	•	-	-	•	-	-	-	-	-	-	-	-	-
T5 600	-	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-
T6 800	-	-	-	-	•	-	-	•	•	-	-	-	-	-	-	-
T7 1000	-	-	-	-	-	-	-	-	-	••	•	-	-	-	-	-
T7 1200	-	-	-	-	-	-	-	-	-	••	••	•	-	-	-	-
T8 1600	-	-	-	-	-	-	-	-	-	-	-	-	•	-	-	-
T8 2000	-	-	-	-	-	-	-	-	-	-	-	-	••	•	-	-
T8 2500	-	-	-	-	-	-	-	-	-	-	-	-	••	••	•	-
T8 3000	-	-	-	-	-	-	-	-	-	-	-	-	••	••	••	•

• = Complete circuit breaker already coded

•• = Circuit breaker to be assembled

⁽¹⁾ If ordered loose PR331/P and PR332/P must be completed with the "trip unit adapters"

⁽²⁾ PR223DS, minimum In = 160 A

⁽³⁾ Trip unit for T7 only

Tmax main characteristics

Molded Case Circuit Breakers

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Range of application of the circuit breakers in alternating current (AC)

Breaker type	Trip unit	Range [A]
T1 1p 100	TMF	15...100
T1 100	TMF	15...100
T2 100	TMF	15...100
	MA	20...100
	PR221DS	25...100
T3 225	TMF	60...225
	MA	100...200
Ts3 150	TMF	15...150
	MA	3...150
Ts3 225	TMF	175...225
	MA	175...200
T4 250	TMF	20
	TMD	30...50
	TMA	80...250
	PR221DS	80...250
	PR222DS/P-PR222DS/PD-A	100...250
T5 400/600	TMA	300...400
	PR221DS	300-400-600
	PR222DS/P-PR222DS/PD-A	300-400-600
T6 800	TMA	600...800
	PR221DS	600...800
	PR222DS/P-PR222DS/PD-A	600...800
T7 1000/1200	PR231/P-PR232/P	400...1200
	PR331/P-PR332/P	400...1200
T8 1600/2000/2500/3000	PR331/P	1000...3000
	PR332/P	1000...3000

MA = magnetic only trip unit with adjustable magnetic thresholds

TMF = thermal magnetic trip unit with fixed thermal and magnetic thresholds

TMD = thermal magnetic trip unit with adjustable thermal and fixed magnetic thresholds

TMA = thermal magnetic trip unit with adjustable thermal and magnetic thresholds

PR22_, PR23_, PR33_ = electronic trip units

Range of application of the circuit breakers in direct current (DC)

Breaker type	Trip unit	Range [A]
T1 100	TMF	15...100
T2	MA	20...100
T3 225	TMF	60...225
Ts3 150	TMF	15...150
	MA	3...150
Ts3 225	TMF	175...225
	MA	175...200
T4 250	TMD	30...50
	TMA	80...250
	TMF	20
T5 400	TMA	300...400
T6 800	TMA	600...800

Tmax main characteristics

Molded Case Circuit Breakers

Thermal magnetic trip units

The Tmax T1_1p, T1, T2, T3, Ts3, T4, T5 and T6 circuit breakers can be fitted with thermal magnetic trip units and are used in protection of alternating and direct current networks with a range of use from 15 A to 800 A. They allow the protection against overload with a thermal device (with fixed threshold for T1 1p, T1, T2, T3, Ts3, T4 and adjustable threshold for T4, T5 and T6) realized using the bimetal technique, and protection against short-circuit with a magnetic device (with fixed threshold for T1, T2, T3, Ts3 and T4 up to 50 A and adjustable threshold for T4, T5 and T6).

The four-pole circuit breakers are always supplied with the neutral protected by the trip unit and with protection of the neutral at 100% of the phase settings up to 100 A. For higher settings, the protection of the neutral is at 50% of the phase setting unless the protection of the neutral at 100% of the phase setting is required.

Thermal magnetic trip units																						
I _n [A]	15	20	25	30	35	40	50	60	70	80	90	100	125	150	175	200	225	250	300	400	600	800
T1 (I _n =I _n)	•	•	•	•	-	•	•	•	•	•	•	•	-	-	-	-	-	-	-	-	-	-
T2 (I _n =I _n)	•	•	•	•	•	•	•	•	•	•	•	•	-	-	-	-	-	-	-	-	-	-
T3 (I _n =I _n)	-	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•	-	-	-	-	-
Ts3 (I _n =I _n)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-	-	-	-	-
T4 (I _n =I _n)	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4 (I _n =0.7...1xI _n)	-	-	-	•	-	•	•	-	-	•	-	•	•	•	-	•	-	•	-	-	-	-
T5 400 (I _n =0.7...1xI _n)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	•	-	-
T6 (I _n =0.7...1xI _n)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•	•
T1																						
I ₃ [A]	1000	1000	1000	1000		1000	1500	1500	1500	1500	1500	1500	-	-	-	-	-	-	-	-	-	-
Neutral [A]	1000	1000	1000	1000		1000	1500	1500	1500	1500	1500	1500	-	-	-	-	-	-	-	-	-	-
T2, T3																						
I ₃ [A]	500	500	500	500	500	500	500	600	700	800	900	1000	1250	1500	1750	2000	2250	-	-	-	-	-
Neutral [A]	500	500	500	500	500	500	500	600	700	800	900	1000	1250	1500	1750	2000	2250	-	-	-	-	-
Ts3																						
I ₃ [A]	500	500	500	500	500	500	500	600	700	800	900	1000	1250	1500	1750	2000	2250	-	-	-	-	-
Neutral [A]	500	500	500	500	500	500	500	600	700	800	900	1000	1250	1500	1750	2000	2250	-	-	-	-	-
T4, T5																						
I ₃ [A]	-	500	-	500	-	500	500	-	-	400	-	500	625	750	-	1000	-	1250	1500	2000	3000	4000
Neutral [A]	-	500	-	500	-	500	500	-	-	400	-	500	625	750	-	1000	-	1250	1500	2000	3000	4000
T6																						
I ₃ = 5...10xI _n [A]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3000	4000
Neutral [A] - 100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3000	4000
Neutral [A] - 50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1500	2000

Tmax main characteristics

Molded Case Circuit Breakers

Thermomagnetic trip units TMD / TMA (for T4, T5 and T6)

2



Thermal threshold
Adjustable from 0.7 to 1 x In




Thermal threshold
Adjustable from 0.7 to 1 x In

Magnetic threshold
Adjustable from 5 to 10 x In



TMD/TMA - T4

 $I_1=0.7 \dots 1 \times I_n$	In [A]	20	30	40	50	80	100	125	150	200	250
	Min. adj.	–	21	28	35	56	70	88	105	140	175
	Max. adj.	–	30	40	50	80	100	125	150	200	250
 $I_3 = 10 \times I_n$ $I_3 = 5 \dots 10 \times I_n$	$I_3 = 10 \times I_n$ [A]	500	500	500	500	–	–	–	–	–	–
	$I_3 = 5 \dots 10 \times I_n$ [A]	–	–	–	–	800	1000	1250	1500	2000	2500
	Min. adj.	–	–	–	–	400	500	625	750	1000	1250
	Max. adj.	–	–	–	–	800	1000	1250	1500	2000	2500

TMA - T5

 $I_1=0.7 \dots 1 \times I_n$	In [A]	300	400
	Min. adj.	210	280
	Max. adj.	300	400
 $I_3 = 5 \dots 10 \times I_n$	I_3 [A]	3000	4000
	Min. adj.	1500	2000
	Max. adj.	3000	4000

TMA - T6

 $I_1=0.7 \dots 1 \times I_n$	In [A]	600	800
	Min. adj.	420	560
	Max. adj.	600	800
 $I_3 = 5 \dots 10 \times I_n$	I_3 [A]	6000	8000
	Min. adj.	3000	4000
	Max. adj.	6000	8000

Tmax main characteristics

Molded Case Circuit Breakers

Electronic trip units

For use in alternating current the Tmax T2, T4, T5, T6 T7 and T8 circuit breakers can be equipped with trip units constructed using electronic technology. This allows protection functions to be obtained which provide high reliability, tripping precision and insensitivity to temperature and to the electromagnetic components.

The power supply needed for correct operation is supplied directly by the current sensors of the trip unit, and tripping is always guaranteed, even under single-phase load conditions.

Characteristics of the Tmax electronic trip units	
Operating temperature	-13 °F...+158 °F (-25 °C...+70 °C)
Relative humidity	98%
Self-supply	0.2 x In (single phase)
Auxiliary power supply (where applicable)	24 V DC
Operating frequency	45...66 Hz
Electromagnetic compatibility (LF and HF)	IEC 60947-2 Annex F

For Tmax T2, T4, T5 and T6 the protection trip unit consists of:

- 3 or 4 current sensors (current transformers)
- external current sensors (e.g. for the external neutral), when available
- a trip unit
- a trip coil (for T2 housed in the right slot, for T4, T5 and T6 integrated in the electronic trip unit).

For Tmax T7 and T8 the protection trip unit consists of:

- 3 or 4 current sensors (Rogowski coils and current transformers)
- external current sensors (e.g. for the external neutral)
- interchangeable rating plug
- a trip unit
- a trip coil housed in the body of the circuit breaker.

Rating plugs										
Circuit breaker	CS Rated current I _n	In [A]								
		400	600	800	1000	1200	1600	2000	2500	3000
T7	1000	•	•	•	•	-	-	-	-	-
	1200	•	•	•	•	•	-	-	-	-
T8	1600	-	-	-	•	•	•	-	-	-
	2000	-	-	-	•	•	•	•	-	-
	2500	-	-	-	•	•	•	•	•	-
	3000	-	-	-	•	•	•	•	•	•

The current sensors supply the electronic trip unit with the energy needed for correct operation of the trip unit and the signal needed to detect the current. The current sensors are available with rated primary current as shown in the table.





Tmax main characteristics

Molded Case Circuit Breakers

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Current sensors		In [A]														
Trip unit type	Breaker type	25	60	100	150	250	300	400	600	800	1000	1200	1600	2000	2500	3000
PR221DS	T2	•	•	•	•	-	-	-	-	-	-	-	-	-	-	-
	T4	-	-	•	•	•	-	-	-	-	-	-	-	-	-	-
	T5	-	-	-	-	-	•	•	•	-	-	-	-	-	-	-
	T6	-	-	-	-	-	-	-	•	•	-	-	-	-	-	-
PR222DS/P, PR222DS/PD-A	T4	-	-	•	•	•	•	-	-	-	-	-	-	-	-	-
	T5	-	-	-	-	-	•	•	•	-	-	-	-	-	-	-
	T6	-	-	-	-	-	-	-	•	•	-	-	-	-	-	-
PR231/P, PR232/P, PR331/P, PR332/P	T7	-	-	-	-	-	-	•	•	•	•	•	-	-	-	-
PR331/P, PR332/P	T8	-	-	-	-	-	-	-	-	-	•	•	•	•	•	•

Basic protection functions

	(L) Protection against overload This protection function trips when there is an overload with inverse long-time delay trip according to an inverse time curve ($I^2t=k$). The protection cannot be excluded.
	(S) Protection against short-circuit with time delay This protection function trips when there is a short-circuit, with long inverse time-delay trip ($I^2t=k$ ON) or a constant trip time ($I^2t=k$ OFF). The protection can be excluded.
	(I) Instantaneous protection against short-circuit This protection function trips instantaneously in case of a short-circuit. The protection can be excluded.
	(G) Protection against ground fault The protection against ground fault trips when the vectorial sum of the currents passing through the current sensors exceeds the set threshold value, with long inverse time-delay trip ($I^2t=k$ ON) or a constant trip time ($I^2t=k$ OFF). The protection can be excluded.

When a protection function trips, the circuit breaker opens by means of the trip coil, which changes the contact AUX-SA (supplied on request, see chapter "Accessories") to tripping. Mechanical signalling reset takes place with resetting of the circuit breaker.

Tmax main characteristics

Molded Case Circuit Breakers















The PR332/P trip unit makes it possible to carry out highly developed protection against the most varied types of fault. It adds the following advanced protection functions to the basic protection functions.

Advanced protection functions	
<div>U</div>	<p>(U) Protection against unbalanced phase</p> <p>The protection function against unbalanced phase U can be used in those cases where a particularly precise control is needed regarding missing and/or unbalance of the phase currents. The trip time is instantaneous. The protection can be excluded.</p>
<div>OT</div>	<p>(OT) Protection against overtemperature</p> <p>The protection against overtemperature trips instantaneously when the temperature inside the trip unit exceeds 85 °C, in order to prevent any temporary or continual malfunction of the microprocessor. The protection cannot be excluded.</p>
<div>ZS</div>	<p>(ZS) Zone selectivity</p> <p>ZS zone selectivity is an advanced method for carrying out coordination of the protections in order to reduce the trip times of the protection closest to the fault in relation to the time foreseen by time selectivity. Zone selectivity can be applied to the protection functions S and G, with constant time-delay trip. The protection can be excluded.</p>
<div>UV OV RV</div>	<p>(UV, OV, RV) Protections against voltage</p> <p>The three protections trip with a constant time-delay in the case of undervoltage, overvoltage and residual voltage respectively. The latter allows to detect interruptions of the neutral (or of the ground conductor in systems with grounded neutral). The protections can be excluded.</p>
<div>RP</div>	<p>(RP) Protection against reversal of power</p> <p>The protection against reversal power causes tripping of the breaker, with constant time-delay trip, when the flow of power reverses sign and exceeds, as an absolute value, the set threshold. It is particularly suitable for protection of large machines such as generators. The protection can be excluded.</p>
<div>UF OF</div>	<p>(UF, OF) Protections of frequency</p> <p>The two protections detect the variation in network frequency above or below the adjustable thresholds, opening the circuit breaker, with constant time-delay trip. The protection can be excluded.</p>

Tmax main characteristics

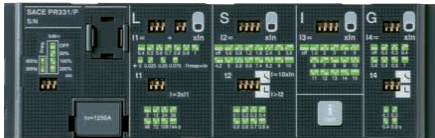

Molded Case Circuit Breakers

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SACE PR221DS		
Protection functions	PR221DS-LS/I	PR221DS-I
		
SACE PR222DS/P		
Protection functions	PR222DS/P-LSI	PR222DS/P-LSIG
		
SACE PR222DS/PD-A		
Protection functions	PR222DS/PDA-LSI	PR222DS/PDA-LSIG
		
SACE PR231/P		
Protection functions	PR231/P-LS/I	PR231/P-I
		
SACE PR232/P		
Protection functions	PR232/P-LSI	
		

Tmax main characteristics

Molded Case Circuit Breakers

SACE PR331/P			
Protection functions	PR331/P-LSIG		
	<div>L S I G</div>		
SACE PR332/P			
Protection functions	PR232/P	PR232/P	PR232/P
	<div>L I</div>	<div>L S I</div>	<div>L S I G</div>
Advanced protection functions	<div>U OT</div>	<div>U OT</div>	<div>U OT</div>
Options (available with PR330/V only)	<div>UV OV RV RB UR OR</div>	<div>UV OV RV RB UR OR</div>	<div>UV OV RV RB UR OR</div>

Tmax main characteristics

Molded Case Circuit Breakers

PR221DS – Tmax T2, T4, T5 and T6

The PR221DS trip unit, available for T2, T4, T5 and T6, provides protection functions against overload L and short-circuit S/I (version PR221DS-LS/I): with this version you can choose whether to have inverse time-delay S or instantaneous I protection against short-circuit by moving the dedicated dip-switch. Alternatively, the version with only the protection function against instantaneous short-circuit I is available.

There is a single adjustment for the phases and the neutral. The neutral is adjustable from 50 - 100% of the phases for Tmax T2 $I_n = 100$ A ($T2 I_n < 100$ A, $N = 100\%$), whereas for T4, T5 and T6 it is possible to select the protection threshold OFF, 50% or 100% directly from the front of the trip unit by means of the specific dip switch.

The trip coil is always supplied with the PR221DS trip unit for Tmax T2 and is housed in the right-hand slot of the circuit breaker. Dedicated auxiliary contacts are available for T2 with electronic trip units

For Tmax T4, T5 and T6, the opening solenoid is housed internally and therefore, by not using the right-hand slot of the circuit breaker, all the auxiliary contacts available can be used.

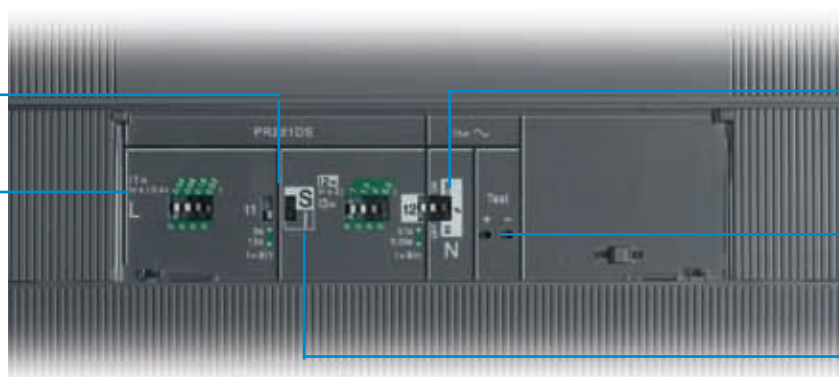
Protection S
Against short-circuit
with delayed trip

Protection L
Against overload







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

Socket for TT1
test unit

Protection I
Against short-circuit
with instantaneous trip



PR221DS - Protection functions and settings

Protection functions			Trip threshold	Trip curves ⁽¹⁾		
	Against overload with long inverse time delay trip and trip characteristic according to an inverse time curve ($I^2t = \text{constant}$)		$I_1 = 0.40 - 0.44 - 0.48 - 0.52 - 0.56 - 0.60 - 0.64 - 0.68 - 0.72 - 0.76 - 0.80 - 0.84 - 0.88 - 0.92 - 0.96 - 1 \times I_n$ Release between $1.1 \dots 1.3 \times I_1$ (IEC 60947-2 and UL 489)	at $6 \times I_1$ $t_1 = 3s$	at $6 \times I_1$ $t_1 = 6s$ only for T2	at $6 \times I_1$ $t_1 = 12s$ only for T4, T5
	Against short-circuit with inverse short time delay trip and trip characteristic with inverse time ($I^2t = \text{constant}$) (selectable as an alternative to protection function L)		$I_2 = 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4.5 - 5.5 - 6.5 - 7 - 7.5 - 8 - 8.5 - 9 - 10 \times I_n^{(2)}$ Tolerance: $\pm 10\%$ (T4-T5) $\pm 10\%$ up to $2 \times I_n$ (T2) $\pm 20\%$ above $2 \times I_n$ (T2)	at $8 \times I_n$ $t_2 = 0,1s$	at $8 \times I_n$ $t_2 = 0,25s$	
	Against short-circuit with instantaneous trip (selectable as an alternative to protection function S)		$I_3 = 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4.5 - 5.5 - 6.5 - 7 - 7.5 - 8 - 8.5 - 9 - 10 \times I_n^{(3)}$ Tolerance: $\pm 10\%$ (T4-T5) $\pm 20\%$ (T2)	instantaneous		

⁽¹⁾ These tolerances hold in the following conditions:
– self-powered relay at full power and/or auxiliary supply;
– two or three-phase power supply.

In conditions other than those considered, the following tolerances hold:

	Trip time
S	$\pm 20\%$
I	$\leq 40ms$

⁽²⁾ For T5 $I_n = 600$ A - $I_2 \text{ max} = 9.5 \times I_n$

⁽³⁾ For T5 $I_n = 600$ A - $I_3 \text{ max} = 9.5 \times I_n$

Tmax main characteristics

Molded Case Circuit Breakers

PR222DS/P – Tmax T4, T5 and T6

The PR222DS/P trip unit, available for T4, T5 and T6, has protection functions against overload L, delayed S and instantaneous I short-circuit (version PR222DS/P-LSI). Alternatively, in addition to the functions L, S, I, it also has protection against ground fault G (version PR222DS/P-LSIG). Setting of the PR222DS trip unit can be carried out either by means of dip switches on the front of the circuit breaker or electronically, using the PR010/T programming and control unit or the BT030 wireless communication unit.

There is a single setting for the phases and neutral for which one can decide whether to set the threshold of the protection functions to OFF, to 50% or to 100% of the phases by means of two dedicated dip switches.

Furthermore, on the front of the PR222DS/P (or PR222DS/PD-A) trip units, signalling of pre-alarm and alarm of protection L is available. The pre-alarm threshold value, signalled by the red LED fixed, is equal to $0.9 \times I_n$. It is also possible to remotely transmit the alarm of protection L by simply connecting connector X3 to the dedicated contact.

PR222DS/PD-A – Tmax T4, T5 and T6

Apart from the protection functions available for the PR222DS/P trip unit (for the settings see page 2/18), the PR222DS/PD-A trip unit, available for T4, T5 and T6 also has the communication unit integrated with Modbus® RTU protocol.

The Modbus® RTU protocol has been known and used worldwide for many years and is now a market standard thanks to its simplicity of installation, configuration and to its integration in the various different supervision, control and automation systems, as well as good level performances. The PR222DS/PD-A trip units allow the Tmax T4, T5 and T6 circuit breakers to be integrated in a communication network based on the Modbus® RTU protocol. Modbus® RTU provides a Master-Slave system architecture where a Master (PLC, PC...) cyclically interrogates several Slaves (field devices). The devices use the EIA RS485 standard as the physical means for data transmission at a maximum transmission speed of 19.2 kbps.

Again for this trip unit, the power supply needed for correct operation of the protection functions is supplied directly by the current transformers of the trip unit and tripping is always guaranteed, even under conditions of single-phase load down. Nevertheless, communication is only possible with an auxiliary power supply of 24 V DC.

PR222DS/PD-A – Electrical characteristics

Auxiliary power supply (galvanically insulated)	24 V DC \pm 20%
Maximum ripple	\pm 5%
Inrush current @ 24 V	1 A for 30 ms
Rated current @ 24 V	100 mA
Rated power @ 24 V	2.5 W

The PR222DS/PD-A trip unit, with integrated communication and control functions, allows a wide range of information to be acquired and transmitted remotely, opening and closing commands to be carried out by means of the electronic version motor operator, the configuration and programming parameters of the unit to be stored, such as the current thresholds of the protection functions and the protection curves.

All the information can be consulted both locally, directly on the front of the circuit breaker with the front display unit FDU, or on the HMI030 switchgear multi-meter and remotely by means of supervision and control systems.

Moreover, by connecting of the BT030 external module to the test connector of the PR222DS/PD-A trip unit, wireless communication to a PDA or Notebook is possible through a Bluetooth port.

The PR222DS/PD-A trip units can be associated with the AUX-E auxiliary contacts to know the state of the circuit breaker (open/closed), and with MOE-E motor operator (the AUX-E are obligatory when MOE-E is to be used) to remotely control circuit-breaker opening and closing as well. If the circuit breaker fitted with the PR222DS/PD-A trip unit is inserted in a supervision system, during the test phases with the PR010/T unit, communication is automatically abandoned and starts again on completion of this operation.

Tmax main characteristics

Molded Case Circuit Breakers

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Communication functions	PR222DS/P	PR222DS/PD-A
Protocol		Modbus RTU standard
Physical medium		EIA RS485
Speed (maximum)		19.2 kbps
Measurement functions		
Phase currents	• (1)	•
Neutral current	• (1)	•
Ground current	• (1)	•
Voltages (phase to phase, phase to ground)		
Powers (active, reactive, apparent)		
Power factors		
Energies		
Peak factor		
Frequency		
Signalling functions		
L pre-alarm and alarm LED	• (5)	• (5)
L alarm output contact ⁽²⁾	•	•
Available data		
Circuit breaker status (open, closed) ⁽³⁾		•
Mode (local, remote)		•
Protection parameters set	• (1)	•
Alarms		
Protections: L, S, I, G	• (1)	•
Failed tripping under fault conditions	• (1)	•
Maintenance		
Total number of operations		•
Total number of trips		•
Number of trip tests		•
Number of manual operations		•
Number of trips for each individual protection function		•
Record of last trip data	• (1)	•
Commands		
Circuit breaker opening/closing (with motor operator)		•
Alarm reset	• (1)	•
Circuit breaker reset (with motor operator)		•
Setting the curves and protection thresholds	• (1)	•
Safety function		
Automatic opening in the case of failed Trip command fail (with motor operator) ⁽⁴⁾		•
Events		
Changes in circuit breaker state, in the protections and all the alarms		•

⁽¹⁾ With PR010/T unit or BT030 unit

⁽²⁾ Typical contact: MOS photo Vmax: 48 V DC/30 V AC
Imax: 50 mA DC/35 mA AC

⁽³⁾ Available with AUX-E electronic auxiliary contacts

⁽⁴⁾ The motor operator must be in electronic version (MOE-E) and electronic auxiliary contacts (AUX-E) have to be used

⁽⁵⁾ Signals: – Pre-alarm L - permanently lit
– Alarm L - flashing (0.5 s ON / 0.5 s OFF)
– Incongruent manual setting (L > S / S > I) - flashing (1 s ON / 2 s OFF)
– WINK (remote control to identify the relay) - flashing (0.125 s ON / 0.125 s OFF)

Tmax main characteristics

Molded Case Circuit Breakers

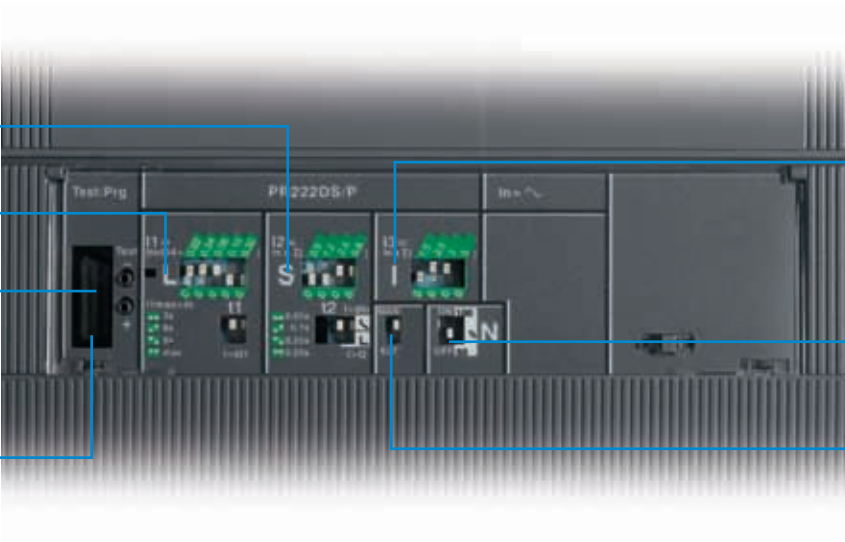
PR222DS/P

Protection S
Against short-circuit
with delayed trip

Protection L
Against overload

Socket for TT1
test unit

Socket for connection
of PR010/T test unit
and BT030 wireless
communication unit



Protection I
Against short-circuit
with instantaneous trip

Dip-switch for
neutral setting

Selection for electronic
or manual setting

PR222DS/PD-A

Protection S
Against short-circuit
with delayed trip

Protection L
Against overload

Socket for TT1
test unit

Socket for connection
of PR010/T test unit
and BT030 wireless
communication unit



Protection I
Against short-circuit
with instantaneous trip

Dip-switch for
neutral setting










Selection for electronic
or manual setting

Selection for local
or remote setting

Tmax main characteristics

Molded Case Circuit Breakers

PR222DS/P, PR222DS/PD-A – Protection functions and settings

Protection functions			Trip threshold	Trip curves ⁽¹⁾
<div>2</div>  CANNOT BE EXCLUDED	Against overload with long inverse time delay trip and trip characteristic according to an inverse time curve ($I^2t=\text{constant}$)		Manual setting $I_1 = 0.40 - 0.42 - 0.44 - 0.46 - 0.48 - 0.50 - 0.52 - 0.54 - 0.56 - 0.58 - 0.60 - 0.62 - 0.64 - 0.66 - 0.68 - 0.70 - 0.72 - 0.74 - 0.76 - 0.78 - 0.80 - 0.82 - 0.84 - 0.86 - 0.88 - 0.90 - 0.92 - 0.94 - 0.96 - 0.98 - 1 \times I_n$	Manual setting at $6 \times I_1$ $t_1 = 3s$ at $6 \times I_1$ $t_1 = 6s$ at $6 \times I_1$ $t_1 = 9s$ at $6 \times I_1$ $t_1 = 18s^{(2)}$
			Electronic setting $I_1 = 0.40 \dots 1 \times I_n$ (step $0.01 \times I_n$) Release between $1.1 \dots 1.3 \times I_1$ (IEC 60947-2 and UL 489)	Electronic setting at $6 \times I_1$ $t_1 = 3 \dots 18s$ (step $0.5s$) ⁽²⁾ Tolerance: $\pm 10\%$
 CAN BE EXCLUDED	Against short-circuit with inverse short time delay trip and trip characteristic with inverse time ($I^2t=\text{constant}$) or definite time	$I^2t=\text{const}$ ON  $I^2t=\text{const}$ OFF 	Manual setting $I_2 = 0.6 - 1.2 - 1.8 - 2.4 - 3.0 - 3.6 - 4.2 - 5.8 - 6.4 - 7.0 - 7.6 - 8.2 - 8.8 - 9.4 - 10 \times I_n^{(3)}$	Manual setting at $8 \times I_n$ $t_2 = 0.05s$ at $8 \times I_n$ $t_2 = 0.1s$ at $8 \times I_n$ $t_2 = 0.25s$ at $8 \times I_n$ $t_2 = 0.5s$
			Electronic setting $I_2 = 0.60 \dots 10 \times I_n$ (step $0.1 \times I_n$) ⁽³⁾ Tolerance: $\pm 10\%$	Electronic setting at $8 \times I_n$ $t_2 = 0.05 \dots 0.5s$ (step $0.01s$) Tolerance: $\pm 10\%$ ⁽⁴⁾
 CAN BE EXCLUDED	Against short-circuit with instantaneous trip		Manual setting $I_3 = 1.5 - 2.5 - 3 - 4 - 4.5 - 5 - 5.5 - 6.5 - 7 - 7.5 - 8 - 9 - 9.5 - 10.5 - 12 \times I_n^{(3)}$	instantaneous
			Electronic setting $I_3 = 1.5 \dots 12 \times I_n$ (step $0.1 \times I_n$) ⁽³⁾ Tolerance: $\pm 10\%$	
 CAN BE EXCLUDED	Against ground fault with inverse short time delay trip and trip characteristic according to an inverse time curve ($I^2t=\text{constant}$)		Manual setting $I_4 = 0.2 - 0.25 - 0.45 - 0.55 - 0.75 - 0.8 - 1 \times I_n$	Manual setting up to $3.15 \times I_4$ $t_4 = 0.1s$ up to $2.25 \times I_4$ $t_4 = 0.2s$ up to $1.6 \times I_4$ $t_4 = 0.4s$ up to $1.10 \times I_4$ $t_4 = 0.8s$
			Electronic setting $I_4 = 0.2 \dots 1 \times I_n$ (step $0.01 \times I_n$) Tolerance: $\pm 10\%$	Electronic setting $t_4 = 0.1 \dots 0.8 \times I_n$ (step $0.01s$) Tolerance: $\pm 20\%$

⁽¹⁾ These tolerances hold in the following conditions:

- self-powered relay at full power and/or auxiliary supply;
- two or three-phase power supply.

In conditions other than those considered, the following tolerances hold:

	Trip time
S	$\pm 20\%$
G	$\pm 20\%$

⁽²⁾ For $T5 I_n = 600 A$ $t_1 = 10.5s$

⁽³⁾ For $T5 I_n = 600 A$ $I_{3max} = 9.5 \times I_n$
 $I_{2max} = 9.5 \times I_n$

⁽⁴⁾ Tolerance: $\pm 10 ms$ up to $t_2 = 0.1s$

Tmax main characteristics

Molded Case Circuit Breakers

PR231/P – Tmax T7

The PR231/P trip unit is the basic trip unit for Tmax T7. It provides protection functions against overload L and short-circuit S/I (version PR231/P-LS/I). With this version you can choose whether to have protection S or protection I by moving the dedicated dip-switch. Alternatively the version with only the protection function against instantaneous short-circuit I is available (version PR231/P-I see also page 2/33 and following). Setting the trip parameters of the PR231/P trip unit is done directly on the front of the circuit breaker by means of dip switches. There is only one for the phases and the neutral, so it is possible to set the protection threshold at 50% or at 100% of the phase protection.

To provide protection of the installation by means of the PR231/P protection trip unit, it is necessary to select the rated network frequency (50/60 Hz), using the special dip-switch.

Interchangeability of PR231/P can be requested by means of a dedicated code.

PR231/P

Protection L

Against overload

Socket for TT1 test unit

Rating Plug

Dip-switch for network frequency



Protection S




Against short-circuit with delayed trip

Dip-switch for neutral setting

Protection I

Against short-circuit with instantaneous trip

PR231/P - Protection functions and settings

Protection functions	Trip threshold	Trip curves ⁽¹⁾	Excludability	Relation $t = f(I)$
 CANNOT BE EXCLUDED Against overload with long inverse time delay trip and trip characteristic according to an inverse time curve ($I^2t = \text{constant}$)	$I_1 = 0.40 \dots 1 \times I_n$ step = $0.04 \times I_n$ Trip between $1.1 \dots 1.3 \times I_1$ IEC 60947-2 UL 489	at $6 \times I_1$ at $6 \times I_1$ $t_1 = 3 - 12s$ Tolerance: $\pm 10\%$	-	$t = k/I^2$
 CAN BE EXCLUDED Against short-circuit with long inverse time delay trip and trip characteristic with inverse time ($I^2t = \text{constant}$) (selectable as an alternative to protection function I)	$I_2 = 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4.5 - 5.5 - 6.5 - 7 - 7.5 - 8 - 8.5 - 9 - 10 \times I_n$ Tolerance: $\pm 10\%$	at $10 \times I_n$ at $10 \times I_n$ $t_2 = 0.1 - 0.25s$ Tolerance: $\pm 10\%$	•	$t = k/I^2$
 CAN BE EXCLUDED Against short-circuit with instantaneous trip (selectable as an alternative to protection function S)	$I_3 = 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4.5 - 5.5 - 6.5 - 7 - 7.5 - 8 - 8.5 - 9 - 10 \times I_n$ Tolerance: $\pm 10\%$	instantaneous	-	$t = k$

⁽¹⁾ These tolerances hold in the following conditions:

– self-powered trip unit at full power

– two or three-phase power supply

In conditions other than those considered, the following tolerances hold:

	Trip threshold	Trip time
S	$\pm 10\%$	$\pm 20\%$
I	$\pm 15\%$	$\leq 60ms$

Tmax main characteristics

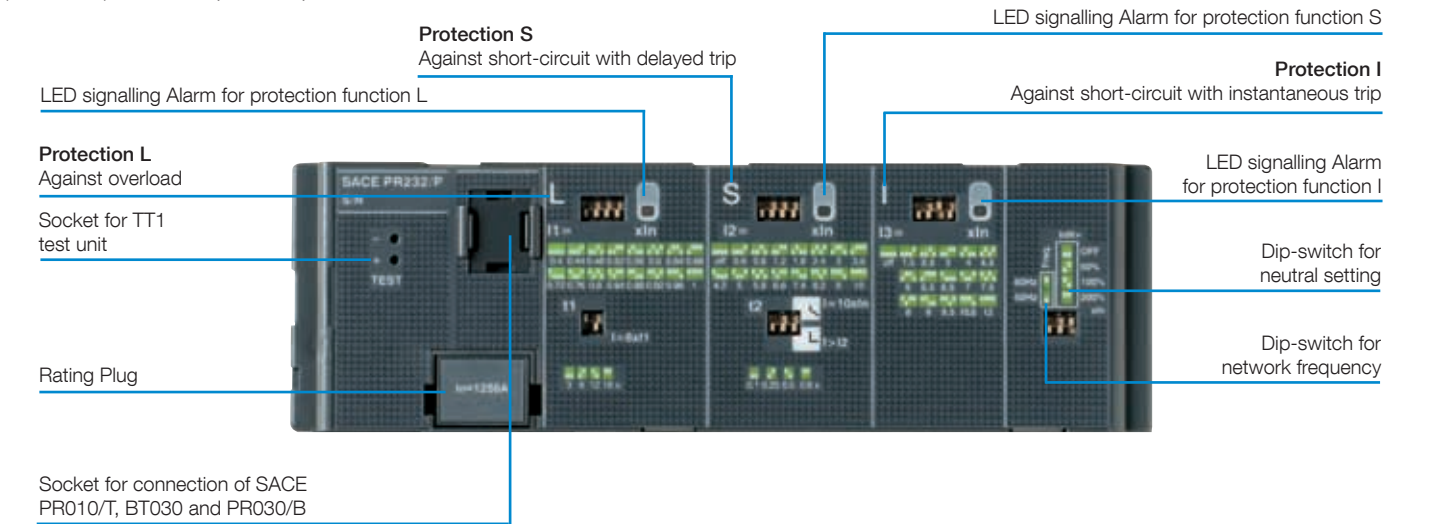
Molded Case Circuit Breakers

PR232/P – Tmax T7

The PR232/P trip unit, available for T7, provides protection functions against overload L, delayed short-circuit S and instantaneous short-circuit I (version PR232/P-LSI).

Setting the trip parameters (see table) of the PR232/P trip unit can be carried out by means of the dip-switches it is unique for the phases and the neutral, for which it is possible to set the protection threshold to OFF, to 50%, 100% or 200% of the threshold of the phases directly from the front of the trip unit with a special dip-switch. In particular, adjustment of the neutral to 200% of the phase current requires setting protection L to respect the current-carrying capacity of the circuit breaker.

To provide protection of the installation by means of the PR232/P protection trip unit, it is necessary to select the rated network frequency (50/60 Hz) with the special dip-switch.



PR232/P - Protection functions and settings						
Protection functions		Trip threshold	Trip curves ⁽¹⁾	Thermal memory ⁽²⁾	Excludability	Relation t = f(I)
<div><div>L</div><div>CANNOT BE EXCLUDED</div></div>	Against overload with long inverse time delay trip and trip characteristic according to an inverse time curve (I ² t=constant)	I ₁ = 0.40...1 x I _n step = 0.04 x I _n Trip between 1.1...1.3 x I ₁ IEC 60947-2 UL 489	at 6 x I ₁ t ₁ = 3s t ₁ = 6s t ₁ = 12s t ₁ = 18s Tolerance: ±10%	•	—	t = k/I ²
<div><div>S</div><div>CAN BE EXCLUDED</div></div>	Against short-circuit with inverse short time delay trip and trip characteristic with inverse time (I ² t=constant) or definite time	I ₂ = 0.6 - 0.8 - 1.2 - 1.8 - 2.4 - 3 - 3.6 - 4.2 - 5 - 5.8 - 6.6 - 7.4 - 8.2 - 9 - 10 x I _n Tolerance: ±10%	at 10 x I _n t ₂ =0.1s t ₂ =0.25s t ₂ =0.5s t ₂ =0.8s Tolerance: ±10%	•	•	t = k/I ²
		I ₂ = 0.6 - 0.8 - 1.2 - 1.8 - 2.4 - 3 - 3.6 - 4.2 - 5 - 5.8 - 6.6 - 7.4 - 8.2 - 9 - 10 x I _n Tolerance: ±10%	I > I ₂ t ₂ =0.1s t ₂ =0.25s t ₂ =0.5s t ₂ =0.8s Tolerance: ±10%	—	•	t = k
<div><div>I</div><div>CAN BE EXCLUDED</div></div>	Against short-circuit with instantaneous trip	I ₃ = 1.5 - 2.5 - 3 - 4 - 4.5 - 5 - 5.5 - 6.5 - 7 - 7.5 - 8 - 9 - 9.5 - 10.5 - 12 x I _n Tolerance: ±10%	instantaneous	—	•	t = k

⁽¹⁾ These tolerances hold in the following conditions:
– self-powered trip unit at full power (without start-up)
– two or three-phase power supply

In conditions other than those considered, the following tolerances hold:
⁽²⁾ Active up to 7 min. after tripping of the breaker (ON/OFF setting by means of PR010/T test unit).




	Trip threshold	Trip time
S	± 10%	± 20%
I	± 15%	≤ 60ms

Tmax main characteristics

Molded Case Circuit Breakers

There are three red LEDs available on the front of the PR232/P trip unit dedicated to the signalling alarm of protections L, S, and I. Furthermore, a yellow flashing LED allows the state of pre-alarm of function L to be signalled, which is activated when 90% of the set trip threshold is reached. The yellow flashing LED every 3s indicates the normal operation.

2

PR232/P - Alarm and Pre-alarm LED				
Protection	Colour	Pre-alarm	Alarm	Last trip
	Yellow	•	–	–
	Red	–	•	•
	Red	–	•	•
	Red	–	•	•

Following circuit breaker opening, it is possible to know which protection function made the trip unit trip by connecting the PR030/B battery unit onto the front of the trip unit. This is also possible thanks to the PR010/T test and configuration unit.

By means of the BT030 wireless communication unit the PR232/P can be connected to a PDA or to a personal computer, extending the range of information available for the user. In fact, by means of the ABB SACE's SD-Pocket communication software, it is possible to read the values of the currents flowing through the circuit breaker, the value of the last 20 interrupted currents, and the protection settings.

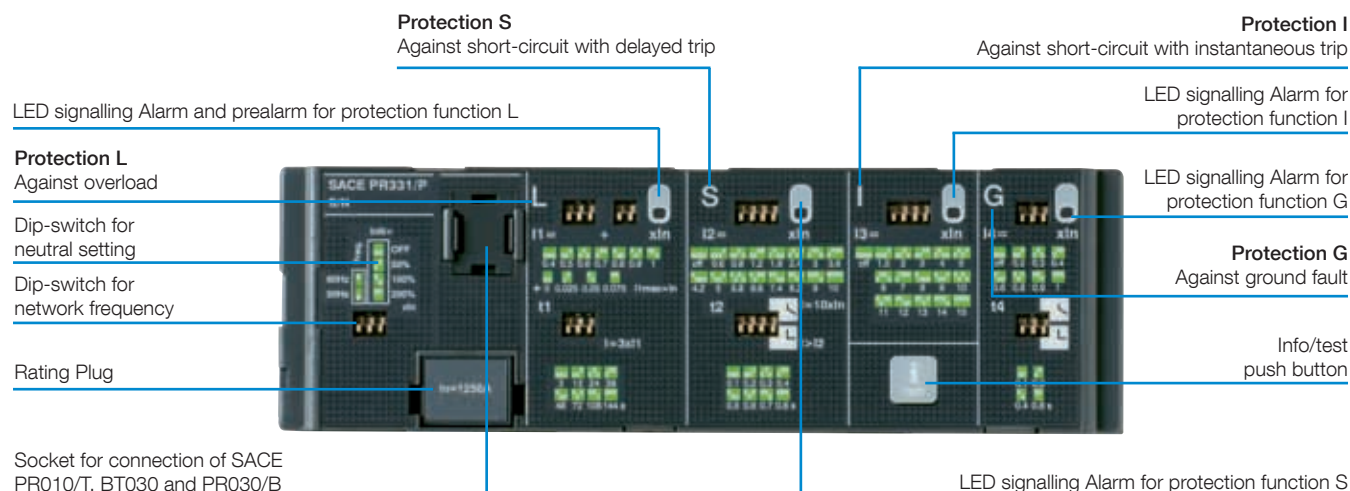
Tmax main characteristics

Molded Case Circuit Breakers





PR331/P – Tmax T7 and T8

The PR331/P, available for Tmax T7 and T8 in the PR331/P-LSIG version, is suitable for protecting a wide range of alternating current installations with its complete range of protection functions together with the wide combination of thresholds and trip times offered. In addition the unit is provided with multifunction LED indicators. Furthermore, PR331/P allows connection to external devices enhancing its advanced characteristics like remote signalling and monitoring, or interface from front of HMI030 panel.

2



PR331/P - Protection functions and settings

Protection functions	Trip threshold	Trip curves ⁽¹⁾	Excludability	Relation $t = f(I)$
 L CANNOT BE EXCLUDED	Against overload with long inverse time-delay trip and trip characteristic according to an inverse time curve ($I^2t=k$)	$I_1 = 0.40 \dots 1 \times I_n$ step = $0.025 \times I_n$ Trip between $1.05 \dots 1.2 \times I_1$	$I_1 = 3 - 12 - 24 - 36 - 48 - 72 - 108$ 144s Tolerance: $\pm 10\%$ up to $6 \times I_n$ $\pm 20\%$ above $6 \times I_n$	$t = k/I^2$
 S CAN BE EXCLUDED	Against short-circuit with short inverse time-delay trip and trip characteristic with inverse time ($I^2t=k$) or with definite time	$I_2 = 0.6 - 0.8 - 1.2 - 1.8 - 2.4 - 3 - 3.6 - 4.2 - 5 - 5.8 - 6.6 - 7.4 - 8.2 - 9 - 10 \times I_n$ Tolerance: $\pm 7\%$ up to $6 \times I_n$ $\pm 10\%$ above $6 \times I_n$	at $10 \times I_n$ $t_2 = 0.1 \dots 0.8s$ step = $0.1s$ Tolerance: min ($\pm 10\%$, $\pm 40ms$)	$t = k/I^2$
 I CAN BE EXCLUDED	Against short-circuit with adjustable instantaneous trip	$I_3 = 1.5 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 \times I_n^{(2)}$ Tolerance: $\pm 10\%$	$I > I_3$ $t_2 = 0.1 \dots 0.8s$ step = $0.1s$ Tolerance: $\pm 15\%$ up to $6 \times I_n$ $\pm 20\%$ above $6 \times I_n$	$t = k$
 G CAN BE EXCLUDED	Against ground fault with short inverse time-delay trip and trip characteristic according to an inverse time curve ($I^2t=k$) or with definite time	$I_4 = 0.2 - 0.3 - 0.4 - 0.6 - 0.8 - 0.9 - 1 \times I_n$ Tolerance: $\pm 7\%$	$4.47 \times I_4$ $3.16 \times I_4$ $2.24 \times I_4$ $1.58 \times I_4$ $t_4 = 0.1s$ $t_4 = 0.2s$ $t_4 = 0.4s$ $t_4 = 0.80s$ Tolerance: $\pm 15\%$	$t = k/I^{(3)}$
	$I_4 = 0.2 - 0.3 - 0.4 - 0.6 - 0.8 - 0.9 - 1 \times I_n$ Tolerance: $\pm 7\%$	$t_4 = 0.1s$ $t_4 = 0.2s$ $t_4 = 0.4s$ $t_4 = 0.80s$ Tolerance: min ($\pm 10\%$, $\pm 40ms$)		$t = k$

⁽¹⁾ These tolerances hold in the following conditions:
 – self-powered trip unit at full power and/or auxiliary supply
 – two or three-phase power supply
 In conditions other than those considered, the following tolerances hold:

⁽²⁾ For T7 $I_n = 1200 A - I_{n,max} = 12 \times I_n$
⁽³⁾ $t = k/I^2$ up to the current value indicated, $t = k$ equating to the chosen setting) beyond the current value indicated

	Trip threshold	Trip time
L	Release between 1.05 and $1.25 \times I_1$	$\pm 20\%$
S	$\pm 10\%$	$\pm 20\%$
I	$\pm 15\%$	$\leq 60ms$
G	$\pm 15\%$	$\pm 20\%$

Tmax main characteristics

Molded Case Circuit Breakers

User interface

The user communicates directly with the trip unit by means of the dip switches. Up to four LEDs (according to the version) are also available for signalling. These LEDs (one for each protection) are active when:

- a protection is timing. For protection L the pre-alarm status is also shown;
- a protection has tripped (the corresponding LED is activated by pressing the “Info/Test” pushbutton);
- a failure in connection of a current sensor or in the trip coil is detected. The indication is active when the unit is powered (through current sensors or an auxiliary power supply)
- wrong rating plug for the circuit breaker.

The protection tripped indication works even with the circuit breaker open, without the need for any internal or external auxiliary power supply. This information is available for 48 hours of inactivity after the trip and is still available after reclosing. If the query is made more than 48 hours later it is sufficient to connect a PR030/B battery unit, PR010/T, or a BT030 wireless communication unit.

Setting the neutral

Protection of the neutral can be set at 50%, 100% or 200% of the phase currents. In particular, adjustment of the neutral at 200% of the phase current is possible if the following inequality is respected:
 $I_n \times I_n \times \%N < I_u$. The user can also switch the neutral protection OFF.

Test function

The Test function is carried out by means of the Info/Test pushbutton and the PR030/B battery unit (or BT030) fitted with a polarized connector housed on the bottom of the box, which allows the device to be connected to the test connector on the front of PR331/P trip units. The PR331/P electronic trip unit can be tested by using the SACE PR010/T test and configuration unit by connecting it to the TEST connector.

Power supply

The unit does not require an external power supply for protection functions or for alarm signalling functions. It is self-supplied by means of the current sensors installed on the circuit breaker.
For operation, it is required for the three phases to be passed through by a current of 70 A. An external power supply can be connected in order to activate additional features, and in particular for connection to external devices: HMI030 and PR021/K.

PR331/P - Electrical characteristics	
Auxiliary power supply (galvanically insulated)	24 V DC ± 20%
Maximum ripple	± 5%
Inrush current @ 24 V	~ 1 A for 5 ms
Rated power @ 24 V	~ 2 W

Communication

By means of the BT030 wireless communication unit, PR331/P can be connected to a PDA or to a personal computer, extending the range of information available for the user. In fact, using ABB’s SD-Pocket communication software, it is possible to read the values of the currents flowing through the circuit breaker, the value of the last 20 interrupted currents, and the protection settings.
PR331/P can also be connected to the optional external PR021/K signalling unit, for the remote signalling of protections alarms and trips, and to HMI030, for the remote user interfacing.

Tmax main characteristics

Molded Case Circuit Breakers

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PR332/P – Tmax T7 and T8

The SACE PR332/P trip unit for Tmax T7 and T8 (available in three versions: PR332/P-LI, PR332/P-LSI, PR332/P-LSIG) is a sophisticated and flexible protection system based on a state-of-the-art microprocessor and DSP technology. Fitted with the optional internal PR330/D-M dialogue unit, PR332/P turns into an intelligent protection, measurement and communication device based on the Modbus® RTU protocol. By means of the PR330/D-M, PR332/P can also be connected to the ABB EP010 Fieldbus plug adapter, which makes it possible to choose among several different networks, such as Profibus and DeviceNet.

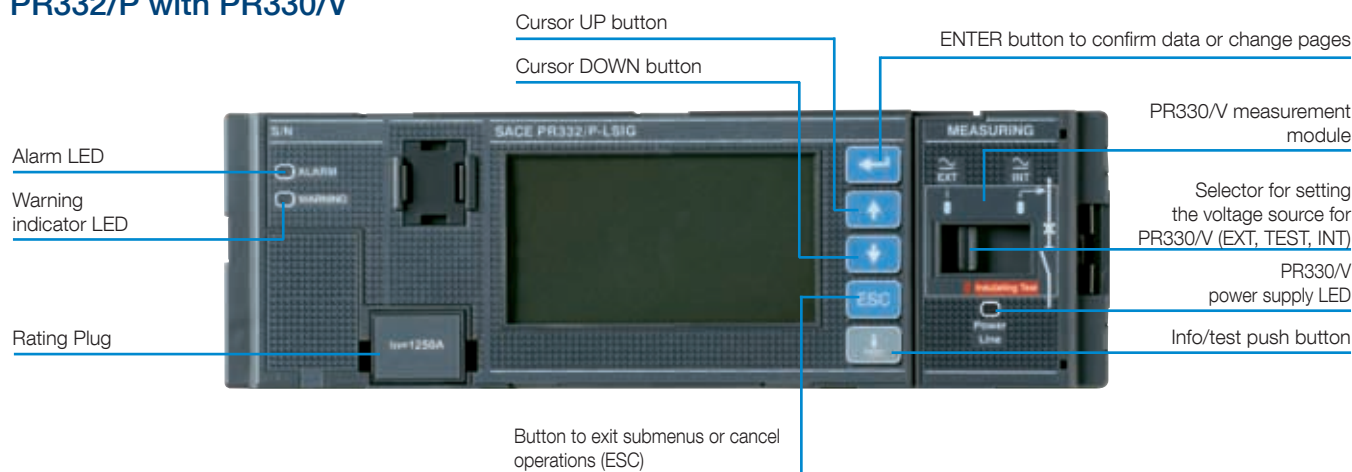
The new PR332/P is the result of ABB SACE's experience in designing trip units. The exhaustive range of settings makes this protection unit ideal for general use in power distribution.

Access to information and programming using a keyboard and graphic liquid crystal display is extremely simple and intuitive. An integrated ammeter and many other additional features are provided over and above the protection functions. These additional functions can be further increased with addition on board of the dialogue, signalling, measurement, and wireless communication units. All the thresholds and trip curve delays of the protection functions are stored in special memories which retain the information even when no power is supplied.

PR332/P









PR332/P with PR330/V



Tmax main characteristics

Molded Case Circuit Breakers

PR332/P - Protection functions and settings

Protection functions		Trip threshold	Trip curves ⁽¹⁾	Excludability	Relation: t = f(I)	Thermal memory ⁽²⁾	Zone selectivity ⁽²⁾
	Against overload with inverse long-time delay trip	I ₁ = 0.4...1 x I _n step = 0.01 x I _n Trip between 1.05...1.2 x I ₁	at I = 3 x I ₁ t ₂ = 3...144s step = 3s Tolerance: ±10% up to 6 x I _n ±20% above 6 x I _n	—	t = k/I ²	•	—
		I ₁ = 0.4...1 x I _n step = 0.01 x I _n Trip between 1.05...1.2 x I ₁	t ₂ = 3...144s step = 3s Tolerance: ±10% up to 6 x I _n ±20% above 6 x I _n	•	t = f(α) ⁽³⁾ α = 0.02- 1-2	•	—
	Against short-circuit with short inverse time-delay trip and trip characteristic with inverse time (I²t=k) or with definite time	I ₂ = 0.6...10 x I _n step = 0.1 x I _n Tolerance: ±7% up to 6 x I _n ±10% above 6 x I _n	at 10 x I _n t ₂ = 0.05...0.8s step = 0.01s Tolerance: ±15% up to 6 x I _n ±20% over 6 x I _n	•	t = k/I ²	•	—
		I ₂ = 0.6...10 x I _n step = 0.1 x I _n Tolerance: ±7% up to 6 x I _n ±10% above 6 x I _n	t ₂ = 0.05...0.8s step = 0.01s t ₂ sel = 0.04...0.2s step = 0.01s Tolerance: min (±10%; ±40ms)	•	t = k	—	•
	Against short-circuit with adjustable instantaneous trip	I ₃ = 1.5...15 x I _n step = 0.1 x I _n Tolerance: ±10%	≤ 30 ms	•	t = k	—	—
	Against ground fault with short inverse time-delay trip and trip characteristic according to an inverse time curve (I²t=k) or with definite time	I ₄ = 0.2...1 x I _n step = 0.02 x I _n Tolerance: ±7%	t ₄ = 0.1...1s step = 0.05s Tolerance: ±15%	•	t = k/I ² ⁽⁶⁾	—	—
		I ₄ = 0.2...1 x I _n step = 0.02 x I _n Tolerance: ±7%	t ₄ = 0.1...1s step = 0.05s t ₄ sel = 0.04...0.2s step = 0.05s Tolerance: min (±10%; ±40ms)	•	t = k	—	•
	Against overtemperature of the trip unit with instantaneous trip	Trip unit temperature over 85 °C	instantaneous	—	temp = k	—	—
	Against unbalanced phase with definite time-delay trip	I ₆ = 2%...90% x I ₁ step = 1% x I ₁ Tolerance: ±10%	t ₆ = 0.5...60 s step = 0.5s Tolerance: min (±20%; ±100ms)	•	t = k	—	—

⁽¹⁾ These tolerances are valid under the following conditions:
 – trip unit self-supplied at full power and/or auxiliary supply
 – two or three-phase power supply
 In conditions other than those considered, the following tolerances hold:

	Trip threshold	Trip time
L	Release between 1.05 and $1.25 \times I_1$	$\pm 20\%$
S	$\pm 10\%$	$\pm 20\%$
I	$\pm 15\%$	$\leq 60ms$
G	$\pm 15\%$	$\pm 20\%$
Other	$\pm 10\%$	$\pm 20\%$

⁽²⁾ Active with 24V auxiliary power supply

⁽⁴⁾ For T7 $I_n = 1000 \text{ A}$ - $I_{3 \text{ max}} = 12 \times I_n$







⁽⁶⁾ $k = (2s) \cdot (I_1)^2$

Tmax main characteristics

Molded Case Circuit Breakers

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PR332/P with PR330/V - Advanced protection functions and settings

Advanced protection functions	Trip threshold	Trip curves ⁽¹⁾	Excludability	Relation $t = f(I)$	Thermal memory ⁽²⁾	Zone selectivity
 UV Against undervoltage with adjustable constant time	$U_g = 0.5 \dots 0.95 \times U_n$ step = $0.01 \times U_n$ Tolerance: $\pm 5\%$	$t_g = 0.1 \dots 5s$ step = $0.1s$ Tolerance: min ($\pm 20\% \pm 100ms$)	•	$t = k$	—	—
 OV Against overvoltage with adjustable constant time	$U_g = 1.05 \dots 1.2 \times U_n$ step = $0.01 \times U_n$ Tolerance: $\pm 5\%$	$t_g = 0.1 \dots 5s$ step = $0.1s$ Tolerance: min ($\pm 20\% \pm 100ms$)	•	$t = k$	—	—
 RV Against residual voltage with adjustable constant time	$U_{10} = 0.1 \dots 0.4 \times U_n$ step = $0.01 \times U_n$ Tolerance: $\pm 5\%$	$t_{10} = 0.5 \dots 30s$ step = $0.5s$ Tolerance: min ($\pm 10\% \pm 100ms$)	•	$t = k$	—	—
 RP Against reversal of power with adjustable constant time	$P_{11} = -0.3 \dots -0.1 \times P_n$ step = $0.02 \times P_n$ Tolerance: $\pm 10\%$	$t_{11} = 0.5 \dots 25s$ step = $0.1s$ Tolerance: min ($\pm 10\% \pm 100ms$)	•	$t = k$	—	—
 UF Against underfrequency with adjustable constant time	$f_{12} = 0.90 \dots 0.99 \times f_n$ step = $0.01 \times f_n$ Tolerance: $\pm 5\%$	$t_{12} = 0.5 \dots 3s$ step = $0.1s$ Tolerance: min ($\pm 10\% \pm 100ms$)	•	$t = k$	—	—
 OF Against overfrequency with adjustable constant time	$f_{13} = 1.01 \dots 1.10 \times f_n$ step = $0.01 \times f_n$ Tolerance: $\pm 5\%$	$t_{13} = 0.5 \dots 3s$ step = $0.1s$ Tolerance: min ($\pm 10\% \pm 100ms$)	•	$t = k$	—	—

⁽¹⁾ These tolerances are valid under the following conditions:
 – trip unit self-supplied at full power and/or auxiliary supply
 – two or three-phase power supply
 In conditions other than those considered, the following tolerances hold:

	Trip threshold	Trip time
L	Release between 1.05 and 1.25 x I_n	$\pm 20\%$
S	$\pm 10\%$	$\pm 20\%$
I	$\pm 15\%$	$\leq 60ms$
G	$\pm 15\%$	$\pm 20\%$
Other	$\pm 10\%$	$\pm 20\%$

⁽²⁾ Active with 24V auxiliary power supply

⁽⁴⁾ For T7 $I_n = 1000 A$ - $I_{gmax} = 12 \times I_n$

⁽⁵⁾ $k = (2s) \cdot (I_g)^2$

Setting the neutral

In PR332/P, the neutral protection is 50% of the value set for phase protection in the standard version. The neutral protection can be excluded or set to 100%.

In installations where very high harmonics occur, the resulting current at the neutral can be higher than that of the phases. Therefore it is possible to set the neutral protection at 150% or 200% of the value set for the phases. In this case it is necessary to reduce the setting of L protection accordingly. The table below lists the neutral settings for the various possible combinations between type of circuit breaker and the threshold I_1 setting.

Adjustable neutral protection settings

Threshold I_1 settings (overload protection)

Circuit breaker model	$0.4 < I_1 < 0.5$	$0.5 < I_1 < 0.66$	$0.66 < I_1 < 1^{(1)}$
T7-T8	0-50-100-150-200%	0-50-100-150%	0-50-100%

⁽¹⁾ The setting $I_1 = 1$ indicates the maximum overload protection setting. The actual maximum setting allowable must take into account any derating based on temperature, the terminals used and the altitude (see the "Installations" chapter)

Tmax main characteristics

Molded Case Circuit Breakers

Start-up function

The start-up function allows protections S, I and G to operate with higher trip thresholds during the start-up phase. This avoids untimely tripping caused by the high inrush currents of certain loads (motors, transformers, lamps).

The start-up phase lasts from 100 ms to 30 s, in steps of 0.01 s. It is automatically recognized by the PR332/P trip unit when the peak value of the maximum current exceeds the threshold that can be set by the user. A new start-up becomes possible after the current has fallen down to $0.1 \times I_n$, if the trip unit is supplied from an external source.

2

Protection against overtemperature

The user has the following signals or commands available for protection against overtemperature:

- lighting up of the “Warning” LED when the temperature is higher than 70 °C or lower than -20 °C (temperature at which the microprocessor is still able to operate correctly);
- lighting up of the “Alarm” LED when the temperature is higher than 85 °C or lower than -25 °C (temperature above which the microprocessor can no longer guarantee correct operation) and, when decided during the unit configuration stage, simultaneous opening of the circuit breaker with indication of the trip directly on the display, as for the other protections.

Self-diagnosis

The PR332/P range of trip units contains an electronic circuit which periodically checks the continuity of internal connections (trip coil and each current sensor, including the Source Ground Return when present).

In the case of a malfunction an alarm message appears directly on the display. The Alarm is highlighted by the Alarm LED as well.

Test Functions

Once enabled from the menu, the “Info/Test” pushbutton on the front of the trip unit allows correct operation of the chain consisting of the microprocessor, trip coil and circuit breaker tripping mechanism to be checked.

The control menu also includes the option of testing correct operation of the display, signalling LEDs.

By means of the front multi-pin connector it is possible to apply a SACE PR010/T Test unit which allows the functions of the PR222DS/P, PR222DS/PD-A, PR232/P, PR331/P and PR332/P ranges of trip units to be tested and checked.

User interface

The human-machine interface (HMI) of the device is made up of a wide graphic display, LEDs, and browsing pushbuttons. The interface is designed to provide maximum simplicity.

The language can be selected from among five available options: Italian, English, German, French and Spanish.

As in the previous generation of trip units, a password system is used to manage the “Read” or “Edit” modes. The default password, 0001, can be modified by the user.

The protection parameters (curves and trip thresholds) can be set directly via the HMI of the device. The parameters can only be changed when the trip unit is operating in “Edit” mode, but the information available and the parameter settings can be checked at any time in “Read” mode. When a communication device (internal PR330/D-M module or external BT030 device) is connected, it is possible to set parameters simply by downloading them into the unit (over the network for PR330/D-M, by using the SD-Pocket software and a PDA or a notebook for BT030). Settings can then be carried out quickly and automatically in an error-free way by transferring data directly from DocWin.

Tmax main characteristics

Molded Case Circuit Breakers

Indicator LEDs

LEDs on the front panel of the trip unit are used to indicate all the warnings and alarms. A message on the display always explicitly indicates the type of event that has concerned.

Example of events indicated by the "WARNING" LED:

- unbalance between phases;
- pre-alarm for overload ($L1 > 90\% \times I_1$);
- first temperature threshold exceeded (70 °C);
- contact wear beyond 80%;
- phase rotation reversed (with optional PR330/V).

Example of events indicated by the "ALARM" LED:

- timing of function L;
- timing of function S;
- timing of function G;
- second temperature threshold exceeded (85 °C);
- contact wear 100%;
- timing of Reverse Power flow protection (with optional PR330/V).

Data logger

PR332/P is provided with the Data Logger function that automatically records the instantaneous values of all the currents and voltages in a wide memory buffer. Data can be easily downloaded from the unit by means of SD-Pocket or SD-TestBus2 applications and can be transferred to any personal computer for elaboration. The function freezes the recording whenever a trip occurs or in case of other events, so that a detailed analysis of faults can be easily performed. SD-Pocket and SD-TestBus2 also allow reading and downloading of all the other trip information.

- Number of analog channels: 8
- Maximum sampling rate: 4800 Hz
- Maximum sampling time: 27 s (@ sampling rate 600 Hz)
- 64 events tracking.

Trip information and opening data

In case a trip occurs PR332/P store all the needed information:

- Protection tripped
- Opening data (current)
- Time stamp (guaranteed with auxiliary supply or self-supply with power failure no longer than 48h).

By pushing the "Info/Test" pushbutton the trip unit shows all these data directly on display.

No auxiliary power supply is needed. The information is available to user for 48 hours with the circuit breaker open or without current flowing. The information of the latest 20 trips are stored in memory.

If the information can be furthermore retrieved more than 48 hours later, it is sufficient to connect a PR030/B battery unit or a BT030 wireless communication unit.

Load control

Load control makes it possible to engage/disengage individual loads on the load side before the overload protection L is tripped, thereby avoiding unnecessary trips of the circuit breaker on the supply side. This is done by means of contactors or disconnect switches (externally wired to the trip unit), controlled by the PR332/P through PR021/K unit.

Two different Load Control schemes can be implemented:

- disconnection of two separate loads, with different current thresholds
- connection and disconnection of a load, with hysteresis.

Current thresholds and trip times are smaller than those available for selection with protection L, so that load control can be used to prevent overload tripping. External PR021/K accessory unit is required for Load Control. The function is only active when an auxiliary power supply is available.

Tmax main characteristics

Molded Case Circuit Breakers

2

PR330/V Measurement Module

This optional internal module, installed in PR332/P, allows the trip unit to measure the phase and neutral voltages and to process them in order to achieve a series of features, in terms of protection and measurement.

The PR330/V module when ordered mounted on the circuit breaker, does not require any external connection or voltage transformers since it is connected internally to the upper terminals of Tmax T7 (selector in "INT" position) through the internal voltage sockets. When necessary, the connection of voltage pick-ups can be moved to any other point (i.e. lower terminals), by using the alternative connection located in the terminal box and by switching the selector to the "EXT" position. For the dielectric test of the circuit breaker the selector must be switched to the "Insulating TEST" position. PR330/V is able to energize the PR332/P while line voltage input is above 85 V. The use of Voltage Transformers is mandatory for rated voltages higher than 690 V.

Voltage transformers shall have burdens between 5 VA and 10 VA and accuracy class 0.5 or better.

Additional Protections with PR330/V:

- Undervoltage (UV) protection
- Overvoltage (OV) protection
- Residual voltage (RV) protection
- Reversal of power (RP) protection
- Underfrequency (UF) protection
- Overfrequency (OF) protection.

All the above indicated protections can be excluded, although it is possible to leave only the alarm active when required: in this case the trip unit will indicate the "ALARM" status. With the circuit breaker closed, these protections also operate when the trip unit is self-supplied. With the circuit breaker open, they operate when the auxiliary power supply (24 V DC or PR330/V) is present.

Measurement function

The current measurement function (ammeter) is present on all versions of the PR332/P trip unit. The display shows histograms showing the currents of the three phases and neutral on the main page. Furthermore, the most loaded phase current is indicated in numerical format. Ground fault current, where applicable, is shown on a dedicated page.

The latter current value takes on two different meanings depending on whether the external toroidal transformer for the "Source Ground Return" function or the internal transformer (residual type) is connected.

The ammeter can operate either with self-supply or with an auxiliary power supply voltage. The display is rear-lit and the ammeter is active even at current levels lower than 160 A.

Accuracy of the ammeter measurement chain (current sensor plus ammeter) is no more than 1.5% in the $0.3-6 \times I_n$ current interval of I_n .

- Currents: three phases (L1, L2, L3), neutral (Ne) and ground fault;
- Instantaneous values of currents during a period of time (data logger);
- Maintenance: number of operations, percentage of contact wear, opening data storage (last 20 trips and 20 events).

When the optional PR330/V is connected the following additional measurement functions are present:

- Voltage: phase-phase, phase-neutral and residual voltage
- Instantaneous values of voltages during a period of time (data logger)
- Power: active, reactive and apparent
- Power factor
- Frequency and peak factor
- Energy: active, reactive, apparent, counter.

Tmax main characteristics

Molded Case Circuit Breakers

Communication

PR332/P electronic trip unit can be fitted with communication modules, which make possible to exchange data and information with other industrial electronic devices by means of a network.

2

The basic communication protocol implemented is Modbus RTU, a well-known standard of widespread use in industrial automation and power distribution equipment. A Modbus RTU communication interface can be connected immediately and exchange data with the wide range of industrial devices using the same protocol. ABB has developed a complete series of accessories for electronic trip unit PR332/P:

- PR330/D-M is the communication module for PR332/P protection trip units. It is designed to allow easy integration of the Tmax circuit breakers in a Modbus network. The Modbus RTU protocol is used widely in the power and the automation industries. It is based on a master/slave architecture, with a bandrate of up to 19.2 kbps. A standard Modbus network is easily wired up and configured by means of an RS485 physical layer. ABB SACE trip units work as slaves in the field bus network. All information required for simple integration of PR330/D-M in an industrial communication system is available on the ABB Web page.
- BT030 is a device to be connected to the Test connector of PR222DS/P, PR222DS/PD-A, PR232/P, PR331/P and PR332/P trip units. It allows Bluetooth communication between the trip unit and a PDA or a Notebook with a Bluetooth port. This device is dedicated to use with the SD-Pocket or SD-TestBus2 application. It can provide the auxiliary supply needed to energize the protection trip unit by means of rechargeable batteries.
- EP010-FBP-PDP22 is the Fieldbus Plug interface allows connection of ABB SACE trip units with Modbus communication to a Profibus, DeviceNet, or AS-I field bus network.

Furthermore, a new generation of software dedicated to installation, configuration, supervision and control of protection trip units and circuit-breakers is now available:

- SD-View 2000
- SD-Pocket
- SD-TestBus2.

All information required for simple integration of PR330/D-M in an industrial communication system are available on the ABB Web page (<http://www.abb.com>).

Tmax main characteristics

Molded Case Circuit Breakers

2

Communication functions	PR332/P + PR330/D-M	PR332/P + PR330/D-M and EP010
Protocol	Modbus RTU standard	FBP-PDP22
Physical means	RS485	Profibus-DP or DeviceNet cable
Speed (maximum)	19.2 kbps	115 kbps
Measurement functions		
Phase currents	•	•
Neutral current	•	•
Ground current	•	•
Voltage (phase-phase, phase-neutral, residual)	opt. ⁽¹⁾	opt. ^{(1) (2)}
Power (active, reactive, apparent)	opt. ⁽¹⁾	opt. ^{(1) (3)}
Power factor	opt. ⁽¹⁾	(4)
Frequency and peak factor	opt. ⁽¹⁾	(4)
Energy (active, reactive, apparent)	opt. ⁽¹⁾	(4)
Harmonic analysis	—	—
Signalling functions		
LED: auxiliary power supply, pre-alarm, alarm, transmission, reception	•	•
Temperature	•	•
Indication for L, S, I, G and other protection	•	•
Available data		
Circuit breaker status (open, closed)	•	•
Circuit breaker position (racked-in, racked-out)	•	•
Mode (local, remote)	•	•
Protection parameters set	•	•
Load control parameters	•	•
Alarms		
Protections: L, S, I, G	•	•
Undervoltage, overvoltage and residual voltage protection (timing and trip)	opt. ⁽¹⁾	opt. ⁽¹⁾
Reverse power protection (timing and trip)	opt. ⁽¹⁾	opt. ⁽¹⁾
Directional protection (timing and trip)	—	—
Underfrequency/overfrequency protection (timing and trip)	opt. ⁽¹⁾	opt. ⁽¹⁾
Phases rotation	—	—
Failed tripping under fault conditions	•	•
Maintenance		
Total number of operations	•	•
Total number of trips	•	•
Number of trip tests	•	•
Number of manual operations	•	•
Number of separate trips for each protection function	•	•
Contact wear (%)	•	•
Record data of last trip	•	•
Commands		
Circuit breaker open/close	•	•
Alarms reset	•	•
Setting of curves and protection thresholds	•	•
Synchronize system time	•	•
Events		
Status changes in circuit breaker, protections and all alarms	•	•

⁽¹⁾ With PR330/V

⁽²⁾ No residual voltage

⁽³⁾ No apparent power available

⁽⁴⁾ Please ask ABB for further details

Tmax main characteristics

Molded Case Circuit Breakers

2

Power supply

The PR332/P trip unit does not normally require any external power supplies, being self-supplied from the current sensors (CS): to activate the protection and ammeter functions, it is sufficient for at least one phase to have a current load higher than 80 A.

The unit ensures fully self-supplied operation. When an auxiliary power supply is present, it is also possible to use the unit with the circuit breaker either open or closed with very low current flowing through (<80 A).

It is also possible to use an auxiliary power supply provided by the PR030/B portable battery unit, which allows the protection functions to be set when the trip unit is not self supplied.

PR332/P stores and shows all the information needed after a trip (protection tripped, trip current, time, date). No auxiliary supply is required.

Information data	PR332/P	PR330/D-M
Auxiliary power supply (galvanically insulated)	24 V DC \pm 20%	from PR332/P
Maximum ripple	\pm 5%	\pm 5%
Inrush current @ 24 V	~1 A for 5 ms	~0.5 A for 5 ms
Rated power @ 24 V	~3 W	+1 W

ⁿ The setting $I_{l, =1}$ indicates the maximum overload protection setting. The actual maximum setting allowable must take into account any derating based on temperature, the terminals used and the altitude (see the "Installations" chapter)

Tmax main characteristics

Molded Case Circuit Breakers

2

Motor control protectors electrical characteristics						
Breaker type		T2		T3	Ts3	
Frame size	[A]	100		225	150	
Number of poles	[No.]	3		3	2-3-4	
Ratings	[A]	20...100		100...200	3...25	50...150 175...200
Interrupting ratings	Frame type	S	H	S	L	L L
	240 V AC [kA]	65	150	65	50	150 150
	480 V AC [kA]	35	65	35	25	85 65
	600Y/347 V AC [kA]	-	-	10	-	- -
	600 V AC [kA]	-	-	-	10	25 -
	500 V DC (3 poles in series) [kA]	-	-	35	65 ⁽¹⁾	65 50
	600 V DC (3 poles in series) [kA]	-	-	-	50	50 -
Trip units	Magnetic only adjustable (6...12xIn)	•		•	-	
	Magnetic only adjustable (4...12xIn)	-		-	•	
	Electronic PR221DS-I (1...10xIn)	•		-	-	

(1) Only for 25A rating

Motor control protectors electrical characteristics (continued)													
Breaker type		T4				T5				T6			
Frame size	[A]	250				400-600				800			
Number of poles	[No.]	3				3				3			
Ratings	[A]	100-150-250				300-400-600				600-800			
Interrupting ratings	Frame type	N	S	H	L	N	S	H	L	N	S	H	L
	240 V AC [kA]	65	100	150	200	65	100	150	200	65	100	200	200
	480 V AC [kA]	25	35	65	100	25	35	65	100	35	50	65	100
	600Y/347 V AC [kA]	-	-	-	-	-	-	-	-	-	-	-	-
	600 V AC [kA]	18	25	35	65	18	25	35	65	20	25	35	42
	500 V DC (3 poles in series) [kA]	-	-	-	-	-	-	-	-	-	-	-	-
	600 V DC (3 poles in series) [kA]	-	-	-	-	-	-	-	-	-	-	-	-
Trip units	Electronic PR221DS-I (1...10xIn)	•				•				•			

Motor control protectors electrical characteristics (continued)				
Breaker type		T7		
Frame size	[A]	1000-1200		
Number of poles	[No.]	3		
Ratings	[A]	1000-1200		
Interrupting ratings	Frame type	S	H	L
	240 V AC [kA]	65	100	150
	480 V AC [kA]	50	65	100
	600Y/347 V AC [kA]	-	-	-
	600 V AC [kA]	25	50	65
	500 V DC (3 poles in series) [kA]	-	-	-
	600 V DC (3 poles in series) [kA]	-	-	-
Trip units	Electronic PR221DS-I (1...10xIn)	•		

Tmax main characteristics

Molded Case Circuit Breakers

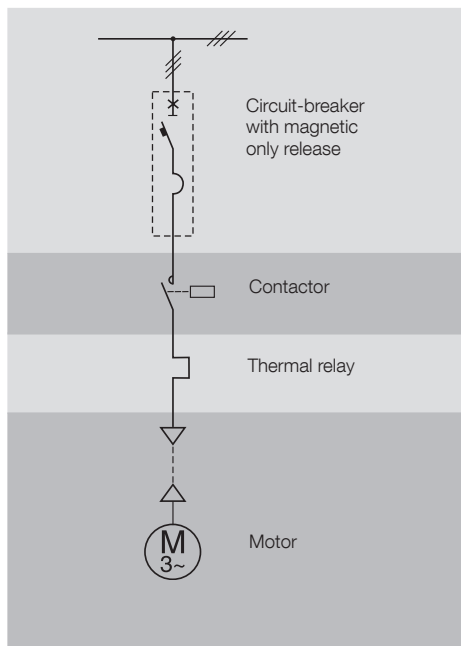
General characteristics

MCP circuit breakers are used to protect three phase asynchronous motors. The traditional system used for this purpose is based on three different devices: a circuit breaker for protection against short-circuit, a thermal relay for protection against overload and phase loss or unbalance of phase, and a contactor for motor switching. All this has to take into account the problems that arise at the moment of the motor starting. In particular, when selecting these devices, different factors must be taken into consideration, such as:

- the motor power;
- the diagram and type of starting;
- the type of motor: with cage rotor or with wound rotor;
- the fault current at the point of the network where the motor is installed.

ABB offers two different protection types:

- a magnetic only trip unit (MA) for Tmax T2 and T3 with adjustable threshold between $6 \dots 12 \times I_n$, for Ts3 with adjustable threshold between $4 \dots 12 \times I_n$;
- an electronic trip unit with only an instantaneous short circuit protection I, PR221DS-I for Tmax T4, T5 and T6, and PR231/P-I for Tmax T7.




Protection against short-circuit

Tmax main characteristics

Molded Case Circuit Breakers


2

MA – Magnetic only trip unit (for T2 and T3)

In [A]	20	50	100	125	150	200
	•	•	•			
T2	•	•	•			
T3			•	•	•	•
I _Δ [A]	120...240	300...600	600...1200	750...1500	900...1800	1200...2400

$$I_{\Delta} = 6 \dots 12 \times I_n$$

MA – Magnetic only trip unit (for Ts3)

In [A]	3	5	10	25	50	100	125	150	175	200
	•	•	•	•	•	•	•	•	•	•
Ts3	•	•	•	•	•	•	•	•	•	•
I _Δ [A]	12...36	20...60	40...120	100...300	200...600	400...1200	500...1500	600...1800	700...2100	800...2400

$$I_{\Delta} = 4 \dots 12 \times I_n$$


Electronic trip units

In [A]	25	60	100	150	250	300	400	600	800	1000	1200
T2	•	•	•	-	-	-	-	-	-	-	-
T4	-	-	•	•	•	-	-	-	-	-	-
T5	-	-	-	-	-	•	•	•	-	-	-
T6	-	-	-	-	-	-	-	•	•	-	-
T7	-	-	-	-	-	-	-	-	-	•	•

Trip current function I

I _Δ [A]	25...250	60...600	100...1000	150...1500	250...2500	300...3000	400...4000	600...6000	800...8000	1000...12000	1200...14400
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PR221DS-I


Protection function	Trip threshold	Excludability	Relation t=f(I)
 Against short-circuit with adjustable instantaneous trip	I _Δ = 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4.5 - 5.5 - 6.5 - 7 - 7.5 - 8 - 8.5 - 9 - 10 x I _n Tolerance: ± 20% (T2) ± 10% (T4-T5, T6)	•	t = k

Note: The tolerances are valid under the following hypotheses:
 – relay self-supplied on running and/or auxiliary power supply (without start up)
 – two-phase or three-phase power supply.

In all the cases not foreseen by the above-mentioned hypotheses, the following tolerance values are valid:

Trip threshold	Trip time
± 20%	≤ 40ms

PR231P-I

Protection function	Trip threshold	Excludability	Relation t=f(I)
 Against short-circuit with adjustable instantaneous trip	I _Δ = 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4.5 - 5.5 - 6.5 - 7 - 7.5 - 8 - 8.5 - 9 - 10 x I _n Tolerance: ± 10%	-	t = k

Note: The tolerances are valid under the following hypotheses:
 – relay self-supplied on running and/or auxiliary power supply (without start up)
 – two-phase or three-phase power supply.

In all the cases not foreseen by the above-mentioned hypotheses, the following tolerance values are valid:

Trip threshold	Trip time
± 15%	≤ 60ms

Tmax main characteristics

Molded Case Circuit Breakers

Electrical characteristics

The MCS can be used as a general circuit breakers in sub-switch-boards, switching and isolation parts for lines, busbars or groups of apparatus, or as bus-ties. They can be part of a general isolation device of groups of machines or of complexes for motor operation and protection.

The MCS are derived from the corresponding circuit breakers of which they keep the overall dimensions, versions, fixing systems and the possibility of mounting accessories. All the molded case switches in accordance with UL 489 and CSA C22.2 Standards are self protected.

MCS					
Breaker type		T1N	T3S	T3S	Ts3H
Frame size	[A]	100	150	225	150
Number of poles	[No.]	3-4	3-4	3-4	3-4
Magnetic override	[A]	1000	1500	2250	1500
Rated voltage	AC (50-60 Hz) [V]	600Y/347	600Y/347	600Y/347	600
	DC [V]	500	500	500	500

MCS (continued)			
Breaker type		T4N-S-H-L-V	T5N-S-H-L-V
Frame size	[A]	250	400-600
Number of poles	[No.]	3-4	3-4
Magnetic override	[A]	3000	5000
Rated voltage	AC (50-60 Hz) [V]	600	600
	DC [V]	600	600

MCS (continued)		
Breaker type		T7
Frame size	[A]	1200
Number of poles	[No.]	3-4
Magnetic override	[A]	20000
Rated voltage	AC (50-60 Hz) [V]	600
	DC [V]	-

Isolation

MCS's main function is to isolate the circuit they are inserted in. Once the contacts are open they are at a distance which prevents an arc from striking, in accordance with the standards regarding isolation behaviour. The position of the operating lever corresponds with the position of the contacts (positive operation).

Protection

Each molded case switch must be protected on the supply side by a device which safeguards it against short-circuits.

Tmax main characteristics

Molded Case Circuit Breakers

Electrical characteristics

Present 3 poles UL circuit breakers Tmax T2 H, Tmax T4 H and T4 V and Tmax T5 H 400 A and T5 V 400 A have been undergone to specific tests according to UL 489 in order to be classified as UL Current Limiting circuit breakers. These breakers have peculiar characteristics in terms of limitation of peak current and limitation of specific let-through energy.

According to UL 489 standard, Current Limiting circuit breakers will be signed "Current Limiting" on the front and will have a label on the right side specifying peak current and specific let-through energy values.

Accessories and trip units are the same ones as those available for standard UL Tmax MCCBs.

Tmax Current Limiting						
Breaker type		T2	T4	T5		
Frame size	[A]	100	250	400		
Number of poles	[No.]	3	3	3		
Rated voltage	AC (50-60 Hz) [V]	480	600	600		
	DC [V]		600	600		
Interrupting ratings	Frame type	H	H	V	H	V
	240 V AC [kA rms]	150	150	200	150	200
	277 V AC [kA rms]	-	-	-	-	-
	347 V AC [kA rms]	-	-	-	-	-
	480 V AC [kA rms]	65	65	150	65	150
	600Y/347 V AC [kA rms]	-	-	-	-	-
	600 V AC [kA rms]	-	35	100	35	100
	250 V DC (2 poles in series) [kA rms]	-	-	-	-	-
	500 V DC (3 poles in series) [kA rms]	-	-	-	-	-
	500 V DC (2 poles in series) [kA rms]	-	50	100	50	100
	600 V DC (3 poles in series) [kA rms]	-	35	65	35	65
Trip units	TMF	•	•	-		
	TMD/TMA	-	•	•		
	Electronic	•	•	•		
Dimensions	H [in/mm]	5.12/130	8.07/205	8.07/205		
	W 3p [in/mm]	3.54/90	4.13/105	5.51/140		
	D [in/mm]	2.76/70	4.07/103.5	4.07/103.5		
Mechanical life	[No. operations]	25000	20000	20000		

For your notes

2

Handwriting practice lines consisting of 20 horizontal dotted lines.

For your notes

Handwriting practice lines consisting of 20 horizontal dotted lines.

For your notes

2

Handwriting practice area with 20 horizontal dotted lines.

Tmax accessories information

Molded Case Circuit Breakers

Electrical and mechanical accessories

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Tmax accessories information

Molded Case Circuit Breakers

Versions and types

Starting from the fixed version with front terminals, the Tmax circuit breakers can be converted into the various versions (plug-in for T2, T3, Ts3, T4 and T5; draw out for Ts3, T4, T5, T6 and T7), using the conversion kits. This makes management of the product, its versions and stock very flexible. In any case, it is always possible to request the circuit breaker in the desired version completely preset in the factory, by ordering, on the same line, the fixed circuit breaker and the conversion kit, to which must be added the cradle.

T7 is available in two different versions: the toggle version similar to the other sizes in the Tmax family, and the new motorizable version.

3



Fixed

The Tmax FIXED three-pole or four-pole version circuit breakers offer:

- circuit breakers characterized by just two depths up to 1000 A: 70 mm for Tmax T1, T2 and T3 and 103.5 mm for Tmax Ts3, T4, T5 and T6. For T7 the depth varies according to the type of operating mechanism (with toggle or spring charging motor)
- standard circuit breakers fronts: 45 mm for Tmax T1, T2 and T3 and 105 mm for Ts3, T4 and T5, 140 mm for T6 and 280 mm for T7
- flange for compartment door
- possibility of assembly on back plate (or on DIN rail with T1, T2, T3 and Ts3, with the help of a special accessory),
- thermomagnetic (on Tmax T1, T2, T3, Ts3, T4, T5 and T6) or electronic (on Tmax T2, T4, T5, T6 and T7) trip units
- standard FC Cu type terminals (front for copper cables) for T1 and F type (front) on all the Tmax family sizes.



Plug-in

The PLUG-IN version of the circuit breaker (Tmax T2, T3, Ts3, T4 and T5) consists of:

- cradle to be installed directly on the back plate of the unit
- moving part obtained from the fixed circuit breaker with addition of the isolating contacts (near the connection terminals), of the rear frame (for fixing to the cradle) and of the terminal covers.

The circuit breaker is racked out by unscrewing the top and bottom fixing screws. A special lock prevents circuit breaker racking in and racking out with the contacts in the closed position.

In case the circuit breaker has electrical accessories mounted (SOR, UVR, MOS, MOE, MOE-E, AUX, AUX-E, AUE, RC222), the socket-plug connectors or the adapters for isolation of the relative auxiliary circuits must also be ordered.



Draw out

The circuit breakers in the DRAW OUT version (Tmax Ts3, T4, T5, T6 and T7) are made up of:

- cradle to be installed directly on the back plate of the unit fitted with lateral guides to allow the moving part racking-in and racking-out operation to be carried out easily, and a dedicated flange for the compartment door to replace the one provided with the circuit breaker in the fixed version;
- moving part obtained from the fixed circuit breaker with addition of the relative conversion kit from fixed to draw out moving part;
- mandatory accessory to be applied onto the front of the circuit breaker selected between front for lever operating mechanism (standard supply for circuit breakers fitted with accessories in the factory, excluding T7) motor operator and rotary handle operating mechanism. Application of one of these accessories allows the racking-in and racking-out of the moving part with the compartment door closed (on T7 no accessory is required to have racking-out with the door closed).

Tmax accessories information

Molded Case Circuit Breakers

Draw out (continued)

Racking-in and racking-out of the moving part is carried out the special operating lever supplied with the cradle. This particular device allows the circuit breaker to be placed in the isolated position (with power and auxiliary circuits disconnected) with the compartment door closed, to the great advantage of operator safety. The handle can only be inserted with the circuit breaker open. Once removed or racked-out, the circuit breaker can be operated in open/closed and, by means of special connection extensions, blank tests can be carried out of the auxiliary control circuit functions.

The T4, T5 and T6 circuit breakers in the draw out version can only be fitted with pre-wired electrical accessories, provided with the appropriate ADP adapters for isolation of the relative auxiliary circuits.

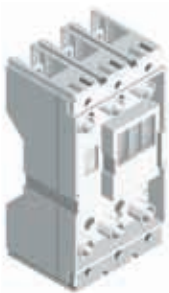


Stored Energy

The stored energy T7 and T8 circuit breaker can be equipped with the spring charging motor. To allow a complete remote control with T7 and T8 motorizable, the circuit breaker must be fitted with:

- shunt trip;
- closing coil;
- spring charging motor.

Versions available			
Breaker type	F Fixed	P Plug-in	W Draw out
T1	•	-	-
T2	•	•	-
T3	•	•	-
Ts3	•	•	•
T4	•	•	•
T5	•	•	•
T6	•	-	•
T7	•	-	•
T7M	•	-	•
T8	•	-	-



Cradle – FP (UL FILE: E116596)

The cradle, available for all the sizes of the Tmax family starting from T2, allows the circuit breaker to be made in the plug-in or draw out version. Different positions of the circuit breaker are possible:

- plug-in: connected, removed;
- draw out: connected, removed, racked-out for test (only for T7), racked-out.

In the standard version, the cradles of T2 and T3 are available with front terminals (F). A distinctive characteristic is the possibility of fitting these cradles with the same terminal, terminal cover and phase separator kits used for the fixed circuit breakers. With Tmax Ts3, T4, T5, T6 and T7, cradles with dedicated front and rear terminals are available. Moreover, the cradles of Ts3, T4 and T5 with front terminals can also be fitted with the special ES, FC Cu and FC CuAl terminals.

The rear flat terminals of the cradles of Tmax T7 are orientated (horizontally or vertically). Factory assembly is horizontal as standard. It is possible to ask for the cradle with vertical terminals. This extra code can be associated either with the top or bottom terminals (if asking for assembly of both the terminals vertically, the extra code must be repeated twice). The anti-racking-in locks, to be mounted on the left side of the cradle, and which prevent racking-in of incorrect moving parts are supplied as standard fitting of the cradles of Tmax T7. In detail, it is possible to define the different ways of combination between the cradle and the moving part according to: T7 with lever or which can be motorized, breaking capacity and rated uninterrupted current.

Tmax accessories information

Molded Case Circuit Breakers

3



Kit for conversion of plug-in cradle to draw out cradle (UL FILE: E116596)

For Tmax Ts3, T4 and T5 a conversion kit is available which is made up of a guide to prepare the plug-in cradle of the circuit breaker to the draw out cradle of the circuit breaker, a racking-out crank handle and by the flange for the compartment door to replace the one supplied with the fixed or plug-in circuit breaker version.



Racking-out crank handle

This allows racking-out and racking-in of the draw out circuit breaker into the cradle, with the door closed. The crank handle is the same for the whole range of circuit breakers and is automatically supplied with the cradle of draw out circuit breakers or with the conversion kit for plug-in cradles to draw out cradles.



Sliding contacts blocks

The sliding contact blocks are required for Tmax T7 in the draw out version equipped with electrical accessories or with an electronic trip unit. Their function is to realize the electrical connections of the secondary circuits between the mobile part and the cradle and these blocks work in pairs: one block is to be mounted on the mobile part and the other one on the cradle. The following table combines the types of sliding contact blocks and the electrical accessories.

Left block	Central block	Right block
Spring charging motor	PR331	Auxiliary contacts (Q or SY)
Spring charged contact (AUX-SC)	PR332	Shunt trip
Ready to close contact (AUX-RTC)	-	Closing coil
Early auxiliary contacts (AUE)	-	Under voltage release
Contact for signalling trip coil release trip (AUX-SA)	-	-
Trip reset	-	-

If at least one of the electrical accessories listed in the previous table is fitted on the circuit breaker the respective pair of blocks must be mounted on the mobile part and on the cradle.



T2-T3

Kit for conversion into moving part of plug-in for T2 - T3 - Ts3 - T4 - T5 (UL FILE: E116596)

Allows the fixed circuit breaker with front terminals to be converted into the moving part of a plug-in circuit breaker. The kit consists of:

- isolating contacts
- anti-racking out safety device
- assembly screws and nuts
- low terminal covers for the moving part.

The cradle for plug-in version is necessary to complete the circuit breaker.



T4-T5

Tmax accessories information

Molded Case Circuit Breakers



T4-T5-T6



T7

Kit for conversion into moving part of draw out for Ts3 - T4 - T5 - T6 - T7 (UL FILE: E116596)

Allows the fixed circuit breaker with front terminals to be converted into the moving part of a draw out circuit breaker. The kit consists of:

- isolating contacts
- frame
- assembly screws and nuts
- low terminal covers for the moving part.

The circuit breakers in the draw out version must always be completed either with the front for lever operating mechanism (standard supply for circuit breakers fitted with accessories in the factory, excluding T7), rotary handle operating mechanism or motor operator.

The cradle for draw out version is necessary to complete the circuit breaker.

Tmax accessories information

Molded Case Circuit Breakers

3

Connection terminals

The basic version circuit breaker is supplied with:

- front terminals for copper cables (FC Cu), for the Tmax T1 circuit breaker
- front terminals (F), for all the other Tmax family sizes.

Different types of terminals, which can be combined in different ways, are also available (top of one type, bottom of a different type), thereby allowing the circuit breaker to be connected to the plant in the most suitable way in relation to installation requirements.

The following can be distinguished:

- **front terminals** which allow connection of cables or busbars working directly from the front of the circuit breaker
- **oriented rear terminals** which allow installation of the circuit breakers in switchboards 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 with cable lugs.

On page 3/8 and following, the information needed to make the connections for each type of terminal is summarised. For connection with bare cables, the minimum and maximum cross-sections of the cables, which can be clamped in the terminals, the type of cables (rigid or flexible) and the diameter of the terminal are indicated. For connections with busbars, flat terminals of different sizes and composition are recommended. The torque values to be applied to the terminal tightening screws for cables and to the screws used to connect the busbars to the flat terminals are indicated.



Insulating terminal covers

The terminal covers are applied to the circuit breaker to prevent accidental contact with live parts and thereby guarantee protection against direct contacts. The following are available:

- low terminal covers (LTC): these guarantee IP40 degree of protection for fixed circuit breakers with rear terminals and for moving parts of plug-in and draw out circuit breakers
- high terminal covers (HTC): these guarantee IP40 degree of protection, for fixed circuit breakers with front, front extended, front for cables terminals.

With Tmax T2 and T3, the cradles of plug-in circuit breakers can use the same terminal covers as the corresponding fixed circuit breakers. For cradles of T4 and T5, the proper terminal covers (TC-FP) are available. The degrees of protection indicated at page 1/8 are valid for the circuit breaker installed in a switchboard.

Tmax accessories information

Molded Case Circuit Breakers



Phase separators

These allow increased insulation characteristics between the phases at the connections. They are mounted from the front, even with the circuit breaker already installed, inserting them into the corresponding slots and they are available in two versions:

- 3.94" (100 mm) high
- 7.87" (200 mm) high.

The H = 3.94" (100 mm) phase separators are supplied as obligatory with front extended type terminals (EF), whereas the ones with height 7.87" (200 mm) are obligatory with front extended spread type terminals (ES). The phase separating partitions are incompatible with both the high and low insulating terminal covers; while with Ts3 circuit breakers, phase separating partitions are always supplied with low terminal covers.

The cradles can use the same phase separating partitions as the corresponding fixed circuit breakers.

With the phase separating partitions mounted, on request, with Tmax T1, T2 and T3 a special kit is available to reach IP40 degree of protection from the front of the circuit breaker.

It is possible to mount the phase separating partitions between two circuit breakers or cradles side by side.



Screws for sealing the terminal covers

These are applied to the terminal covers of fixed circuit breakers or to the moving parts of plug-in or draw out circuit breakers. They prevent removal of both the high and low terminal covers and can be locked with a wire and lead seal.





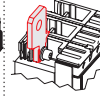

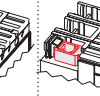
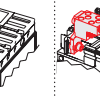





Kit for taking up the auxiliary power supply

Special kits are available with the fixed version of Tmax T2, T3, T4 and T5 circuit breakers for taking up the auxiliary power supply directly from the connection terminals. They can only be combined with the front terminals for copper cables (FC Cu) for T2, T3 and T4 or with the front terminals (F) for T4-T5.

Tmax accessories information

Molded Case Circuit Breakers

Connection terminals (fixed circuit breaker)

Breaker type	F	EF	ES	FC Cu	FC CuAl ⁽¹⁾	MC	RC CuAl	HR	VR	HR for RC221/222	R
											
	Front terminals	Front extended terminals	Front extended spread terminals	Front terminals for copper cables	Front terminals for CuAl cables	Multi-cable terminals	Rear terminals for CuAl cables	Rear flat horizontal terminals	Rear flat vertical terminals	Rear flat horizontal terminals	Rear terminals
T1	-	F	-	F ⁽²⁾	F	-	-	F	-	F	-
T2	F ⁽²⁾	F	F	F	F	-	-	-	-	-	F
T3	F ⁽²⁾	F	F	F	F	-	-	-	-	-	F
Ts3	F ⁽²⁾	F	F	F	F	-	F	-	-	-	F
T4	F ⁽²⁾	F	F	F	F	F	-	-	-	-	F
T5	F ⁽²⁾	F	F	F	F	-	-	-	-	-	F
T6	F ⁽²⁾	F	F	-	F	-	F	-	-	-	F
T7	F ⁽²⁾	F	F	-	F	-	-	F	F	-	F
T8	F ⁽²⁾	-	F	-	F	-	-	-	-	-	F

⁽¹⁾ UL listed

⁽²⁾ Standard supply

F = Fixed

Connection terminals (cradle or plug-in base)

Breaker type	F	EF	ES	FC Cu	FC CuAl ⁽¹⁾	R	RS	HR	VR	HR/VR	RC
	Front terminals	Front extended terminals	Front extended spread terminals	Front terminals for copper cables	Front terminals for CuAl cables	Rear terminals	Rear spread terminals	Rear flat horizontal terminals	Rear flat vertical terminals	Rear flat terminals	Rear terminals for CuAl cables
T2	P ⁽²⁾	P	P	P	P	P	-	-	-	-	-
T3	P ⁽²⁾	P	P	P	P	P	-	-	-	-	-
Ts3	-	P-W	-	P-W ⁽¹⁾	-	-	-	-	-	P-W	-
T4	-	P-W	-	P-W	P-W	-	-	P-W	P-W	-	-
T5	-	P-W	P ⁽³⁾ -W ⁽³⁾	P-W	P-W	-	-	P-W	P-W	-	-
T6	-	W	-	-	-	-	-	W	W ⁽¹⁾	-	-
T7	-	W	-	-	-	-	W	-	-	W	W ⁽¹⁾

⁽¹⁾ UL listed

⁽²⁾ Standard supply

⁽³⁾ For T5 600 only

P = Plug-in

W = Draw out

Tmax accessories information

Molded Case Circuit Breakers

3

Front terminals - F (Allows connection of busbars or cables with ring terminals)



Breaker type	Version	Pieces	Busbars/cable terminal [in-mm]				Tightening [lbin-Nm]	Terminal covers			Phase separators
			W	H	D	Ø		High	Low	Cradle	
T2	F-P	1	0.79-20	0.30-7.5	0.20-5	0.26-6.5	54-6	R	R	-	R
T3	F-P	1	0.94-24	0.37-9.5	0.31-8	0.33-8.5	71-8	R	R	-	R
Ts3 150	F	1	0.79-20	0.39-10	0.16-4	0.35-9	80-9	R	R	-	R*
Ts3 225	F	1	0.79-20	0.39-10	0.24-6	0.35-9	80-9	R	R	-	R*
T4	F	1	0.98-25	0.37-9.5	0.31-8	0.33-8.5	161-18	R	R	-	R
T5	F	1	1.38-35	0.43-11	0.39-10 ⁽¹⁾	0.41-10.5	252-28	R	R	-	R
T6	F	2	1.97-50	0.47-12	0.20-5	2x0.28-2x7	80-9	R	R	-	R
T7	F	2	1.97-50	0.79-20	0.31-8	2x0.43-2x11	161-18	-	R	-	R
T8 2000	F	3	3.94 - 100	-	0.2 - 5	4x 0.59 - 15	625 - 70	-	R	-	R
T8 2500	F	4	3.94 - 100	-	0.2 - 5	4x 0.59 - 15	625 - 70	-	R	-	R

⁽¹⁾ minimum 0.19"-5 mm

Front extended terminals - EF (Allows connection of busbars or cables with ring terminals)



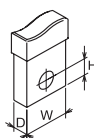
Breaker type	Version	Pieces	Busbars [in-mm]			Cable terminal [in-mm]		Tightening [lbin-Nm]	Terminal covers		Phase separators
			W	D	Ø	W	Ø		A ⁽¹⁾	B ⁽¹⁾	
T1	F	1	0.59-15	0.20-5	0.33-8.5	0.59-15	0.33-8.5	63-7	80-9	R	S
T2	F-P	1	0.79-20	0.16-4	0.33-8.5	0.79-20	0.33-8.5	54-6	80-9	R	S
T3	F-P	1	0.79-20	0.24-6	0.39-10	0.79-20	0.39-10	71-8	161-18	R	S
Ts3 150	F	1	0.79-20	0.16-4	0.33-8.5	0.79-20	0.31-8	80-9	80-9	R	R*
Ts3 225	F-P-W	1	0.79-20	0.24-6	0.33-8.5	0.79-20	0.33-8.5	80-9	80-9	R	R*
T4	F	1	0.79-20	0.39-10	0.39-10	0.79-20	0.39-10	161-18	161-18	R	S
	P-W	1	0.79-20	0.39-10	0.31-8	0.79-20	0.31-8	-	80-9	-	R
T5	F	2	1.18-30	0.28-7	0.43-11	1.18-30	0.43-11	252-28	161-18	R	S
	P-W	2	1.18-30	0.59-15	0.39-10	1.18-30	0.39-10	-	161-18	-	R
T6	F-W	2	1.97-50	0.20-5	0.55-14	1.97-50	0.55-14	80-9	268-30	-	R
T7	F-W	2	1.97-50	0.39-10	4x0.43-4x11 ⁽²⁾	-	-	161-18 ⁽³⁾	355-40 ⁽⁴⁾	-	S

⁽¹⁾ class 4.8 screws (not supplied)

⁽³⁾ 12 Nm onto cradle of draw out circuit breaker

⁽²⁾ only use two holes diagonally

⁽⁴⁾ class 8.8 screws (not supplied)



A = Tightening the terminal onto the circuit breaker

B = Tightening the cable/busbar onto the terminal

R = On request

R* = Are supplied with low terminal covers (which are, in turn, on request)

S = Standard

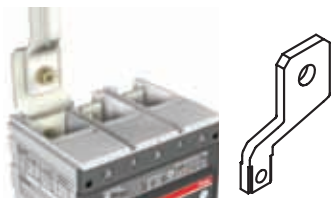
Pieces = Number of busbars, cables or cable terminals

Tmax accessories information

Molded Case Circuit Breakers

3

Front extended spread terminals - ES (Allows connection of busbars or cables with ring terminals)

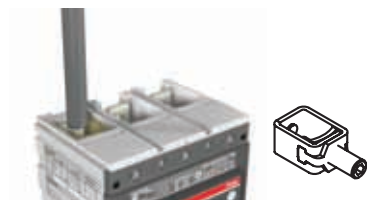


Breaker type	Version	Pieces	Busbars [in-mm]			Cable terminal [in-mm]		Tightening [lbin-Nm]		Terminal covers			Phase separators
			W	D	Ø	W	Ø	A	B ⁽¹⁾	high	low	cradle	
T2	F-P	1	1.18-30	0.16-4	0.41-10.5	1.18-30	0.41-10.5	54-6	161-18	–	–	–	S
T3	F-P	1	1.18-30	0.16-4	0.41-10.5	1.18-30	0.41-10.5	71-8	161-18	–	–	–	S
Ts3	F	1	1.18-30	0.16-4	0.33-8.5	1.18-30	0.33-8.5	80-9	80-9	–	S	–	S*
T4	F	1	1.18-30	0.24-6	0.41-10.5	1.18-30	0.41-10.5	161-18	161-18	–	–	–	S
T5	F-P ⁽²⁾ -W ⁽²⁾	1	1.58-40	0.39-10	0.43-11	0.43-11	0.43-11	252-28	161-18	–	–	–	S
T6	F	1	3.15-80	0.20-5	3x-0.51-3x13	3x1.77-3x45	0.51-13	80-9	268-30	–	–	–	–
T7	F	2	1.97-50	0.39-10	3x-0.51-3x13	4x1.77-4x45	0.51-13	161-18	355-40	–	–	–	S
T8 2000	F	6	–	–	–	1.73 - 44	0.67 - 17	365 - 40	365 - 40	–	–	–	R
T8 2500	F	6	–	–	–	1.73 - 44	0.67 - 17	365 - 40	365 - 40	–	–	–	R

⁽¹⁾ class 4.8 screws (not supplied)

⁽²⁾ for T5 600 only

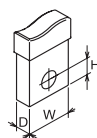
Front terminals for copper cables - FC Cu (Allows connection of bare copper cables directly to the circuit breaker)



Breaker type	Assembly	Version	Pieces	Cable [AWG or Kcmil-mm²]		Flexible busbars W x S x N ⁽²⁾	Tightening [lbin - Nm]		Ø [in-mm]	Terminal covers			Phase separators
				rigid	flexible		A	B		high	low	cradle	
T1/T1 1p	standard	F	1	2.5...70	2.5...50	9 x 0.8 x 6	–	63-7	0.47-12	R	R	–	R
	standard	F	2	–	2.5...35	–	–	63-7	0.47-12	R	R	–	R
T2	standard	F-P	1	1...95	1...70	13 x 0.5 x 10	–	63-7	0.55-14	R	R	R	R
	standard	F-P	2	–	1...50	–	–	63-7	0.55-14	R	R	R	R
T3	standard	F-P	1	6...185	6...150	15.5 x 0.8 x 10	–	89-10	0.71-18	R	R	R	R
	standard	F-P	2	–	6...70	–	–	89-10	0.71-18	R	R	R	R
Ts3	standard	F-P-W	1	10...350-6...185	–	–	–	142-16	0.71-18	R	R	S	R*
T4	standard	F-P-W	1	2.5...185	2.5...120	15.5 x 0.8 x 10	–	89-10	0.71-18	R	R	S	R
	standard	F-P-W	2	–	2.5...95	–	–	89-10	0.71-18	R	R	S	R
T5	standard	F-P-W	1	16...300	16...240	24 x 1 x 10	–	222-25	1.10-28	R	R	S	R
	standard	F-P-W	2	–	16...150	–	–	222-25	1.10-28	R	R	R	–
	external	F	2	120...240	–	–	18	222-25	–	S	–	–	–

⁽¹⁾ UL Listed

⁽²⁾ W = width; S = thickness; N = n. of bars



A = Tightening the terminal onto the circuit breaker

B = Tightening the cable/busbar onto the terminal

R = On request

S = Standard

R* = Are supplied with low terminal covers (which are, in turn, on request)

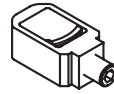
S* = Are supplied as standard with the low terminal covers

Pieces = Number of busbars, cables or cable terminals

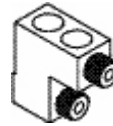
Tmax accessories information

Molded Case Circuit Breakers

Front terminals for copper/aluminium cables - FC CuAl (UL listed, allows connection of bare copper or flexible aluminium cables)

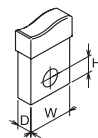


**T2-T5
Standard**



**T4-T5
External**

Type	Assembly	Version	Pieces	Cable [AWG or Kcmil-mm²]	Tightening [lbin-Nm]		Ø [in-mm]	Terminal covers			Phase separators
					A	B		high	low	cradle	
T1 1P/T1	standard	F	1	14...10-2.5...6	20-2.5	–	0.37-9.5	R	R	–	R
				8.0-10	40-4.5	–	–	–	–	–	–
				6...1/0-16...50	45-5	–	–	–	–	–	–
T2 100	standard	F-P	1	14...1/0-2.5...50	80-9	50-5.6	–	R	R	R	R
T3 100	standard	F-P	1	14...1/0-2.5...50	80-9	50-5.6	0.39-10	R	R	R	R
T3 225	standard	F-P	1	4...300-25...150	80-9	200-22.6	0.67-17	R	R	R	R
Ts3-D 150 (In=100)	standard	F	1	14...1/0-2.5...50	80-9	50-5.6	–	R	–	–	–
Ts3 150	standard	F	1	2...4/0-35...95	80-9	120-13.5	0.56-14.2	R	–	–	–
Ts3 225	standard	F	1	4...300-25...150	80-9	276-31	–	R	–	–	–
T4 250	standard	F-P-W	1	6...350-6...185	80-9	274-31	0.7-18	R	R	S	R
T4 250	standard	F	1	14...1/0-2.5...50	80-9	50-5.6	0.39-9.9	R	R	–	R
T5 400	external	F	2	3/0...250-95...120	159-18	274-31	0.61-15.5	S	–	–	R
T5 400	standard	F-P-W	1	250...500-120...240	159-18	380-43	0.84-21.5	R	R	S	R
T5 600	external	F	2	3/0...500-95...240	159-18	274-31	0.84-21.5	S	–	–	R
T6 600	standard	F	2	250...500-120...240	44-5	276-31	0.87-22	S	–	–	–
T6 800	standard	F	2	250...500-120...240	44-5	276-31	0.87-22	S	–	–	–
T7 1200	external	F	4	2/0...500-70...240	160-18	380-43	0.84-21.5	S	–	–	–



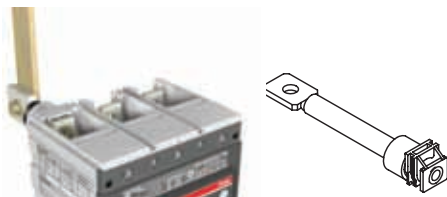
A = Tightening the terminal onto the circuit breaker
 B = Tightening the cable/busbar onto the terminal
 R = On request
 S = Standard
 R* = Are supplied with low terminal covers (which are, in turn, on request)
 S* = Are supplied as standard with the low terminal covers
 Pieces = Number of busbars, cables or cable terminals

Tmax accessories information

Molded Case Circuit Breakers

3

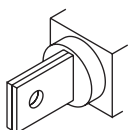
Rear terminals - R (Allows connection of busbars or cable with ring terminal at the rear. 4 different positions to facilitate the connection)



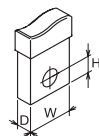
Breaker type	Version	Pieces	Busbars [in-mm]			Tightening [lbin-Nm]		Terminal covers		Phase separators
			W	D	Ø	A	B ⁽¹⁾	high	low	
T2	F-P	1	0.79-20	0.16-4	0.33-8.5	54-6	80-9	–	S	–
T3	F-P	1	0.79-20	0.24-6	0.33-8.5	54-6	80-9	–	S	–
Ts3 150	F	1	0.79-20	0.16-4	0.49-12.5	89-10	179-20	–	S	S*
Ts3 225	P-W	1	0.79-20	0.16-4	0.49-12.5	89-10	179-20	–	–	–
	F	1	0.79-20	0.24-6	0.49-12.5	89-10	179-20	–	S	S*
T4	P-W	1	0.79-20	0.24-6	0.49-12.5	89-10	179-20	–	–	–
	F	1	0.79-20	0.39-10	0.33-8.5	54-6	80-9	–	S	–
T5	F	2	1.18-30	0.28-7	0.43-11	161-18	161-18	–	S	–
T6	F	2	1.97-50	0.20-5	0.55-14	161-18	268-30	–	S	–
T7	F	2	1.97-50	0.31-8	2x0.43-2x11	179-20	355-40	–	S	–

⁽¹⁾ class 8.8 screws (not supplied)

Rear vertical terminals - VR (Allows connection of busbars or cable with ring terminal at the rear.



Breaker type	Version	Pieces	Busbars / cable terminals [in-mm]			Tightening [lbin-Nm]		Terminal covers			Phase separators
			W	D	Ø	A	B ¹	high	low	cradle	
T8 2000	F	3	3.94 - 100	0.2 - 5	4x 0.59 - 15	625 - 70	625 - 70	-	-	-	R
T8 2500	F	4	3.94 - 100	0.2 - 5	4x 0.59 - 15	625 - 70	625 - 70	-	-	-	R
T8 3000	F	4	3.94 - 100	0.2 - 5	4x 0.71 - 18	890 - 100	890 - 100	-	-	-	R

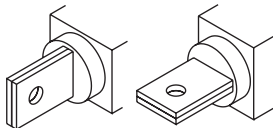


A = Tightening the terminal onto the circuit breaker
 B = Tightening the cable/busbar onto the terminal
 R = On request
 S = Standard
 S* = Are supplied as standard with the low terminal covers
 Pieces = Number of busbars, cables or cable terminals

Tmax accessories information

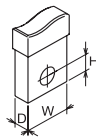
Molded Case Circuit Breakers

Rear flat horizontal and vertical terminals for cradles - HR/VR (Allows connection of busbars or cables with ring terminals at the rear)



Breaker type	Version	Pieces	Busbars [in-mm]			Cable terminal [in-mm]		Tightening [lbin-Nm]		Terminal covers			Phase separators
			W	D	Ø	W	Ø	A	B ⁽¹⁾	high	low	cradle	
T4	P - W	1	0.79-20	0.39-10	0.39-10	0.79-20	0.39-10	–	159-18	–	–	–	–
T5 400	P - W	1	0.98-25	0.39-10	0.47-12	0.98-25	0.47-12	–	159-18	–	–	–	–
T5 600	P - W	2	1.57-40	0.59-15	0.43-11	1.57-40	0.43-11	–	159-18	–	–	–	–
T6	W	2	1.97-50	0.20-5	0.55-14	1.97-50	0.55-14	–	268-30	–	–	–	–
T7	W	2	1.97-50	0.39-10	2x0.43-2x11	–	–	106-12	355-40	–	–	–	–

⁽¹⁾ class 4.8 screws (not supplied)



A = Tightening the terminal onto the circuit breaker
 B = Tightening the cable/busbar onto the terminal
 R = On request
 S = Standard
 S* = Are supplied as standard with the low terminal covers
 Pieces = Number of busbars, cables or cable terminals

Tmax accessories information

Molded Case Circuit Breakers

Service releases

The Tmax family of circuit breakers can be fitted with service releases (shunt trip, closing coil and undervoltage release). These are available in the pre-cabled version, depending on the size of the circuit breaker fitted with 39.4" (1 m) long free cables, with a connector with 39.4" (1 m) cables or with a simple pin connector and two terminals to be mounted in the terminal board.

Assembly is carried out for all the releases by pressing into the special seat in the left part of the circuit breaker (right for T7 and T8) and fixing with the screw provided.

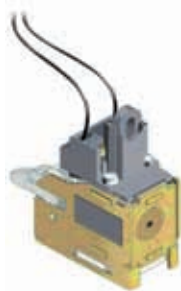
The releases are interchangeable for T1, T2, T3, Ts3 (both for the three-pole and four-pole version), whereas for T4, T5 and T6 in the four-pole version the shunt trip (not possible with PS-SOR) and the undervoltage release can be housed at the same time, as long as they are in the wired version and the shunt trip is necessarily mounted in the slot of the third pole. T4, T5, T6 circuit breakers in the draw out version can only be equipped with pre-cabled accessories; the T4-T5-T6 circuit breakers complete with motorized controls can only be fitted with prewired undervoltage and shunt trips.

The T7 and T8 circuit breakers allows simultaneous mounting of all three service releases. These two possibilities are available on the three-pole version as well. Moreover Tmax T7 and T8 can be equipped with two shunt trips instead of the undervoltage release to facilitate some specific applications where a very high safety level of the remote circuit breaker opening command is required.

3

Shunt trip – SOR (UL FILE: E116596)

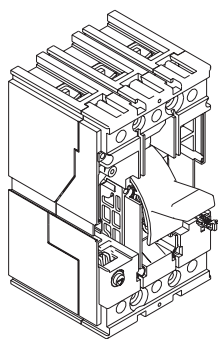
Allows circuit breaker opening by means of an electric command. Operation of the trip is provided for a voltage between 70% and 110% of the rated power supply voltage value U_n , both in alternating current and in direct current. For Tmax T1, T2, T3, T4, T5 and T6, the SOR shunt trip is fitted with a limit contact for cutting off the power supply in the open position and with the release tripped.



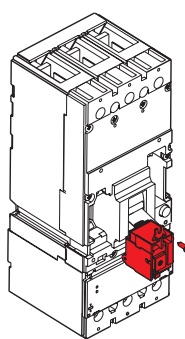
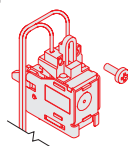
T1-T2-T3



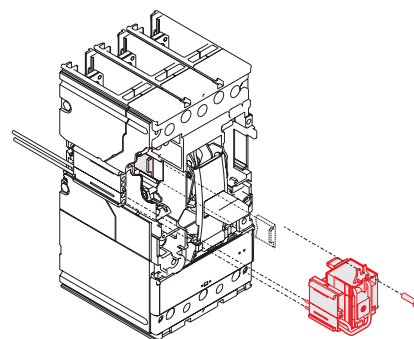
T4-T5-T6



T1-T2-T3



Ts3



T4-T5-T6



T7

Tmax accessories information

Molded Case Circuit Breakers

Shunt trip - SOR - Electrical characteristics

Control voltage	Inrush power consumption									
	Tmax T1, T2, T3		Tmax Ts3		Tmax T4, T5, T6		Tmax T7		Tmax T8	
	AC [VA]	DC [W]	AC [VA]	DC [W]	AC [VA]	DC [W]	AC [VA]	DC [W]	AC [VA]	DC [W]
12 V DC	-	50	-	120	-	150	-	-	-	-
24 V AC/DC	-	-	100	100 or 4 ⁽¹⁾	-	-	300	300	-	200
24...30 V AC/DC	50	50	-	-	150	150	-	-	-	-
30 V AC/DC	-	-	-	-	-	-	300	300	200	200
48 V AC/DC	-	-	-	120	-	-	300	300	200	200
48...60 V AC/DC	60	60	-	-	150	150	-	-	-	-
60 V AC/DC	-	-	-	-	-	-	300	300	200	200
110...120 V AC/DC	-	-	100 or 4 ⁽¹⁾	-	-	-	300	300	200	200
120...127 V AC/DC	-	-	-	-	-	-	300	300	200	200
110...127 V AC-110...125 V DC	50	50	-	120	150	150	-	-	200	200
220...240 V AC/DC	-	-	-	-	-	-	300	300	200	200
220...240 V AC-220...250 V DC	50	50	100	120	150	150	-	-	-	-
240...250 V AC/DC	-	-	-	-	-	-	300	300	200	200
380...400 V AC	-	-	-	-	-	-	300	-	200	-
380...440 V AC	55	-	-	-	150	-	-	-	-	-
415...440 V AC	-	-	-	-	-	-	300	-	200	-
480 V AC	-	-	100	-	-	-	-	-	-	-
480...525 V AC	55	-	-	-	150	-	-	-	-	-
Opening times [ms]	15	15	≤ 15	≤ 15	15	15	20	20	60	60

⁽¹⁾ Shunt trip of permanent supply

Shunt trip with permanent service – PS-SOR

Furthermore, for T4, T5 and T6, opening coils with permanent service (PS-SOR) are available, with much lower power consumption and which can be supplied continuously: in this case, in fact, they are not fitted with auxiliary limit contact. The pre-cabled or uncabled version can be chosen for these coils as well.

Shunt trip - PS-SOR - Electrical characteristics

Control voltage	Tmax T4, T5, T6	
	AC [VA]	DC [W]
24 V AC/DC	4	4
110...120 V AC	4	-

Tmax accessories information

Molded Case Circuit Breakers



SCR - T7

Closing coil – SCR

The closing coil - only available on the motorizable versions of Tmax T7 and T8 - allows remote closure of the circuit breaker when the circuit breaker closing springs are charged. The technical characteristics and the service voltages of the closing coil are identical to those of the shunt trip available on T7 and T8. The closing time of the circuit breaker by means of SCR is 80 ms.



UVR - T1-T2-T3

Undervoltage release – UVR (UL FILE: E116596)

The undervoltage release opens the circuit breaker due to lack of release power supply voltage or due to values under $0.7 \times U_n$ with a trip range from 0.7 to $0.35 \times U_n$. After tripping, the circuit breaker can be closed again with a voltage higher than $0.85 \times U_n$. With the undervoltage release de-energised, it is not possible to close the circuit breaker or the main contacts.

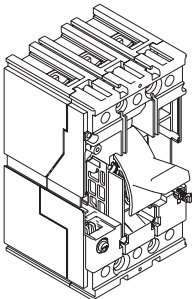


UVR - T4-T5-T6

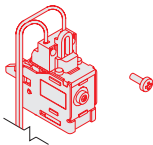


UVR - T7

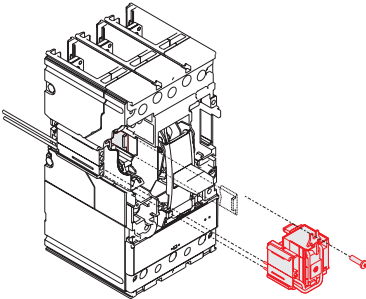
UVR - Electrical characteristics										
Control voltage	Power consumption during permanent operation									
	Tmax T1, T2, T3		Tmax Ts3		Tmax T4, T5, T6		Tmax T7		Tmax T8	
	AC [VA]	DC [W]	AC [VA]	DC [W]	AC [VA]	DC [W]	AC [VA]	DC [W]	AC [VA]	DC [W]
24 V AC/DC	-	-	6	3	-	-	3.5	3.5	-	5
24...30 V AC/DC	1.5	1.5	-	-	6	3	-	-	-	-
30 V AC/DC	-	-	-	-	-	-	3.5	3.5	5	5
48 V AC/DC	1	1	6	3	6	3	-	-	5	5
60 V AC/DC	1	1	-	-	6	3	-	-	5	5
110...120 V AC/DC	-	-	6	-	-	-	3.5	3.5	5	5
120...127 V AC/DC	-	-	-	-	-	-	3.5	3.5	5	5
110...127 V AC-110...125 V DC	2	2	-	-	6	3	-	-	-	-
220...240 V AC/DC	-	-	-	-	-	-	3.5	3.5	5	5
220...240 V AC-220...250 V DC	2.5	2.5	-	3	6	3	-	-	-	-
220...250 V AC	-	-	6	-	-	-	-	-	-	-
240...250 V AC/DC	-	-	-	-	-	-	3.5	3.5	5	5
380...400 V AC	-	-	-	-	-	-	3.5	-	5	-
380...440 V AC	3	-	-	-	6	-	-	-	-	-
415...440 V AC	-	-	-	-	-	-	3.5	-	5	-
480 V AC	-	-	6	-	-	-	-	-	-	-
480...525 V AC	4	-	-	-	6	-	-	-	-	-
Opening times [ms]	15	15	≤ 18	≤ 18	≤ 25	≤ 25	≤ 25	≤ 25	30	30



T1-T2-T3



Ts3



T4-T5-T6

Tmax accessories information

Molded Case Circuit Breakers



Connectors for service releases (only for Ts3)

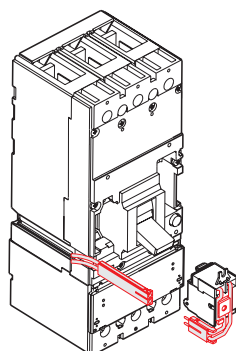
These allow the shunt trip or undervoltage release to be connected to the power supply circuit. They are available in the following versions:

- for fixed circuit breakers
- for plug-in/draw out circuit breakers.

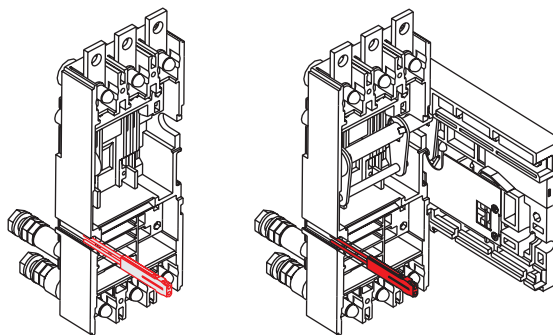
Assembly is by means of pressure into special slots in the left side of the circuit breaker.

Cables of different lengths (UL/CSA) are available.

Socket-plugs with 3, 6 or 12 poles and cable kit (UL/CSA) with a length of 78.8" (2 m) are available for Tmax: the socket-plugs are necessary only for plug-in version.



KT3C-SU



KT3C-SUP

Tmax accessories information

Molded Case Circuit Breakers

Electrical signals

These allow information on the operating state of the circuit breaker to be read outside.

Installation of these accessories is carried out directly from the front of the circuit breaker in special slots placed on the right-hand side of the circuit breaker, completely segregated from the live parts - all to the benefit of user safety. The auxiliary contacts can be supplied (depending on the type) either with cabling directly on the circuit breaker terminal board or in the pre-cabled version, depending on the size of the circuit breaker fitted with free cables 39.4" (1 m) long, with a connector with 39.4" (1 m) long cables. The pre-cabled version is mandatory on the T4, T5 and T6 circuit breakers in the draw out version. The auxiliary contacts for T7 are always fitted with three terminals to be mounted in the terminal board to carry out the cabling. The auxiliary contacts are available for use both in direct and alternating current at various voltages. The signals are reset when the circuit breaker is reset.



AUX-C - 250 V AC/DC

T1-T8 (AUX)

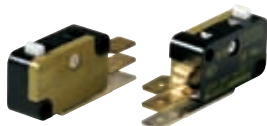
Available both in the pre-cabled and uncabled version, auxiliary contacts supply the following electrical signalling:

- Form C (open/closed): indicates the position of the circuit breaker contacts (Q)
- Bell alarm: signals circuit breaker opening due to overcurrent release trip (for overload or short circuit), trip of the residual current release, of the opening coil or of the undervoltage release, of the emergency opening pushbutton of the motor operator or two to operation of the test pushbutton (SY)
- Contact for signalling electronic trip unit tripped: signals intervention of one of the protection functions of the electronic trip unit (S51) (except for Ts3).

The auxiliary contacts for T7 and T8 are always fitted with terminals to be mounted in the terminal box to carry out wiring.

T4, T5, T6, T7 and T8 with electronic trip units (AUX-SA)

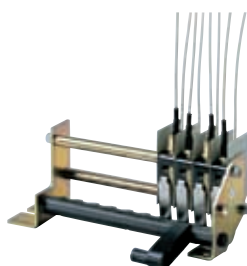
There is a contact for signalling electronic trip units tripped, only available in the pre-cabled version for use at 250 V AC.



T7

T4, T5 and T6 (AUX-MO)

This auxiliary contact, only in the uncabled version, must be combined with the motor operator and indicates the motor operation mode (manual or remote).



T8

T7 (AUX-RTC)

The "circuit breaker ready to close" auxiliary contact is available with wiring directly on the terminal box of the stored energy T7 circuit breaker and signals that the circuit breaker is ready to accept a closing command if there are the following five conditions:

- circuit breaker open
- closing springs charged
- any opening coil de-energised
- any undervoltage coil energised
- opening solenoid armed.

T7 (AUX-SC)

Remotely indicates the state of the circuit breaker operating mechanism is closing springs (supplied only with the spring charging motor).

Tmax accessories information

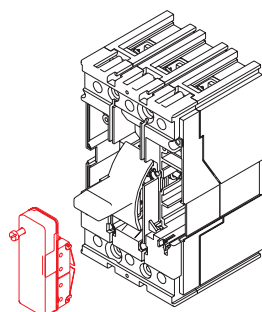
Molded Case Circuit Breakers

T4, T5 and T6 with PR222DS/PD-A and electronic trip unit (AUX-E)

Only available in the pre-cabled version, the auxiliary contacts AUX-E (also called electronic version contacts) communicate the state of the circuit breaker to the electronic trip unit and make an open/closed signal available to the outside and another one for electronic trip unit tripped. They can only be combined with the PR222DS/PD-A electronic trip unit and only function when there is a 24 V DC auxiliary power supply to the trip unit for the communication functions.

The AUX-E contacts can, moreover, be directly connected to the MOE-E motor operator.

The “traditional” version of the auxiliary contacts can also be combined with the protection trip units with dialogue; in this case, only electrical signalling of the state of the circuit breaker will be provided and it will not be possible to communicate remotely or control the motor.



AUX-C

Tmax accessories information

Molded Case Circuit Breakers

3

AUX. Contacts 250 V - T1...T6 Electrical characteristics

Power supply voltage	Service current Category of utilisation (IEC 60947-5-1)	
	AC 14	DC 13
125 V	6 A	0.3 A
250 V	5 A	0.15 A

Protection with gG 10x38 type fuse (Imax 6 A)

AUX. Contacts 400 V - Ts3 Electrical characteristics

Power supply voltage	Breaking capacity Ohmic Load [A]	
AC (50-60) [V]	DC [V]	
-	125	0.3
-	250	0.15
250	-	6
400	-	3

AUX 400 V - T4...T7 Electrical characteristics

Power supply voltage	Service current In [A]	
	AC	DC
125 V	-	0.5
250 V	12 ⁽¹⁾	0.3
400 V	3	-

⁽¹⁾ 5 A for Tmax T7

AUX 24 V - T1...T7

Power supply voltage	Service current In [A]	
	AC	DC
24 V	-	≥ 0.75 mA
5 V	-	≥ 1 mA

AUX-E - T4...T6 Technical information

Typical contact	Mosfet
Vmax	350 V DC/230 V AC
Imax	50 mA AC/DC
Pmax (resistive load)	17 W, 11 VA
System contact/ground insulation	2000 V AC (1 min. @ 50 Hz)
Contact/contact insulation	400 V DC

Table of the possible combinations of the T7-T7M auxiliary contacts

Circuit breaker	Auxiliary contact type
T7	1 aux "C" + 1 BA "C"
T7	2 aux "C"
T7	3 aux "C" + 1BA "C"
T7M	2 aux "C"
T7M	2 aux "C" + 2 aux "C"

Tmax accessories information

Molded Case Circuit Breakers

Types of auxiliary contacts

Type and control voltage	T1	T2 TMD	T2 PR221	T3	Ts3	T4	T5	T6	T7	T8
AUX 250 V AC/DC 1 Aux "C" + 1 BA "C"	•	•	-	•	-	•	•	•	-	-
AUX 250 V AC/DC 3 Aux "C" + 1 BA "C"	•	•	-	•	-	•	•	•	-	-
AUX 250 V AC/DC 1 electronic release trip contact + 1 Aux "C" + 1 BA "C"	-	-	•	-	-	-	-	-	-	-
AUX 250 V AC/DC 2 Aux "C" + 1 BA "C"	-	-	•	-	-	-	-	-	-	-
AUX 400 V AC 1 Aux "C" + 1 BA "C"	-	-	-	-	-	•	•	•	•	-
AUX 400 V AC 2 Aux "C"	-	-	-	-	•	•	•	•	•	-
AUX 400 V AC 1 Aux "C" + 1 BA "C"	-	-	-	-	•	-	-	-	-	-
AUX 400 V AC 4 Aux "C" for PR232 and PR331 trip units	-	-	-	-	-	-	-	-	-	•
AUX 400 V AC 4 Aux "C" for PR332 trip unit	-	-	-	-	-	-	-	-	-	•(1)
AUX 24 V DC 1 Aux "C" + 1 BA "C"	-	-	-	-	-	-	-	-	•	-
AUX 24 V DC 2 Aux "C"	-	-	-	-	-	-	-	-	-	-
AUX 24 V DC 3 Aux "C" + 1 BA "C"	•	•	-	•	-	•	•	•	-	-
AUX 24 V DC 4 Aux "C" for PR232 and PR331 trip units low voltage	-	-	-	-	-	-	-	-	-	•
AUX 24 V DC 4 Aux "C" for PR332 trip units low voltage	-	-	-	-	-	-	-	-	-	•
AUX-SA 250 V AC 1 SA electronic release trip contact	-	-	-	-	-	•	•	•	•	•
AUX-SAR 250 V AC 1 SA electronic release trip contact with remote reset	-	-	-	-	-	-	-	-	-	•
AUX-MO 1 contact signalling manual/remote	-	-	-	-	-	•	•	•	-	-
AUX-RTC 24 V DC 1 contact signalling ready to close	-	-	-	-	-	-	-	-	•	-
AUX-RTC 250 V AC/DC 1 contact signalling ready to close	-	-	-	-	-	-	-	-	•	-
AUX-SC 24 V DC 1 contact signalling closing springs charged	-	-	-	-	-	-	-	-	•	-
AUX-SC 250 V AC/DC 1 contact signalling closing springs charged	-	-	-	-	-	-	-	-	•	-
AUX-E 1 Aux "C" + 1 BA "C" (only with PR222DS/PD-A)	-	-	-	-	-	•	•	•	-	-
AUX-YU1 Normally close contact signalling undervoltage de-energized	-	-	-	-	-	-	-	-	-	•
AUX-YU2 Normally open contact signalling undervoltage de-energized	-	-	-	-	-	-	-	-	-	•

(1) 4 contacts always supplied with T8 equipped with PR332 trip units

Tmax accessories information

Molded Case Circuit Breakers

3



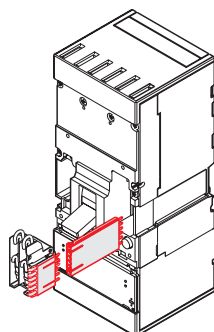
Connectors for auxiliary contacts (only for Ts3)

These allow the auxiliary contacts to be connected to the relative power supply circuit.

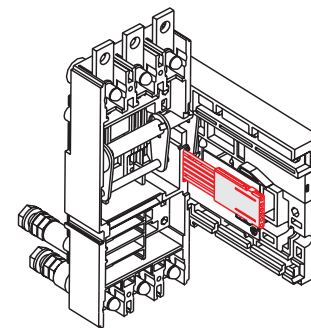
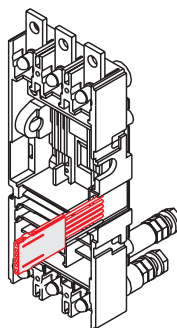
For Ts3 circuit breakers, the auxiliary contacts (fitted with plug connector) can only be supplied by means of the specific connectors to be ordered specifying the size and version of the circuit breaker (fixed or plug-in/draw out).

Assembly is carried out by mounting into special slots on the right side of the circuit breaker.

Socket-plugs with 3, 6 or 12 poles and cable kit (UL/CSA) with a length of 78.8" (2 m) are available.



KTs3C-AB

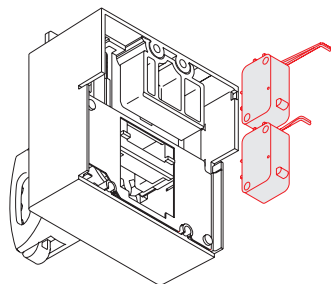


KTs3C-ABP



Early auxiliary contacts – AUE

Early auxiliary contacts are normally open contacts, advanced in relation to closing (2 contacts for all the sizes, except for T7 where there are 3). They allow the undervoltage release to be supplied in advance, in relation to closing of the main contacts, in compliance with the IEC 60204-1 and VDE 0113 Standards. They are mounted inside the direct and transmitted rotary handle operating mechanism, whereas on T7 with the electric operating mechanism they are mounted directly on the circuit breaker. The early contacts are only supplied in the cabled version with 39.4" (1 m) long cables, complete with socket-plugs with 6 poles for T1, T2 and T3 or with socket-plug connectors with 39.4" (1 m) cables for T4, T5 and T6. It is necessary to bear in mind that once the connectors for T4, T5 and T6, are inserted in the special slot on the right-hand side of the circuit breaker they extend further out than the outline of the circuit breaker itself. For Ts3 the contact is supplied complete with double slide socket connectors for simultaneous connection of the undervoltage release and of the consent contact itself. The early auxiliary contacts for T7 are always fitted with 3 terminals to be mounted in the terminal board to carry out the cabling.



Tmax accessories information

Molded Case Circuit Breakers



Auxiliary position contacts – AUP

Auxiliary position contacts which provide electrical signalling of the circuit breaker position in relation to the cradle are available. The following auxiliary position contacts are available:

T2 - T3

- contacts signalling circuit breaker is racked-in.

Ts3

- contacts signaling circuit breakers is racked-in
- contacts signaling circuit breakers is drawn-out.

T4 - T5 - T6

- circuit breaker racked-in signalling contacts for plug-in and draw out versions
- circuit breaker racked-out signalling contacts only for draw out version
- circuit breaker racked-in signalling contacts for plug-in and draw out versions 24 V DC
- circuit breaker racked-out signalling contacts only for draw out version 24 V DC.

T7

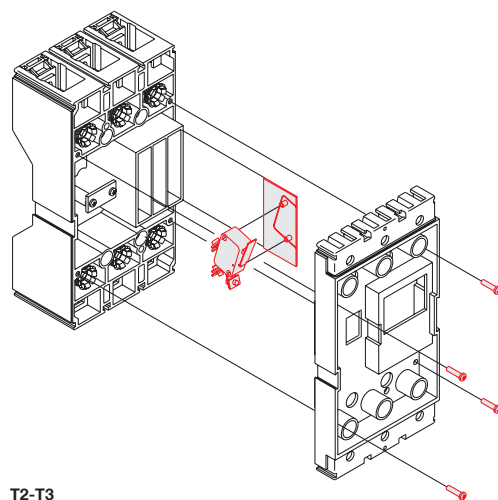
- contacts for signalling circuit breaker is racked-in
- contacts for signalling circuit breaker is isolated-test
- contacts for signalling circuit breaker is racked-out.



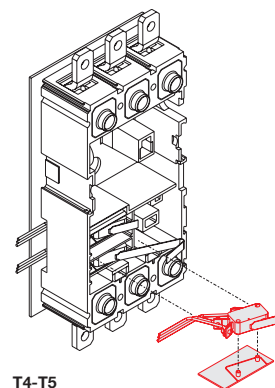
T7

A maximum of three contacts can be installed on the cradle of T2, T3, T4 and T5, a maximum of two contacts for Ts3, whereas up to five auxiliary contacts can be mounted on the cradle of T6 in all the combinations (for T4 and T5, in the draw out version, only one contact for signalling circuit breaker racked-out can be housed in the compartment closest to the bottom terminals).

The auxiliary contacts for T7 are inserted in a single block consisting of two contacts for signalling racked-in, two for isolated-test and two for racked-out.



T2-T3



T4-T5

Tmax accessories information

Molded Case Circuit Breakers

3



Trip reset

Available on the motorized T7 and T8, the trip reset is a coil which allows remote circuit breaker resetting following a trip of the overcurrent releases. It is available with two power supply voltages: 24...30 V AC/DC, 110...130 V AC/DC and 200...240 V AC/DC.

Mechanical operation counter

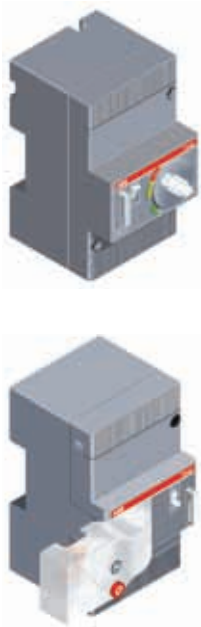
Available on the motorized T7 and T8, it is connected to the operating mechanism by means of a simple lever mechanism. It indicates the number of circuit breaker mechanical operations. The indication is visible from the outside on the front of the circuit breaker.

Tmax accessories information

Molded Case Circuit Breakers

Remote control

Remote opening and closing on Tmax circuit breaker is now possible. By means of electrical signal, the opening and closing is done either through a solenoid operator (T1, T2 and T3), a direct motor operator (Ts3) or a stored energy motor operator (T4, T5 and T6). On Tmax T7 motorized version and T8, the opening and closing command are done through coils (YO - YC) along with the spring charging motor. In order to get a complete electrically operated T7M or T8, all three of the above parts mentioned are required.



Solenoid operator for T1, T2 and T3 – MOS (UL FILE: E116596)

The solenoid operator allows remote circuit breaker opening and closing control and is particularly recommended for use in electric network supervision and control systems. A selector allows switching from automatic to manual operation and a block is also available (supplied as standard) for the operating mode of the motor. It is always provided with a padlock in the open position which prevents any additional commands, either locally or remotely. It operates both circuit breaker opening and closing, working directly on the circuit breaker lever.

It is offered in two versions, the first is “side-by-side” with the circuit breaker for T1 and T2, for installation on a panel or DIN EN 50022 rail. The other on the “front” for T1, T2 and T3, suitable for installation directly on the front of the circuit breaker.

The latter is complete with an operating handle. The front version can also be used with plug-in circuit breakers.

Coupling with the residual current release is only allowed for a circuit breaker with a side-by-side solenoid operator, to allow access to the user interface of the residual current release from the front of the switchgear. In fact, using the solenoid operator superimposed would imply the circuit breaker position on the rear of the door and its residual current release and the interface would no longer be accessible. This combination can only be installed directly on the back plate of the switchgear. Both versions can be used either in the three-pole or four-pole version. The solenoid operator is supplied complete with 1m long cables and, just for the superimposed version, with a socket-plug connector with 5 poles.

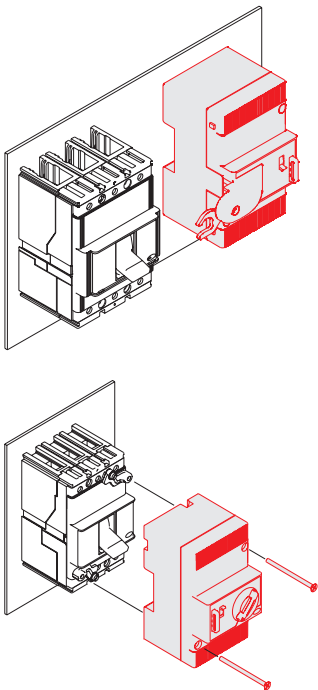
Both the opening and closing commands are operated by the solenoid which acts directly on the circuit breaker lever.

The main parameters relative to the solenoid operator are indicated in the table.

Electrical details		
AC	[V]	110...250
DC	[V]	48...60 / 110...250
Operating voltage limits	[% Un]	85...110% Un
Inrush power consumption during operation		1800 [VA] / 1000 [W]
Power on stand-by		< 100 [mW]
Opening duration	[s]	< 0.1
Closing duration	[s]	< 0.1
Mechanical life	[no. Operations]	25000
	[no. Operations/h]	240 (T1 and T2); 120 (T3)
Degree of protection, on the front		IP30
Minimum control impulse time on opening and closing	[ms]	>100

The unit is permanently supplied on stand-by, a control is applied by means of an external contact (relay, opto-insulator) in a low power circuit.

Contact characteristics: V AC/DC = 24 V
I AC/DC = 50 mA



Tmax accessories information

Molded Case Circuit Breakers

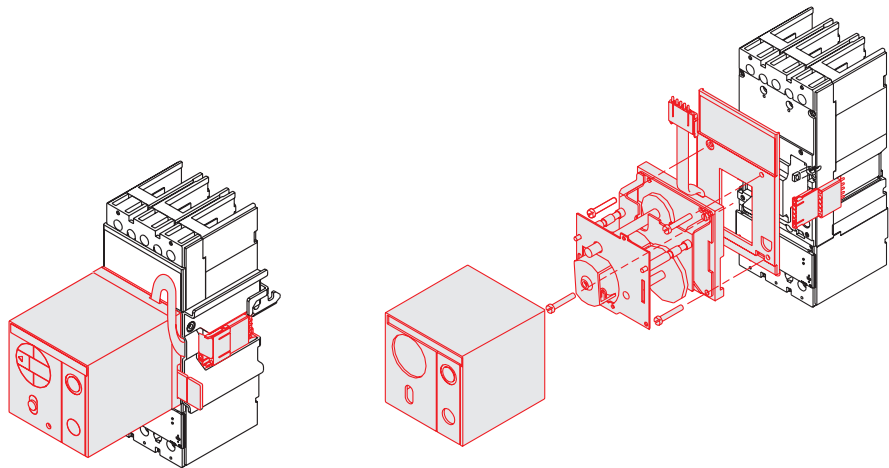
3



Direct action motor operator for Ts3 (UL file: E116596)

Both the opening and closing command is controlled by the motor, which acts directly on the circuit breaker lever. The table shows the power supply voltage values Un [V].

Motor operator Ts3			
Electrical details		AC	DC
Rated voltage, Un	[V]	-	24
	[V]	-	48...60
	[V]	120	125
	[V]	240	250
	[V]	440	-
Operating voltage limits	[% Un]	85...110% Un	85...110% Un
Inrush power absorption Ps		500 [VA]	500 [W]
Service power absorption Pc		350 [VA]	350 [W]
Operating frequency	[Hz]	50-60	50-60
Time constant	[ms]	18	18
Opening duration	[s]	0.1	0.1
Closing duration	[s]	0.1	0.1
Mechanical life	[no. operations]	15000 (S3-S4) - 10000 (S5)	15000 (S3-S4) - 10000 (S5)
Degree of protection, on the front		IP30	IP30
Minimum duration of the opening and closing command impulse		≥ 150	≥ 150



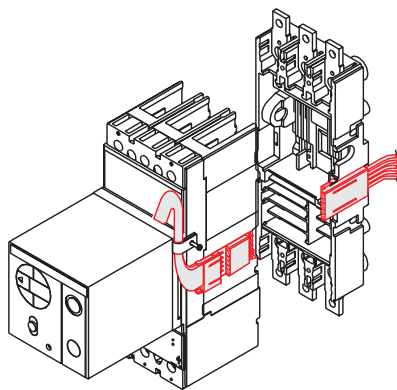
Tmax accessories information

Molded Case Circuit Breakers



Connectors for motor operators (only for Ts3)

The motor operators for Ts3 can only be supplied by means of the specific connectors. They are of the slide type and allow simultaneous connection of both the motor operator and the auxiliary contacts to the relative power supply circuit. They are an alternative to the corresponding connectors for the auxiliary contacts because they are housed in the same seat. They must be ordered specifying the size and version of the circuit breaker (fixed or plug-in/draw out).



Tmax accessories information

Molded Case Circuit Breakers

3



Stored energy motor operator for T4, T5 and T6 – MOE and MOE-E (UL FILE: E116596)

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 39.4" (1 m) long cables and is always fitted with a padlock in the open position, which prevents any command, either locally or remotely. The connectors, once inserted in the special slot on the left-hand side of the circuit breaker, extend out of the outline of the circuit breaker itself and are only compatible with pre-wired electrical accessories. A selector allows passage from automatic to manual operation and a block is also available (supplied as standard) for the operating mode of the motor.

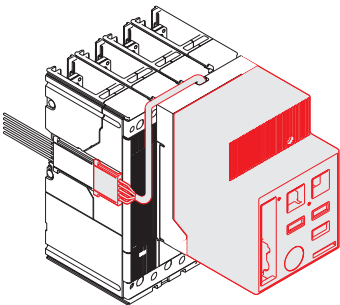
The motor operator can be fitted both with a key lock in the open position (with the same MOL-S keys for groups of circuit breakers or different MOL-D keys) and with an MOL-M key lock against manual operation: in the former case, the lock in the open position is both of electrical and mechanical type, 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 a contact to signal "auto" or "manual" (not on changeover).

On request, it can also be fitted with an AUX-MO auxiliary 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-A electronic trip unit, 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 (standard supply with MOE-E). The MOE-E allows use of the digital signals coming from the supervision and control system, by means of the PR222DS/PD-A 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 main parameters relative to the stored energy motor operator are indicated in the table.



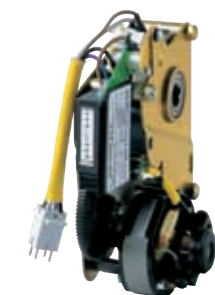
MOE and MOE-E					
Electrical details		Tmax T4-T5		Tmax T6	
		AC [V]	DC [V]	AC [V]	DC [V]
Rated voltage, Un	[V]	–	24	–	24
		–	48...60	–	48...60
		110...125	110...125	110...125	110...125
		220...250	220...250	220...250	220...250
		380	–	380	–
Operating voltage	[% Un]	85...110	85...110	85...110	85...110
Power consumption on inrush Ps		≤ 300 VA	≤ 300 W	≤ 400 VA	≤ 400 W
Power consumption in service Pc		≤ 150 VA	≤ 150 W	≤ 150 VA	≤ 150 W
Opening duration	[s]	1.5	1.5	3	3
Closing duration	[s]	< 0.1	< 0.1	< 0.1	< 0.1
Resetting duration	[s]	3	3	5	5
Mechanical life	[no. Operations]	20000	20000	10000	10000
Degree of protection, on the front		IP30	IP30	IP30	IP30
Minimum control impulse time on opening and closing	[ms]	≥100	≥100	≥100	≥100

Tmax accessories information

Molded Case Circuit Breakers



T7M



T8

Spring charging motor for T7 and T8

Only available on Tmax T7M and T8 in the stored energy version, the spring charging motor automatically charges the circuit breaker operating mechanism springs. This operation is carried out automatically immediately after closure of the circuit breaker.

When there is no power supply or during maintenance work, the closing springs can, in any case, be charged manually by means of the special operating mechanism lever. It is always fitted with limit contact. The spring charging motor is always fitted with a terminal to be mounted in the terminal board to carry out the cabling.

Spring charging motor					
Electrical details		Tmax T7M		Tmax T8	
		AC [V]	DC [V]	AC [V]	DC [V]
Rated voltage, Un	[V]	24...30	24...30	24...30	24...30
		48...60	48...60	48...60	48...60
		100...130	100...130	100...130	100...130
		220...250	220...250	220...250	220...250
		380...415	-	-	-
Opening voltage	[% Un]	85...110	85...110	85...110	85...110
Power consumption		≤ 100 VA	≤ 100 W	500 VA	500 W
Charging time	[s]	8 - 10	8 - 10	4 - 5	4 - 5

Note: To allow a complete remote control with T7M and T8, the circuit breaker must be fitted with:

- shunt trip;
- closing coil;
- spring charging motor.

Tmax accessories information

Molded Case Circuit Breakers

Adapters – ADP

For the SOR, PS-SOR, UVR, AUX, MOE or MOE-E and AUE pre-wired electrical accessories used with Tmax T4, T5 and T6 in the plug-in or draw out versions, it is necessary to use the adapters to be coupled with the plug, which will then be connected to the socket on the cradle. According to the electrical accessories required, one or two adapters must be mounted on the left and/or right side of the moving part.

There are four adapter types available:

- 5-way adapters
- 6-way adapters
- 10-way adapters
- 12-way adapters.

The table below indicates the adapters which have to be used for the various possible combinations of electrical accessories:

Adapters ADP for T4, T5 and T6 wired accessories				
Device type	5- way	6- way	10- way	12- way
SOR	•	-	-	-
UVR	•	-	-	-
MOE (MOE-E)	-	-	•	-
MOE (MOE-E) + SOR or UVR	-	-	•	-
AUE	-	-	•	-
AUE + SOR or UVR	-	-	•	-
AUX 1Q + 1SY 1 open/closed changeover contact + 1 trip unit tripped changeover contact	-	•	-	-
AUX 2Q 2 open/closed changeover contacts	-	•	-	-
AUX 3Q + 1SY 3 open/closed changeover contacts + 1 trip unit tripped changeover contact	-	-	-	•

On the other hand, for Tmax T2 and T3 in the plug-in version it is necessary, to order the socket-plug connectors: with 12 poles for the AUX auxiliary contacts - 3 open/closed changeover + 1 release tripped changeover, with 6 poles for the AUX auxiliary contacts -1 open/closed changeover + 1 release tripped changeover and with 3 poles for the service releases (SOR or UVR).

For T2 in the plug-in version with PR221 electronic trip unit and suitable auxiliary contact, it is necessary to order a 6 and a 3 pole socket-plug connector.

Socket plug connectors

In order to allow the racking-in and racking-out operations of the moving part of the plug-in circuit breaker, the wired and unwired electrical accessories of Tmax T2 and T3 and the unwired electrical accessories of Tmax T4, T5 and T6 must be fitted with one or more socket plug connectors, as per the table below.

Socket plug connectors			
Device type / Breaker type	3 poles	6 poles	12 poles
T2-T3-T4-T5-T6	-	-	-
SOR	•	-	-
UVR	•	-	-
AUX 1Q +1SY 1 open/closed changeover contact + 1 trip unit tripped changeover contact	-	•	-
AUX 2Q 2 open/closed changeover contacts	-	•	-
AUX 3Q + 1SY 3 open/closed changeover contacts + 1 trip unit tripped changeover contact	-	-	•
T2-T3			
MOS overload ⁽¹⁾	-	•	-
AUE	•	-	-
AUX 2Q + 1SY for PR221 2 open/closed contacts + 1 trip unit tripped changeover contact	•	•	-
AUX 1S51 + 1Q + 1SY for PR221 1 changeover contact + 1 SA electronic release trip contact + 1 trip unit tripped changeover contact	•	•	-

⁽¹⁾ Always provided with the overlaid solenoid operator

Tmax accessories information

Molded Case Circuit Breakers

Operating mechanism and locks

Operating mechanism are often used to switch a breaker on or off using an external device such as a rotary handle or a flange handle. Locks are used to prevent any closing or opening of the circuit breaker by means of key locks or padlock provision. Operating mechanisms are available for Tmax T1 up to T7 and locks are available for T1 up to T8.

Rotary handle operating mechanism – RHD/RHE (UL FILE: E116596)

Thanks to its ergonomic grip, the rotary handle facilitates the circuit breaker closing and opening operations. It is always fitted with a padlock-lock in the open position which prevents circuit breaker closing. The opening in the padlock-lock can take up to 3 padlocks - Ø 0.27" (7 mm) stem (not supplied), 0.24" (6 mm) only for Ts3 (not supplied). It is always (except for Ts3) fitted with a compartment door lock and on request it can be supplied with a key lock in the open position. Application of the rotary handle operating mechanism is an alternative to the motor operator and to the front interlocking plate (MIF) for T1, T2 and T3, or to the motor operator and to the front for lever operating mechanism for Ts3, T4, T5 and T6. The rotary handle operating mechanism is available in either the direct mount or variable depth version on the compartment door. The rotary handle operating mechanism in the emergency version, complete with a red on yellow background handle, suitable for controlling machine tools, is available in both the versions.

The rotary handle operating mechanism is available on T7 with lever operating mechanism and, only for the direct mount version, is characterised by an articulated grip which allows the switchgear door to be opened in case of an emergency with the circuit breaker closed. The release settings and nameplate data remain accessible to the user.

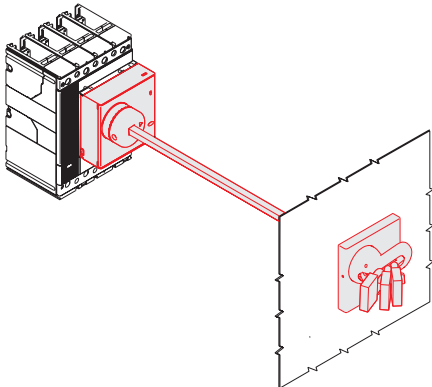
The variable depth rotary handle operating mechanisms can be ordered by building up the following three devices:

- rotary handle on the compartment door
- shaft (19.68"/500 mm)
- base for circuit breaker or, alternatively, by using the code of the ready-configured version.

Type of RH_ operating mechanism

Device type		T1			T2, T3			Ts3			T4, T5			T6		T7 ⁽¹⁾	
		F	F	P	F	P	W	F	P	W	F	P	W	F	W	F	W
RHD	Direct mounted	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RHD_EM	Emergency direct	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RHE	Transmitted with adjustable distance	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RHE_EM	Emergency transmitted with adjustable distance	•	•	•	•	•	-	•	•	•	•	•	•	•	•	•	•
RHE_B	Base for circuit breaker	•	•	•	-	-	-	•	•	•	•	•	•	•	•	•	•
RHE_S	Shaft for variable depth handle	•	•	•	•	•	-	•	•	•	•	•	•	•	•	•	•
RHE_H	Handle for transmitted RH with variable depth	•	•	•	-	-	-	•	•	•	•	•	•	•	•	•	•
RHE_H_EM	Emergency handle for transmitted RH with variable depth	•	•	•	-	-	-	•	•	•	•	•	•	•	•	•	•

⁽¹⁾ The rotary handle operating mechanism is only available for T7 with lever operating mechanism and it is as an alternative to the key lock mounted on the circuit breaker.



Tmax accessories information

Molded Case Circuit Breakers

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Cable operated flange handle T1 -T5

Cable operated flange handles are now available for Tmax T1-T5. Available with 2 handle types and 7 different cable lengths for a maximum flexibility. A complete kit is necessary. The kit is composed as 1 handle, 1 cable and 1 operating mechanism. Located on the side of the enclosure, this flange handle will open or close the circuit breaker with the help of the cable and the mechanism. The handle is available as NEMA 1, 3R, 12 grey painted and also as NEMA 4, 4X nickel coated.



The IP54 protection for rotary handle (UL FILE: E116596)

Allows IP54 degree of protection to be obtained.

It is available for the transmitted rotary handle operating mechanism on the compartment door (RHE) for all the Tmax circuit breakers.



Front for lever operating mechanism – FLD (UL FILE: E116596)

This can be installed on fixed, plug-in or draw out Tmax Ts3, T4, T5 and T6 circuit breakers. In the case of draw out circuit breakers, installed in a switchboard, it allows the IP40 degree of protection to be maintained for the whole isolation run of the circuit breaker.

It is always fitted with a padlock in the open position Ø 0.24" (6 mm) stem up to three padlocks (not supplied) which prevents closing of the circuit breaker and of the compartment door, and with compartment door lock. On request, it can be fitted with a key lock in the open position.

It is available in the following versions:

- for fixed or plug-in circuit breaker
- for draw out circuit breaker.

The front for lever operating mechanism is always an alternative to the motor operator and to the rotary handle and to the display FDU.

The same flange for the compartment door already supplied with the circuit breaker or the one supplied with the conversion kit for draw out (except for Ts3) version can be used.



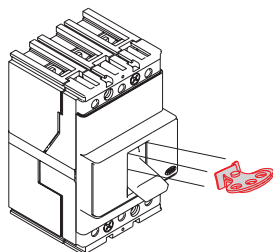
Padlock for operating lever – PLL

This is applied to the T1 - T2 - T3 circuit breaker cover to prevent the lever closing or opening operation. It allows installation up to a maximum of three padlocks Ø 0.24" (7 mm) stem (not supplied). It is available in the following versions:

- plug-in locking device only of the closing operation
- locking plate on the closing and opening operation according to the assembly position. The lock on the opening operation does not prevent release of the mechanism following a fault or remote control command
- locking plate just for the closing operation.

It is incompatible with the front accessories: solenoid operator, rotary handle operating mechanism and mechanic interlock.

The padlock is also available for T7 and it is directly mounted on the circuit breaker cover.



T1-T3

Tmax accessories information

Molded Case Circuit Breakers



Key lock on the circuit breaker for T1, T2, T3 and T7, T8 – KLC

This allows the mechanical closing operation of the circuit breaker to be locked and is installed directly on the front in the slot in correspondence with the left pole. This cannot be installed when the front operating mechanism, rotary handle operating mechanism or stored energy motor operator are present, or on the three-pole circuit breakers equipped with service releases (UVR, SOR). The key lock is the Ronis 622 type and is available in two versions:

- standard type, with key only removable with the circuit breaker locked
- special type, with key removable in both positions.

On T7 and T8, the key lock in the open position is mounted directly on the circuit breaker cover both in the version with different keys and with the same keys. Presettings for Ronis and Profalux key locks are also available.

3



Key lock for rotary handle operating mechanism for T1, T2 and T3 – RHL

This allows the mechanical closing operation of the circuit breaker to be locked.

The following versions are available:

- lock with a different key for each circuit breaker
- lock with the same key for groups of circuit breakers.

The circuit breaker in the open position ensures isolation of the circuit in accordance with the IEC 60947-2 Standard. It is also available in the version which allows the lock both in the open and closed position. The lock in the closed position does not prevent release of the mechanism following a fault or remote control.



Key lock for Ts3, T4, T5, T6 and T7, T8 – KLF-D and KLF-S

This allows mechanical operation of the circuit breaker to be locked. This lock can be used with the direct or transmitted rotary handle operating mechanism mounted on the base for circuit breaker or with the front for lever operating mechanism.

The lock of the circuit breaker in the open position ensures isolation of the circuit in accordance with the IEC 60947-2 Standard. For Ts3 different locks are supplied for the direct action motor operator, for stored energy motor operator, for rotary handle or front for lever operating mechanism. For T4, T5, T6 and T7 in the lever operating mechanism version key locks in the open position are available either with different keys (KLF-D) or with the same keys (KLF-S): in this case, up to four different key numbering codes are available (n. 2005-2006-2007-2008).

Lock in the racked-out position for cradle (Ts3, T4, T5 and T6)

For Ts3, T4, T5 and T6 draw out circuit breakers, key or padlocks locks are available to be applied onto the rail of the cradle, to prevent racking-in of the plug-in part.

Selection can be made among the following:

- key lock with different keys (KLF-D FP)
- key lock with the same keys for groups of circuit breakers (KLF-S FP)
- Ronis type key lock (KLF-D Ronis FP)
- padlock, which can take up to three padlocks with Ø 0.24" (6 mm) stem, not supplied (PLL FP).

Tmax accessories information

Molded Case Circuit Breakers



Lock in racked-in – isolated – racked-out position for cradle of T7

This device allows the moving part of a draw out T7 circuit breaker to be locked in the racked-in, isolated-test or racked-out position in the relative cradle. Thanks to mounting an additional accessory, the lock can be limited just to the racked-out position.
The cradle can be equipped with 1 or 2 of these key locks.

Mechanical lock of compartment door

A mechanical lock of compartment door available on Ts3 and T7 for both the lever operating mechanism and for the motorizable version. It does not allow the compartment door to be opened with the circuit breaker closed (and circuit breaker racked-in for circuit breakers in the draw out version) and locks the circuit breaker closing with the compartment door open.
For Ts3 circuit breakers, it consists of two elements: one applied to the rotary handle operating mechanism or to the front for the lever operating mechanism, the other consisting of a metal striker to be applied onto the compartment door.
For T7 two versions are available: a door lock made by means of cables and a second type fixed directly on the side of the circuit breaker or of the relative cradle. The cable door lock must also be fitted with the interlock cable kit and the interlocking plate corresponding to the combined circuit breaker.



Sealable thermal adjustment lock

This is applied to the circuit breaker cover near the thermal element regulator of the TMD thermomagnetic trip unit for T1, T2, T3 and Ts3 and prevents it being tampered with.

Overview of the available locks									
Lock type	T1	T2	T3	Ts3	T4	T5	T6	T7	T8
FDL Front for lever operating mechanism	-	-	-	•	•	•	•	-	-
PLL_ Padlock for operating lever	•	•	•	-	-	-	-	•	-
KLC_ Key lock on the circuit breaker	•	•	•	-	-	-	-	•	•
RHL Keylock for rotary handle operating mechanism	•	•	•	-	-	-	-	-	-
KLF-D and KLF-S Key lock for front for lever and rotary handle	-	-	-	•	•	•	•	-	-
MOL-D and MOL-S_ Key lock in open position for MOE and MOE_E	-	-	-	-	•	•	•	-	-
MOL-M_ Key lock against manual operation for MOE and MOE_E	-	-	-	-	•	•	•	-	-
KLF-FP and PLL FP_ Locks in open position for cradle	-	-	-	-	•	•	•	•	•
Mechanical lock on compartment door	-	-	-	•	-	-	-	•	-
Sealable lock of thermal adjustment	•	•	•	•	-	-	-	-	-

Tmax accessories information

Molded Case Circuit Breakers



T1-T2-T3



T3-T4-T5-T6

Mechanical interlock (UL FILE: E116596)

T1-T2-T3

The mechanical MIF interlock can be applied on the front of two T1, T2 or T3 circuit breakers mounted side by side, in either the three-pole or four-pole fixed version and prevents simultaneous closing of the two circuit breakers. Fixing is carried out directly on the back plate of the switchboard. The front interlocking plate allows installation of a padlock in order to fix the position (possibility of locking in the O-O position as well). It is also possible to interlock three circuit breakers side by side, using the proper plate, thereby making the following interlock combinations: IOO-OIOOOI-OOO. It is incompatible with the front accessories (solenoid operator, rotary handle operating mechanism) and with the residual current releases.

T3

For T3, in the three-pole or four-pole fixed or plug-in version, the MIR mechanical interlock is available. This rear interlock, available in the horizontal (MIR-H) and vertical (MIR-V) version, is compatible with all the front accessories and with the residual current release (only MIR-H). The following interlocking combinations can be made: IO-OI-OO.

Ts3

For Ts3 circuit breakers the (rear) mechanical interlock allows installation of two circuit breakers in a single support and, by means of a walking beam mechanism, makes them mechanically interdependent. It prevents operation in parallel of two power supply sources (eg. normal-emergency). It consists of a kit with levers and assembly accessories and a metallic support. The mechanical interlock is available in the version for side-by-side circuit breakers and for superimposed circuit breakers. Only circuit breakers of the same size and in the same version can be interlocked.

T4-T5-T6

The mechanical interlock for T4, T5 and T6 allows installation of two circuit breakers on a single support and, by means of special lever mechanisms, makes them mechanically interdependent. For Tmax T4 and T5 this is a rear interlock consisting of a vertical or horizontal frame group (MIR-HR or MIR-VR) and of a pair of metal plates for fixing the circuit breakers (MIR-P). The frame group is made up of metal frame and of the lever mechanism interlock. The metal plates are of different type according to the sizes of the circuit breakers to be interlocked. For Tmax T6 this is a rear interlock consisting of a vertical or horizontal support.

Possible interlock combinations			
Type	Breaker 1	+	Breaker 2
A	T4 (F-P-W)	+	T4 (F-P-W)
B	T4 (F-P-W)	+	T5 400 (F-P-W) o T5 600 (F)
C	T4 (F-P-W)	+	T5 630 (P-W)
D	T5 400 (F-P-W) o T5 600 (F)	+	T5 400 (F-P-W) o T5 600 (F)
E	T5 400 (F-P-W) o T5 600 (F)	+	T5 630 (P-W)
F	T5 630 (P-W)	+	T5 630 (P-W)

There are no limitations on the versions to be interlocked, therefore, for example, a fixed circuit breaker can be interlocked with a draw out version switch-disconnector. Since this is a rear interlock, all the front accessories which are compatible with the circuit breakers can be used. In the vertical interlock the bottom terminals of the upper circuit breaker and the top terminals of the lower circuit breaker must be of rear type.

Tmax accessories information

Molded Case Circuit Breakers

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T7

This mechanism makes the mechanical interlock between two T7 circuit breakers by means of flexible cables, which are connected on a plate mounted on the side of the circuit breaker preventing simultaneous closing of the two circuit breakers. The plates to be mounted on the circuit breaker differ according to whether the circuit breaker is in the fixed or draw out version.

The interlock is available both for the manual operating mechanism version and for the motor operator one.

Transparent pushbutton protection – TCP

A transparent protection for the circuit breaker opening and closing pushbuttons is available in two different versions on T7 and T8 with stored energy operating mechanism: one which protects both the pushbuttons and the other which alternatively protects either the opening or the closing pushbutton.

There is the possibility of putting a padlock, which adds the lock function to the protection. In the closed position this lock does not prevent release of the mechanism following a fault or a remote command.

IP54 door protection

Available with T7 motorizable and T8, it is made by means of a transparent plastic cover which completely protects the front of the circuit breaker and allows IP54 degree of protection to be reached. Mounted on hinges, it is provided with a key lock.

Tmax accessories information

Molded Case Circuit Breakers



Front display unit – FDU

The front display is a display unit of the setting currents, alarms and parameters of the PR222DS/P and PR222DS/PD-A electronic trip units of T4, T5 and T6. The display unit can operate correctly with self-supply with $I \geq 0.35 \times I_n$ on at least one phase.

If the display is used in combination with the PR222DS/PD-A trip unit, and therefore with an auxiliary power supply, it is also possible to detect the protection which has caused the release trip and the fault current. It is not compatible with the front accessories: rotary handle operating mechanism, motor operator and front for lever operating mechanism.

HMI030 interface on the front of switchgear

This accessory, which can be used with all the protection trip units fitted with dialogue, is designed for installation on the front of the switchgear. It consists of a graphic display where all the trip unit measurements and alarms/events are displayed. The user can navigate in a simple and intuitive way among the measurements by using the navigation pushbuttons. The device can replace the traditional multimeters without the need for current/voltage transformers. The HMI030 is connected directly to the protection trip unit by means of a serial line and requires a 24 V DC power supply.

Optional modules

The PR332/P trip unit for T7 and T8 can be enriched with additional internal modules, thereby increasing the capacity of the trip units and making these units highly versatile.



PR330/V voltage measuring module

This optional internal module can be added to PR332/P. It measures and processes the phase and neutral voltages, transferring this data to the protection trip unit so that a series of protection and measurement functions can be implemented.

It can be connected to the PR332/P at any time and the latter recognises it automatically without having to be configured.

PR330/V module, when ordered mounted on the circuit breaker, does not require any external connection or voltage transformers since it is connected internally to the upper terminals of Tmax T7 and T8 (selector in "INT" position) through the internal voltage sockets.

At the ordering stage, the code of the internal voltage socket can be specified in addition to the code of the T7 or T8 circuit breaker so as to guarantee the possibility to install even afterwards the PR332/P trip unit equipped with the PR330/V module connected internally to the upper terminals. If necessary, the connection of the voltage sockets can be moved externally with connection to the terminal board using voltage transformers connected to the top or bottom terminals.

On the PR330/V module there is a selector which defines the method of wiring implemented to detect the voltage measurements (INT = connection of the internal module towards the top terminals – EXT = connection to the terminal box). The "Insulating Test" position guarantees carrying out the dielectric test. A "Power Line" LED indicates presence of the line voltage.



PR330/D-M communication module (Modbus RTU)

The PR330/D-M communication module is the solution for connecting Tmax to a Modbus network for remote supervision and control of the circuit breaker.

It is suitable for the PR332/P trip unit for T7 or T8. As for the PR330/V, this module can be added to the protection trip unit and its presence is recognised automatically.

The electronic trip unit is supplied with three LEDs on the front:

- "Power" power supply LED, which indicates the presence of auxiliary power supply to the PR330/D-M module
- "Tx" data transmission LED
- "Rx" data reception LED.

Tmax accessories information

Molded Case Circuit Breakers

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PR330/R – Actuator module

The PR330/R actuator module is fitted in the right slot of T7 and it is used for opening (for T7 with lever operating mechanism it is allowed only the opening operation), and closing the circuit breaker by means of the shunt opening and closing releases by remote control. It is suitable for the PR332/P and must be compulsory ordered with the PR330/D-M communication module.



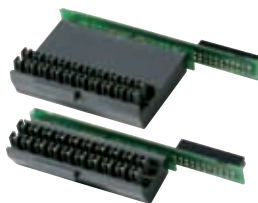
BT030 wireless communication unit

BT030 is a device to be connected to the Test connector of PR222DS, PR232/P, PR331/P and PR332/P. It allows Bluetooth communication between the protection trip unit and a hand-held or laptop PC with a Bluetooth port. BT030 can also be used with Emax circuit breakers fitted with PR121/P, PR122/P and PR123/P. This device is dedicated for use with the SD-Pocket und SD-TestBus2 application. BT030 can provide the power supply needed for self-supply and for the protection release by means of a rechargeable Li-ion battery.



PR030/B power supply unit

With this accessory, which is always supplied with the PR332/P range of trip units, it is possible to read and configure the parameters of the unit whatever the state of the circuit breaker is (open-closed, in the isolated for test position or racked-in, with/without auxiliary power supply). PR030/B is needed for the readout of the data relative to trips if the trip occurred more than 48 hours previously and the trip unit was no longer supplied. An electronic circuit inside allows power supply to the unit for about 3 hours continuously to carry out just the data reading and configuration operations. The life of the battery decreases if the SACE PR030/B is also used to carry out the Trip test and the Auto test.



Trip unit adapter

In order to allow all the connections between the electronic trip unit type PR33x and the terminal board on the circuit breaker, the circuit breaker it self must be fitted with a trip unit adapter. Two different trip unit adapters are available: one is suitable with T7 level operating mechanism, the other with T7 motorizable.



Rating plug

Available on the electronic trip units which can be mounted on T7, the rating plug must be applied on the front of the trip unit itself and provides information about the current sensor settings. It is therefore no longer necessary to change the circuit breaker current sensors, but is sufficient just to replace the rating plug to obtain modification of the rated current of the circuit breaker.

Available rating plug										
Type of circuit breaker	Rated current I _n	I _n (A)								
		400	600	800	1000	1200	1600	2000	2500	3000
T7	1000	•	•	•	•	-	-	-	-	-
	1200	•	•	•	•	•	-	-	-	-
T8	1600	-	-	-	•	•	•	-	-	-
	2000	-	-	-	•	•	•	•	-	-
	2500	-	-	-	•	•	•	•	•	-
	3000	-	-	-	•	•	•	•	•	•

Tmax accessories information

Molded Case Circuit Breakers



Current sensor for external neutral

This is applied to the external neutral conductor and allows protection G against earth faults to be carried out with external neutral three-pole circuit breakers.

The current sensor must be connected to the trip unit by means of the specific connectors X4 for T4, T5 and T6 or with a direct connection in the terminal board for T7 and T8. The combination is not possible with electronic trip unit PR221, PR231 and PR232.

Current sensor rating				
T4 [A]	T5 [A]	T6 [A]	T7 [A]	T8 [A]
100	300	600	400	1000
150	400	800	600	1200
250	600	-	800	1600
-	-	-	1000	2000
-	-	-	1200	2500
-	-	-	-	3000

Connectors

Connectors X3 and X4 allow connection of the electronic trip units with external plant units or components. In fact, they are used to make the L alarm signal available outside, connection of the external neutral and allows two-way communication from the circuit breaker fitted with dialogue towards the outside and vice versa. Both the connectors are available both for fixed version circuit breakers and for plug-in or draw out version circuit breakers.

Connector		
Type	Function	Trip unit
X3	PR021/K	PR222DS/PD-A
	L alarm signal	PR222DS/P, PR222DS/PD-A
	Auxiliary supply	PR222DS/PD-A
	EP 010	PR222DS/PD-A
X4	External neutral	PR222DS/P, PR222DS/PD-A

Tmax accessories information

Molded Case Circuit Breakers

Accessories for trip units

Circuit breakers equipped with electronic trip units	T2-T4-T5-T6	T4-T5-T6		T7 - T8			
	PR221	PR222DS/P	PR222DS/PD-A	PR231/P	PR232/P	PR331/P	PR332/P
FDU ⁽²⁾ - Front display unit	-	•	•	-	-	-	-
HMI030 ⁽¹⁾ - Interface on the front of switchgear	-	-	•	-	-	•	•
X3 - Connectors	-	•	• ⁽³⁾	-	-	-	-
X4 - Connectors	-	•	•	-	-	-	-
BT030 - Wireless communication unit	-	•	•	-	•	•	•
MOE-E (AUX-E included) ⁽²⁾ - Motor operator	-	-	•	-	-	-	-
AUX-E - Auxiliary contacts	-	-	•	-	-	-	-
EP010 ⁽¹⁾ - Field Bus plug	-	-	•	-	-	-	•
CT - Current transformers	-	•	•	-	-	-	-
Rating plugs	-	-	-	•	•	•	•
PR030/B - Power supply unit	-	-	-	-	•	•	•
PR330/D-M - Communication module	-	-	-	-	-	-	•
PR330/V - Voltage measuring module	-	-	-	-	-	-	•
PR330/R - Actuator module	-	-	-	-	-	-	•
CT Sensor - Current sensors	-	-	-	-	-	•	•

⁽¹⁾ Accessories not compatible

⁽²⁾ Accessories not compatible

⁽³⁾ Compulsory

Tmax accessories information

Molded Case Circuit Breakers



Bracket for fixing on DIN rail

This is applied to the fixed circuit breaker and allows installation:

- on standardized DIN EN 50022 rails (for T1, T2, T3);
- on standardized DIN EN 50023 rails (for Ts3).

The bracket for fixing on DIN rail is also available for Tmax circuit breakers combined with RC221 and RC222 residual current releases or with the solenoid operator of the side-by side type.

The fixing bracket kit for Ts3 circuit breakers also includes the front $H = 1.77''$ (45 mm).

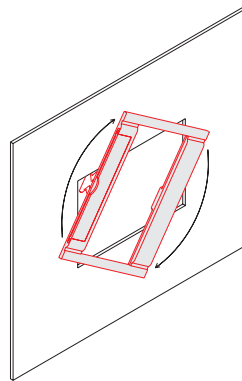


Flange for compartment door

For Ts3 circuit breakers it is possible to use the same flange (to be ordered), which can be used with the circuit breaker (to be ordered separately), with the rotary handle operating mechanism, front for lever operating mechanism and motor operator.

All the flanges for T1, T2, T3, T4, T5, T6, T7 and T8 are of new design and do not require the use of screws for installation: fixing is greatly simplified by just a simple coupling operation. The flange for compartment door for T7 and T8 is always supplied with the circuit breakers. When a rotary handle operating mechanism or residual current releases is used, a dedicated flange is supplied to be used instead of the one supplied with the circuit breaker.

For T4, T5, T6 and T7 draw out circuit breakers, the flange supplied with fixed part must be used instead of the one supplied with the fixed circuit breaker.



Spare parts

A wide range of spare parts is available for the Tmax family of circuit breakers. For further details about the complete range of spare parts available, please ask for the "Spare Parts Catalogue".

Tmax accessories information

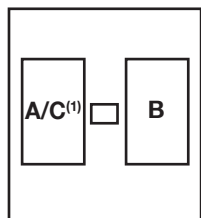
Molded Case Circuit Breakers

Compatibility

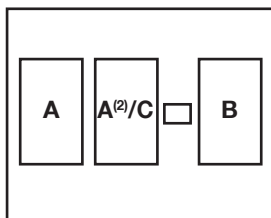
An overview of the assembly compatibility of (internal) accessories with the Tmax Series circuit breakers can be found in this section.

Possible combination of internal accessories

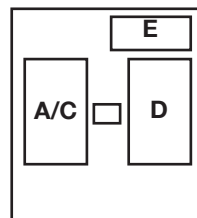
The drawing represents the internal slot of the circuit breakers. A, C and F are housed in the slots on the left of the operating lever, while B, D, E and G in the right one.



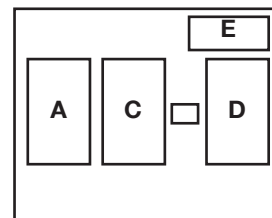
T1, T2 TMD, T3,
Ts3, T4, T5, T6
3 poles



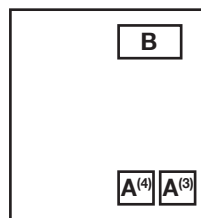
T1, T2 TMD, T3, Ts3,
T4, T5, T6
4 poles



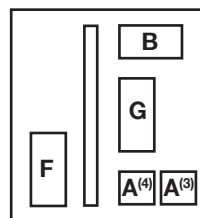
T2 PR221DS,
3 poles



T2 PR221DS,
4 poles



T7 3/4 poles



T7M 3/4 poles

⁽¹⁾ only for T1-T2-T3

⁽²⁾ only SOR for T4-T5-T6. If use SOR-C order also the 3 way connector for second SOR-C 1SDA055273R1

⁽³⁾ position for assembly of the SOR

⁽⁴⁾ position for assembly of the UVR

A = Shunt trip (SOR) or Undervoltage release (UVR)

B = Auxiliary contacts

C = Trip coil of the residual current

D = Trip coil of the electronic trip unit PR221DS

E = Auxiliary contacts for T2 with electronic trip unit PR221DS

F = Spring charging motor

G = Closing coil (SCR)

For your notes

Handwriting practice lines consisting of 20 horizontal dotted lines.

For your notes

3

Handwriting practice area with 20 horizontal dotted lines.

Curves and technical information

Molded Case Circuit Breakers

Characteristic curves	
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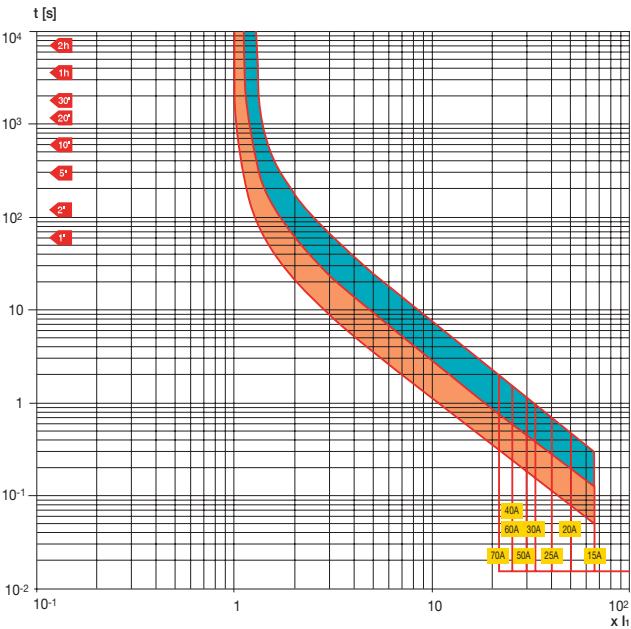
Curves and technical information

Molded Case Circuit Breakers

Trip curves for power distribution
Circuit breakers with thermal magnetic trip units

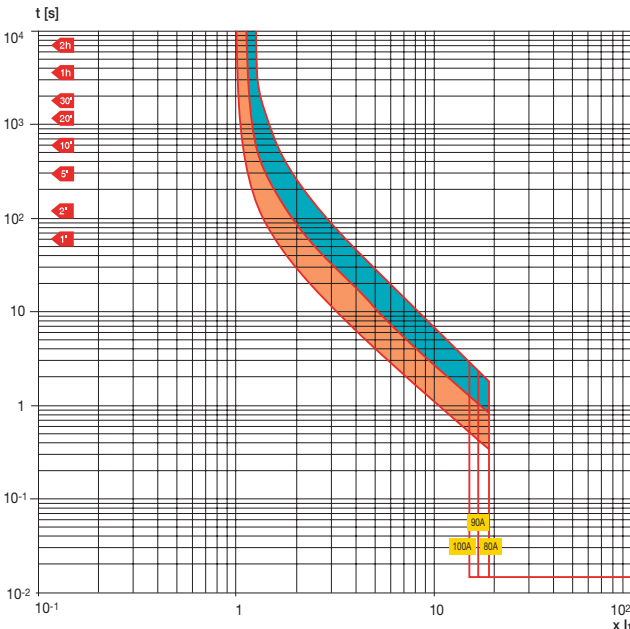
T1 100 / T1 100 1P – TMF

In = 15 - 70 A



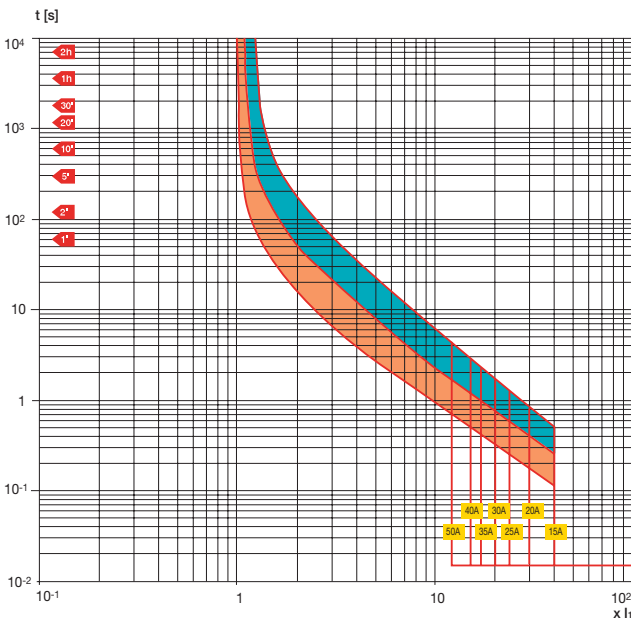
T1 100 / T1 100 1P – TMF

In = 80 - 100 A



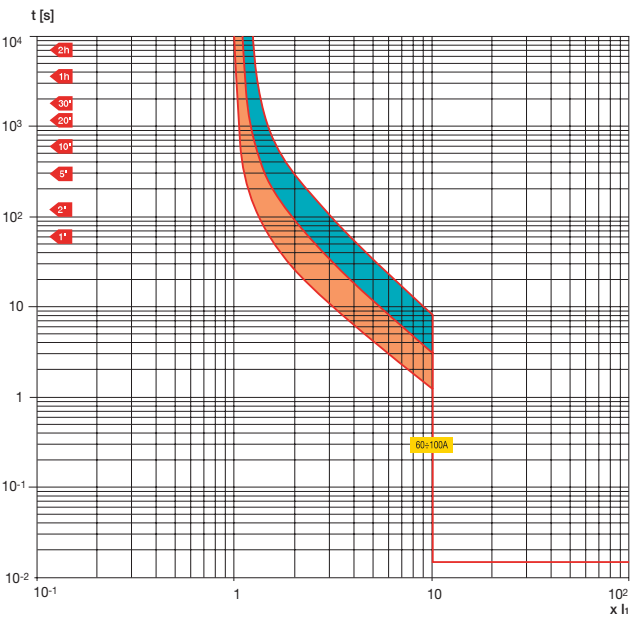
T2 100 – TMF

In = 15 - 50 A



T2 100 – TMF

In = 60 - 100 A

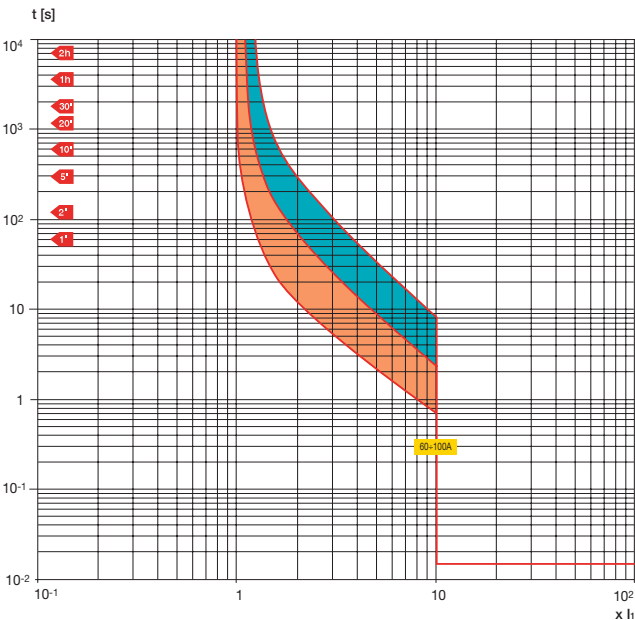


Curves and technical information

Molded Case Circuit Breakers

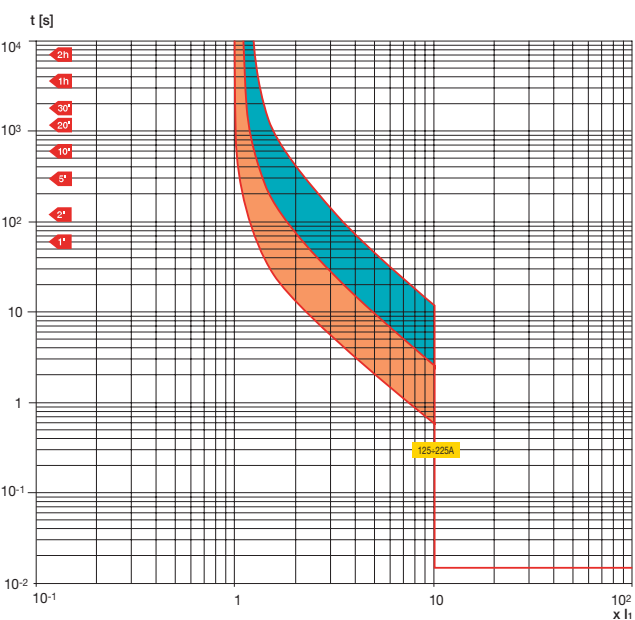
T3 225 – TMF

In = 60 - 100 A



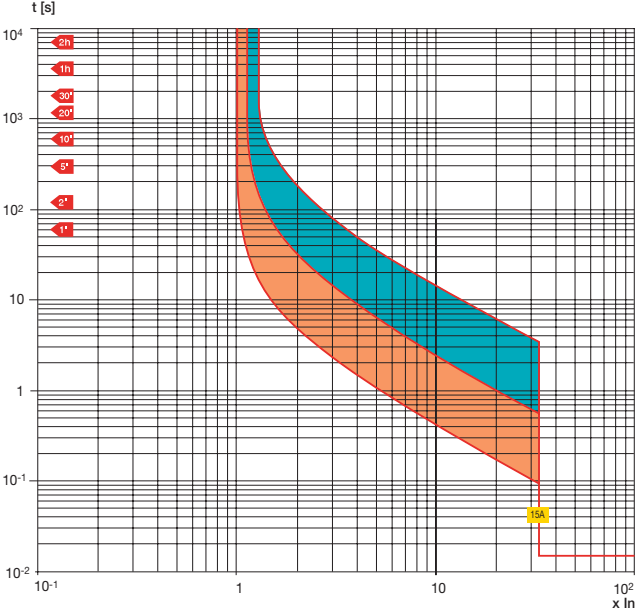
T3 225 – TMF

In = 125 - 225 A



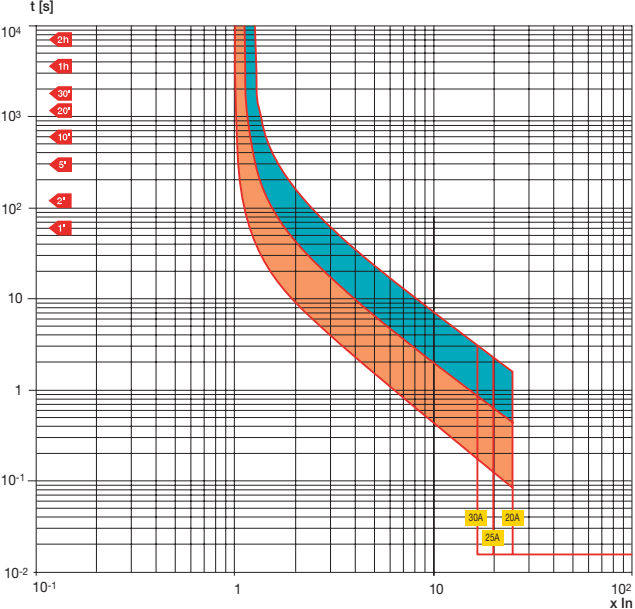
Ts3 150 – TMF

In = 15 A



Ts3 150 – TMF

In = 20 - 30 A

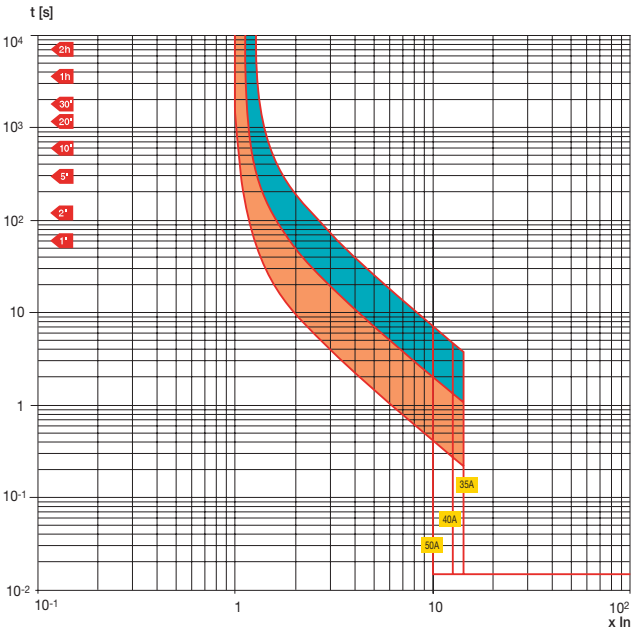


Curves and technical information

Molded Case Circuit Breakers

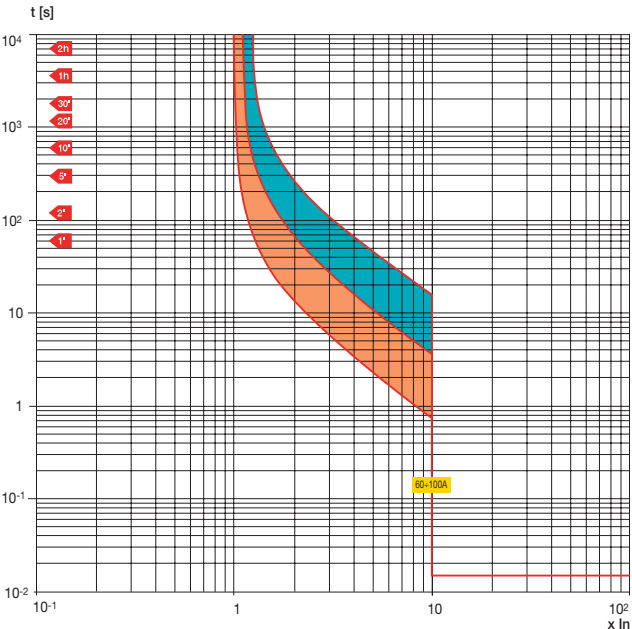
Ts3 150 – TMF

In = 35 - 50 A



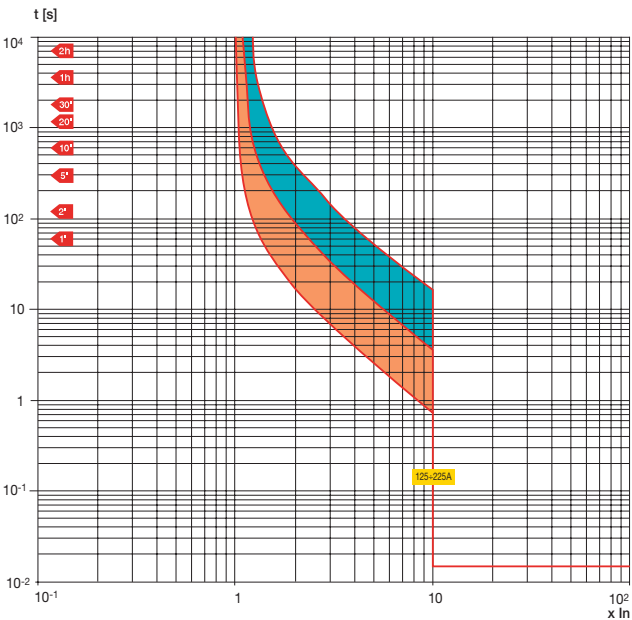
Ts3 150 – TMF

In = 60 - 100 A



Ts3 150 / Ts3 225 – TMF

In = 125 - 225 A

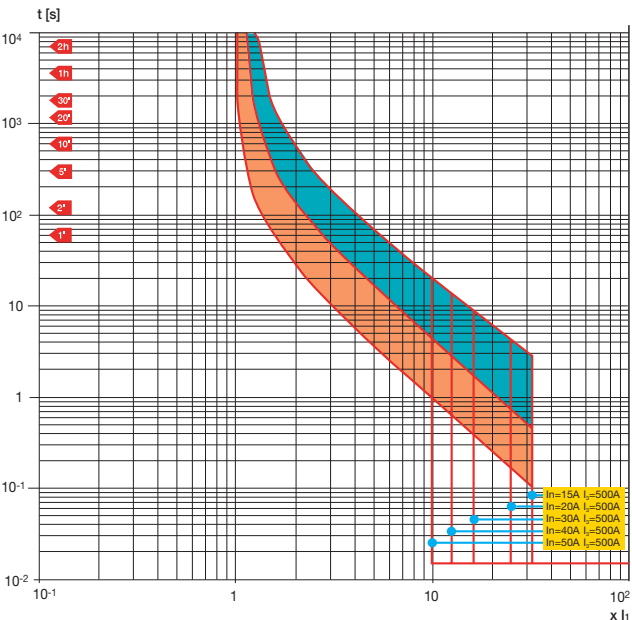


T4 250 – TMF/TMD

In = 20 - 50 A

In = 15 - 20 TMF

In = 30 - 50 TMD

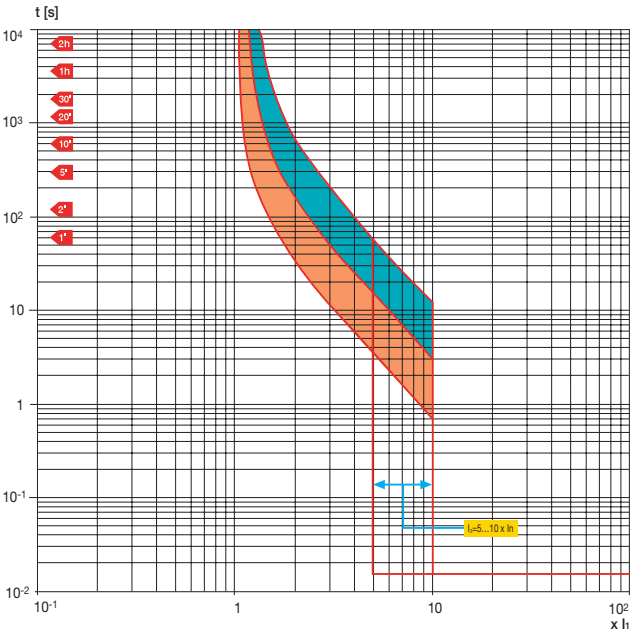


Curves and technical information

Molded Case Circuit Breakers

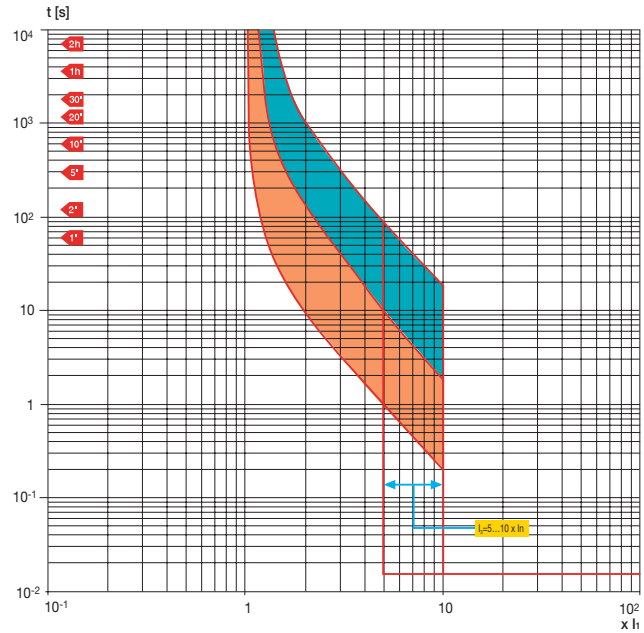
T4 250 – TMA

In = 80 - 250 A



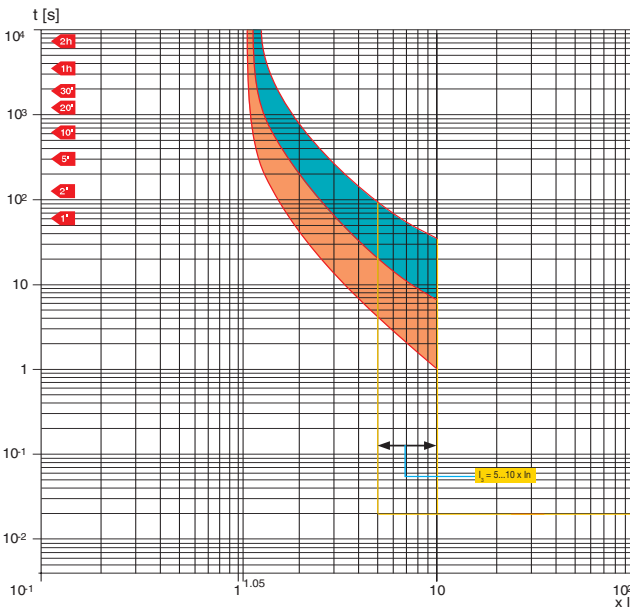
T5 400 – TMA

In = 300 - 400 A



T6 800 – TMA

In = 800 A



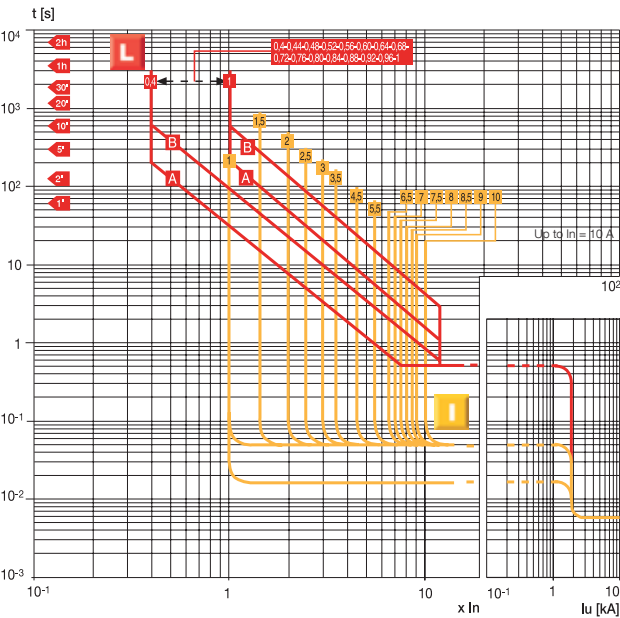
Curves and technical information

Molded Case Circuit Breakers

Trip curves for power distribution
Circuit breakers with thermal magnetic trip units

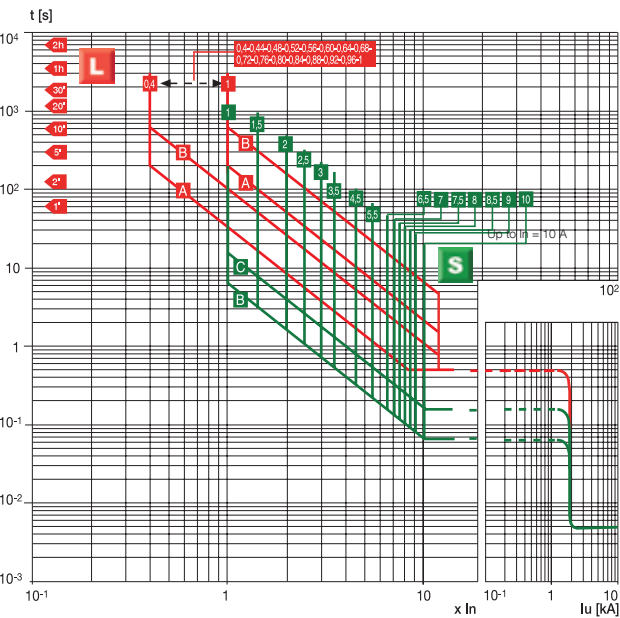
T2 100 – PR221DS-LS

L-I Functions



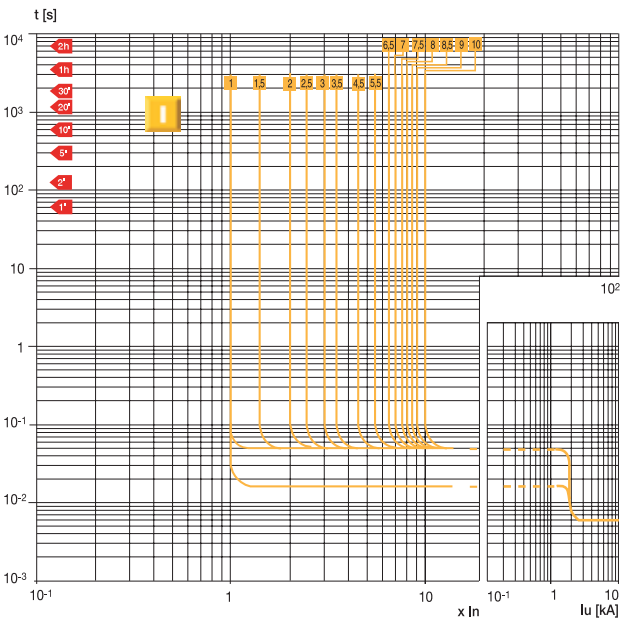
T2 100 – PR221DS-LS

L-S Functions



T2 100 – PR221DS-I

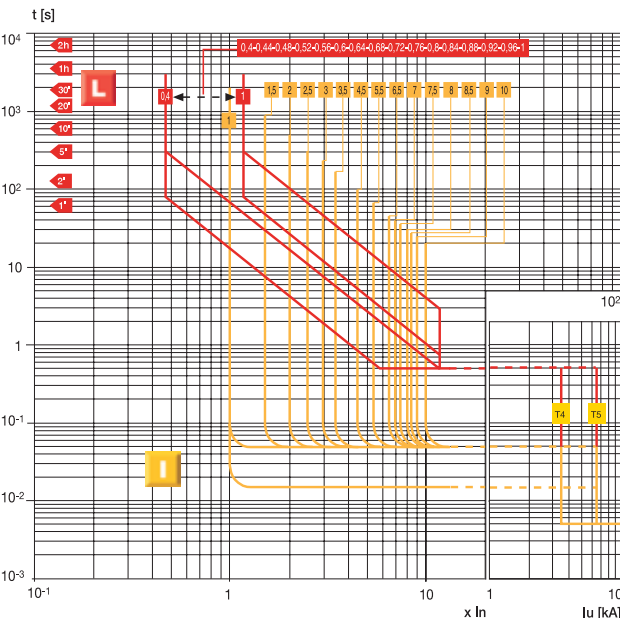
I Function



T4 250 / T5 400/600 – PR221DS

L-I Functions

Note: For T5 In = 600 A - I_gmax = 9.5 x In



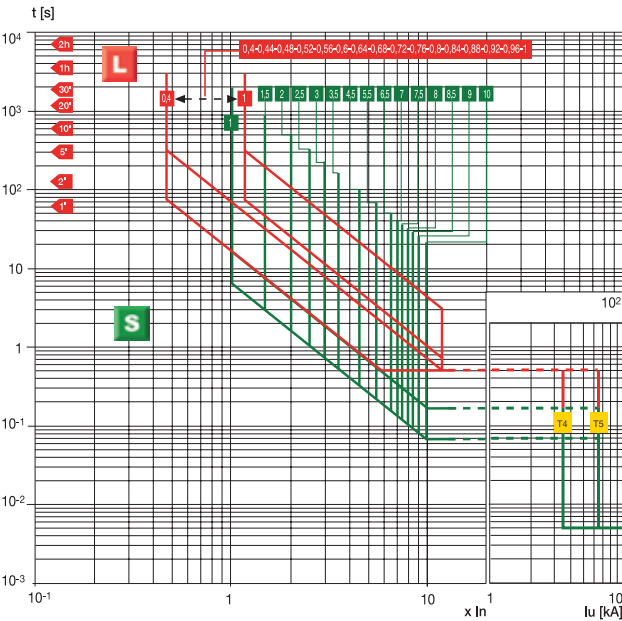
Curves and technical information

Molded Case Circuit Breakers

T4 250 / T5 400/600 – PR221DS

L-S Functions

Note: For T5 In = 600 A - $I_{2max} = 9.5 \times I_n$

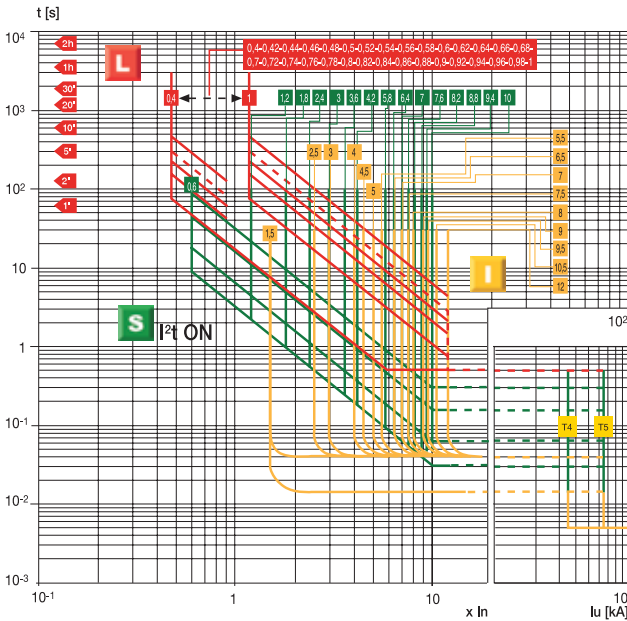


T4 250 / T5 400/600

PR222DS/P and PR222DS/PD-A

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

Note: For T5 In = 600 A - $I_{2max} = 9.5 \times I_n$, $I_{3max} = 9.5 \times I_n$

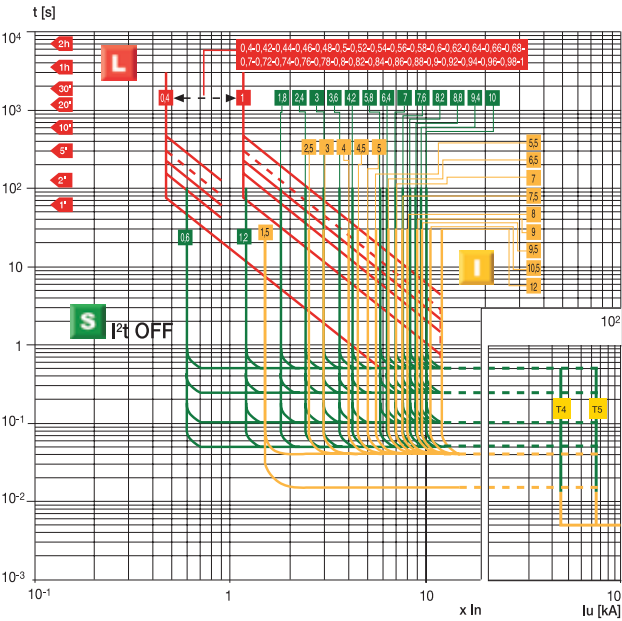


T4 250 / T5 400/600

PR222DS/P and PR222DS/PD-A

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

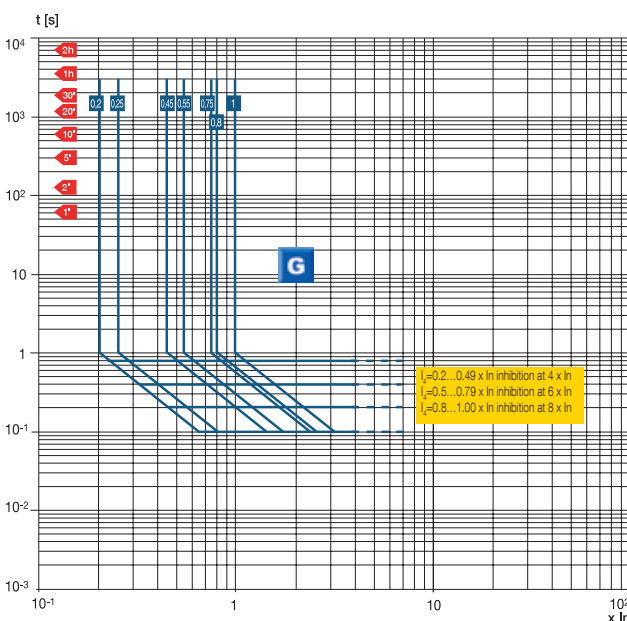
Note: For T5 In = 600 A - $I_{2max} = 9.5 \times I_n$, $I_{3max} = 9.5 \times I_n$



T4 250 / T5 400/600

PR222DS/P and PR222DS/PD-A

G Function

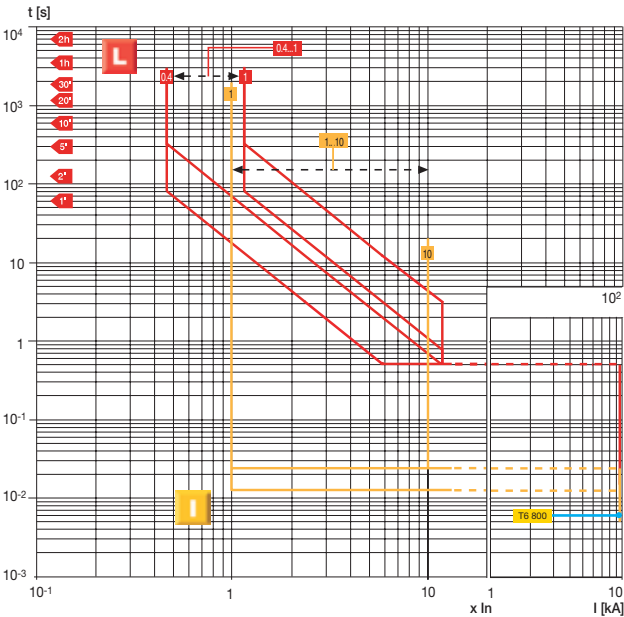


Curves and technical information

Molded Case Circuit Breakers

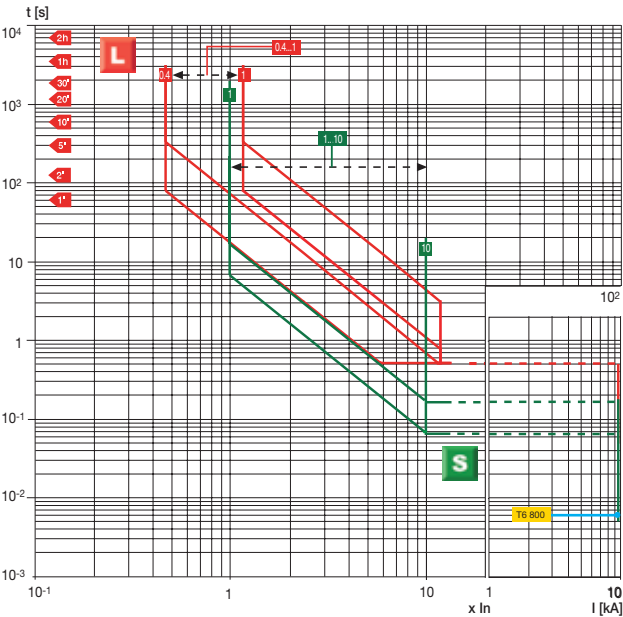
T6 800 – PR221DS

L-I Functions



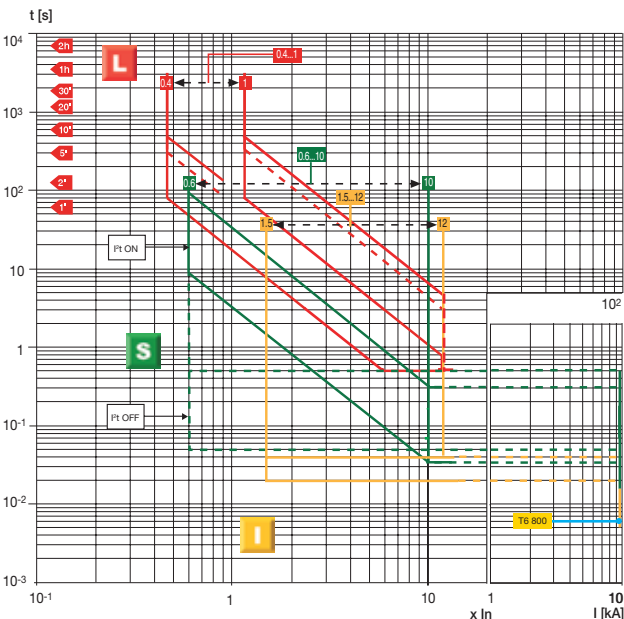
T6 800 – PR221DS

L-S Functions



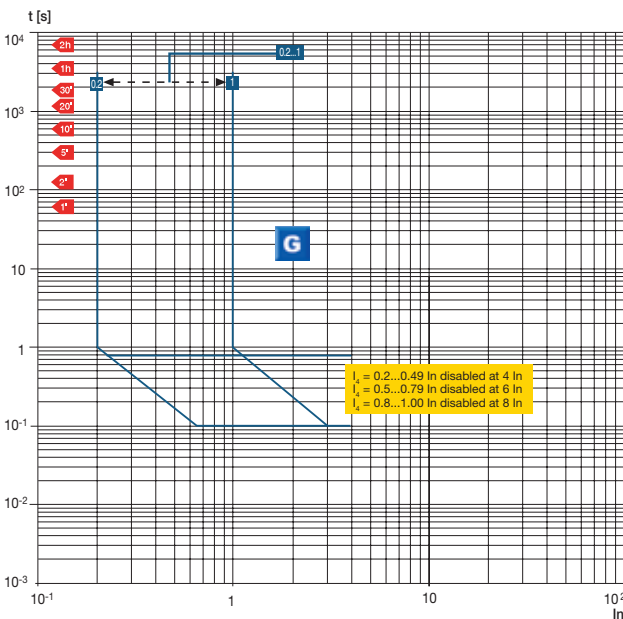
T6 800 – PR222DS and PR222DS/PD-A

L-S-I Functions



T6 800 – PR222DS and PR222DS/PD-A

G Function

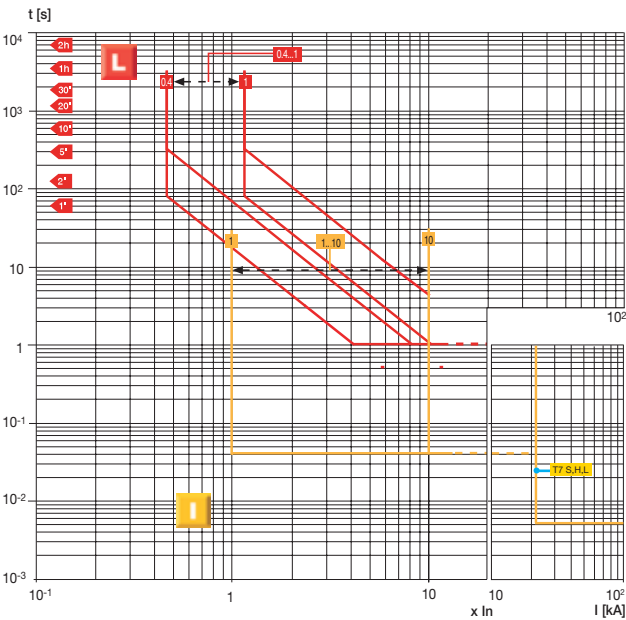


Curves and technical information

Molded Case Circuit Breakers

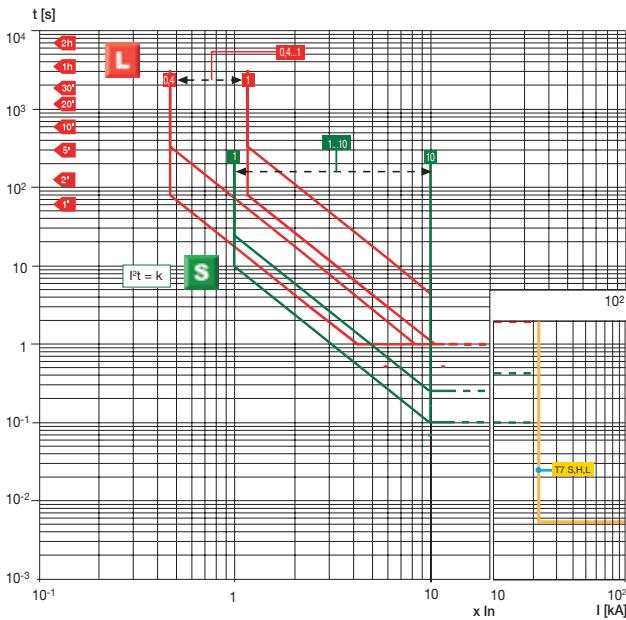
T7 1000/1200 – PR231/P

L-I Functions



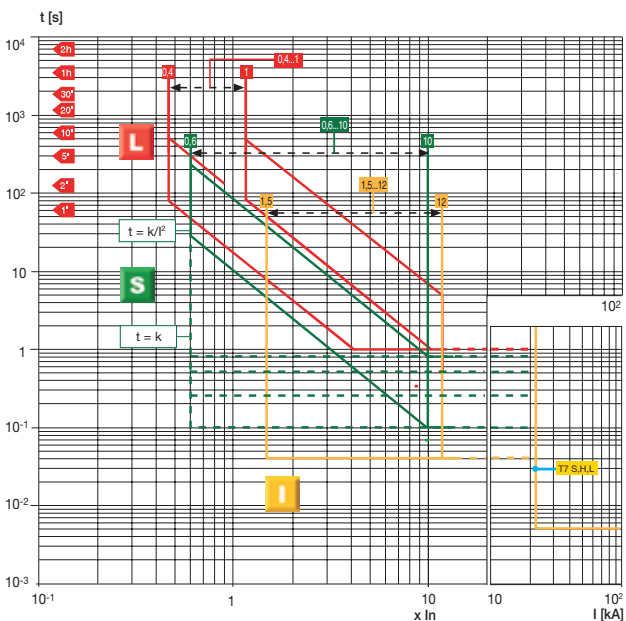
T7 1000/1200 – PR231/P

L-S Functions



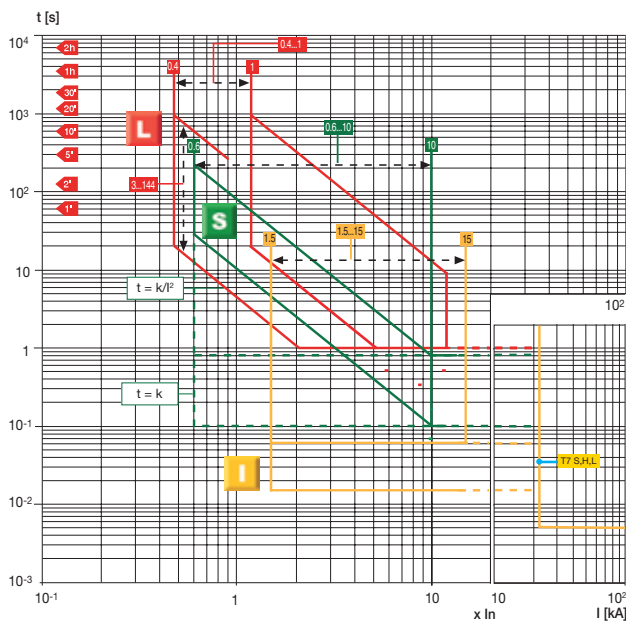
T7 1000/1200 – PR232/P

L-S-I Functions



T7 1000/1200 – PR331/P

L-S-I Functions

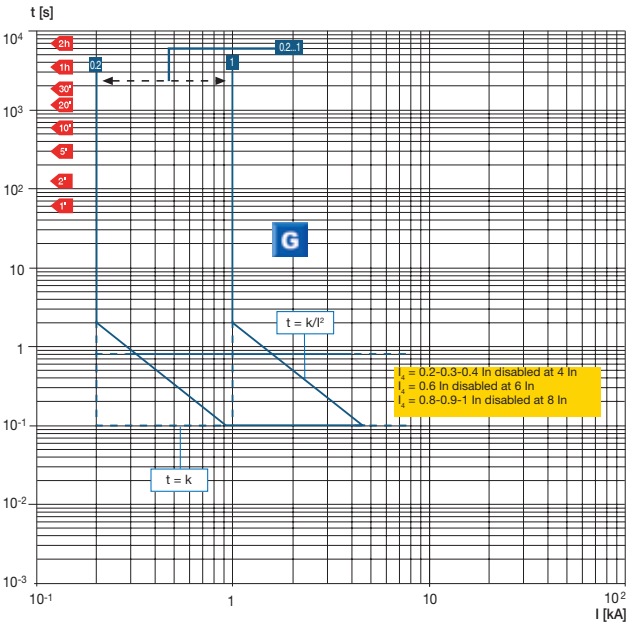


Curves and technical information

Molded Case Circuit Breakers

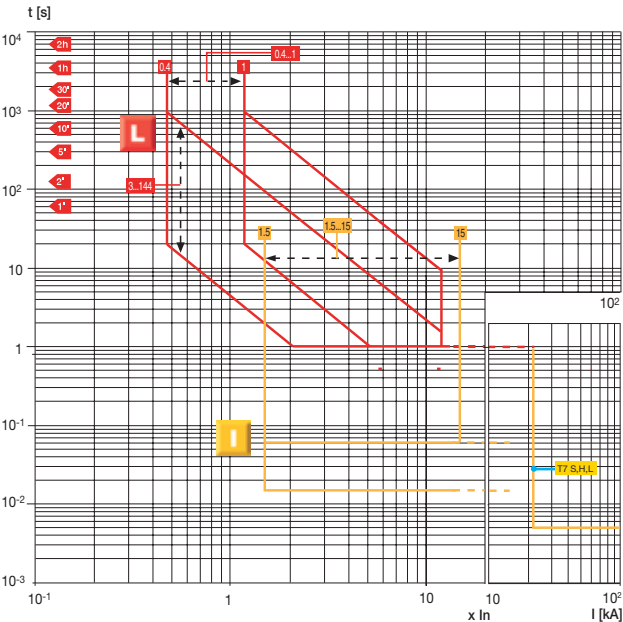
T7 1000/1200 – PR331/P

G Function



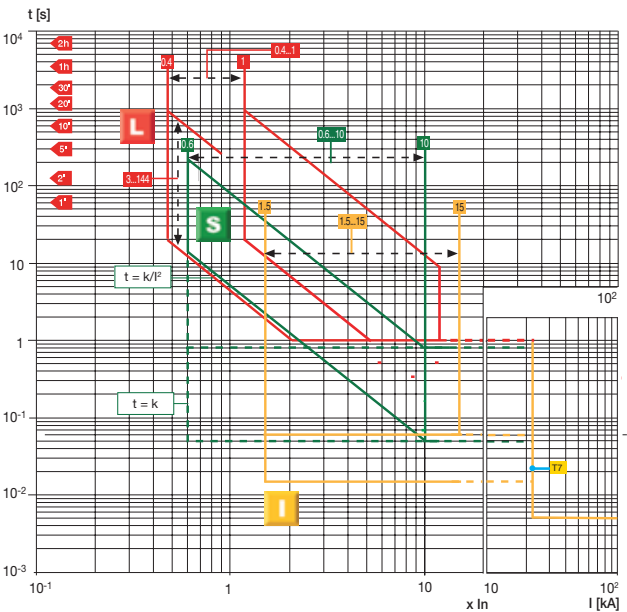
T7 1000/1200 – PR332/P

L-I Functions



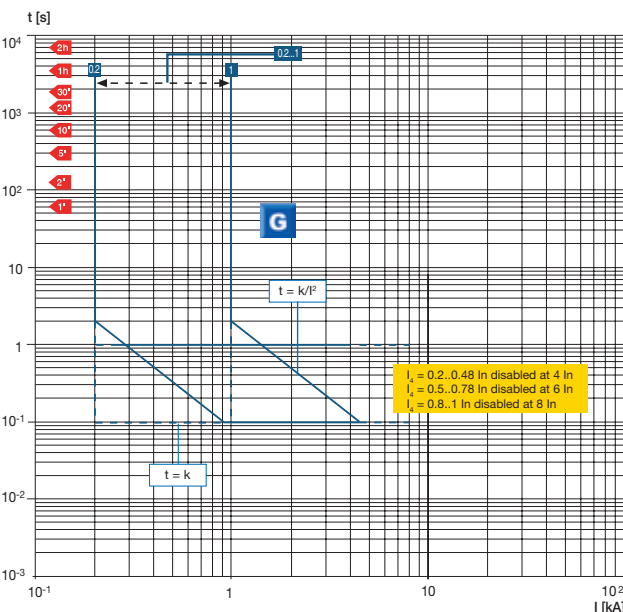
T7 1000/1200 – PR332/P

L-S-I Functions



T7 1000/1200 – PR332/P

G Function

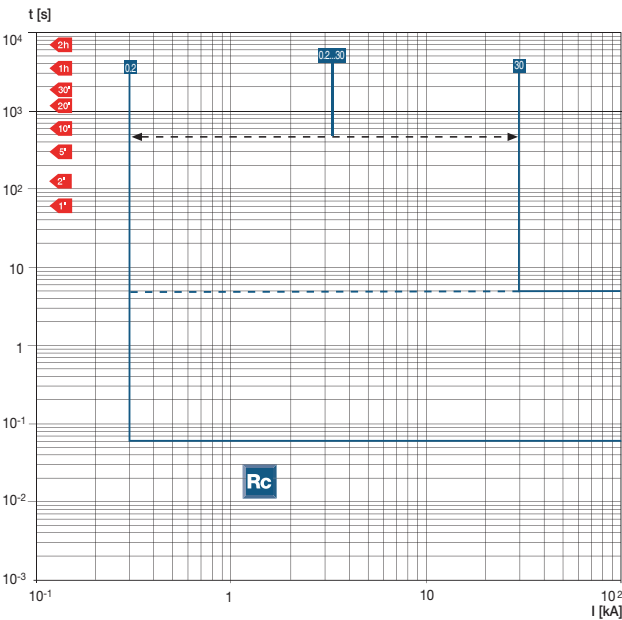


Curves and technical information

Molded Case Circuit Breakers

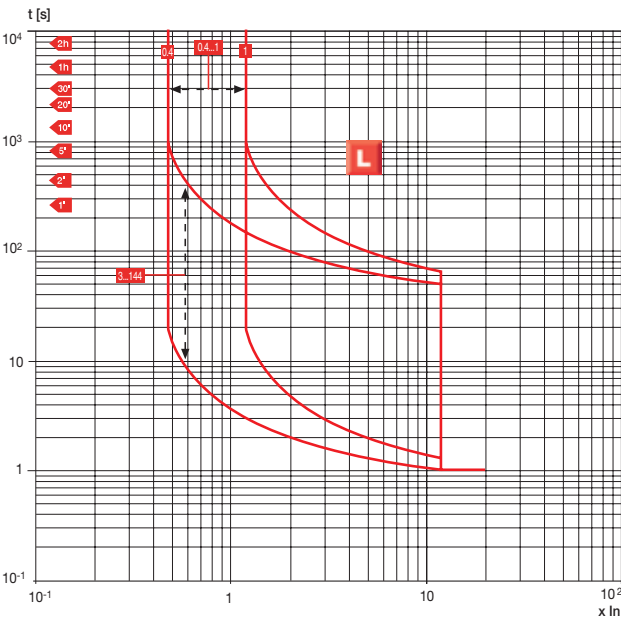
T7 1000/1200 – PR332/P

Rc Function



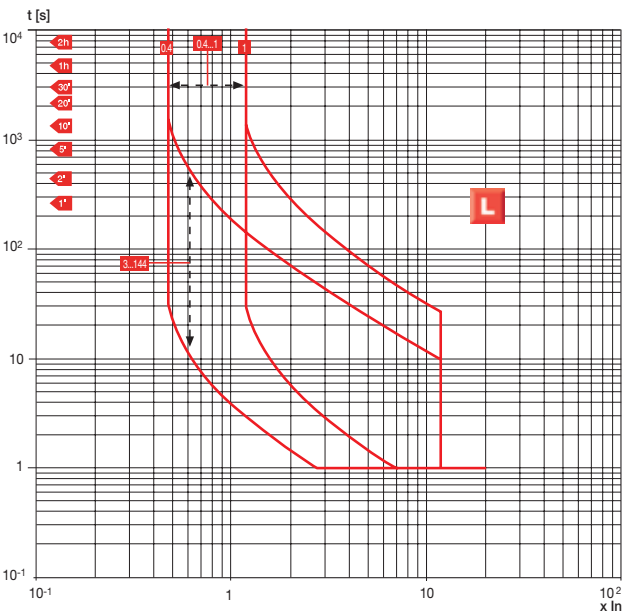
T7 1000/1200 – PR332/P

L Function



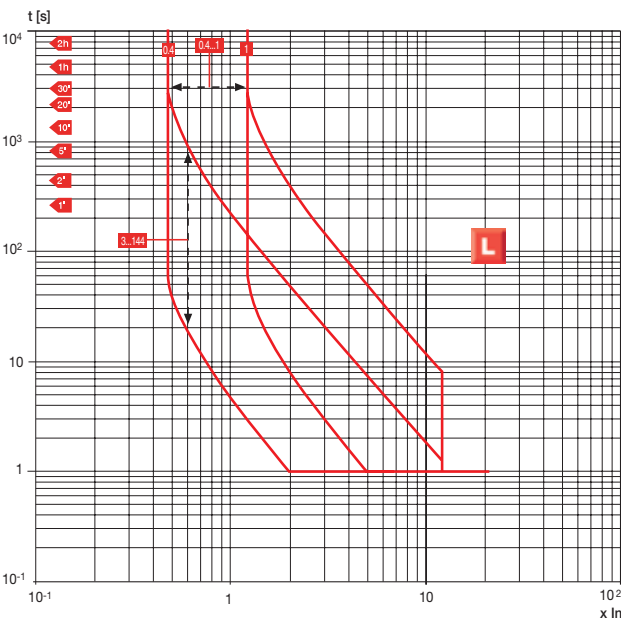
T7 1000/1200 – PR332/P

L Function



T7 1000/1200 – PR332/P

L Function

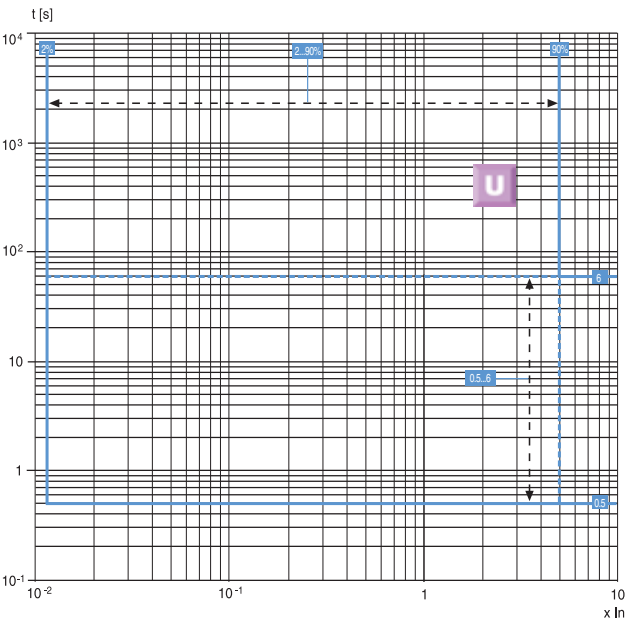


Curves and technical information

Molded Case Circuit Breakers

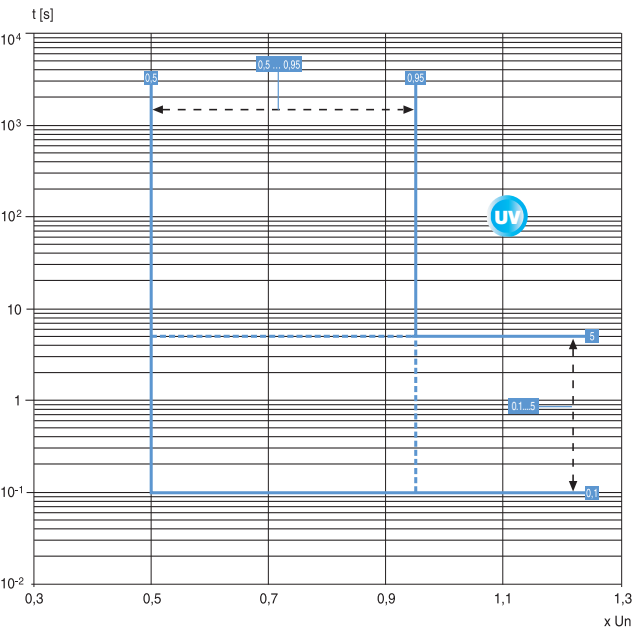
T7 1000/1200 – PR332/P

U Function



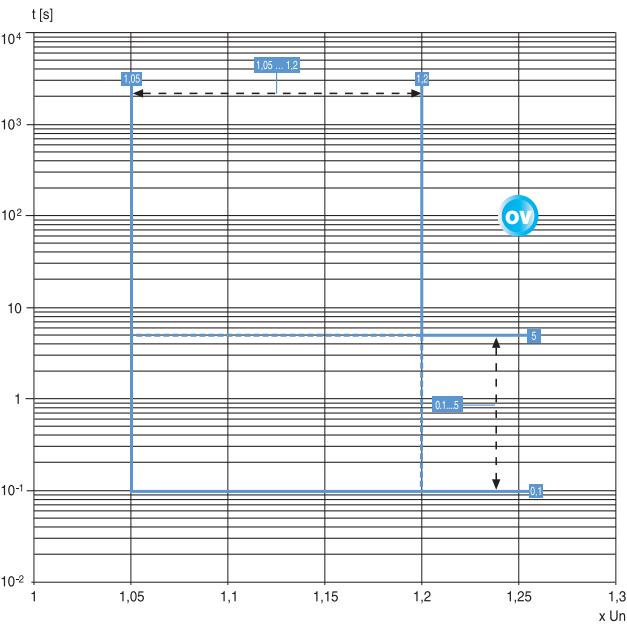
T7 1000/1200 – PR332/P with PR330/V

UV Function



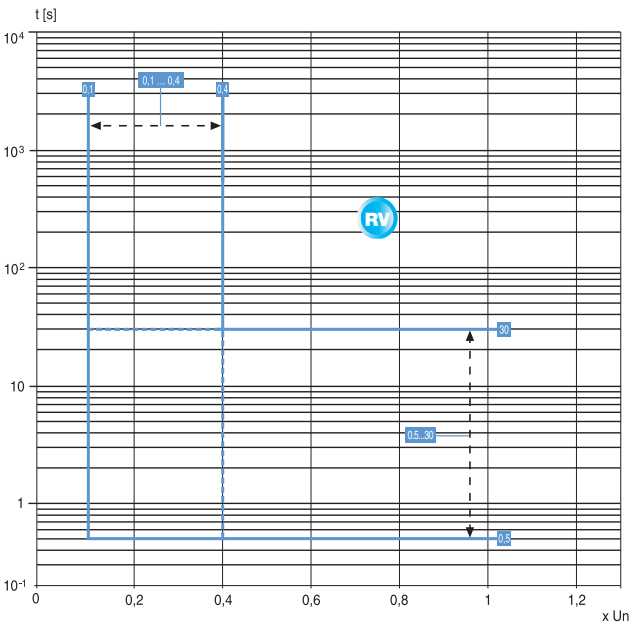
T7 1000/1200 – PR332/P with PR330/V

OV Function



T7 1000/1200 – PR332/P with PR330/V

RV Function

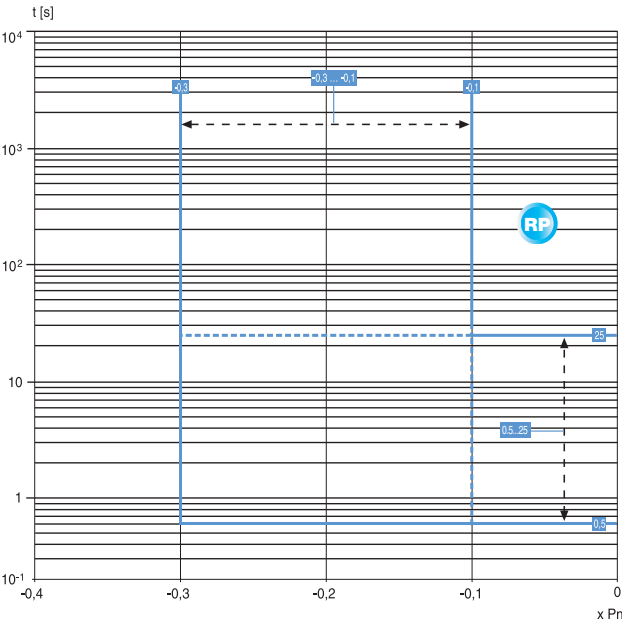


Curves and technical information

Molded Case Circuit Breakers

T7 1000/1200 – PR332/P with PR330/V

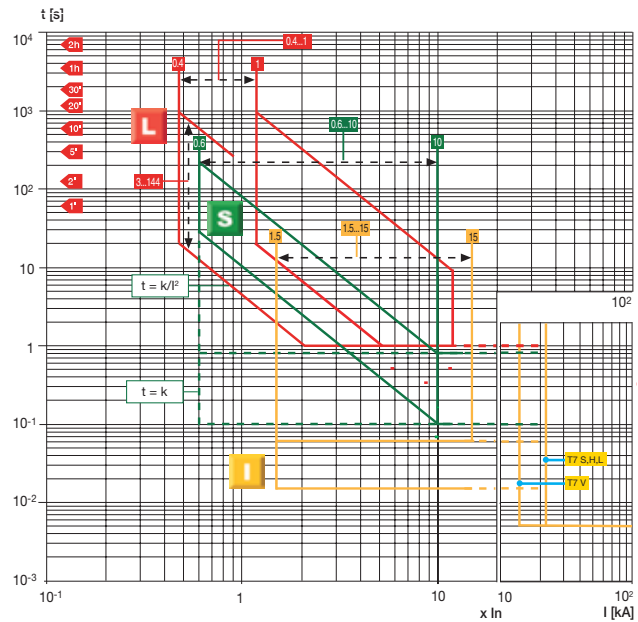
RP Function



T8 1600/2000/2500/3000 – PR331/P

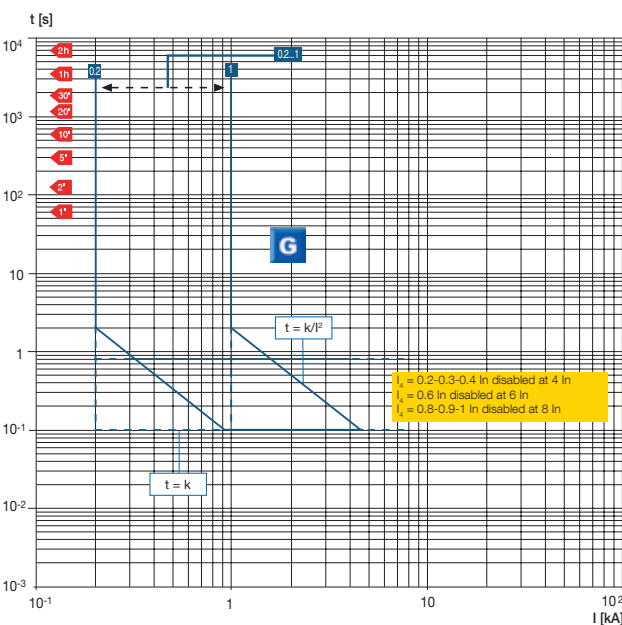
Functions L-S-I

Note: For T8 $I_n = 3000$ A - $I_{gmax} = 12 \times I_n$



T8 1600/2000/2500/3000 – PR331/P

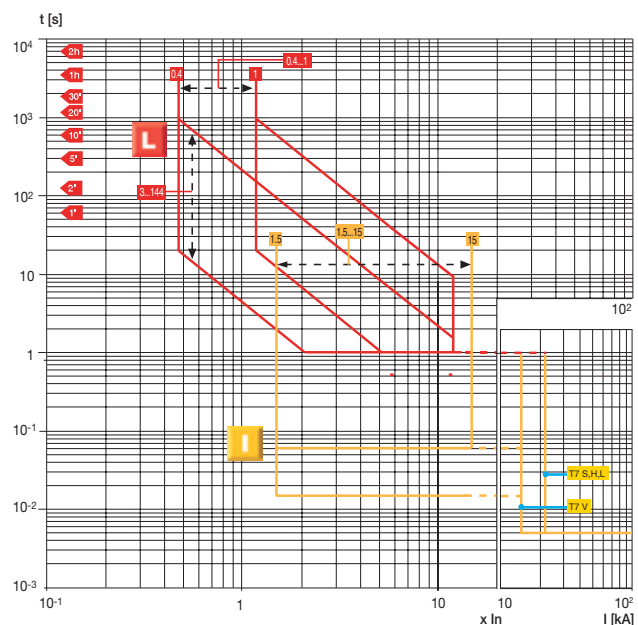
Function G



T8 1600/2000/2500/3000 – PR332/P

L-I Functions

Note: For T8 $I_n = 3000$ A - $I_{gmax} = 12 \times I_n$



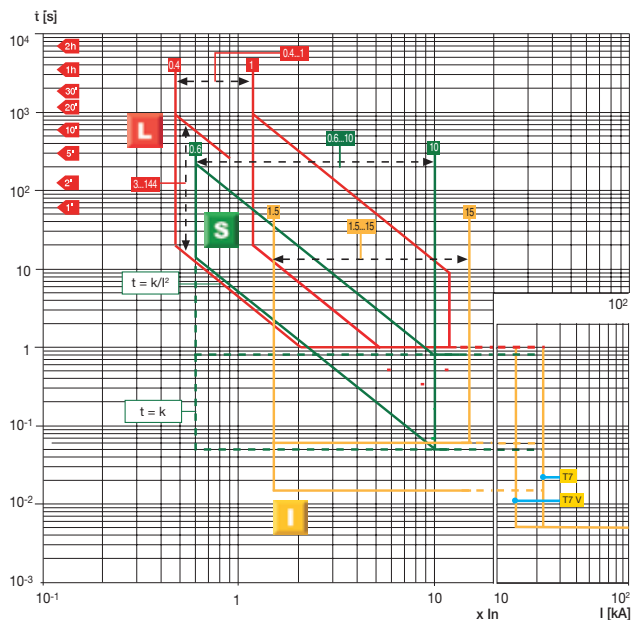
Curves and technical information

Molded Case Circuit Breakers

T8 1600/2000/2500/3000 – PR332/P

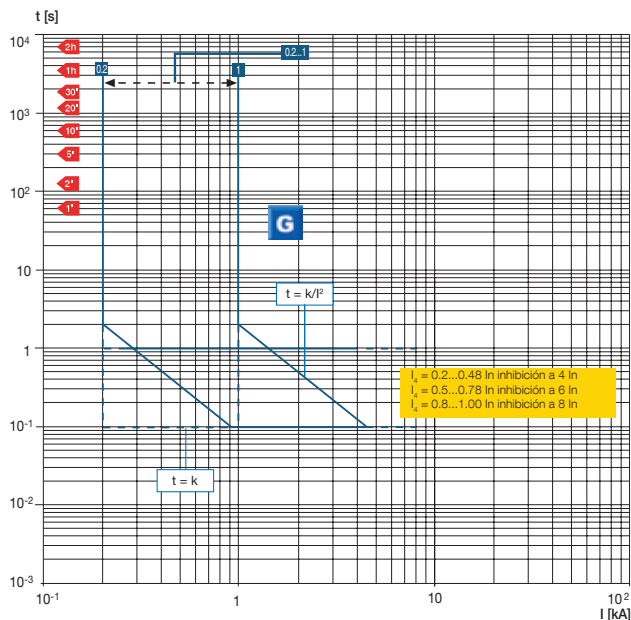
L-S-I Functions

Note: For T8 $I_n = 3000 \text{ A}$ - $I_{3\text{max}} = 12 \times I_n$



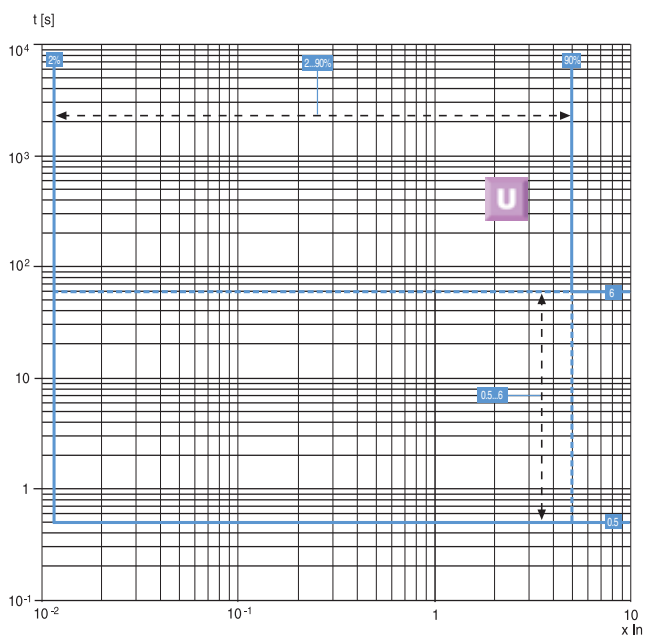
T8 1600/2000/2500/3000 – PR332/P

G Function



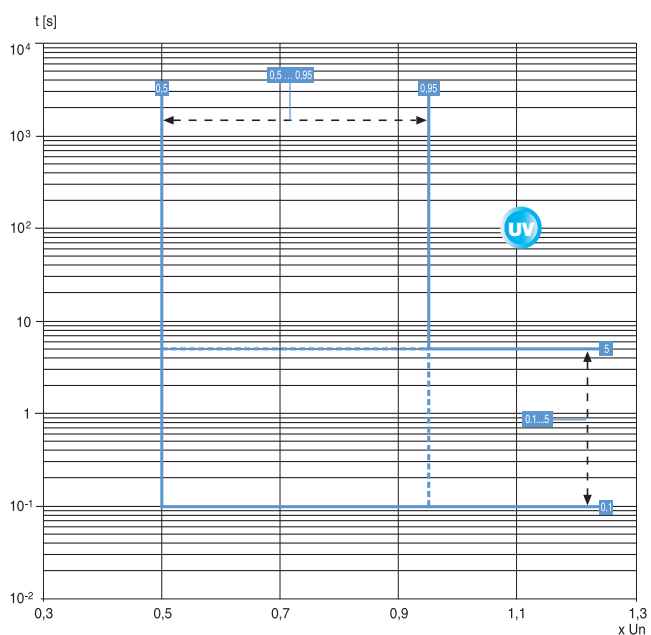
T8 1600/2000/2500/3000 – PR332/P

U Function



T8 1600/2000/2500/3000 PR332/P + PR330/V

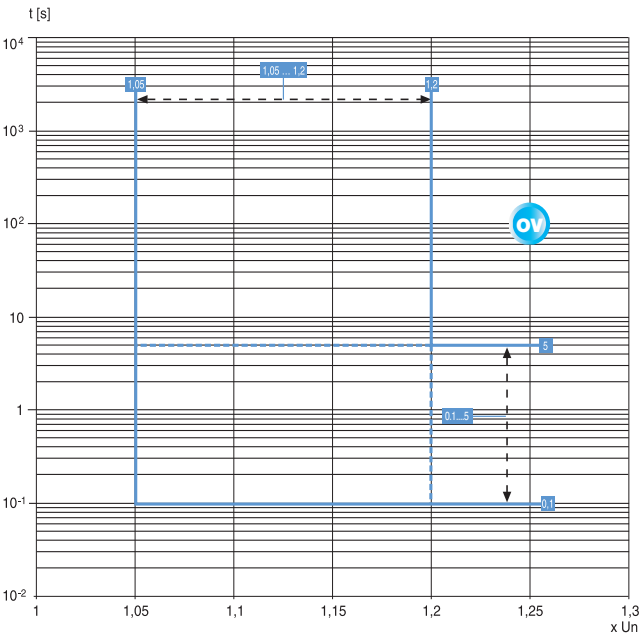
UV Function



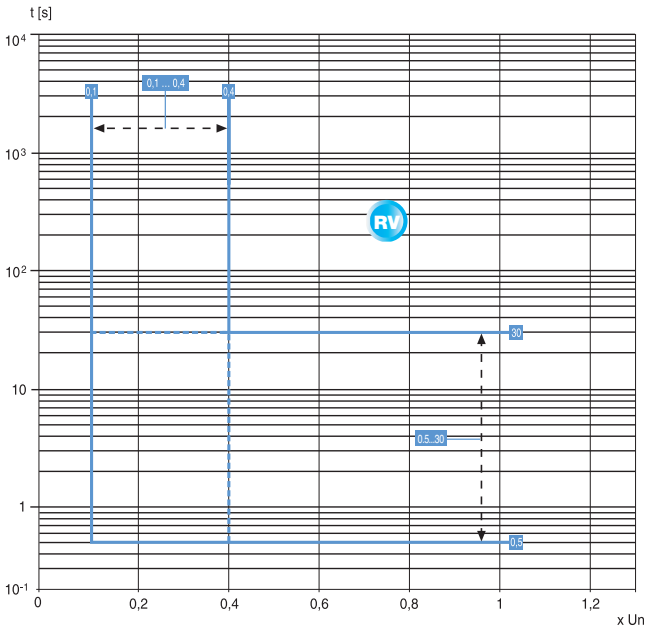
Curves and technical information

Molded Case Circuit Breakers

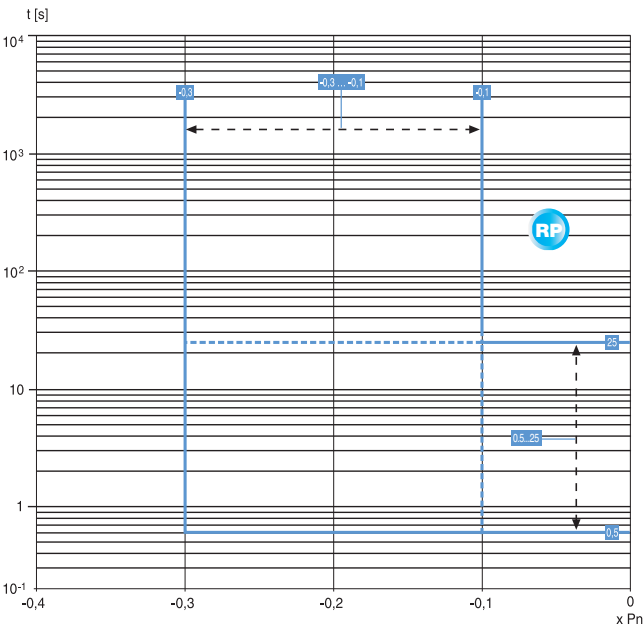
T8 1600/2000/2500/3000 PR332/P + PR330/V
OV Function



T8 1600/2000/2500/3000 PR332/P + PR330/V
RV Function



T8 1600/2000/2500/3000 PR332/P + PR330/V
RP Function



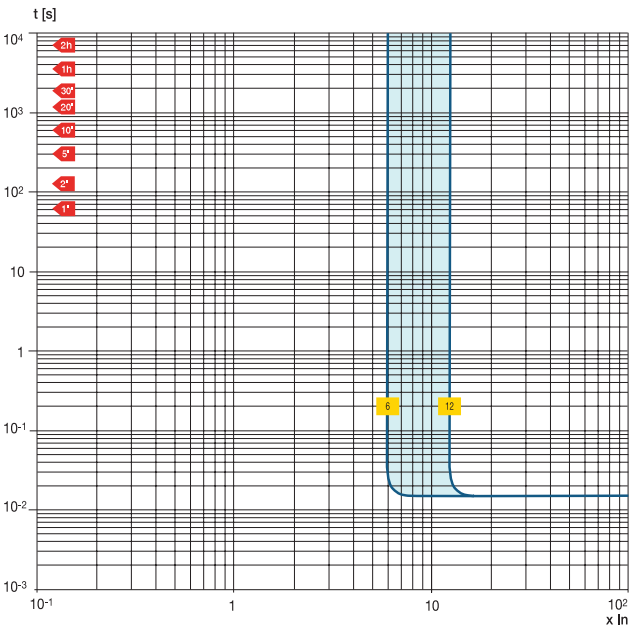
Curves and technical information

Molded Case Circuit Breakers

Trip curves for motor protection (MCP)
Circuit breakers with magnetic only trip units

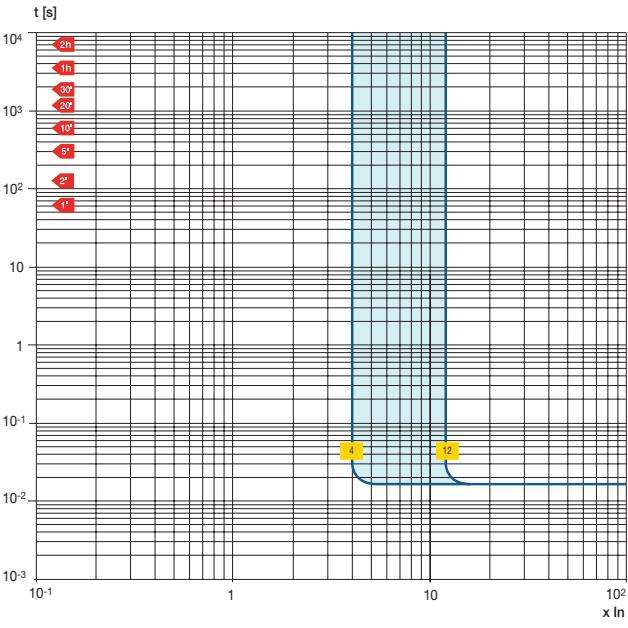
T2-T3 100 MCP

Adjustable magnetic only trip unit $I_3 = 6 \dots 12 \times I_n$



Ts3 150

Adjustable magnetic only trip unit $I_3 = 4 \dots 12 \times I_n$



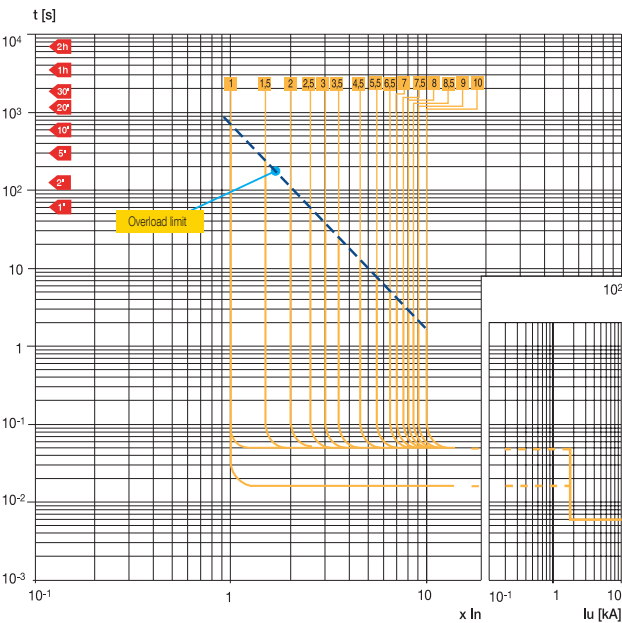
Curves and technical information

Molded Case Circuit Breakers

Trip curves for motor protection (MCP)
Circuit breakers with electronic trip units

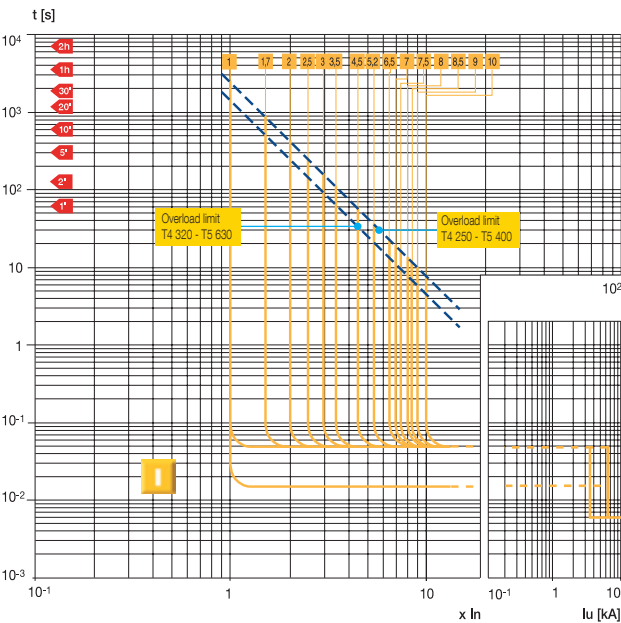
T2 100 – PR221DS-I

I Function



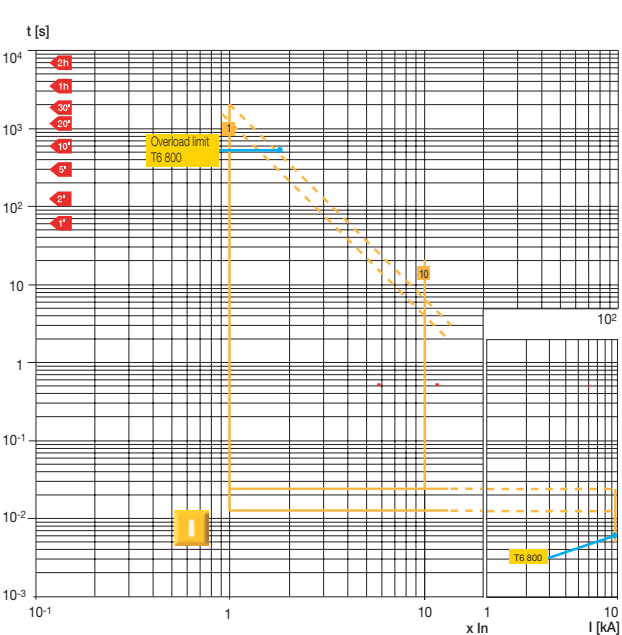
T4 250 / T5 400/600 – PR221DS-I

I Function



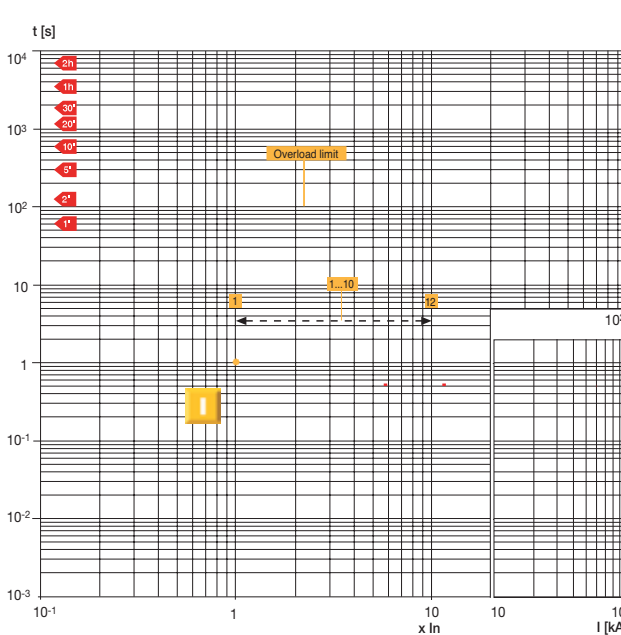
T6 800 – PR221DS-I

I Function



T7 1000/1200 – PR231/P-I

I Function

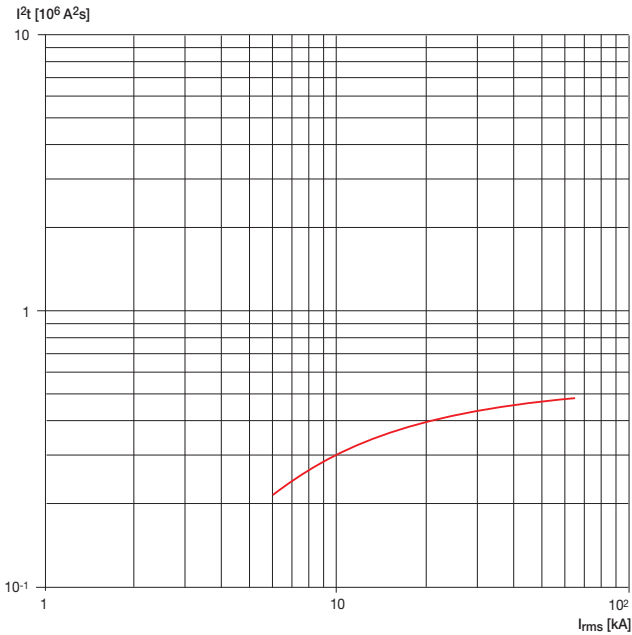


Curves and technical information

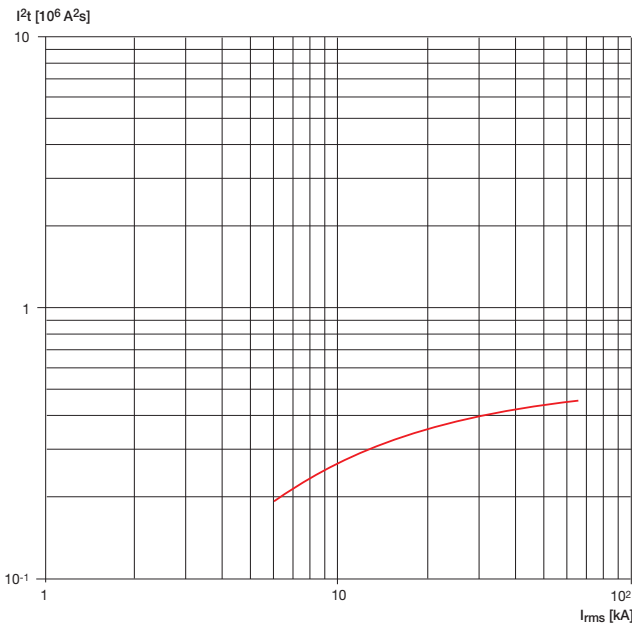
Molded Case Circuit Breakers

Specific let-through energy curves
(current limiting circuit breakers and T8)

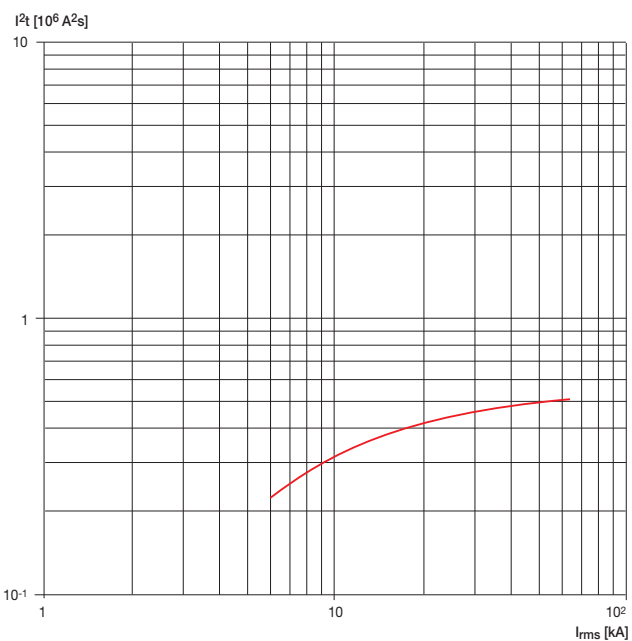
T2H PR221 100A
480 V



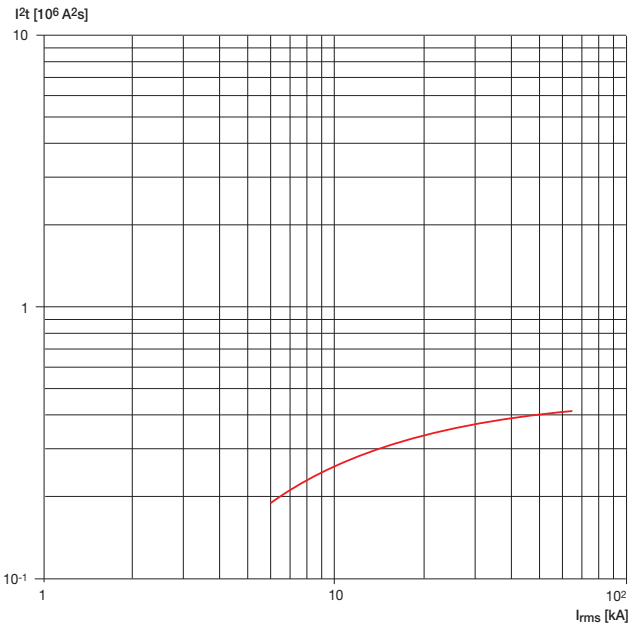
T2H TM 50A
480 V



T2H TM 100A
480 V



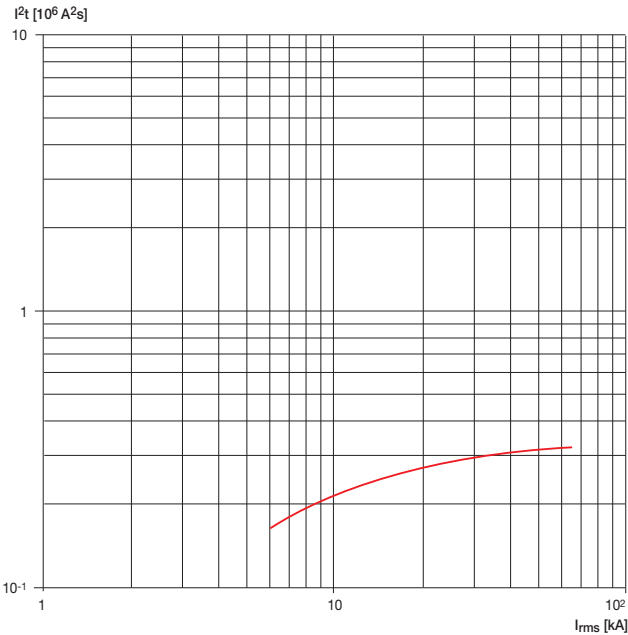
T2H TM 30A
480 V



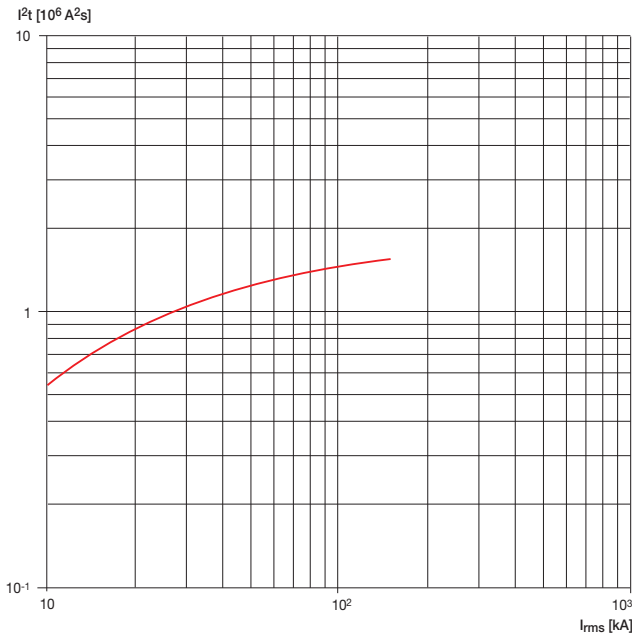
Curves and technical information

Molded Case Circuit Breakers

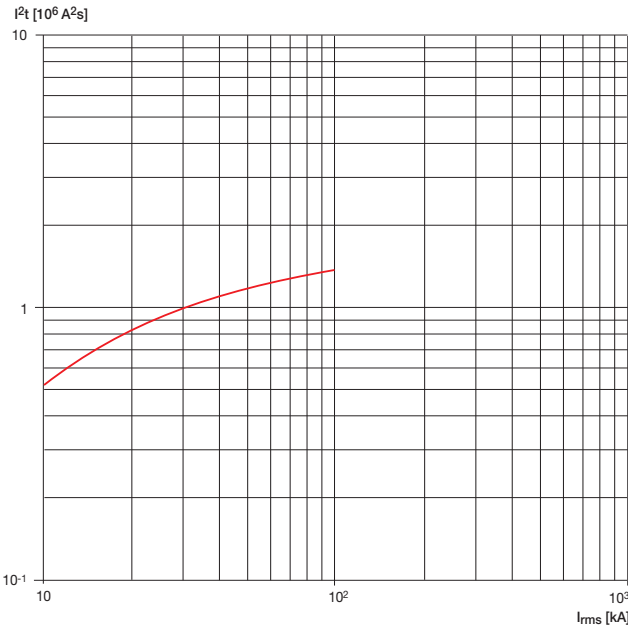
T2H TM 15A
480 V



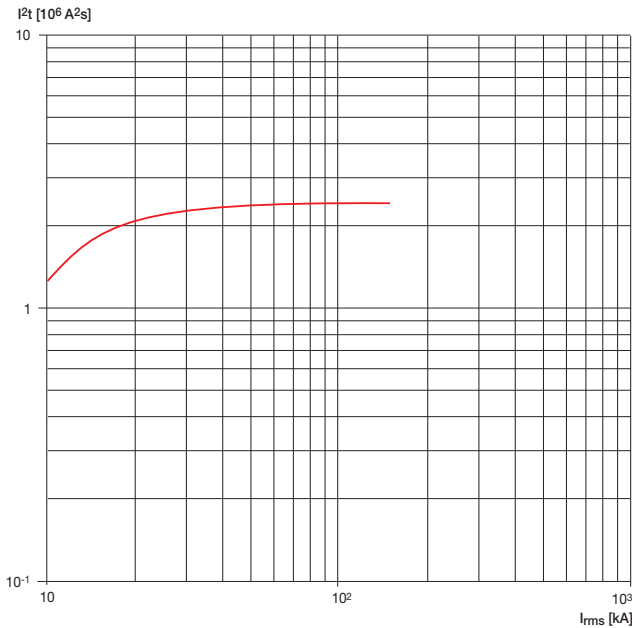
T4H/V
480 V



T4H/V
600 V



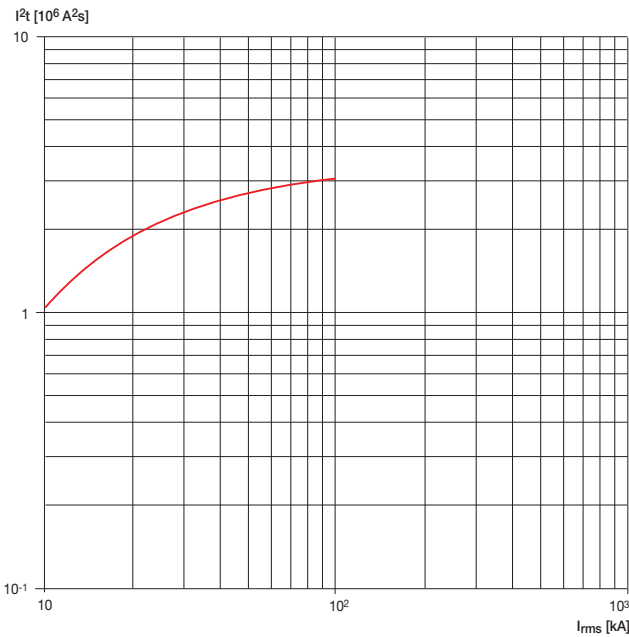
T5H/V 400
480 V



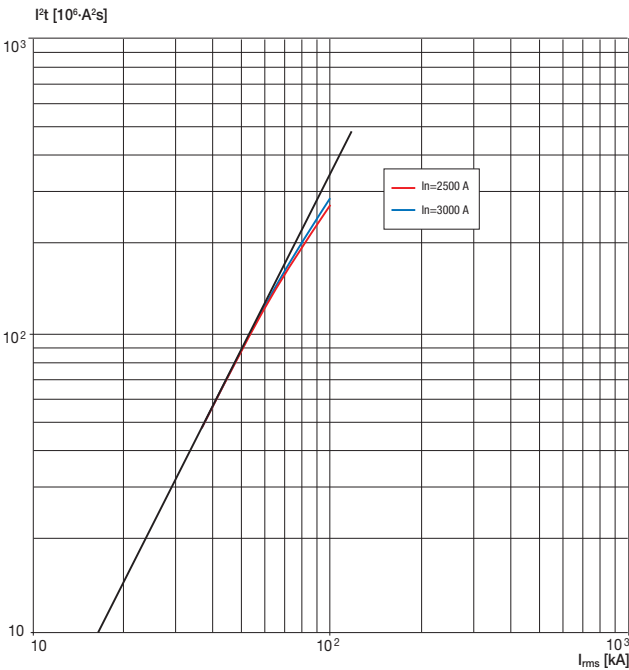
Curves and technical information

Molded Case Circuit Breakers

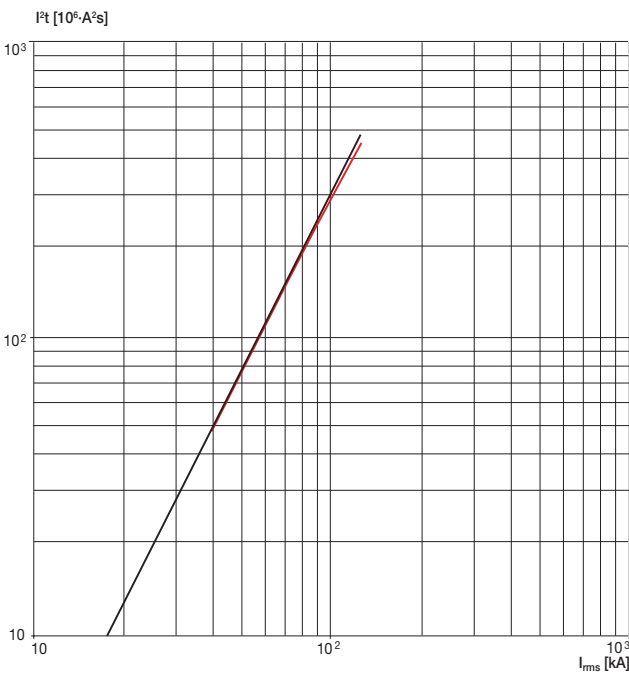
T5H/V 400
600 V



T8
600 V



T8
480 V

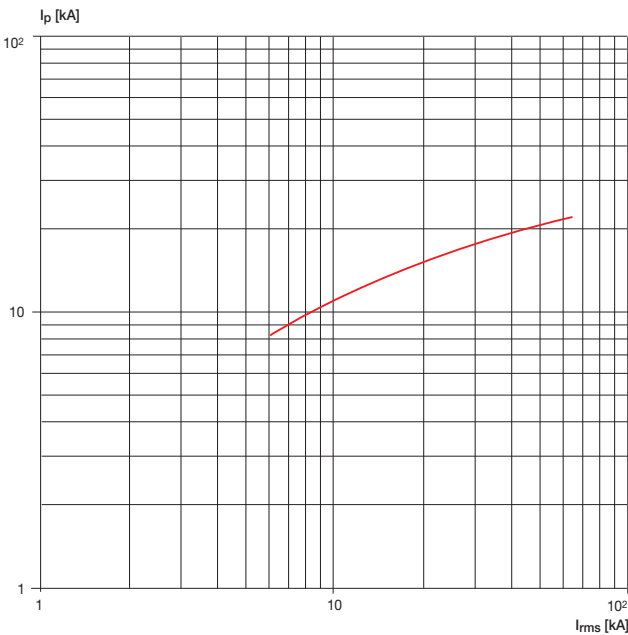


Curves and technical information

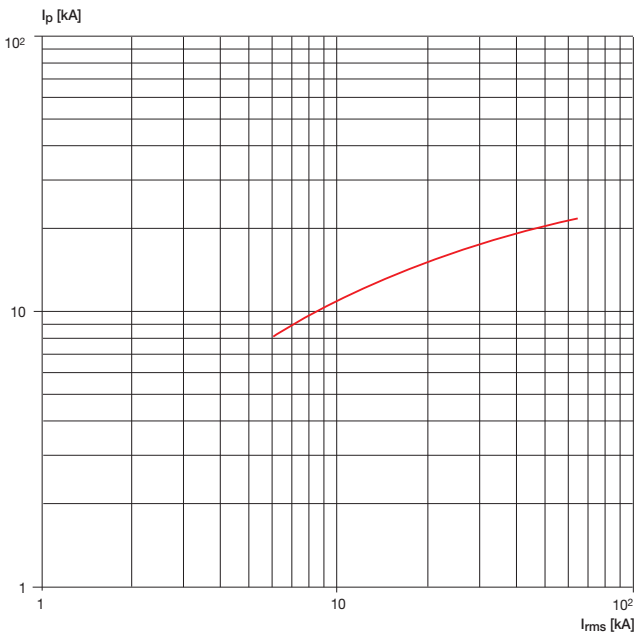
Molded Case Circuit Breakers

Limitation curves
(current limiting circuit breakers and T8)

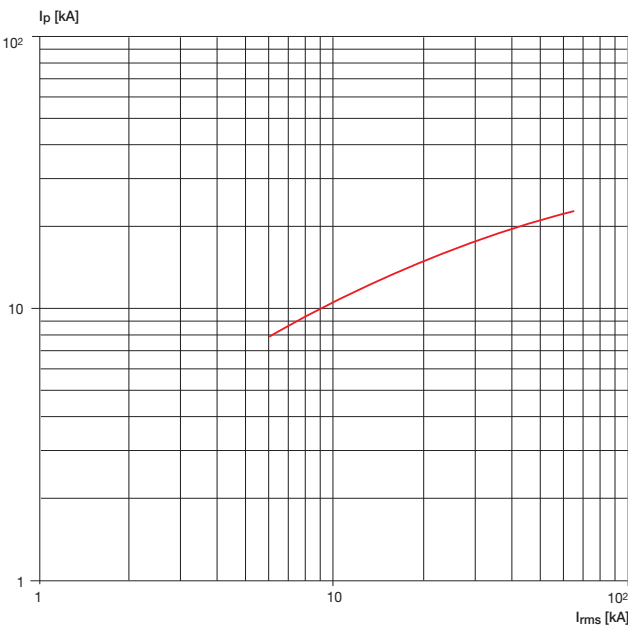
T2H PR221 100A
480 V



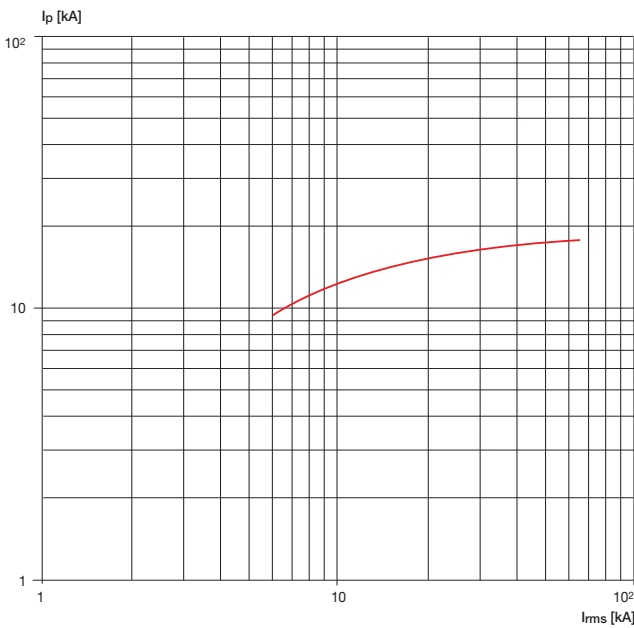
T2H TM 100A
480 V



T2H TM 50A
480 V



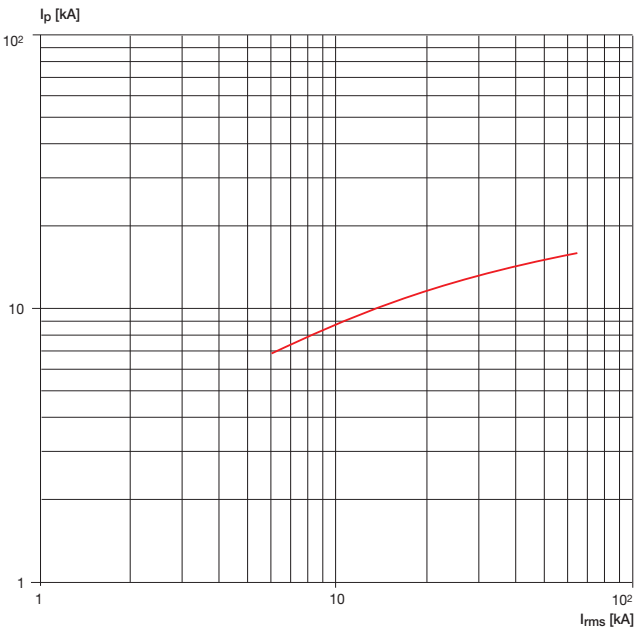
T2H TM 30A
480 V



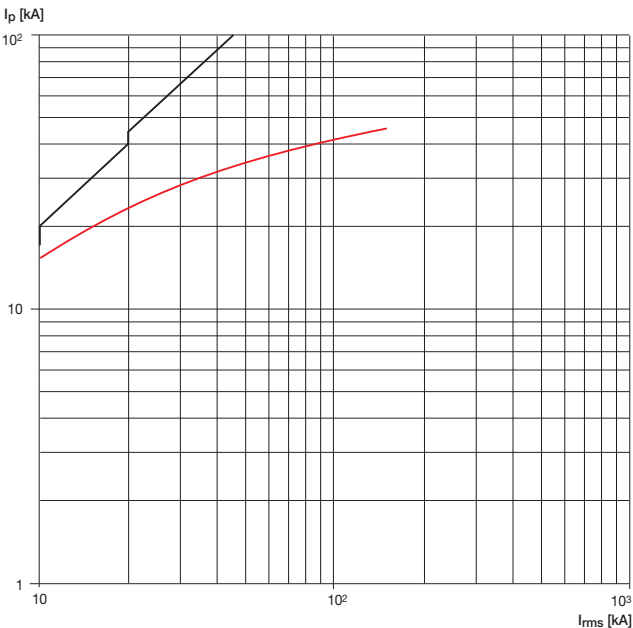
Curves and technical information

Molded Case Circuit Breakers

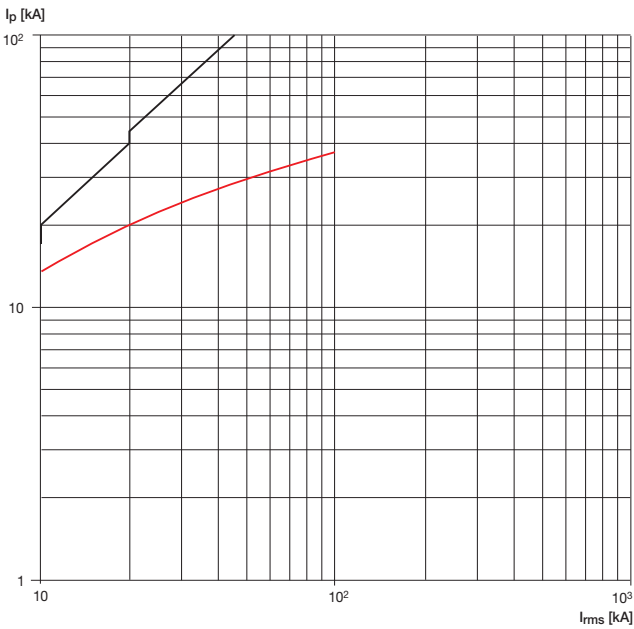
T2H TM 15A
480 V



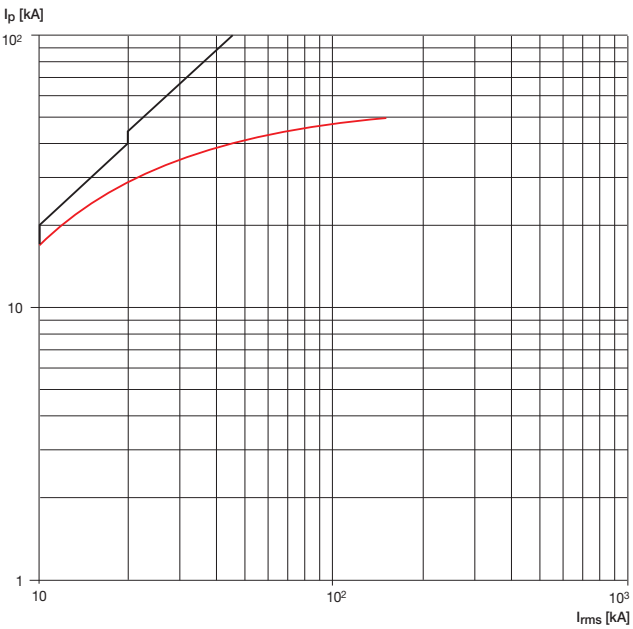
T4H/V
480 V



T4H/V
600 V



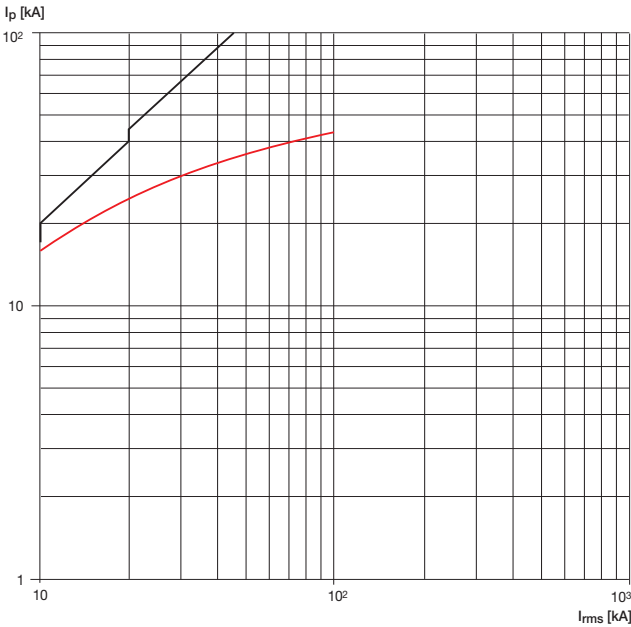
T5H/V 400
480 V



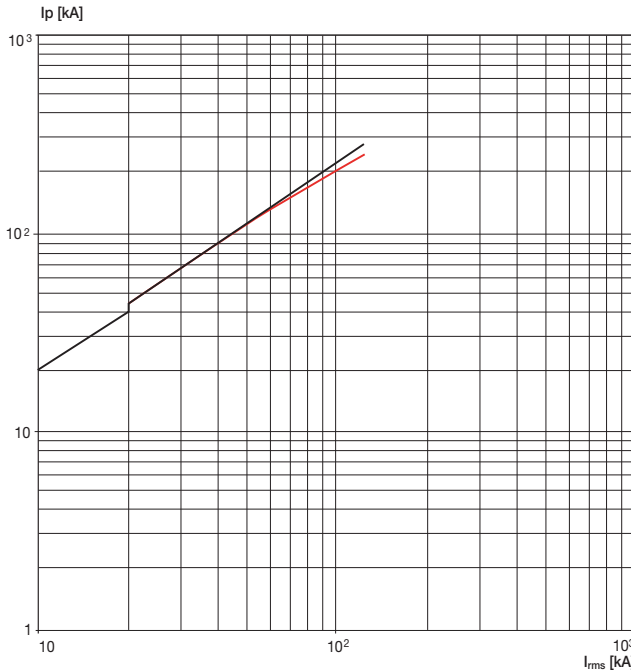
Curves and technical information

Molded Case Circuit Breakers

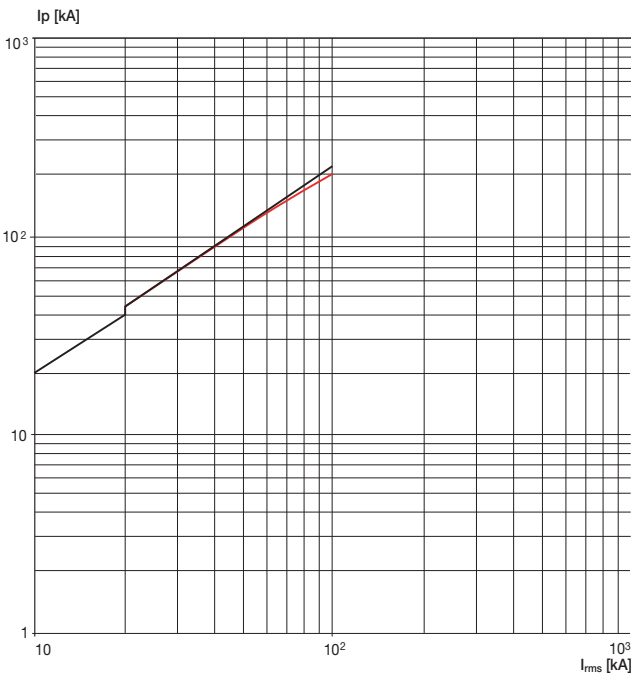
T5H/V 400
600 V



T8
480 V



T8
600 V



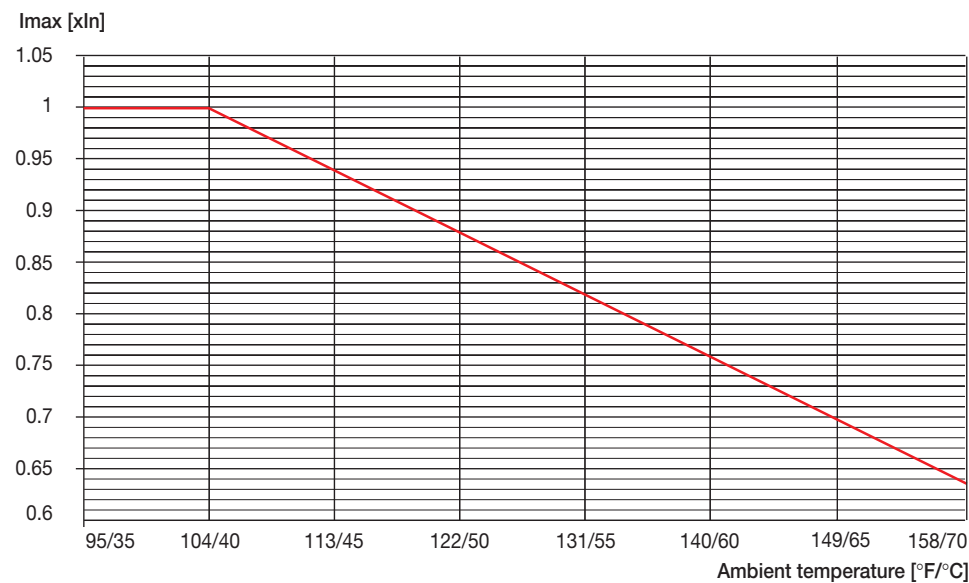
Curves and technical information

Molded Case Circuit Breakers

Temperatre performances

Circuit breakers with electronic trip units

PR221DS
PR222DS/P
PR231/P
PR232/P
PR331/P
PR332/P



Curves and technical information

Molded Case Circuit Breakers

Temperatre performances

Circuit breakers with thermal magnetic trip units

4

Tmax T1 and T1 1P						
In [A]	50 °F / 10 °C	68 °F / 20 °C	86 °F / 30 °C	104 °F / 40 °C	122 °F / 50 °C	140 °F / 60 °C
15	18	17	16	15	14	13
20	24	22	21	20	19	17
25	29	28	27	25	23	22
30	35	34	32	30	28	26
40	47	45	43	40	37	34
50	60	57	53	50	46	42
60	71	68	64	60	56	51
70	83	79	75	70	65	60
80	94	90	85	80	75	69
90	106	101	96	90	84	78
100	121	114	107	100	92	84

Tmax T2						
In [A]	50 °F / 10 °C	68 °F / 20 °C	86 °F / 30 °C	104 °F / 40 °C	122 °F / 50 °C	140 °F / 60 °C
15	18	17	16	15	14	12
20	24	23	21	20	18	17
25	30	28	27	25	23	21
30	35	33	32	30	28	26
35	40	39	37	35	33	31
40	46	44	42	40	38	35
50	56	54	52	50	48	45
60	71	68	64	60	56	51
70	83	79	75	70	65	60
80	96	91	86	80	74	67
90	109	103	97	90	83	75
100	115	110	105	100	95	89

Tmax T3						
In [A]	50 °F / 10 °C	68 °F / 20 °C	86 °F / 30 °C	104 °F / 40 °C	122 °F / 50 °C	140 °F / 60 °C
60	70	67	64	60	56	52
70	82	78	74	70	66	61
80	92	88	84	80	75	71
90	104	100	95	90	85	79
100	117	112	106	100	94	87
125	145	139	132	125	118	110
150	175	167	159	150	141	131
175	205	195	185	175	164	152
200	236	224	213	200	187	172
225	264	251	239	225	211	195

Curves and technical information

Molded Case Circuit Breakers

Tmax Ts3 150						
In [A]	50 °F / 10 °C	68 °F / 20 °C	86 °F / 30 °C	104 °F / 40 °C	122 °F / 50 °C	140 °F / 60 °C
15	18	17	16	15	14	13
20	24	22	21	20	19	17
25	30	28	27	25	23	21
30	35	33	32	30	28	26
35	41	39	37	35	33	30
40	47	44	42	40	37	34
50	59	56	53	50	47	43
60	71	67	64	60	56	51
70	83	78	74	70	66	60
80	94	90	85	80	75	68
90	106	101	95	90	85	77
100	118	112	106	100	95	85
125	148	140	133	125	119	106
150	177	168	159	150	143	127

Tmax Ts3 225						
In [A]	50 °F / 10 °C	68 °F / 20 °C	86 °F / 30 °C	104 °F / 40 °C	122 °F / 50 °C	140 °F / 60 °C
175	207	196	186	175	166	149
200	236	224	212	200	190	170
225	266	252	239	225	214	191

Tmax T4						
In [A]	50 °F / 10 °C	68 °F / 20 °C	86 °F / 30 °C	104 °F / 40 °C	122 °F / 50 °C	140 °F / 60 °C
20	24	22	21	20	19	17
25	30	28	27	25	23	21
40	47	44	42	40	37	34
50	59	56	53	50	47	43
80	94	90	85	80	75	68
100	118	112	106	100	95	85
125	148	140	133	125	119	106
150	177	168	159	150	143	127
200	236	224	212	200	190	170
250	266	252	239	225	214	191

Tmax T5 400/600						
In [A]	50 °F / 10 °C	68 °F / 20 °C	86 °F / 30 °C	104 °F / 40 °C	122 °F / 50 °C	140 °F / 60 °C
300	241...345	230...328	220...314	210...300	200...286	187...267
400	325...465	310...442	295...420	280...400	265...380	250...355
600	483...690	459...656	440...628	420...600	400...572	374...534

Tmax T6 800						
In [A]	50 °F / 10 °C	68 °F / 20 °C	86 °F / 30 °C	104 °F / 40 °C	122 °F / 50 °C	140 °F / 60 °C
600	520...740	493...705	462...660	441...630	405...580	380...540
800	685...965	640...905	605...855	560...800	520...740	470...670

Curves and technical information

Molded Case Circuit Breakers

Power losses			
Type	Trip unit	In [A]	P [W/pole]
T1 - T1B 1p	TMF	15	1.3
		20	1.3
		25	2.0
		30	1.8
		40	2.6
		50	3.7
		60	3.9
		70	5.3
		80	4.8
		90	6.1
		100	6.8
T2	TMF	15	1.0
		20	1.7
		25	1.6
		30	2.4
		35	3.0
		40	2.8
		50	3.2
		60	4.6
		70	4.7
		80	5.4
		90	6.9
		100	7.7
	ELT	10	0.5
		25	1.0
		63	3.5
		100	8.0
T3	TMF	60	3.9
		70	4.2
		80	4.8
		90	5.0
		100	5.3
		125	6.6
		150	7.4
		175	11.6
		200	13.2
		225	15.0
Ts3	TMF	15	3.2
		20	3.2
		25	3.3
		30	3.5
		35	4.8
		40	6.3
		50	5.3
		60	7.7
		70	4.6
		80	6.0
		90	7.6
		100	7.0
		125	6.7
		150	8.8
		175	9.2
		200	12.0
		225	13.5

Curves and technical information

Molded Case Circuit Breakers

Power losses			
Type	Trip unit	In [A]	P [W/pole]
T4	TMF	15	3.6
		20	3.6
	TMD	30	3.6
		40	3.8
		50	3.9
	TMA	80	4.6
		100	5.2
		125	5.7
		150	6.9
		200	9.9
		250	13.7
	ELT	100	1.7
		150	3.9
		200	10.7
T5	TMA	300	12.3
		400	19.5
		600	40.1
	ELT	300	9.3
		400	16.5
		600	37.1
T6	TMA	600	30.6
		800	31
	ELT	600	30
		800	32
T7	ELT	400	5
		600	12
		800	19.3
		1000	30
		1200	47
T8	ELT	1600	30
		2000	46
		2500	73
		3000	117

Curves and technical information

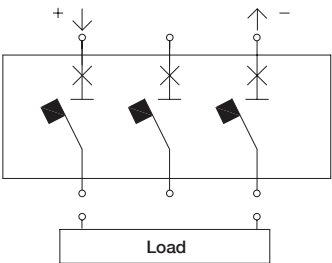
Molded Case Circuit Breakers

Wiring possibilities in DC applications

Use of direct current apparatus

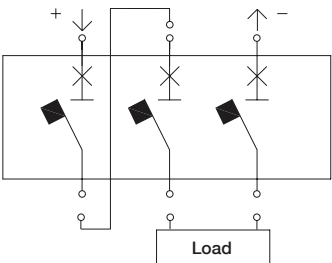
To obtain the number of poles in series needed to guarantee the required breaking capacity at the various operating voltages, suitable connection diagrams must be used. For the breaking capacity (I_{cu}), according to the voltage and the number of poles connected in series with reference to the connection diagrams, please refer to the main characteristic table in the first section of this catalog

Diagram A: Interruption with one pole for polarity



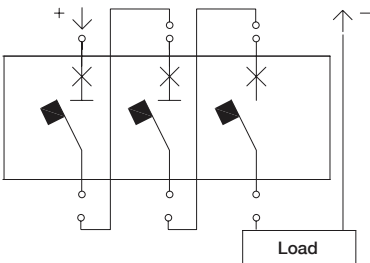
Note: With negative polarity not connected to earth, the installation method must be such as to make the probability of a second earth fault nil.

Diagram B: Interruption with two poles in series for one polarity and one pole for the other polarity



Note: With negative polarity not connected to earth, the installation method must be such as to make the probability of a second earth fault nil.

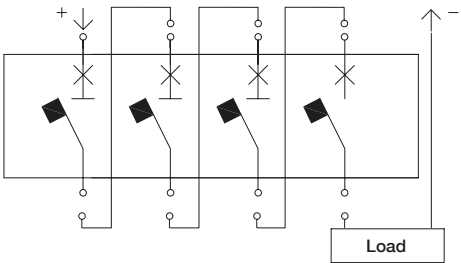
Diagram C: Interruption with three poles in series for polarity



Curves and technical information

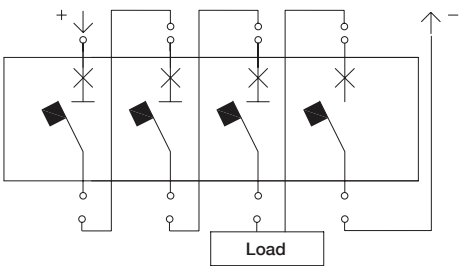
Molded Case Circuit Breakers

Diagram D: Interruption with four poles in series for one polarity (for use at 1000 V DC) IEC



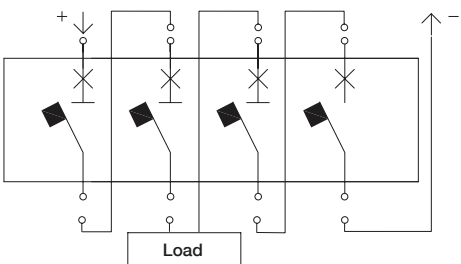
4

Diagram E: Interruption with three poles in series on one polarity and one pole on the remaining polarity



Note: With negative polarity not connected to earth, the installation method must be such as to make the probability of a second earth fault nil.

Diagram F: Interruption with two poles in series for polarity



Note: With negative polarity not connected to earth, the installation method must be such as to make the probability of a second earth fault nil.

For your notes

4

Handwriting practice lines consisting of 20 horizontal dotted lines.

For your notes

Handwriting practice lines consisting of 20 horizontal dotted lines.

For your notes

4

Wiring diagrams

Molded Case Circuit Breakers

General reading information

Tmax T1 to T3 and T4 to T6	5/3
Tmax Ts3	5/3
Tmax T7	5/3
Tmax T8	5/7

Graphic symbols

Symbols according to IEC standards	5/18
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Wiring diagrams for circuit breakers

Tmax T1 to T3 and T4 to T6	5/19
Tmax Ts3	5/20
Tmax T7	5/21
Tmax T8	5/21

Wiring diagrams for electrical accessories

Tmax T1 to T3 and T4 to T6	5/22
Tmax Ts3	5/23
Tmax T7	5/24
Tmax T8	5/24

Wiring diagrams

Molded Case Circuit Breakers

State of operation represented

The diagram is shown in the following conditions:

- plug-in version circuit-breaker open and racked-in
- contactor for motor starting open
- circuits de-energised
- trip units not tripped
- motor operator with springs charged.

Version

The diagram shows a circuit-breaker or switch-disconnector in the plug-in version (only T2, T3, T4 and T5) or in the withdrawable version (T6). The diagram is also valid for the fixed and withdrawable version circuit-breakers or switch-disconnectors.

With the fixed version circuit-breakers or switch-disconnectors, the applications indicated in figures 26-27-28-29-30-31 and 32 cannot be provided.

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Information for reading - Circuit-breaker T1...T3 / T4...T6

Caption

□	=	Figure number of the diagram
*	=	See note indicated by the letter
A1	=	Circuit-breaker applications
A11	=	FDU interfacing unit (front display)
A12	=	AUX-E type signalling unit, with auxiliary relays for electrical signalling of circuit-breaker open and circuit-breaker tripped
A13	=	PR021/K type signalling unit, with auxiliary relays for electrical signalling of the protection functions of electronic trip unit
A14	=	MOE-E type actuation unit, with auxiliary relays for carrying out the commands coming from the dialogue unit
A15	=	PR212/CI type contactor control unit for motor starting
A16	=	Solenoid operating mechanism
A17	=	Unit for M motor electrical latching
A18	=	VM210 type voltage measuring unit
A2	=	Applications of the solenoid operator or motor operator
A3	=	Applications of the RC221, RC222 or RC223 type residual current release
A4	=	Indication apparatus and connections for control and signalling, outside the circuit-breaker
D	=	Electronic time-delay device of the undervoltage release (outside the circuit-breaker)
H, H1	=	Signalling lamps
K	=	Contactor for motor starting
K51	=	Electronic trip unit: <ul style="list-style-type: none">– PR221 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– PR222DS/P, PR222DS/PD-A, 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– PR222MP motor protection type trip unit, with the following protection functions:<ul style="list-style-type: none">- against overload (thermal protection)- against rotor block- against short-circuit- against missing or unbalanced current between the phases
K51/1...8	=	Contact for electrical signalling of the protection functions of the electronic trip unit
K87	=	RC221, RC222 or RC223 type residual current trip unit

Wiring diagrams

Molded Case Circuit Breakers

Caption (continued)

M	=	Motor for circuit-breaker opening and circuit-breaker closing spring charging
M1	=	Three-phase asynchronous motor
Q	=	Main circuit-breaker
Q/0,1,2,3	=	Auxiliary circuit-breaker contacts
R	=	Resistor (see note F)
R1	=	Motor thermistor
R2	=	Thermistor in the motor operator
S1, S2	=	Contacts controlled by the cam of the motor operator
S3, S3/1	=	Change-over contact for electrical signalling of local/remote selector status
S4/1-2	=	Contacts activated by the circuit-breaker rotary handle (see note C)
S51/S	=	Contact for electrical signalling of overload in progress (start)
S75I/1...3	=	Contacts for electrical signalling of circuit-breaker in racked-in position (only provided with circuit-breakers in plug-in and withdrawable version)
S75S/1...3	=	Contacts for electrical signalling of circuit-breaker in racked-out position (only provided with circuit-breakers in plug-in and withdrawable version)
S87/1	=	Contact for electrical signalling of RC222 or RC223 type residual current release pre-alarm
S87/2	=	Contact for electrical signalling of RC222 Change-over contact for electrical signalling of local/remote selector status type residual current release alarm
S87/3	=	Contact for electrical signalling of circuit-breaker open due to RC221, RC222 or RC223 type residual current release trip
SC	=	Pushbutton or contact for closing the circuit-breaker
SC3	=	Pushbutton for motor starting
SD	=	Switch-disconnector of the power supply of the RC221 or RC222 type residual current release
SO	=	Pushbutton or contact for opening the circuit-breaker
SO1, SO2	=	Pushbuttons or contacts for the circuit-breaker opening (see Resetting instructions for circuit-breaker tripped by trip units)
SO3	=	Pushbutton for stopping the motor
SQ	=	Contact for electrical signalling of circuit-breaker open
SY	=	Contact for electrical signalling of circuit-breaker open due to YO, YO1, YO2 or YU thermomagnetic trip unit intervention (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. See note D)
X1,X2,X5...X9	=	Connectors for the circuit-breaker auxiliary circuits (in the case of circuit-breakers in plug-in version, removal of the connectors takes place simultaneously with that of the circuit-breaker. See note E)
X11	=	Back-up terminal box
X3,X4	=	Connectors for the circuits of the electronic trip unit (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 PR222DS/P, PR222DS/PD-A trip unit
XA1	=	Three-way connector for YO/YU (see note E)
XA10	=	Six-way connector for solenoid operator
XA2	=	Twelve-way connector for auxiliary contacts (see note E)
XA5	=	Three-way connector for contact of electrical signalling of circuit-breaker open due to trip of the RC221, RC222 or RC223 type residual current release (see note E)
XA6	=	Three-way connector for contact of electrical signalling of circuit-breaker open due to trip of the overcurrent release (see note E)
XA7	=	Six-way connector for auxiliary contacts (see note E)
XA8	=	Six-way connector for contacts operated by the rotary handle or for the motor operator (see note E)
XA9	=	Six-way connector for the electrical signalling of RC222 or RC223 type residual current release pre-alarm and alarm and for opening by means of the release itself (see note E)

Wiring diagrams

Molded Case Circuit Breakers

Caption (continued)

XB, XC, XE=	Interfacing connectors of the AUX-E unit
XD =	Interfacing connector of the FDU unit
XF =	Interfacing connector of the MOE-E unit
X0 =	Connector for the YO1 trip coil
X01 =	Connector for the YO2 trip coil
XV =	Terminal boxes of the applications
YC =	Closing release of the motor operating mechanism
YO =	Opening release
YO1 =	Trip coil of the electronic trip unit
YO2 =	Trip coil of the RC221, RC222 or RC223 type residual current release
YO3 =	Shunt opening release of the solenoid operator
YU =	Undervoltage release (see note B).

5

Description of figures (seen on top right corner of each wiring diagrams)

Fig. 1 =	Opening release.
Fig. 2 =	Permanent opening release.
Fig. 3 =	Instantaneous undervoltage release (see note B and F).
Fig. 4 =	Undervoltage release with electronic time-delay device outside the circuit-breaker (see note B).
Fig. 5 =	Instantaneous undervoltage release in version for machine tools with one contact in series (see note B, C, and F).
Fig. 6 =	Instantaneous undervoltage release in version for machine tools with two contacts in series (see note B, C, and F).
Fig. 7 =	One changeover contact for electrical signalling of circuit-breaker open due to RC221, RC222 or RC223 type residual current release trip.
Fig. 8 =	RC222 or RC223 type residual current release circuits.
Fig. 9 =	Two electrical signalling contacts for RC222 or RC223 type residual current release pre-alarm and alarm.
Fig. 10 =	Solenoid operator.
Fig. 11 =	Stored energy motor operator.
Fig. 12 =	Local/remote auxiliary contact for stored-energy motor operating mechanism.
Fig. 21 =	Three changeover contacts for electrical signalling of circuit-breaker open or closed and one changeover contact for electrical signalling of circuit-breaker open due to YO, YO1, YO2 and YU thermomagnetic trip unit intervention (tripped position).
Fig. 22 =	One changeover contact for electrical signalling of circuit-breaker open or closed and a changeover contact for electrical signalling of circuit-breaker open due to YO, YO1, YO2 or YU the thermomagnetic trip unit intervention (tripped position).
Fig. 23 =	Two changeover contacts for electrical signalling of circuit-breaker open or closed.
Fig. 24 =	One changeover contact for electrical signalling of circuit-breaker open due to overcurrent release trip (T2).
Fig. 25 =	One contact for electrical signalling of circuit-breaker open due to overcurrent release trip (T4-T5-T6).
Fig. 26 =	First position of circuit-breaker changeover contact, for electrical signalling of racked-in.
Fig. 27 =	Second position of circuit-breaker changeover contact, for electrical signalling of racked-in.
Fig. 28 =	Third position of circuit-breaker changeover contact, for electrical signalling of racked-in.
Fig. 29 =	First position of circuit-breaker changeover contact, for electrical signalling of isolated.
Fig. 30 =	Second position of circuit-breaker changeover contact, for electrical signalling of isolated.
Fig. 31 =	Third position of circuit-breaker changeover contact, for electrical signalling of isolated.
Fig. 32 =	Circuit of the current transformer on neutral conductor outside the circuit-breaker (for plug-in and withdrawable version circuit-breaker).
Fig. 41 =	Auxiliary circuits of the PR222DS/P, PR222DS/PD-A electronic trip unit connected with FDU front display unit.
Fig. 42 =	Auxiliary circuits of the PR222DS/PD-A, electronic trip unit connected with PR021/K type signalling unit.
Fig. 43 =	Auxiliary circuits of the PR222DS/PD-A, electronic trip unit connected with FDU front display unit and with PR021/K type signalling unit.
Fig. 44 =	Auxiliary circuits of the PR222DS/PD-A, electronic trip unit connected with the AUX-E auxiliary contacts.
Fig. 45 =	Auxiliary circuits of the PR222DS/PD-A, electronic trip unit connected with the auxiliary contacts AUX-E and with MOE-E type actuation unit.
Fig. 46 =	Auxiliary circuits of the PR222DS/PD-A, electronic trip unit connected with FDU front display unit and with the AUX-E auxiliary contacts.

Wiring diagrams

Molded Case Circuit Breakers

Incompatibility

The circuits indicated by the following figures cannot be supplied at the same time on the same circuit-breaker:

1 - 2 - 3 - 4 - 5 - 6

5 - 6 - 11

10 - 11 - 45

10 - 12

21 - 22 - 23 - 44 - 45 - 46

24 - 25

26 - 32

41 - 42 - 43 - 44 - 45 - 46

Notes

- A) The circuit-breaker is only fitted with the applications specified in the ABB SACE order confirmation. To make out the order, please consult this catalogue.
- B) The undervoltage release is supplied for power supply branched on the supply side of the circuit-breaker or from an independent source: circuit-breaker closing is only allowed with the release energised (the lock on closing is made mechanically).
- C) The S4/1 and S4/2 contacts shown in figures 5-6 open the circuit with the circuit-breaker open and close it again when a manual closing command is given by means of the rotary handle, in accordance with the Standards regarding machine tools (in any case, closing does not take place if the undervoltage release is not supplied).
- E) Connectors XA1, XA2, XA5, XA6, XA7, XA8 and XA9 are supplied on request. They are always supplied with T2 and T3 circuit-breakers in the plug-in version, and with T4 and T5 circuit-breakers in the plug-in version equipped with unwired electronic accessories. Connectors X1, X2, X5, X6, X7, X8 and X9 are supplied on request. They are always supplied with T4, T5 and T6 circuit-breakers in the fixed version or in the withdrawable version equipped with unwired electronic accessories.
- F) Additional external resistor for undervoltage release supplied at 250 V DC, 380/440 V AC and 480/500 V AC.
- G) In the case of fixed version circuit-breaker with current transformer on external neutral conductor outside the circuit-breaker, when the circuit-breaker is to be removed, it is necessary to short-circuit the terminals of the TI/N transformer.
- H) SQ and SY contacts of AUX-E signalling unit are opto-isolated contacts.
- I) The connection to poles 3-4 of X4 connector can be used in two ways: connecting a generic digital input or connecting the motor thermistor. The two functions are alternative.

Wiring diagrams

Molded Case Circuit Breakers

Information for reading - Circuit-breaker Ts3

Versions

The diagram indicates a circuit breaker or an isolating-switch in draw out or plug-in version but it may be applied to a circuit breaker or an isolating-switch in fixed version too.

Circuit given in figures 21-22-31-32 cannot be supplied with circuit breakers or isolating-switch in fixed version.

Caption

□	=	Figure number of the diagram
*	=	See note indicated by the letter
A1	=	Circuit-breaker accessories
A2	=	Motor operator accessories
A4	=	Indication apparatus and connections for control and signalling, outside the circuit-breaker
D	=	Electronic time-delay device of the undervoltage release (outside the circuit-breaker)
K87	=	Signalling lamps
K O	=	Contactors for motor starting
M	=	Motor with series energization for the circuit breaker opening and closing
Q	=	Main circuit breaker
Q/D...2	=	Circuit breaker auxiliary contacts
R	=	Resistance external to the circuit breaker, supplied for motor supply voltage higher than 220V
S1	=	Position contact operated by a cam of the circuit breaker
S2	=	Safety contact operated by key lock (if provided) or padlock device
S4	=	Contact operated by the circuit breaker rotary handle (see note C)
S75I/1-2	=	Contacts signalling circuit breaker in the connected position (provided with the circuit breaker in draw out or plug-in version only (see note D)
S75S/1-2	=	Contacts signalling circuit breaker in the isolated or plugged-in position (provided with the circuit breaker in draw out or plug-in version only (see note D)
SC	=	Pushbutton or contact for circuit breaker closing, the operation shall last for 100 ms at least.
SO	=	Pushbutton or contact for circuit breaker opening
SO1,SO2	=	Pushbutton or contact for circuit breaker opening, the operation shall last for 100 ms at least (see instructions for resetting the circuit breaker after the releases has tripped)
SY	=	Contact signalling circuit breaker tripped through thermomagnetic, YO, YO1, YO2, YU releases operation (bell alarm)
TI	=	Ring current transformer
X1,X2	=	Connectors for the circuit breaker auxiliary circuits
XV	=	Terminal boards of the accessories
YO	=	Shunt trip
YO1	=	Opening solenoid of the RC211 or RC212 type residual current release
YO2	=	Shunt trip for permanent supply
YU	=	Undervoltage release (see note B)

Wiring diagrams

Molded Case Circuit Breakers

Description of figures (seen on top right corner of each wiring diagrams)

Fig. 1	=	Shunt trip.
Fig. 2	=	Opening solenoid of the RC211 type residual current release.
Fig. 3	=	Opening solenoid of the RC212 type residual current release.
Fig. 4	=	Instantaneous undervoltage release (see note B)
Fig. 5	=	Instantaneous undervoltage release in version for machine tools (see note B and C).
Fig. 6	=	Undervoltage release with solid-state time-delaying device external to the circuit breaker (see note B).
Fig. 7	=	Direct acting motor operator
Fig. 8	=	Shunt trip for permanent supply.
Fig. 11	=	Two change-over contacts signalling circuit breaker on/off.
Fig. 12	=	One change-over contact signalling circuit breaker on/off and one change-over contact signalling circuit breaker tripped through thermomagnetic YO, YO1, YO2, YU releases operation (bell alarm).
Fig. 21	=	First circuit breaker position contact, signalling the connected position (see note D).
Fig. 22	=	Second circuit breaker position contact signalling the connected position (see note D).
Fig. 31	=	First circuit breaker position contact signalling isolated or plugged-out position (see note D).
Fig. 32	=	Second circuit breaker position contact signalling isolated or plugged-out position (see note D).

Incompatibility

The circuits indicated by the following figures cannot be supplied at the same time on the same circuit-breaker:

2 - 3
1 - 4 - 5 - 6 - 7 - 8
11 - 12
21 - 31
22 - 32

Notes

- A) Circuit breaker is delivered complete with the accessories listed in the ABB order acknowledgement only..
- B) Undervoltage release is suitable for circuit breaker supply side feeding or for feeding from an independent source: circuit breaker closes only if the undervoltage release is energized (lock on closing is achieved mechanically).
- C) Contact S4 given in fig. 5 opens the circuit when the circuit breaker is open and it closes when a manual closing control is carried out through rotary handle, in compliance with the Standards relevant to the machine tools (the closing does not occur indeed if the undervoltage release is not energized).
- D) Circuit breaker can be equipped with S75I and S75S position contacts, in whatever combination, with a maximum of 2 contacts.

Wiring diagrams

Molded Case Circuit Breakers

Information for reading - Circuit-breaker T7

Warning

Before installing the circuit-breaker, carefully read notes F and O on the circuit diagrams.

Operating status shown

The circuit diagram is for the following conditions:

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

5

Versions

Though the diagram shows a circuit-breaker in withdrawable version, it can be applied to a fixed version circuit-breaker as well.

Fixed version

The control circuits are fitted between terminals XV (connectors X12-X13-X14-X15 are not supplied). With this version, the applications indicated in figure 31A cannot be provided.

Withdrawable version

The control circuits are fitted between the poles of connectors X12-X13-X14-X15 (terminal box XV is not supplied).

Version without overcurrent release

With this version, the applications indicated in figures 13A, 14A, 41A, 42A, 43A, 44A, 45A, 62A cannot be provided.

Version with PR231/P or PR232/P electronic trip unit

With this version, the applications indicated in figures 41A, 42A, 43A, 44A, 45A, 62A cannot be provided.

Version with PR331/P electronic trip unit

With this version, the applications indicated in figures 42A, 43A, 44A, 45A cannot be provided.

Version with PR332/P electronic trip unit

With this version, the applications indicated in figure 41A cannot be provided

Caption

□	=	Circuit diagram figure number
*	=	See note indicated by letter
A1	=	Circuit-breaker accessories
A3	=	Accessories applied to the fixed part of the circuit-breaker (for withdrawable version only)
A4	=	Example switchgear and connections for control and signalling, outside the circuit-breaker
A13	=	PR021/K signalling unit (outside the circuit-breaker)
A19	=	PR330/R actuation unit
AY	=	SOR TEST UNIT Test/monitoring Unit (see note R)
D	=	Electronic time-delay device of the undervoltage release, outside the circuitbreaker
K51	=	PR231/P, PR232/P, PR331/P, PR332/P type electronic trip unit with the following protection functions: <ul style="list-style-type: none">- L overload protection with inverse long time-delay trip - setting I_1- S short-circuit protection with inverse or definite short time-delay trip - setting I_2- I short-circuit protection with instantaneous time-delay trip - setting I_3- G earth fault protection with inverse short time-delay trip - setting I_4
K51/1...8	=	Contacts of the PR021/K signalling unit
K51/GZin (DBin)	=	Zone selectivity: input for protection G or “reverse” direction input for protection D (only with Uaux. and PR332/P trip unit)
K51/GZout (DBout)=	=	Zone selectivity: output for protection G or “reverse” direction output for protection D (only with and PR332/P trip unit)

Wiring diagrams

Molded Case Circuit Breakers

Caption (continued)

K51/SZin (DFin)	=	Zone selectivity: input for protection S or “direct” input for protection D (only with Uaux. and PR332/P trip unit)
K51/SZout (DFout)	=	Zone selectivity: output for protection S or “direct” output for protection D (only with Uaux. and PR332/P trip unit)
K51/YC	=	Closing control from PR332/P electronic trip unit with communication module PR330/D-M and PR330/R actuation unit
K51/YO	=	Opening control from PR332/P electronic trip unit with communication module PR330/D-M and PR330/R actuation unit
M	=	Motor for charging the closing springs
Q	=	Circuit-breaker
Q/1...6	=	Circuit-breaker auxiliary contacts
S33M/1...3	=	Limit contacts for spring-charging motor
S4/1-2-3	=	Contacts activated by the rotary handle of the circuit-breaker – only for circuit-breakers with manual control (see note C)
S43	=	Switch for setting remote/local control
S51	=	Contact for electrical signalling of circuit-breaker open due to tripping of the overcurrent trip unit. The circuit-breaker may be closed only after pressing the reset pushbutton, or after energizing the coil for electrical reset (if available)
S51/P1	=	Programmable contact (as default it signals overload present - start)
S75E/1...2	=	Contacts for electrical signalling of circuit-breaker in racked-out position (only with withdrawable circuit breakers)
S75I/1...7	=	Contacts for electrical signalling of circuit-breaker in racked-in position (only with withdrawable circuit-breakers)
S75T/1...2	=	Contacts for electrical signalling of circuit-breaker in test isolated position (only with withdrawable circuit breakers)
SC	=	Pushbutton or contact for closing the circuit-breaker
SO	=	Pushbutton or contact for opening the circuit-breaker
SO1	=	Pushbutton or contact for opening the circuit-breaker with delayed trip
SO2	=	Pushbutton or contact for opening the circuit-breaker with instantaneous trip
SR	=	Pushbutton or contact for electrical circuit-breaker reset
SRTC	=	Contact for electrical signalling of circuit-breaker open, with springs charged and ready to close
SY	=	Contact for electrical signalling of circuit-breaker open due to trip units tripped, YO, YO1, YO2, YU (tripped position) only for circuit-breakers with direct control
TI/L1	=	Current transformer located on phase L1
TI/L2	=	Current transformer located on phase L2
TI/L3	=	Current transformer located on phase L3
TO	=	Homopolar Toroidal current transformer (see note T)
TU	=	Insulating voltage transformer
Uaux.	=	Auxiliary power supply voltage (see note F)
UI/L1	=	Current sensor (Rogowski coil) located on phase L1
UI/L2	=	Current sensor (Rogowski coil) located on phase L2
UI/L3	=	Current sensor (Rogowski coil) located on phase L3
UI/N	=	Current sensor (Rogowski coil) located on neutral
UI/O	=	Current sensor (Rogowski coil) located on the conductor connecting to earth the star point of the MV/LV transformer (see note G)
W1	=	Serial interface with control system (external bus): EIA RS485 interface (see note E)
W2	=	Serial interface with the accessories of PR331/P and PR332/P trip units (internal bus)
X12...X15	=	Delivery connectors for auxiliary circuits of withdrawable version circuit-breaker
XB1...XB7	=	Connectors for the accessories of the circuit-breaker
XF	=	Delivery terminal box for the position contacts of the withdrawable circuit-breaker (located on the fixed part of the circuit-breaker)
XO	=	Connector for YO1 release
XR1 – XR2	=	Connector for power circuits of PR231/P, PR232/P, PR331/P, and PR332/P trip units
XR5 – XR13	=	Connector for power circuits of PR332/P trip unit
XV	=	Delivery terminal box for the auxiliary circuits of the fixed circuit-breaker
YC	=	Shunt closing release
YO	=	Shunt opening release
YO1	=	Overcurrent shunt opening release (trip coil)
YO2	=	Second shunt opening release (see note Q)
YR	=	Coil to electrically reset the circuit-breaker
YU	=	Undervoltage release (see notes B, C and Q)

Wiring diagrams

Molded Case Circuit Breakers

Description of figures

Fig. 1A =	Motor circuit to charge the closing springs.
Fig. 2A =	Circuit of shunt closing release.
Fig. 4A =	Shunt opening release.
Fig. 6A =	Instantaneous undervoltage release (see notes B, C and Q).
Fig. 7A =	Undervoltage release with electronic time-delay device, outside the circuit-breaker (see notes B and Q).
Fig. 8A =	Second shunt opening release (see note Q).
Fig. 11A =	Contact for electrical signalling of springs charged or discharged.
Fig. 12A =	Contact for electrical signalling of circuit-breaker open, with springs charged, and ready to close.
Fig. 13A =	Contact for electrical signalling of circuit-breaker open due to tripping of the overcurrent release. The circuit-breaker may be closed only after pressing the reset pushbutton, or after energizing the coil for electronic reset (if available).
Fig. 14A =	Electrical reset control.
Fig. 15A =	Contact operated by the circuit-breaker rotary handle – for circuit-breakers with manual control only (see note C).
Fig. 21A =	Circuit-breaker auxiliary contacts (for circuit-breakers with manual control only).
Fig. 22A =	Circuit-breaker auxiliary contacts (for circuit-breakers with motor control only).
Fig. 31A =	First set of contacts for electrical signalling of circuit-breaker in racked-in, test isolated, racked out position.
Fig. 41A =	Auxiliary circuits of PR331/P trip unit (see note F).
Fig. 42A =	Auxiliary circuits of PR332/P trip units (see notes F and N).
Fig. 43A =	Circuits of the measuring module PR330/V of the PR332/P trip units internally connected to the circuit-breaker (optional).
Fig. 44A =	Circuits of the measuring module PR330/V of the PR332/P trip units externally connected to the circuit-breaker (optional; see note O).
Fig. 45A =	Circuits of the PR332/P trip unit with communication module PR330/D-M connected to PR330/V actuation unit (see notes E, F and N).
Fig. 46A =	Circuits of the PR332/P trip unit PR330/V measuring module connected internally to the three-pole circuit-breaker with external neutral conductor (optional)
Fig. 61A =	SOR TEST UNIT Test/monitoring unit (see note R).
Fig. 62A =	Circuits of the PR021/K signalling module (outside the circuit-breaker).

Incompatibility

The circuits indicated in the following figures cannot be supplied simultaneously on the same circuit-breaker:

6A - 7A - 8A

21A - 22A

41A - 42A - 45A

43A - 44A - 46A

Wiring diagrams

Molded Case Circuit Breakers

Notes

- A) The circuit-breaker is only fitted with the applications specified in the ABB SACE order confirmation. To make out the order, please consult this catalogue.
- B) The undervoltage release is supplied for operation using a power supply branched on the supply side of the circuit-breaker or from an independent source. The circuit-breaker can only close when the release is energized (there is a mechanical lock on closing).
- C) In conformity with the Standards governing machine tools, contacts S4 shown in Fig. 15A can be used to open the Yu undervoltage release circuit (Fig. 6A) when the circuit-breaker is open and close it again upon a manual closing command from the rotary handle.
- E) For the EIA RS485 serial interface connection see document RH0298 regarding MODBUS communication.
- F) The auxiliary voltage Vaux allows actuation of all operations of the PR331/P, PR332/P and trip units.
Having requested a Vaux insulated from earth, one must use "galvanically separated converters" in compliance with IEC 60950 (UL 1950) or equivalent standards that ensure a common mode current or leakage current (see IEC 478/1, CEI 22/3) not greater than 3.5 mA, IEC 60364-41 and CEI 64-8.
- G) Earth fault protection is available with the PR332/P trip unit by means of a current sensor located on the conductor connecting to earth the star centre of the MV/LV transformer.
The connections between terminals 1 and 2 (or 3) of current transformer UI/O and poles T7 and T8 of the X (or XV) connector Must be made with a two-pole shielded and stranded cable (see user manual), no more than 15 m long. The shield must be earthed on the circuit-breaker side and current sensor side.
- N) With PR332/P trip unit, the connections to the zone selectivity inputs and outputs must be made with a two-pole shielded and stranded cable (see user manual), no more than 300 m long. The shield must be earthed on the selectivity input side.
- O) Systems with rated voltage greater than 690V require the use of an insulation voltage transformer to connect to the busbars.
- P) With PR332/P trip unit with communication module PR330/D-M, the coils YO and YC can be controlled directly from contacts K51/YO and K51/YC with maximum voltages of 110-120 V DC e 240-250 V AC.
- Q) The second opening release may be installed as an alternative to the undervoltage release.
- R) The SACE SOR TEST UNIT + opening release (YO) is guaranteed to operate starting at 75% of the Vaux of the opening release itself. While the YO power supply contact is closing (short-circuit on terminals 4 and 5), the SACE SOR TEST UNIT is unable to detect the opening coil status. Consequently:
 - For continuously powered opening coil, the TEST FAILED and ALARM signals will be activated
 - If the coil opening command is of the pulsing type, the TEST FAILED signal may appear at the same time. In this case, the TEST FAILED signal is actually an alarm signal only if it remains lit for more than 20s.
- S) The connection cable shield must only be earthed on the circuit-breaker side.
- T) The connections between the TO toroidal transformer and the poles of the X13 (or XV) connector of the circuit-breaker must be made using a four-pole shielded cable with paired braided conductors (BELDEN 9696 paired type), with a length of not more than 15 m. The shield must be earthed on the circuit-breaker side.

Wiring diagrams

Molded Case Circuit Breakers

Information for reading - Circuit-breaker T8

Warning

Before installing the circuit breaker, carefully read notes F and O on the circuit diagrams.

Operating status shown

- The circuit diagram is for the following conditions:
- circuit breaker in open position
 - circuits de-energized
 - trip units not tripped
 - motor operating mechanism with springs discharged.

5

Versions

The control circuits are fitted between terminals XV (connectors X12-X13-X14-X15 are not supplied).

Molded case switches (MCS)

With this version, the applications indicated in figures 13, 14, 41A, 42A, 43A, 44A, 45A, 62A cannot be provided.

Version with PR331/P electronic trip unit

With this version, the applications indicated in figures 42A, 43A, 44A, 45A cannot be provided.

Version with PR332/P electronic trip unit

With this version, the applications indicated in figure 41A cannot be provided.

Caption

□	=	Circuit diagram figure number
*	=	See note indicated by letter
A1	=	Circuit breaker accessories
A4	=	Example switchgear and connections for control and signaling, outside the circuit breaker
A13	=	PR021/K signaling unit (outside the circuit breaker)
A19	=	PR330/R actuation unit
AY	=	SOR TEST UNIT Test/monitoring Unit (see note R)
D	=	Electronic time-delay device of the undervoltage release, outside the circuit breaker
K51	=	PR331/P, PR332/P type electronic trip unit with the following protection functions: <ul style="list-style-type: none">– L overload protection with inverse long time-delay trip - setting I_1– S short-circuit protection with inverse or definite short time-delay trip - setting I_2– I short-circuit protection with instantaneous time-delay trip - setting I_3– G ground fault protection with inverse short time-delay trip - setting I_4
K51/1...8	=	Contacts of the PR021/K signaling unit
K51/GZin (DBin)	=	Zone selectivity: input for protection G or “reverse” direction input for protection D (only with Uaux. and PR332/P trip unit)
K51/GZout (DBout)=	=	Zone selectivity: output for protection G or “reverse” direction output for protection D (only with and PR332/P trip unit)
K51/SZin (DFin)	=	Zone selectivity: input for protection S or “direct” input for protection D (only with Uaux. and PR332/P trip unit)
K51/SZout (DFout)	=	Zone selectivity: output for protection S or “direct” output for protection D (only with Uaux. and PR332/P trip unit)
K51/YC	=	Closing control from PR332/P electronic trip unit with communication module PR330/D-M and PR330/R actuation unit

Wiring diagrams

Molded Case Circuit Breakers

Caption (continued)

K51/YO	=	Opening control from PR332/P electronic trip unit with communication module PR330/D-M and PR330/R actuation unit
M	=	Motor for charging the closing springs
Q	=	Circuit breaker
Q/1...5	=	Circuit breaker auxiliary contacts
S33M/1...3	=	Limit contacts for spring-charging motor
S43	=	Switch for setting remote/local control
S51	=	Contact for electrical signaling of circuit breaker open due to tripping of the over-current trip unit. The circuit breaker may be closed only after pressing the reset pushbutton, or after energizing the coil for electrical reset (if available)
S51/P1	=	Programmable contact (as default it signals overload present - start)
SC	=	Pushbutton or contact for closing the circuit breaker
SO	=	Pushbutton or contact for opening the circuit breaker
SO1	=	Pushbutton or contact for opening the circuit breaker with delayed trip
SO2	=	Pushbutton or contact for opening the circuit breaker with instantaneous trip
SR	=	Pushbutton or contact for electrical circuit breaker reset
SRTC	=	Contact for electrical signaling of circuit breaker open, with springs charged and ready to close
SY	=	Contact for electrical signaling of circuit breaker open due to trip units tripped, YO, YO1, YO2, YU (tripped position) only for circuit breakers with direct control
TI/L1	=	Current transformer located on phase L1
TI/L2	=	Current transformer located on phase L2
TI/L3	=	Current transformer located on phase L3
Uaux.	=	Auxiliary power supply voltage (see note F)
UI/L1	=	Current sensor (Rogowski coil) located on phase L1
UI/L2	=	Current sensor (Rogowski coil) located on phase L2
UI/L3	=	Current sensor (Rogowski coil) located on phase L3
UI/N	=	Current sensor (Rogowski coil) located on neutral
UI/O	=	Current sensor (Rogowski coil) located on the conductor connecting to ground the star point of the MV/LV transformer (see note G)
W1	=	Serial interface with control system (external bus): EIA RS485 interface (see note E)
W2	=	Serial interface with the accessories of PR331/P and PR332/P trip units (internal bus)
XB1...XB7	=	Connectors for the accessories of the circuit breaker
XF	=	Delivery terminal box for the position contacts of the draw out circuit breaker (located on the cradle of the circuit breaker)
XO	=	Connector for YO1 release
XR1 – XR2	=	Connector for power circuits of PR331/P, and PR332/P trip units
XR5 – XR13	=	Connector for power circuits of PR332/P trip unit
XV	=	Delivery terminal box for the auxiliary circuits
YC	=	Closing coil
YO	=	Shunt trip
YO1	=	Overcurrent shunt trip (trip coil)
YO2	=	Second shunt trip (see note Q)
YR	=	Coil to electrically reset the circuit breaker
YU	=	Undervoltage release (see notes B, C and Q)

Wiring diagrams

Molded Case Circuit Breakers

Description of figures

Fig. 1	=	Motor circuit to charge the closing springs.
Fig. 2	=	Circuit of closing coil.
Fig. 4	=	Shunt trip.
Fig. 6	=	Instantaneous undervoltage release (see notes B, C and Q).
Fig. 7	=	Undervoltage release with electronic time-delay device, outside the circuit breaker (see notes B and Q).
Fig. 8	=	Second shunt trip (see note Q).
Fig. 11	=	Contact for electrical signaling of springs charged or discharged.
Fig. 12	=	Contact for electrical signaling of circuit breaker open, with springs charged, and ready to close.
Fig. 13	=	Contact for electrical signaling of circuit breaker open due to tripping of the overcurrent release. The circuit breaker may be closed only after pressing the reset pushbutton, or after energizing the coil for electronic reset (if available).
Fig. 14	=	Electrical reset control.
Fig. 21	=	Circuit breaker auxiliary contacts (for circuit breakers with manual control only).
Fig. 41A	=	Auxiliary circuits of PR331/P trip unit (see note F).
Fig. 42A	=	Auxiliary circuits of PR332/P trip units (see notes F and N).
Fig. 43A	=	Circuits of the measuring module PR330/V-T8 of the PR332/P trip units internally connected to the circuit breaker (optional).
Fig. 44A	=	Circuits of the measuring module PR330/V-T8 of the PR332/P trip units externally connected to the circuit breaker (optional; see note O).
Fig. 45A	=	Circuits of the PR332/P trip unit with communication module PR330/D-M connected to PR330/V actuation unit (see notes E, F and N).
Fig. 46A	=	Circuits of the PR332/P trip unit PR330/V-T8 measuring module connected internally to the three-pole circuit breaker with external neutral conductor (optional)
Fig. 61A	=	SOR TEST UNIT Test/monitoring unit (see note R).
Fig. 62A	=	Circuits of the PR021/K signalling module (outside the circuit breaker)

Incompatibilities

The circuits indicated in the following figures cannot be supplied simultaneously on the same circuit breaker:

6 - 7 - 8

13 - 14

41A - 42A - 45A

43A - 44A - 46A

Wiring diagrams

Molded Case Circuit Breakers

Notes

- A) The circuit breaker is only fitted with the accessories specified in the ABB order acknowledgement. Please contact your local sales organization.
- B) The undervoltage release is supplied for operation using a power supply branched on the supply side of the circuit breaker or from an independent source. The circuit breaker can only close when the trip unit is energized (there is a mechanical lock on closing).
- E) For the EIA RS485 serial interface connection see document ITSCE - RH0298 regarding MODBUS communication.
- F) The auxiliary voltage U_{aux} allows actuation of all operations of the PR331/P and PR332/P trip units. Having requested a U_{aux} insulated from ground, one must use "galvanically separated converters" in compliance with IEC 60950 (UL 1950) or equivalent standards that ensure a common mode current or leakage current (see IEC 478/1, CEI 22/3) not greater than 3.5 mA, IEC 60364-41 and CEI 64-8.
- G) Ground fault protection is available with the PR332/P trip units by means of a current sensor located on the conductor connecting to ground the star center of the MV/LV transformer. The connections between terminals 1 and 2 (or 3) of current transformer UI/O and poles T7 and T8 of the X (or XV) connector must be made with a two pole shielded and stranded cable (type BELDEN 8762/8772), no more than 15 m long. The shield must be grounded on the circuit breaker side and current sensor side.
- N) With PR332/P trip units, the connections to the zone discrimination inputs and outputs must be made with a two-pole shielded and stranded cable (type BELDEN 8762/8772), no more than 300 m long. The shield must be grounded on the discrimination input side.
- O) Systems with rated voltage greater than 690V require the use of an insulation voltage transformer to connect to the busbars.
- P) With PR332/P trip units with communication module PR330/R, the power supply for coils YO and YC must not be taken from the main power supply. The coils can be controlled directly from contacts K51/YO and K51/YC with maximum voltages of 110-120 V DC and 240-250 V AC.
- Q) The second shunt trip may be installed as an alternative to the undervoltage release.
- R) The SOR TEST UNIT + shunt trip (YO) is guaranteed to operate starting at 75% of the U_{aux} of the shunt trip itself. While the YO power supply contact is closing (short-circuit on terminals 4 and 5), the SOR TEST UNIT is unable to detect the opening coil status. Consequently:
 - for continuously powered opening coil, the TEST FAILED and ALARM signals will be activated
 - if the coil opening command is of the pulsing type, the TEST FAILED signal may appear at the same time. In this case, the TEST FAILED signal is actually an alarm signal only if it remains lit for more than 20s.
- S) The connection cable shield must only be grounded on the circuit breaker side.
- T) The connections between the TO toroidal transformer and the poles of the X13 (or XV) connector of the circuit breaker must be made using a four-pole shielded cable with paired braided conductors (BELDEN 9696 paired type), with a length of not more than 15 m. The shield must be grounded on the circuit breaker side.

Wiring diagrams

Molded Case Circuit Breakers

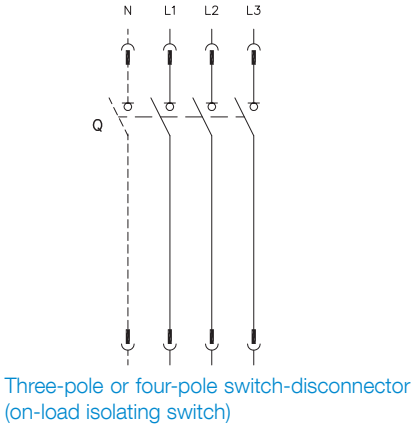
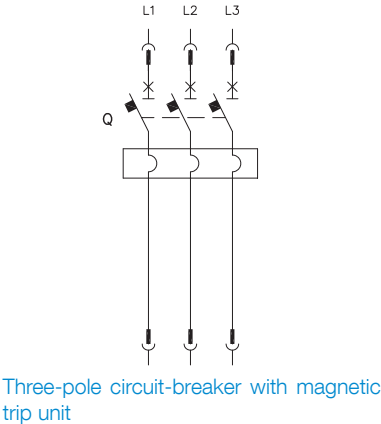
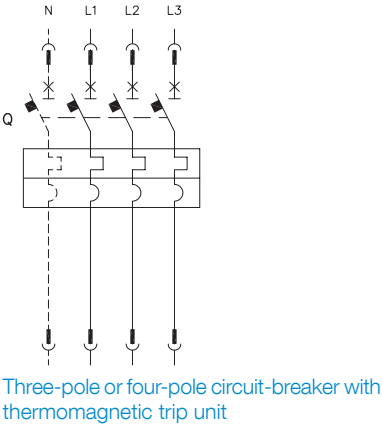
Graphic symbols (IEC 60617 and CEI 3-14...3-26 standards)

	Thermal effect		Connection of conductors		Position switch (limit switch), break contact		Differential current relay
	Electromagnetic effect		Terminal		Position switch (limit switch) change-over break before make contact		Phase-failure detection relay in a three-phase system
	Delay		Plug and socket (male and female)		Contactor (contact open in the unoperated position)		Locked-rotor detection relay operating by current sensing
	Mechanical connection (link)		Resistor (general symbol)		Circuit-breaker disconnect with automatic trip unit		Lamp, general symbol
	Manually operated control (general case)		Temperature dependent resistor		Switch-disconnector (on-load isolating switch)		Mechanical interlock between two devices
	Operated by turning		Motor (general symbol)		Operating device (general symbol)		Operated by electric motor
	Operated by pushing		Induction motor, three-phase, squirrel cage		Thermal relay		Motor with series energization
	Operated by key		Current transformer		Instantaneous overcurrent or rate-of-rise relay		Screen, shield (it may be drawn in any convenient shape)
	Operated by cam		Current transformer with four threaded winding and with one permanent winding with one tapping		Overcurrent relay with adjustable short time-lag characteristic		Equipotentiality
	Earth, ground (general symbol)		Make contact		Overcurrent relay with inverse short time-lag characteristic		Voltage transformer
	Converter with galvanic separator		Break contact		Overcurrent relay with inverse long time-lag characteristic		Winding of three-phase transformer, connection star
	Conductors in a screened cable, two conductors shown		Change-over break before make contact		Earth fault overcurrent relay with inverse short time-lag characteristic		Current sensing element
	Twisted conductors, two conductors shown		Position switch (limit switch), make contact		Phase-balance current relay		

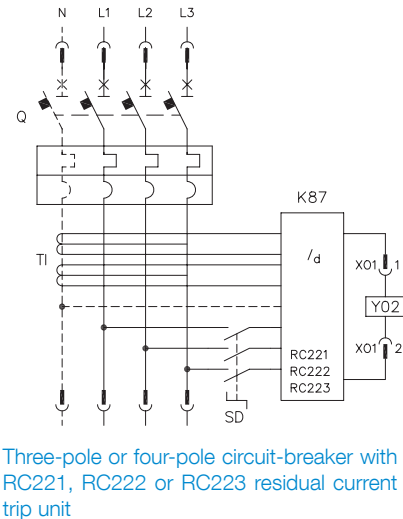
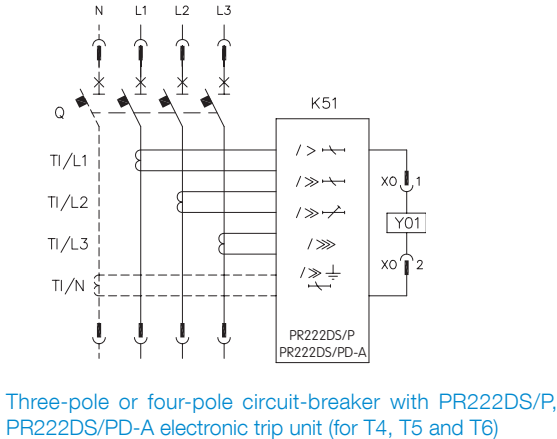
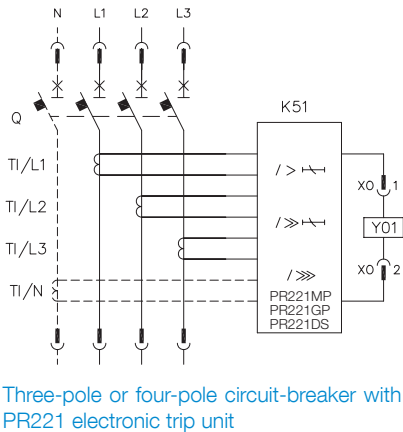
Wiring diagrams

Molded Case Circuit Breakers

State of operation



5

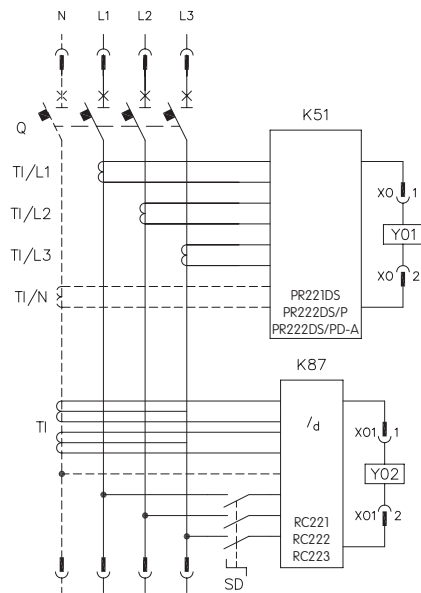


Wiring diagrams

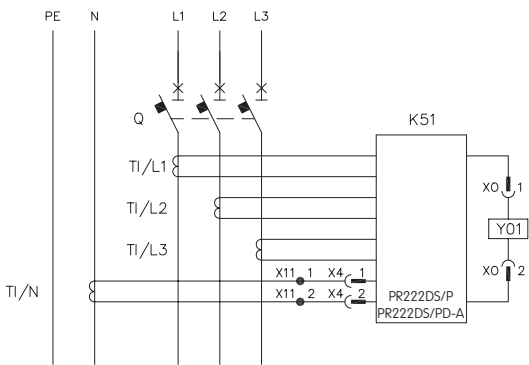
Molded Case Circuit Breakers

State of operation

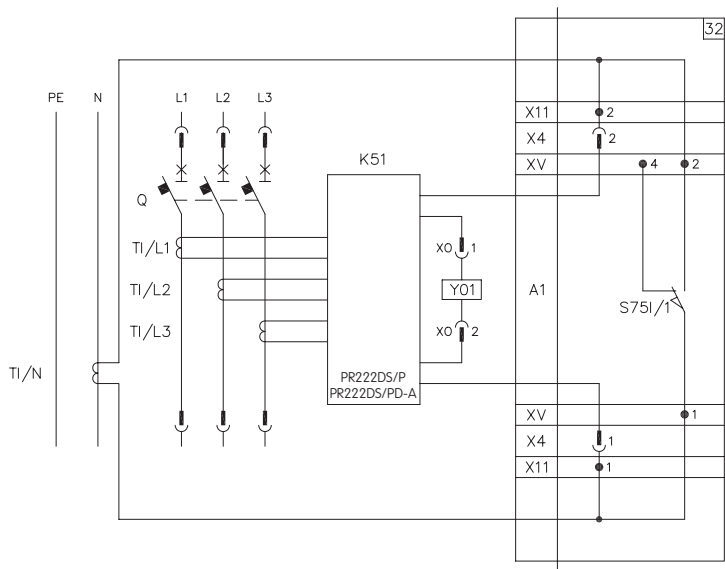
5



Three-pole or four-pole circuit-breaker with PR221DS, PR222DS/P or PR222DS/PD-A electronic trip unit and RC221, RC222 or RC223 residual current trip unit (for T4, T5 and T6 four-pole only)



Fixed version three-pole circuit-breaker with current transformer on neutral conductor, external to circuit-breaker (for T4, T5 and T6)



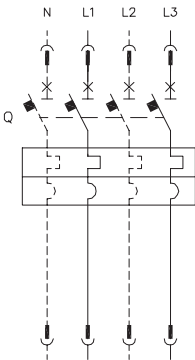
Plug-in or withdrawable version three-pole circuit-breaker with current transformer on neutral conductor, external to circuit-breaker (for T4, T5 and T6)

Wiring diagrams

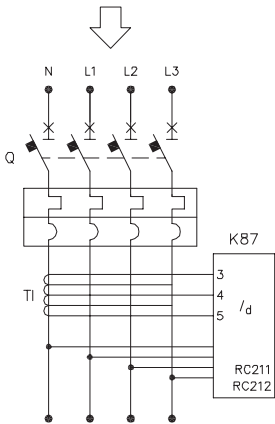
Molded Case Circuit Breakers

Wiring diagrams circuit breakers Ts3

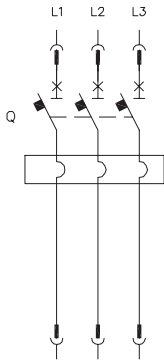
State of operation



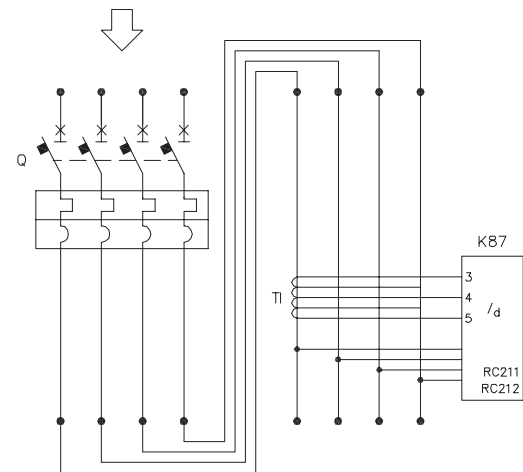
2 pole, 3 pole or 4 pole Ts3 circuit breaker with thermomagnetic trip unit



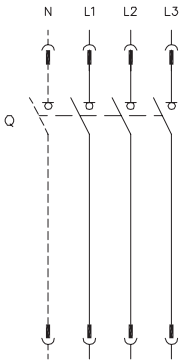
Fixed version 4 pole Ts3 circuit breaker with RC211 or RC212 residual current release (vertical installation)



Ts3 MCP 3 pole with magnetic trip unit



Fixed version 4 pole Ts3 circuit breaker with RC211 or RC212 residual current release (side by side installation)



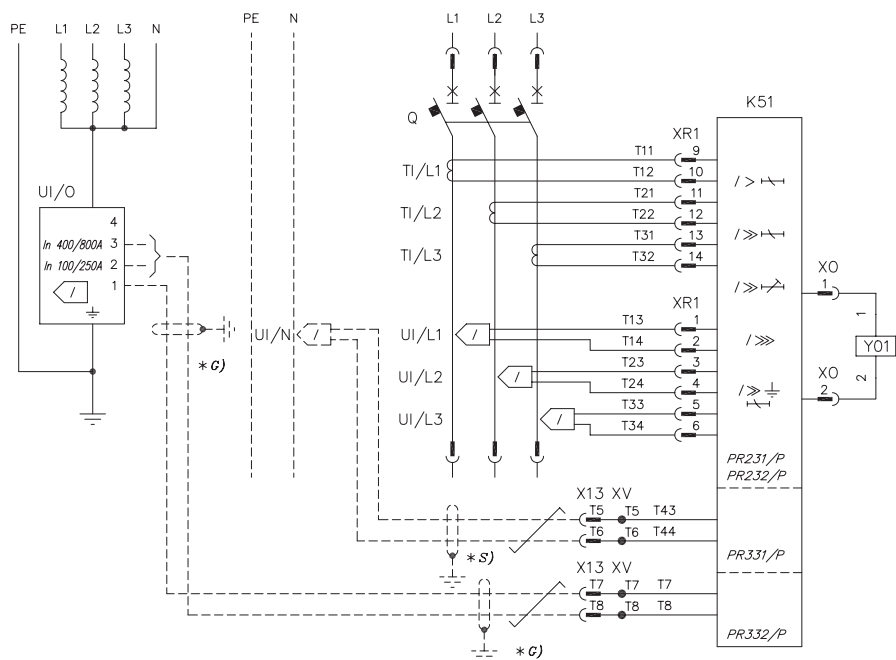
Ts3 MCS 3 pole or 4 pole

Wiring diagrams

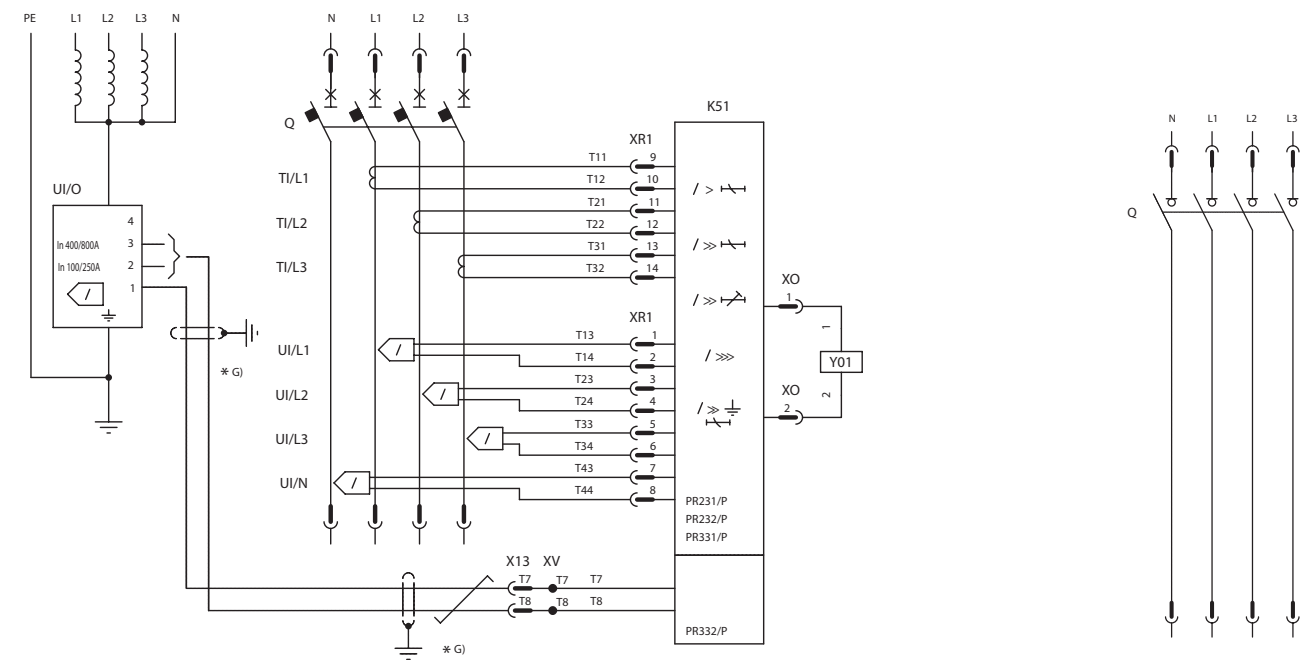
Molded Case Circuit Breakers

State of operation

5



3 pole circuit-breaker with PR231/P, PR232/P, PR331/P, PR332/P electronic trip unit



4 pole circuit-breaker with PR231/P, PR232/P, PR331/P, PR332/P electronic trip unit

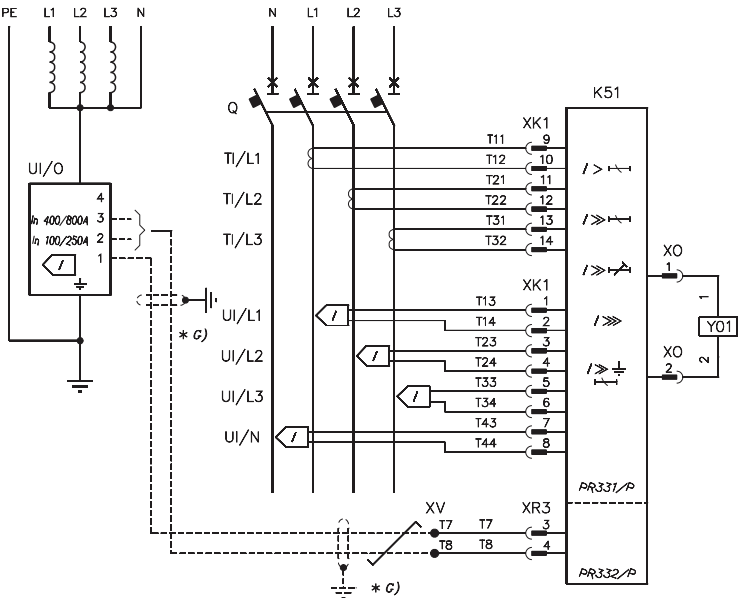
3 pole or 4 pole switch disconnecter

Wiring diagrams

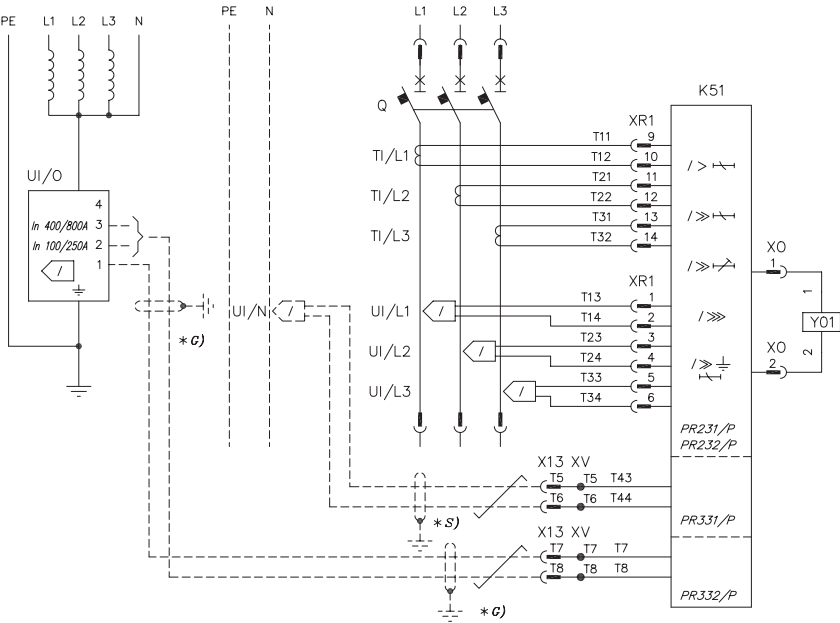
Molded Case Circuit Breakers

State of operation

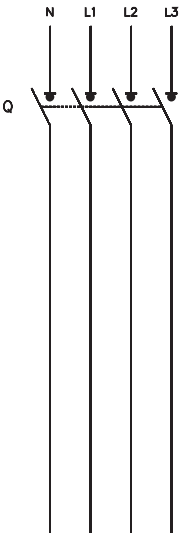
5



4 pole circuit-breaker with PR331/P, PR332/P electronic trip unit



3 pole circuit-breaker with PR331/P, PR332/P electronic trip unit



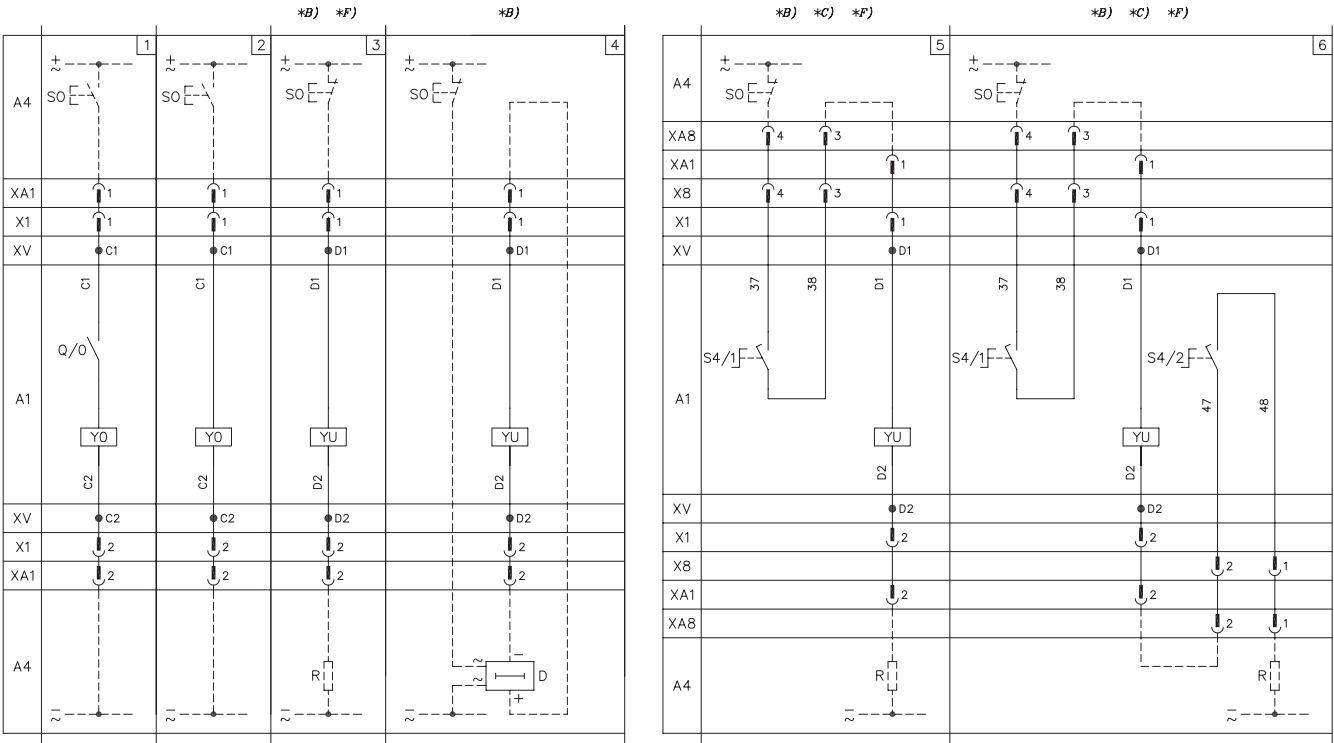
3 pole or 4 pole switch disconnector

Wiring diagrams

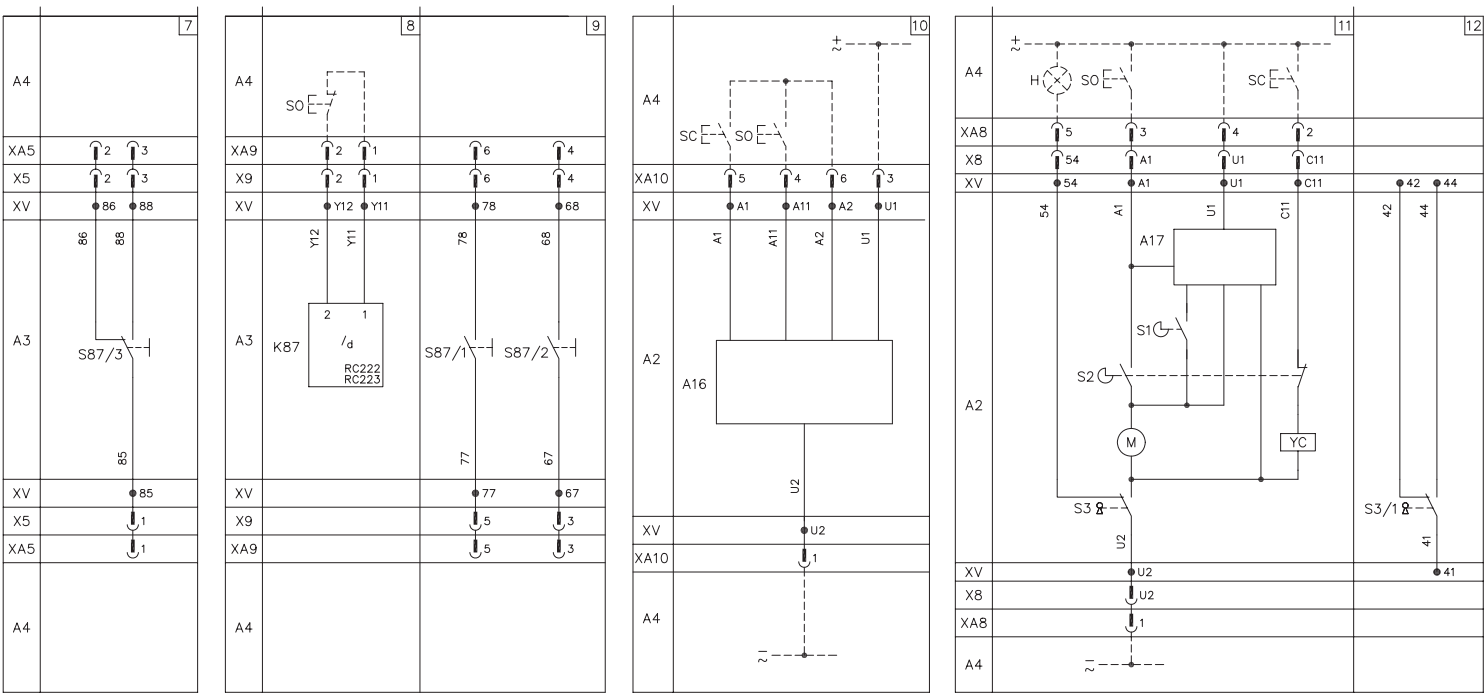
Molded Case Circuit Breakers

Wiring diagrams electrical accessories T1 - T3 and T4 - T6

Shunt trip and undervoltage release



Residual current release and remote controls

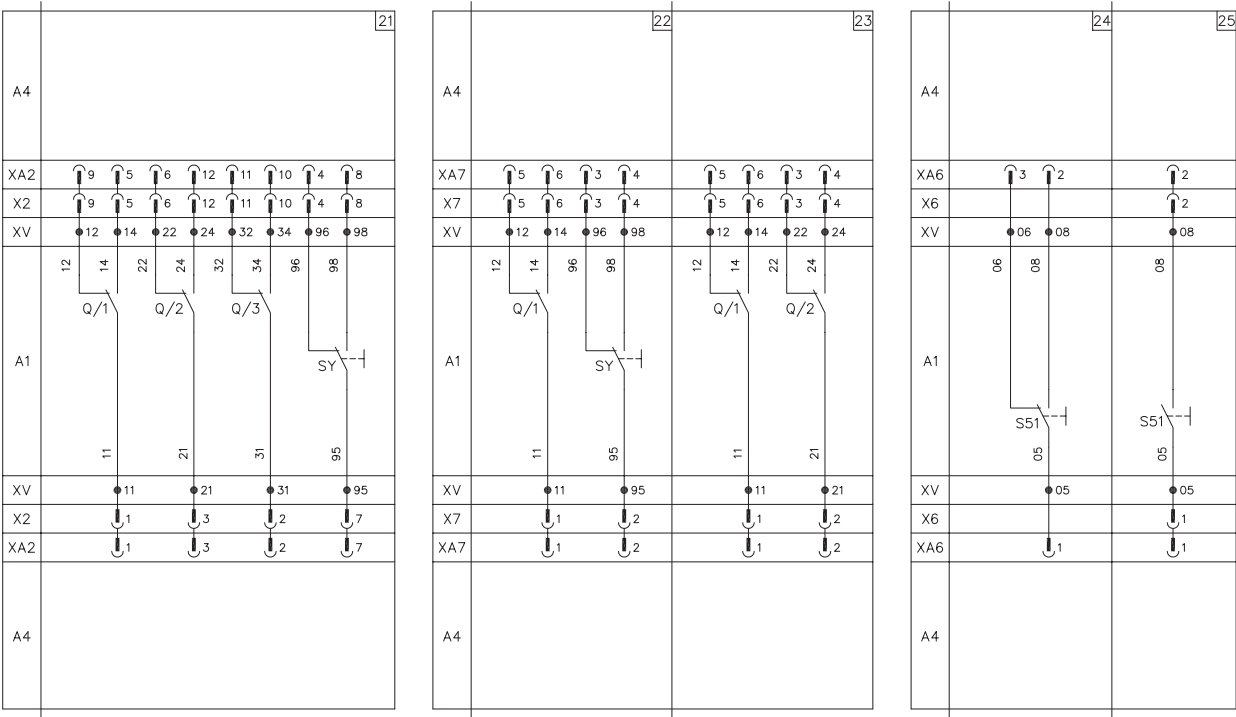


Wiring diagrams

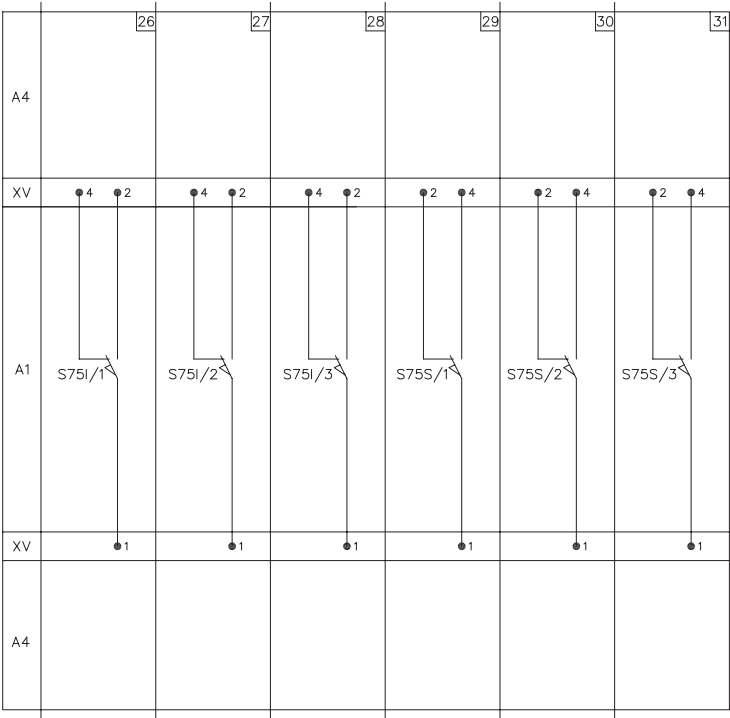
Molded Case Circuit Breakers

Auxiliary contacts

5



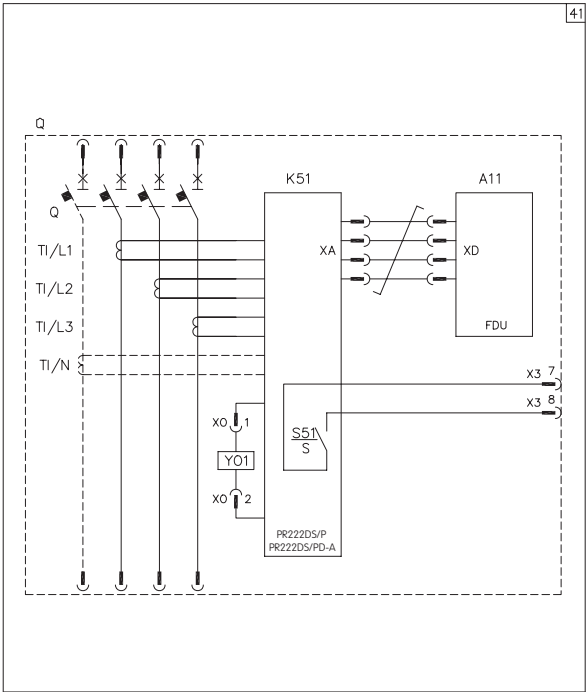
Position contacts



Wiring diagrams

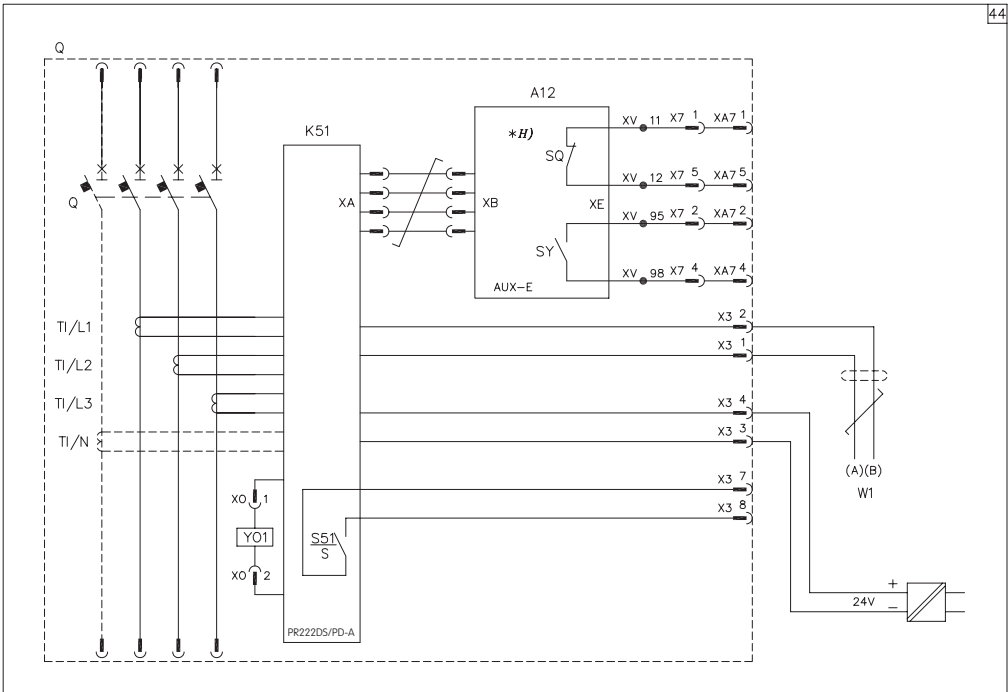
Molded Case Circuit Breakers

PR222DS/P, PR222DS/PD-A electronic trip unit connected to FDU display unit



5

PR222DS/PD-A electronic trip unit connected with the AUX-E auxiliary contacts



5

5



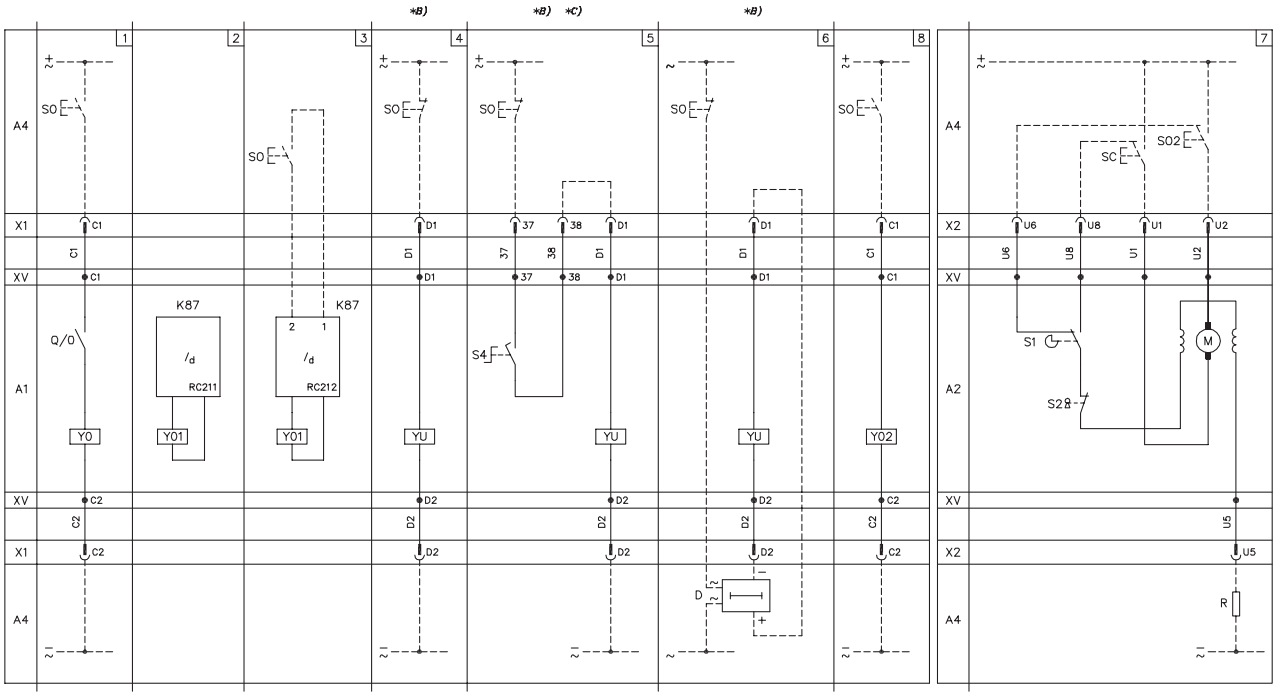
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Wiring diagrams

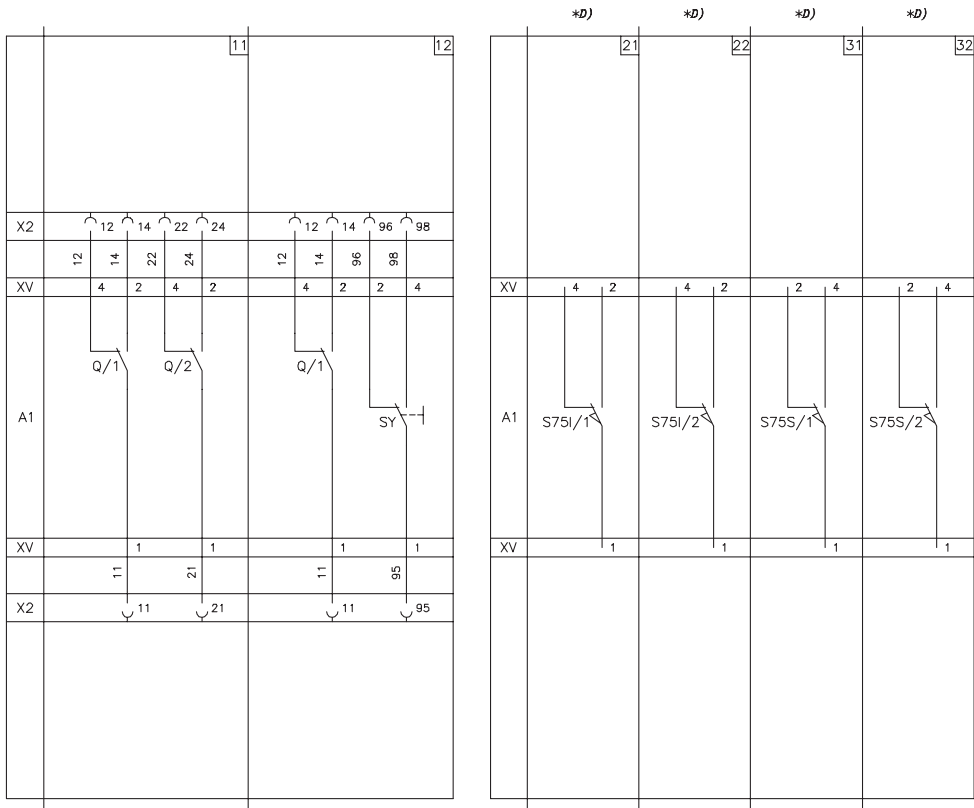
Molded Case Circuit Breakers

Residual current releases, service releases and direct action motor operator



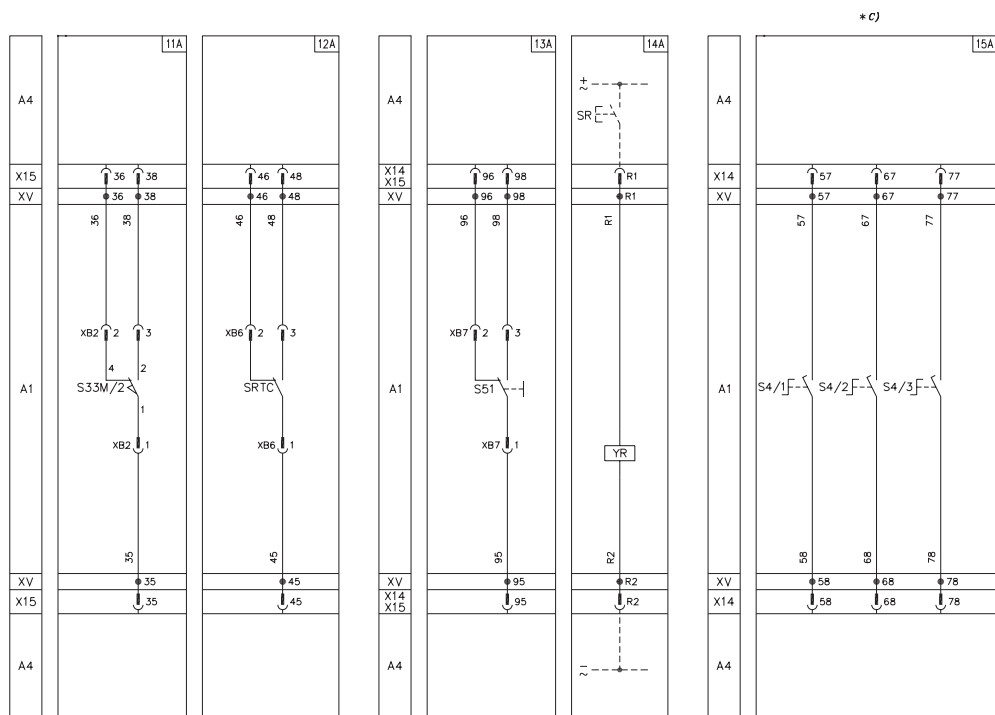
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Auxiliary contacts



5

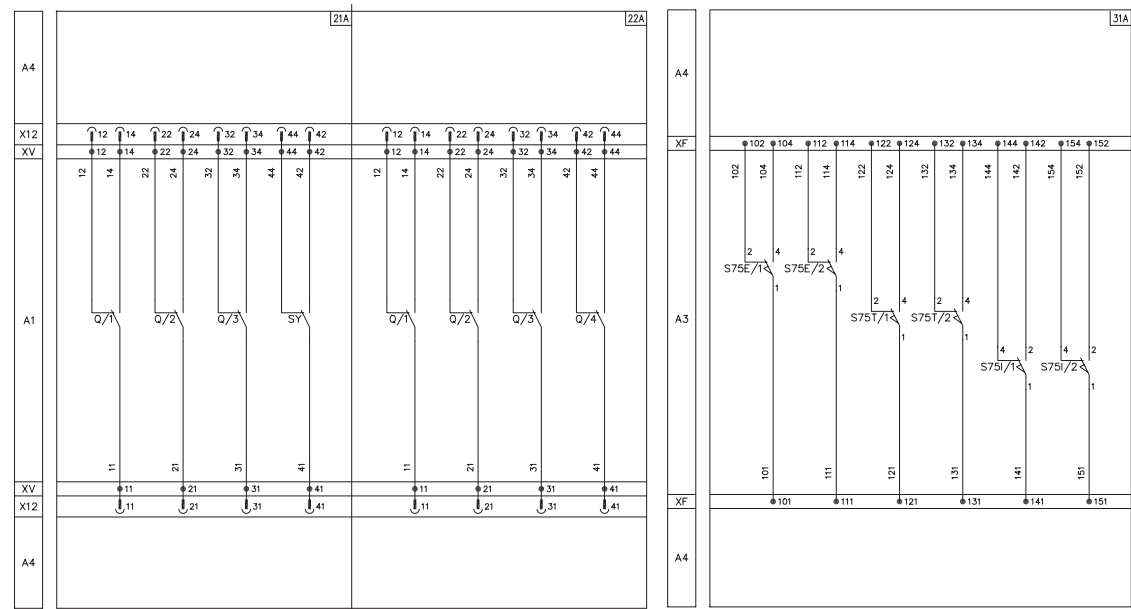
Motor operator, shunt trip, closing coil and undervoltage releases



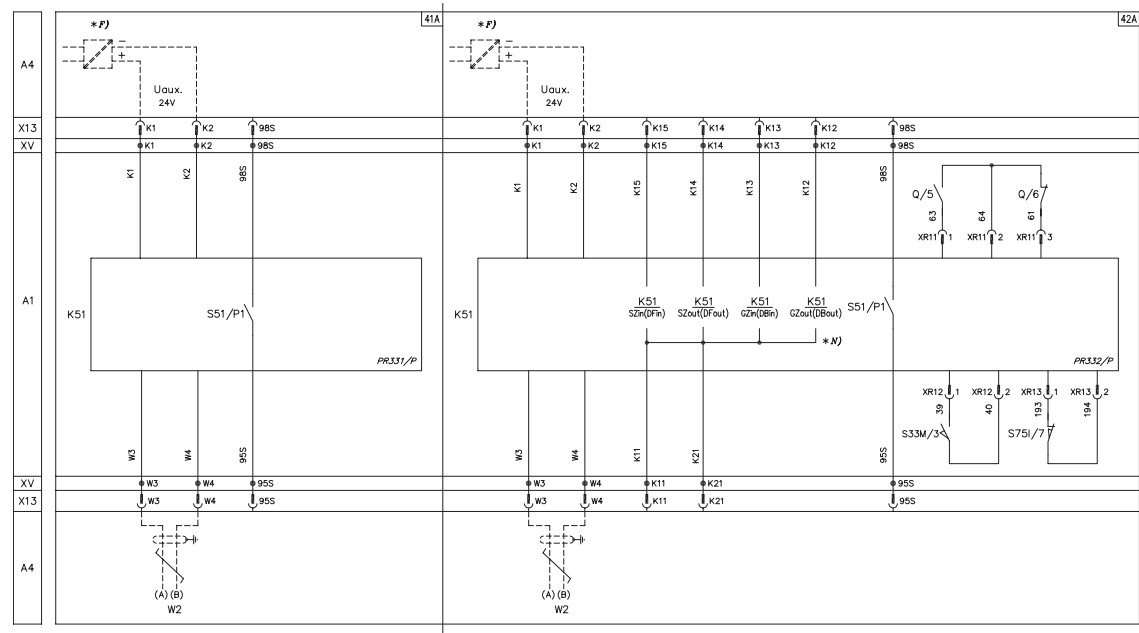
Wiring diagrams

Molded Case Circuit Breakers

Signalling contacts

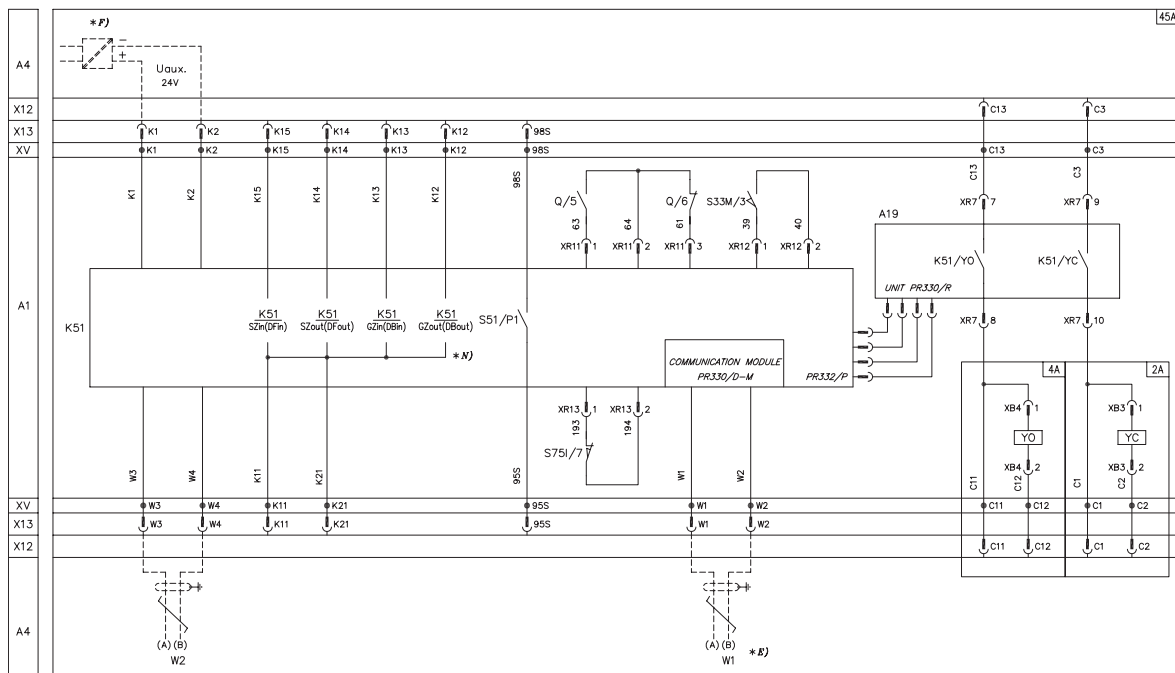


Auxiliary circuits of the PR331/P and PR332/P trip units

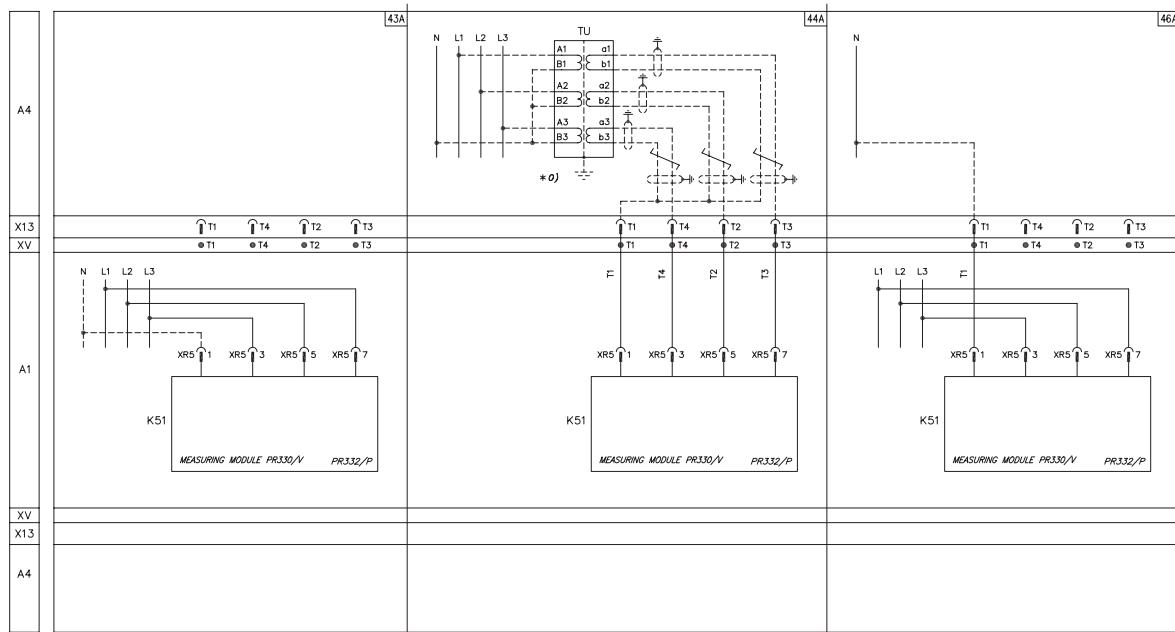


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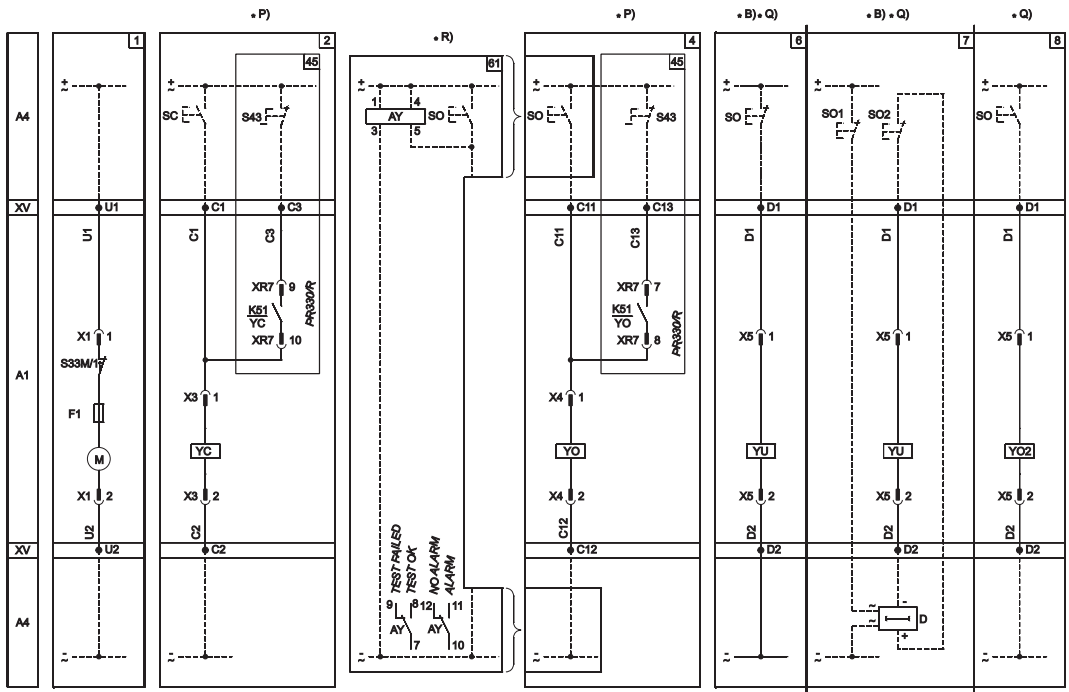
PR332/P trip unit equipped with PR330/R actuator unit and PR330/D-M dialog unit



Mesuring module PR330/V



Motor operator, shunt trip, closing coil and undervoltage releases

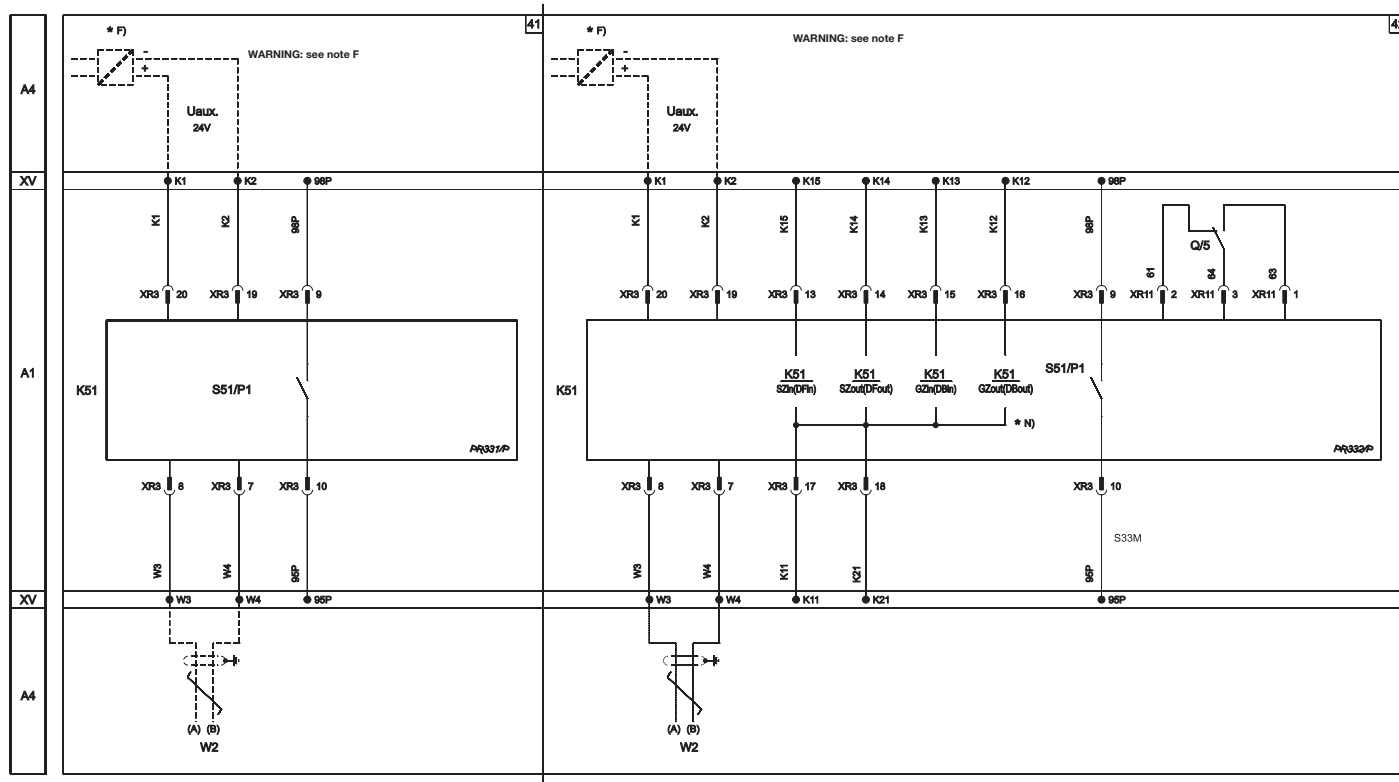


		= B) + Q)	
A4	XV	11	12
A1	XV	13	14
A4	XV	12A	22

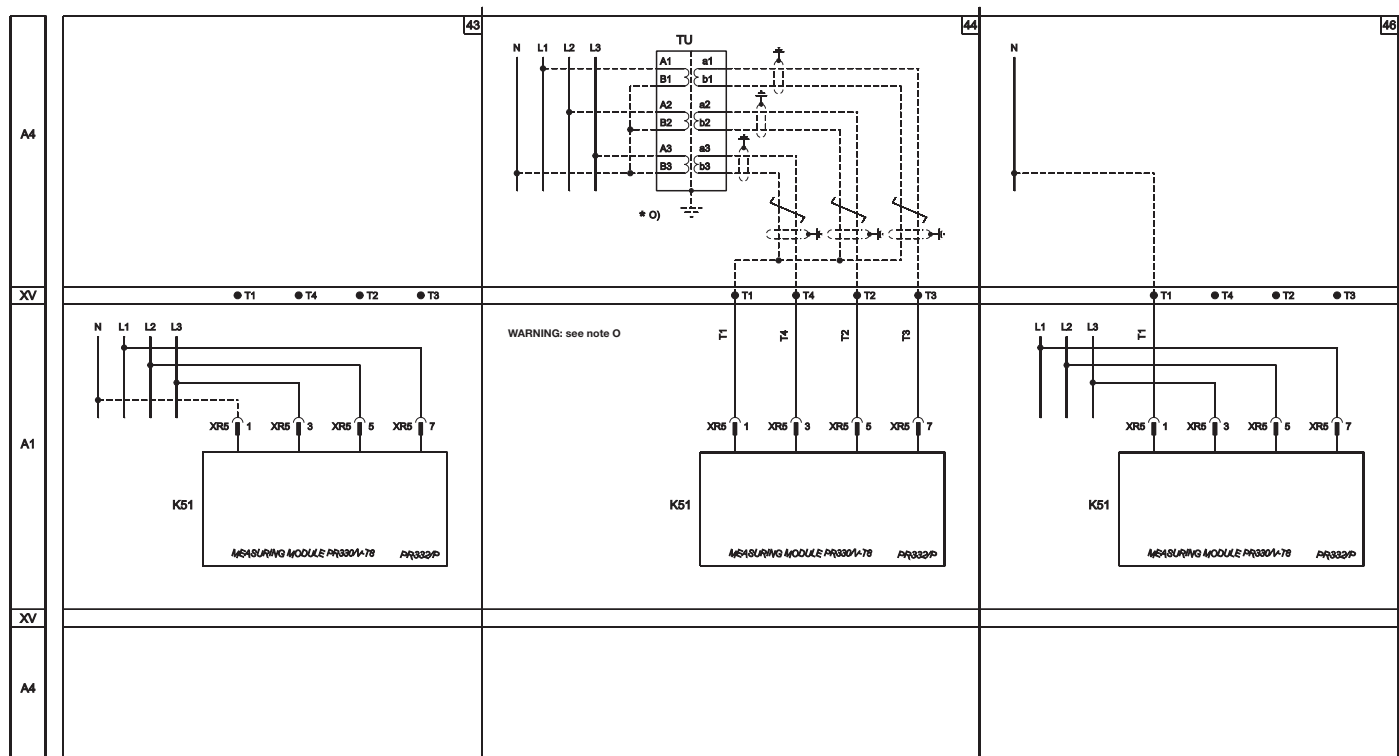
Wiring diagrams

Molded Case Circuit Breakers

Auxiliary circuits of the PR331/P and PR332/P trip units



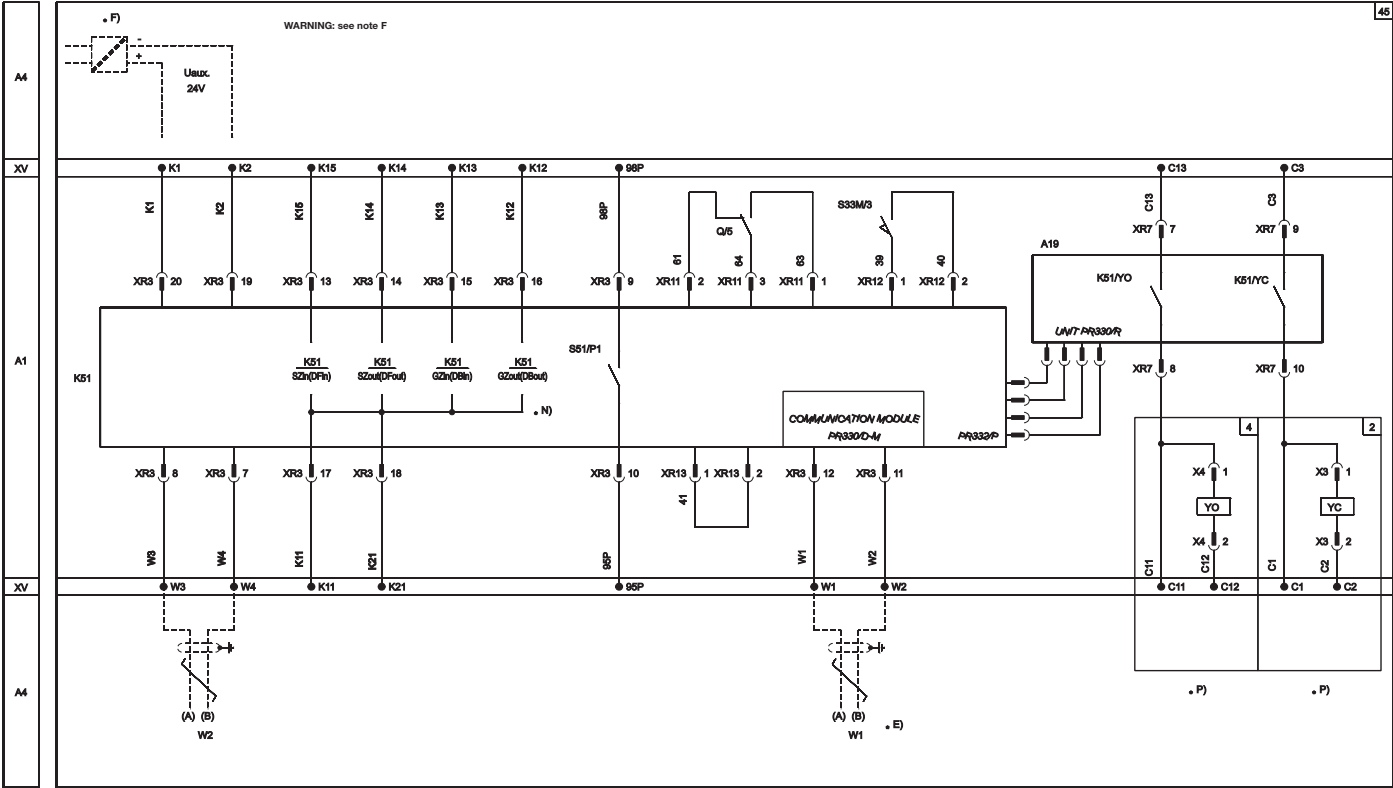
Mesuring module PR330/V-T8



Wiring diagrams

Molded Case Circuit Breakers

PR332/P trip unit equipped with PR330/R actuator unit and PR330/D-M dialog unit



For your notes

5

For your notes

Handwriting practice lines consisting of 20 horizontal dotted lines.

For your notes

5

Overall dimensions

Molded Case Circuit Breakers

Fixed circuit breakers and terminals

Tmax T1 1P and T1	6/2
Tmax T2	6/4
Tmax T3	6/8
Tmax Ts3	6/13
Tmax T4	6/17
Tmax T5 (400A)	6/21
Tmax T5 (600A)	6/25
Tmax T6	6/27
Tmax T7	6/31
Tmax T7M	6/37
Tmax T8	6/43

Plug-in circuit breakers and terminals

Tmax T2	6/47
Tmax T3	6/51
Tmax Ts3	6/55
Tmax T4	6/58
Tmax T5 (400)	6/62

Draw-out circuit breakers and terminals

Tmax Ts3	6/66
Tmax T4	6/69
Tmax T5	6/73
Tmax T6	6/77
Tmax T7	6/80
Tmax T7M	6/83

Accessories

Tmax T1-T2-T3	6/86
Tmax Ts3	6/19
Tmax T4-T5	6/22
Tmax T6	6/23
Tmax T7	6/24
Tmax T7M	6/24

Distances to be respected

Insulation distance	6/23
Minimum distance side-by-side	6/24
Minimum distance superimposed	6/24

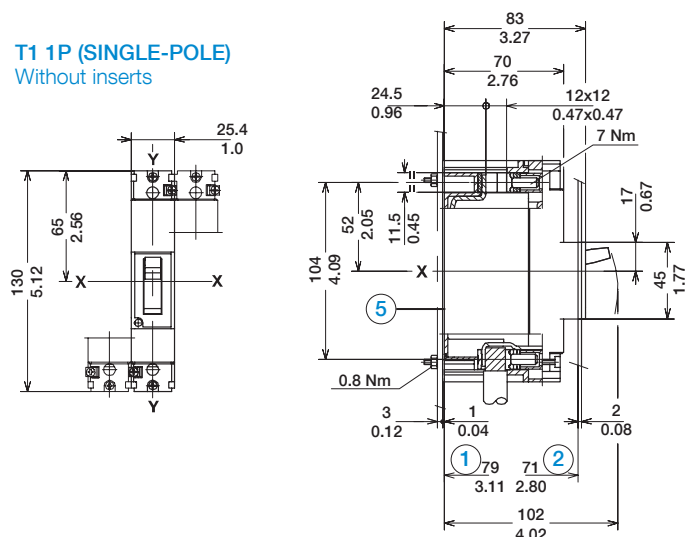
Overall dimensions

Molded Case Circuit Breakers

T1 FIXED VERSION

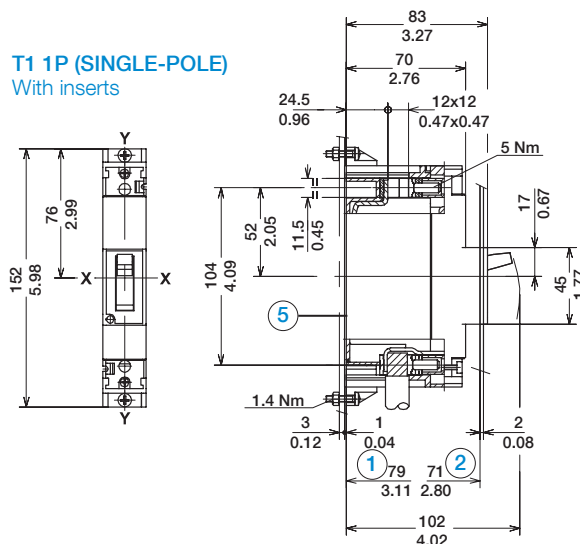
T1 1P (SINGLE-POLE)

Without inserts



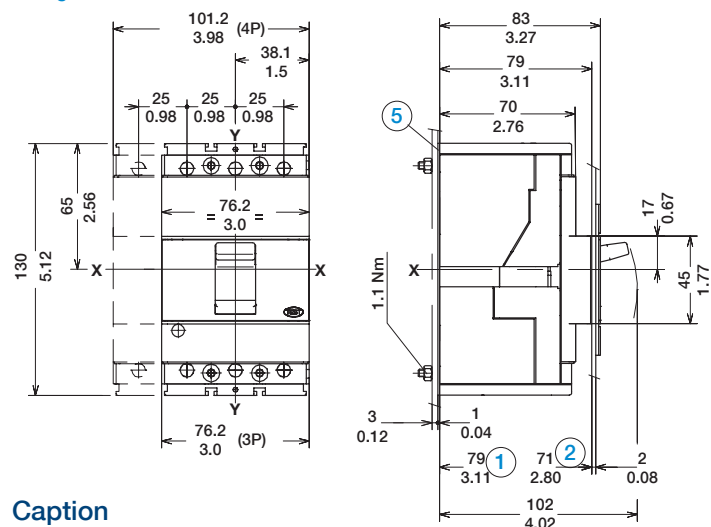
T1 1P (SINGLE-POLE)

With inserts



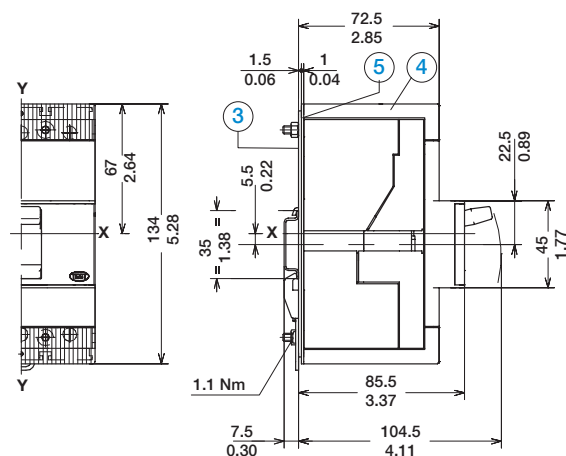
T1 3P/4P

Fixing on sheet



T1 3P/4P

Fixing on DIN rail



Caption

- ① Depth of the switchboard in the case of circuit breaker with face not extending from the compartment door, with or without flange
- ② Depth of the switchboard in the case of circuit breaker with face extending from the compartment door, without flange
- ③ Bracket for fixing onto rail
- ④ Bottom terminal covers with IP40 degree of protection
- ⑤ Insulating plate

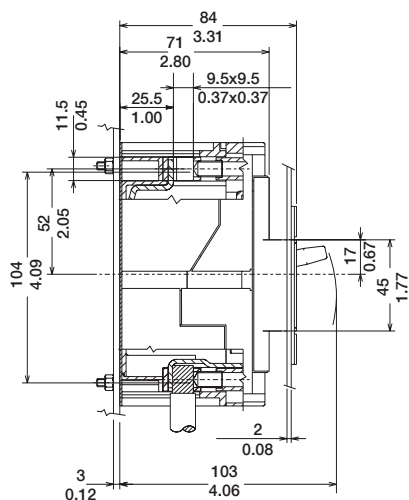
Overall dimensions

Molded Case Circuit Breakers

T1 FIXED VERSION

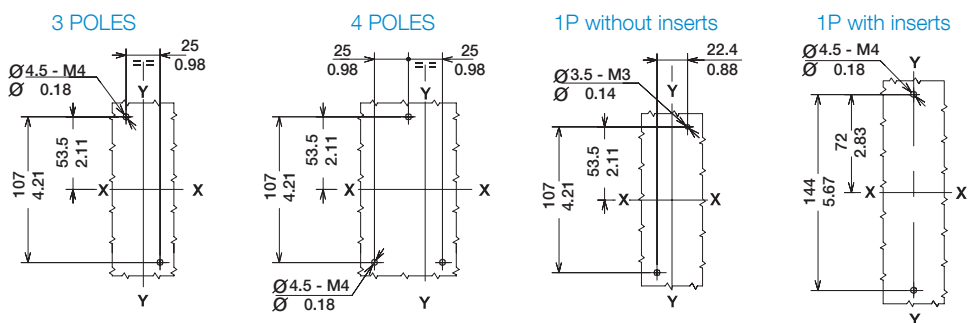
TERMINALS

Front for CuAl cables (FC CuAl)



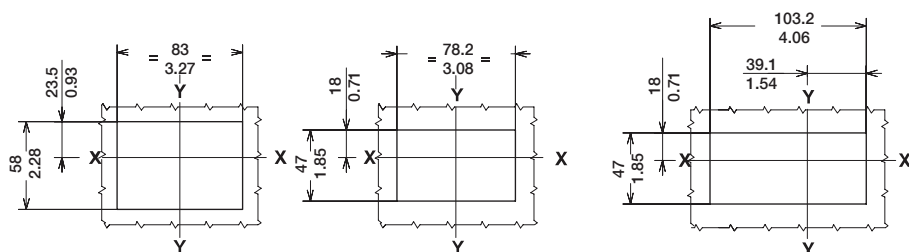
DRILLING TEMPLATES

Support sheet



DRILLING TEMPLATES

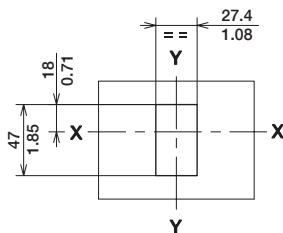
Compartment door



With flange and
circuit breaker face flush
with door (3-4 POLES)

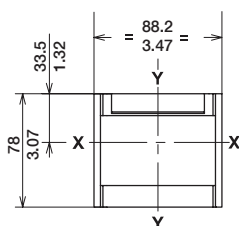
Without flange and
circuit breaker face flush
with door (3-4 POLES)
or extending (3 POLES)

Without flange and
circuit breaker face
extending (4 POLES)



(SINGLE-POLE)

Flange for the compartment door



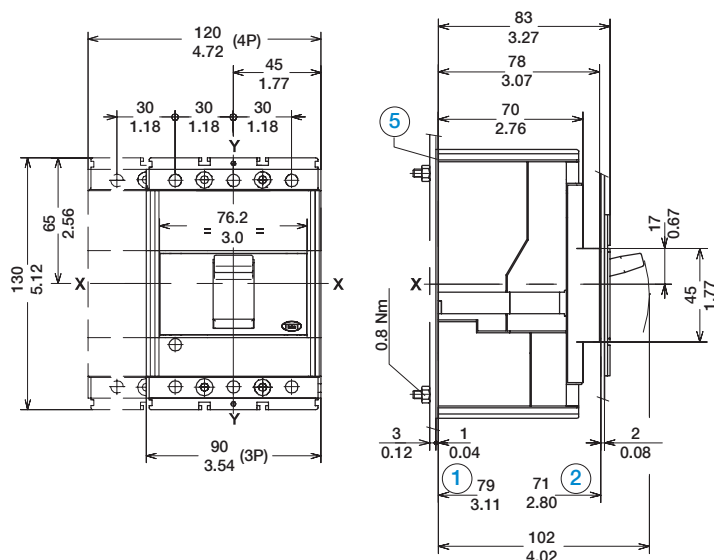
Overall dimensions

Molded Case Circuit Breakers

T2 FIXED VERSION

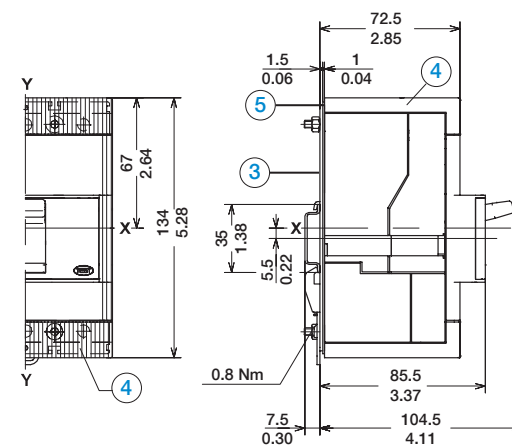
T2 3P/4P

Fixing on sheet



T2 3P/4P

Fixing on DIN rail



Caption

- ① Depth of the switchboard in the case of circuit breaker with face not extending from the compartment door, with or without flange
- ② Depth of the switchboard in the case of circuit breaker with face extending from the compartment door, without flange
- ③ Bracket for fixing onto rail
- ④ Bottom terminal covers with IP40 degree of protection
- ⑤ Insulating plate

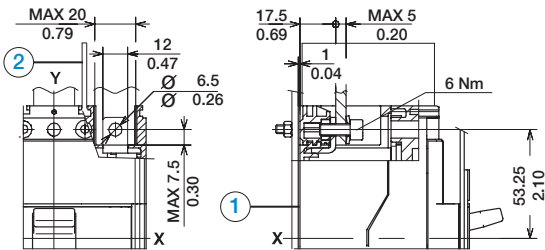
Overall dimensions

Molded Case Circuit Breakers

T2 FIXED VERSION

TERMINALS

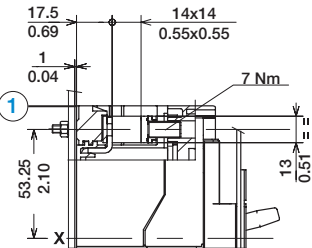
Front (F)



Caption

- ① Insulating base plate (compulsory)
- ② Insulating barriers between phases (compulsory)

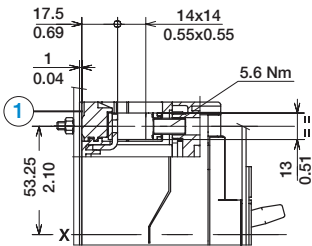
Front for Cu cables (FC Cu)



Caption

- ① Insulating base plate (compulsory)

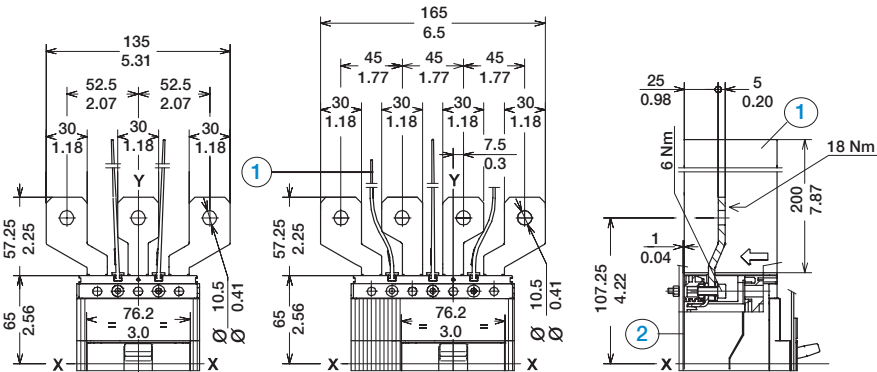
Front for CuAl cables (FC CuAl)



Caption

- ① Insulating base plate (compulsory)

Front extended spread (ES)



Caption

- ① Insulating base plate (compulsory)
- ② Insulating barriers between phases (compulsory)

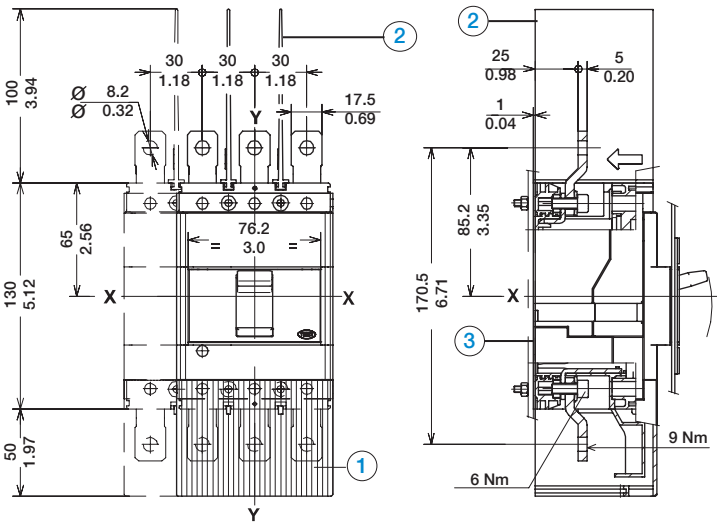
Overall dimensions

Molded Case Circuit Breakers

T2 FIXED VERSION

TERMINALS (continued)

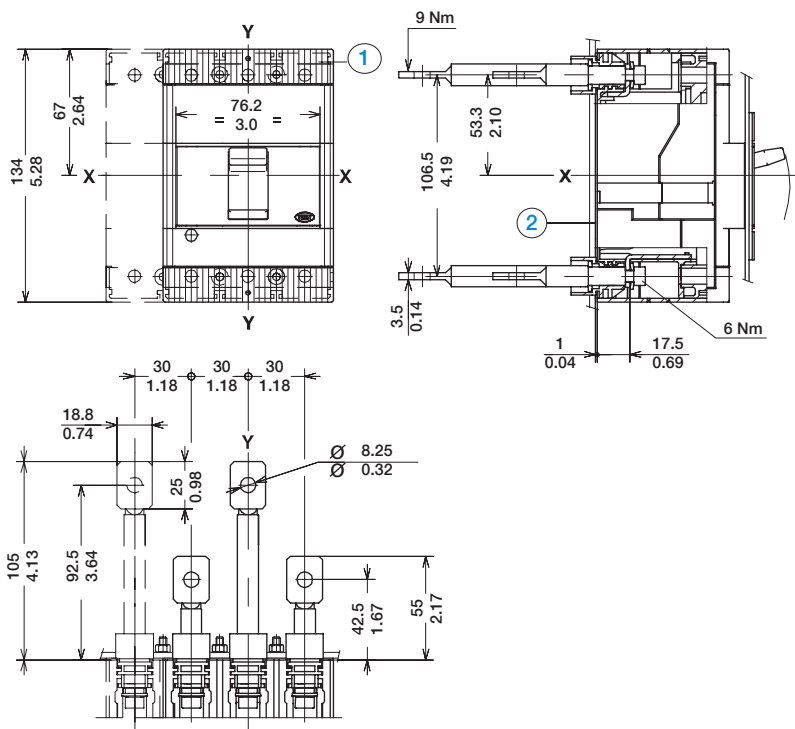
Front extended (EF)



Caption

- 1 High terminal covers with IP40 protection degree
- 2 Insulating barriers between phases (compulsory without 1)
- 3 Insulating base plate (compulsory)

Rear (R)



Caption

- 1 Low terminal covers with IP40 protection degree
- 2 Insulating plate

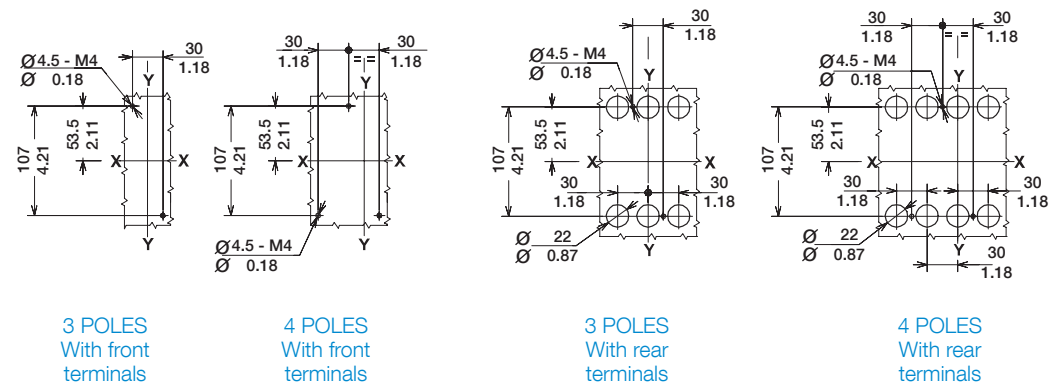
Overall dimensions

Molded Case Circuit Breakers

T2 FIXED VERSION

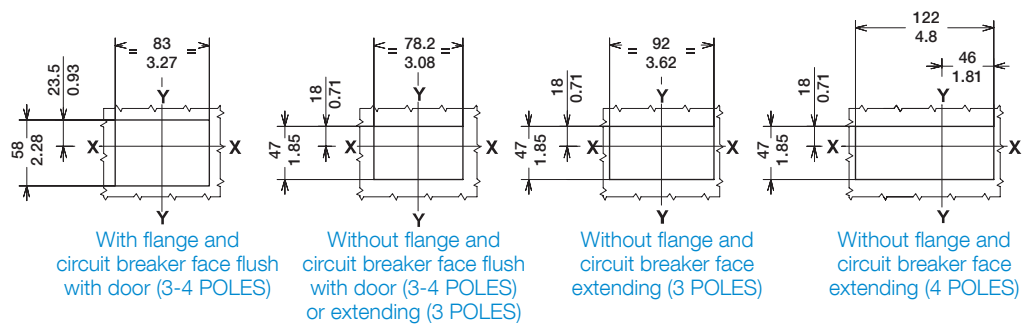
DRILLING TEMPLATES

Support sheet

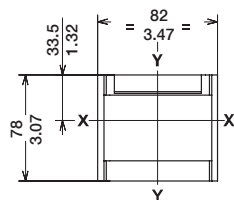


DRILLING TEMPLATES

Compartment door



Flange for the compartment door



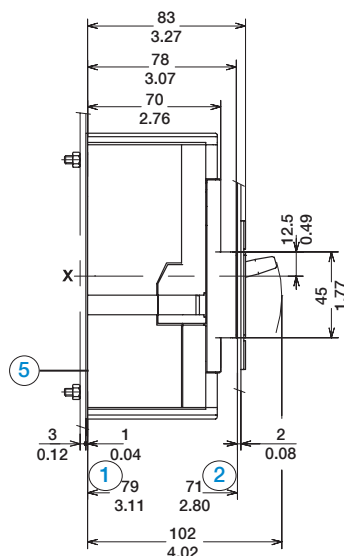
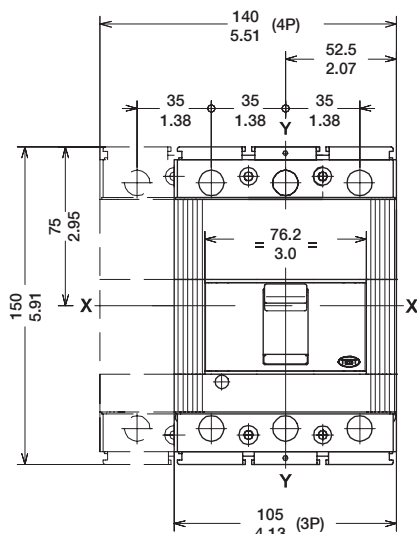
Overall dimensions

Molded Case Circuit Breakers

T3 FIXED VERSION

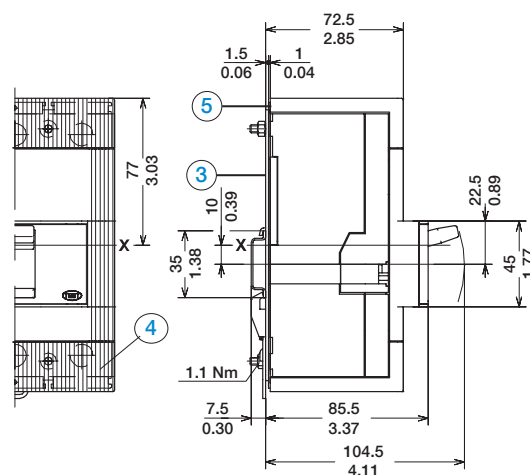
T3 3P/4P

Fixing on sheet



T3 3P/4P

Fixing on DIN rail



Caption

- ① Depth of the switchboard in the case of circuit breaker with face not extending from the compartment door, with or without flange
- ② Depth of the switchboard in the case of circuit breaker with face extending from the compartment door, without flange
- ③ Bracket for fixing onto rail
- ④ Bottom terminal covers with IP40 degree of protection
- ⑤ Insulating plate

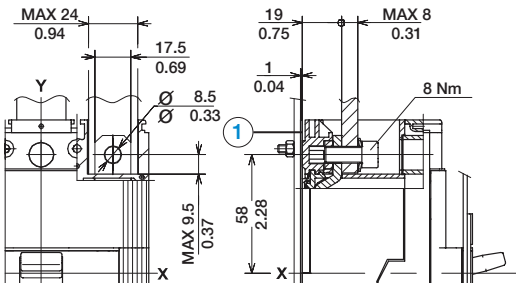
Overall dimensions

Molded Case Circuit Breakers

T3 FIXED VERSION

TERMINALS

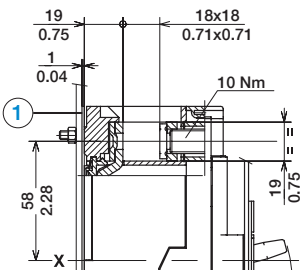
Front (F)



Caption

- ① Insulating base plate (compulsory)

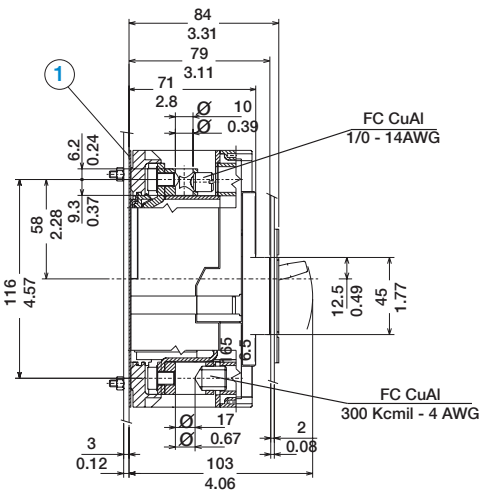
Front for Cu cables (FC Cu)



Caption

- ① Insulating base plate (compulsory)

Front for CuAl cables (FC CuAl)



Caption

- ① Insulating base plate (compulsory)

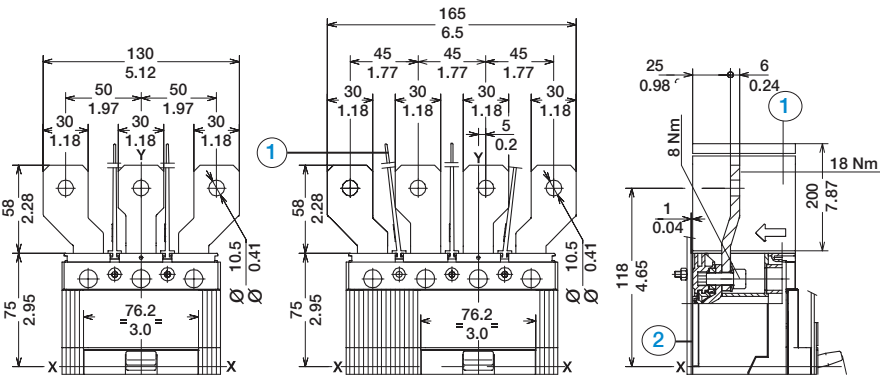
Overall dimensions

Molded Case Circuit Breakers

T3 FIXED VERSION

TERMINALS (continued)

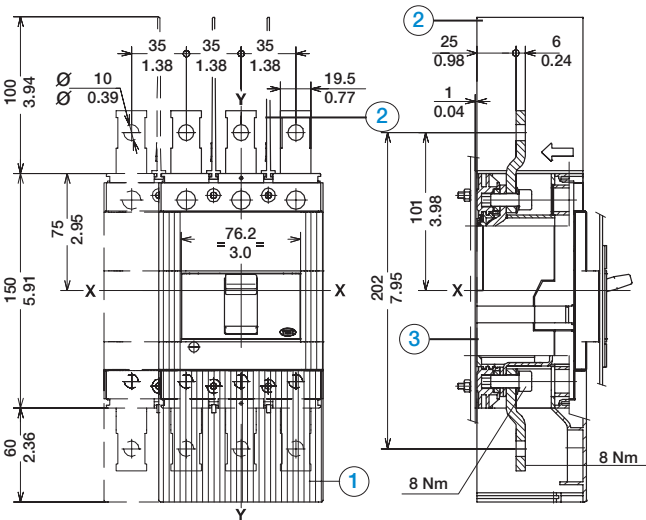
Front extended spread (ES)



Caption

- 1 Insulating barriers between phases (compulsory)
- 2 Insulating plate

Front extended (EF)



Caption

- 1 High terminal covers with IP40 protection degree
- 2 Insulating barriers between phases (compulsory without 1)
- 3 Insulating plate

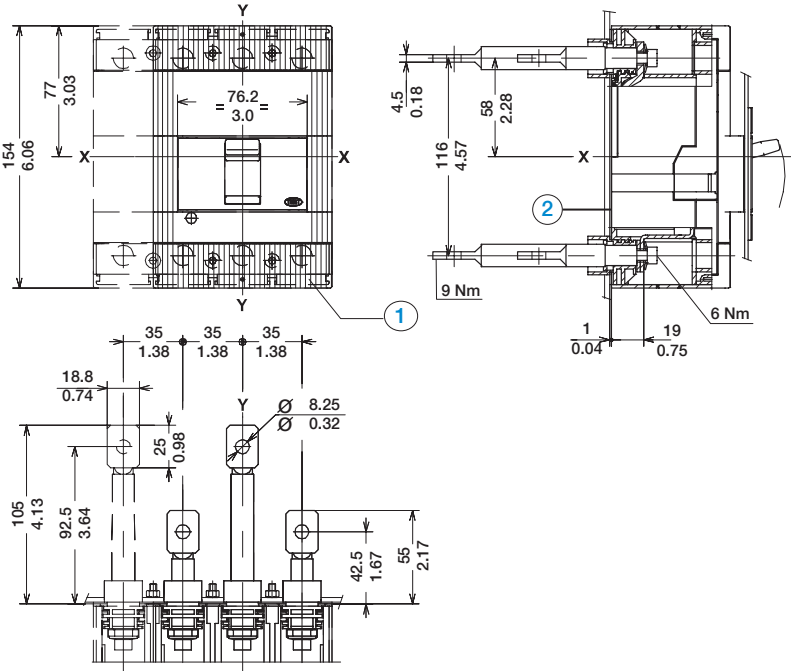
Overall dimensions

Molded Case Circuit Breakers

T3 FIXED VERSION

TERMINALS (continued)

Rear (R)



Caption

- 1 Low terminal covers with IP40 protection degree
- 2 Insulating base plate

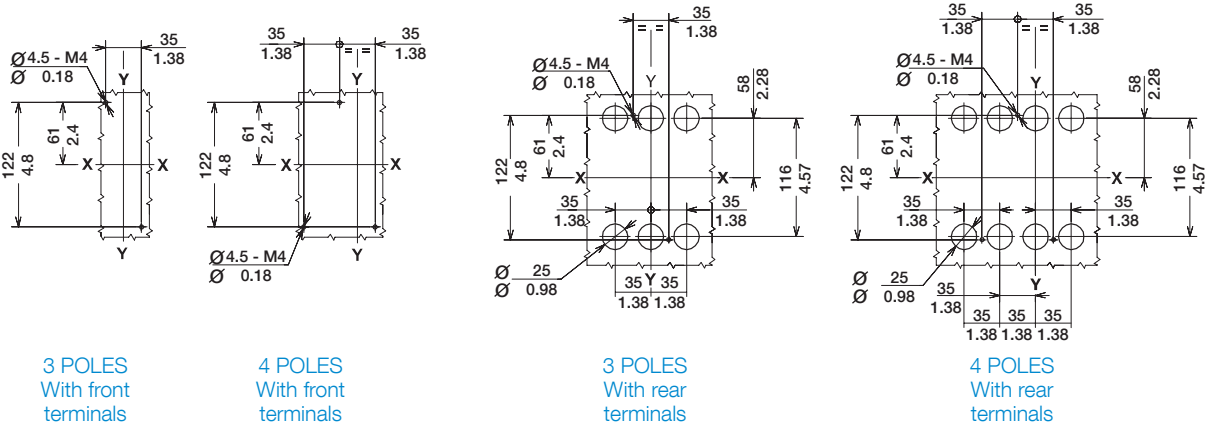
Overall dimensions

Molded Case Circuit Breakers

T3 FIXED VERSION

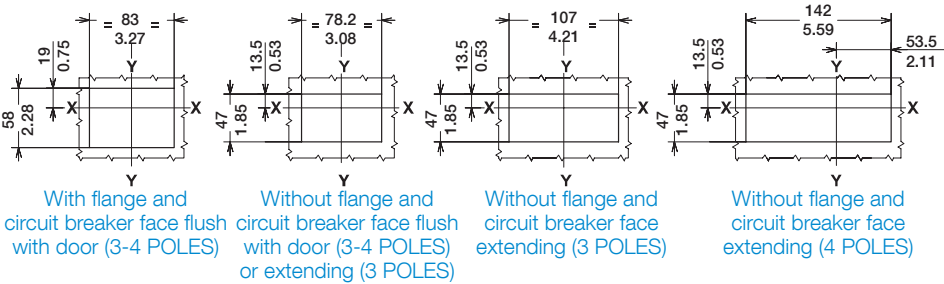
DRILLING TEMPLATES

Support sheet

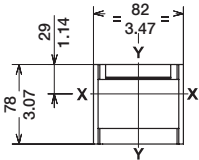


DRILLING TEMPLATES

Compartment door



Flange for the compartment door

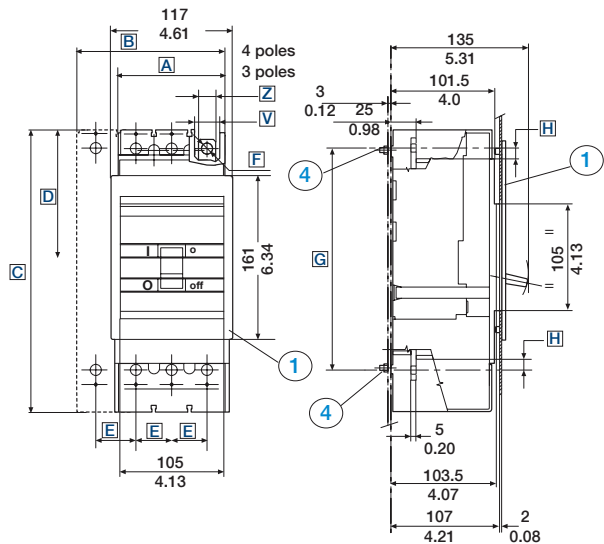


Overall dimensions

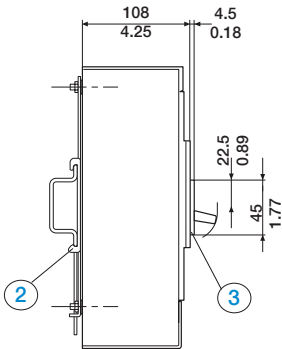
Molded Case Circuit Breakers

Ts3 FIXED VERSION

Ts3 3P/4P
Fixing on sheet



Ts3 3P/4P
Fixing on DIN rail



Dim.	A	B	C	D	E	F	G	H	I	L	V	Z
mm	105	140	170	87.25	35	Ø 8	143	10	73.75	18x18	24	17.5
in	4.13	5.51	6.69	3.44	1.38	Ø 0.31	5.63	0.39	2.90	0.71x0.71	0.94	0.69

Caption

- 1 Flange for compartment door
- 2 DIN rail bracket (75mm DIN)
- 3 1,77 in (45mm) front flange
- 4 Tightening torque 2 Nm

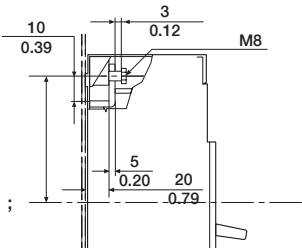
Overall dimensions

Molded Case Circuit Breakers

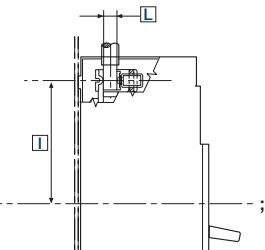
Ts3 FIXED VERSION

TERMINALS

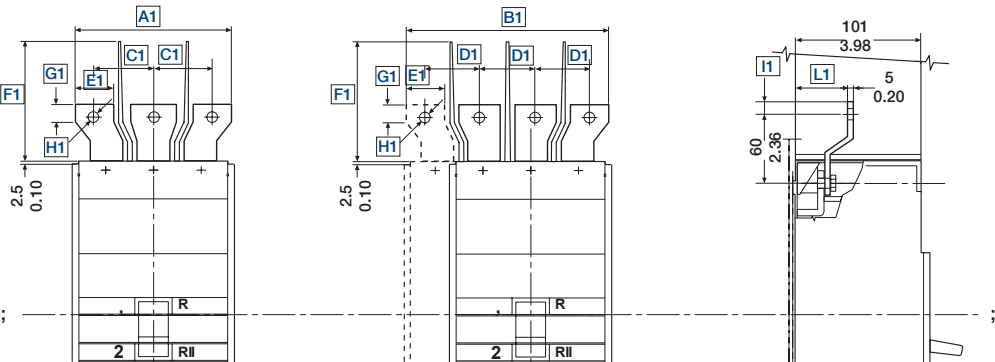
Front (F)



Front for CuAl cables (FC CuAl)



Front extended spread (ES)



Dim.	I	L	A1	B1	C1	D1	E1	F1	G1	H1	I1	L1
mm	73.75	Ø 16	130	165	50	45	30	155	...	Ø 8.5	12.5	45
in	2.90	Ø 0.63	5.12	6.50	1.97	1.77	1.18	6.10	...	Ø 0.33	0.49	1.77

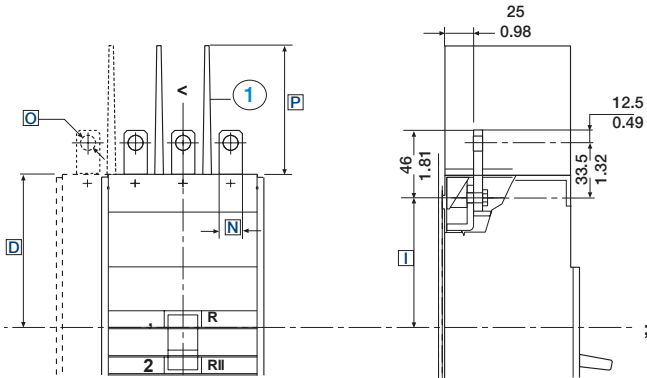
Overall dimensions

Molded Case Circuit Breakers

Ts3 FIXED VERSION

TERMINALS (continued)

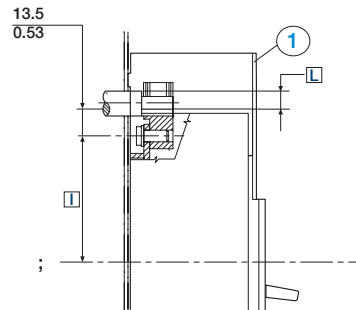
Front extended (EF)



Caption

- 1 Separator plates between the phases (to order)

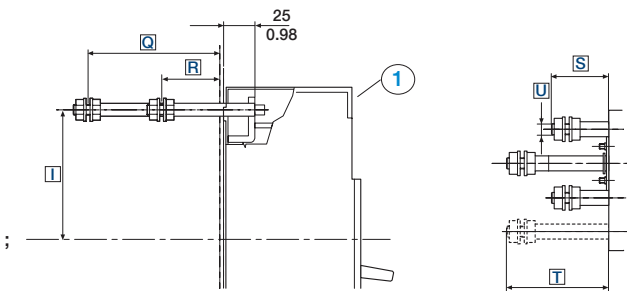
Rear for CuAl cables



Caption

- 1 High terminal covers included in supply

Rear threaded (R)



Caption

- 1 Low terminal covers included in supply

Dim.	D	I	L	N	O	P	Q	R	S	T	U
mm	87.25	73.75	Ø 16	20	Ø 8.5	100	81.5	36.5	55	100	M12
in	3.44	2.90	Ø 0.63	0.79	Ø 0.33	3.94	3.21	1.44	2.17	3.94	M12

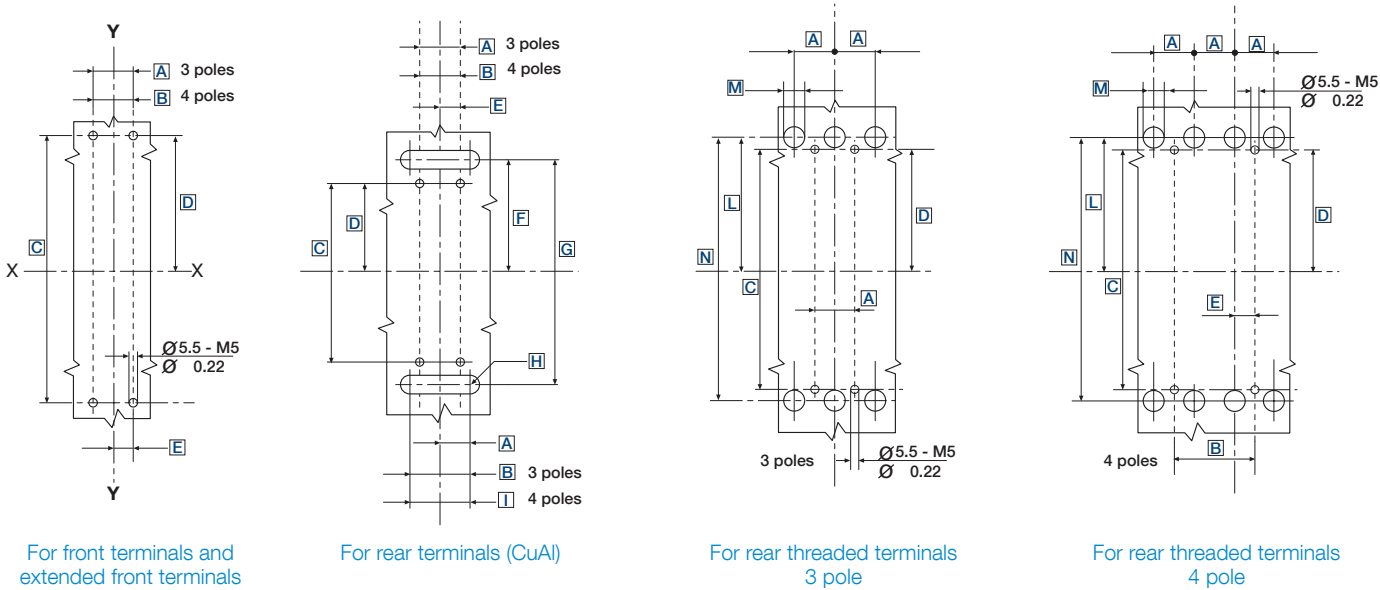
Overall dimensions

Molded Case Circuit Breakers

Ts3 FIXED VERSION

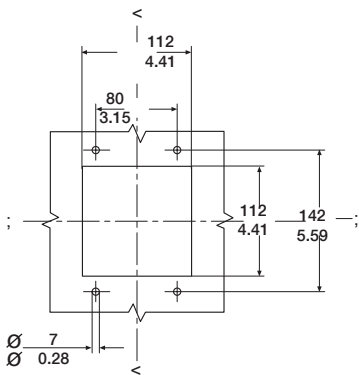
DRILLING TEMPLATES

Support sheet (minimum thickness of sheet metal 0.12" / 3mm)



DRILLING TEMPLATES

Compartment door (minimum thickness of sheet metal 0.08" / 2mm)



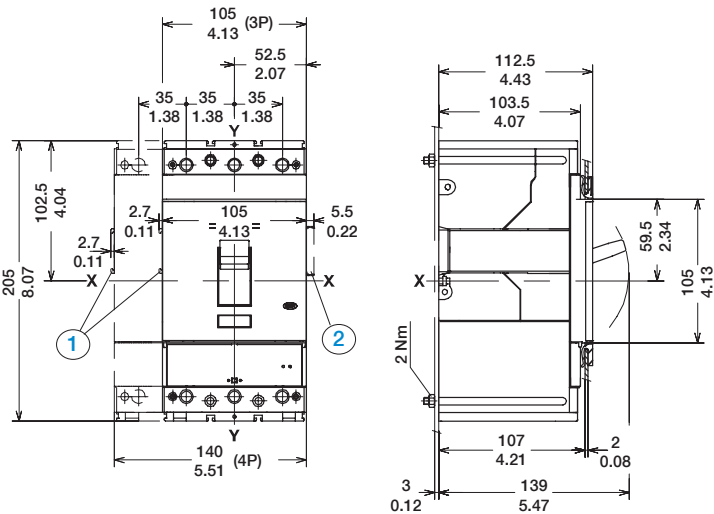
Letter	A	B	C	D	E	F	G	H	I	L	M	N
mm	35	70	139	71.75	17.5	94.75	185	R15	105	73.75	Ø 24	143
in	1.38	2.76	5.47	2.82	0.69	3.73	7.28	R0.59	4.13	2.90	Ø 0.94	5.63

Overall dimensions

Molded Case Circuit Breakers

T4 FIXED VERSION

T4 3P/4P
Fixing on sheet



Caption

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

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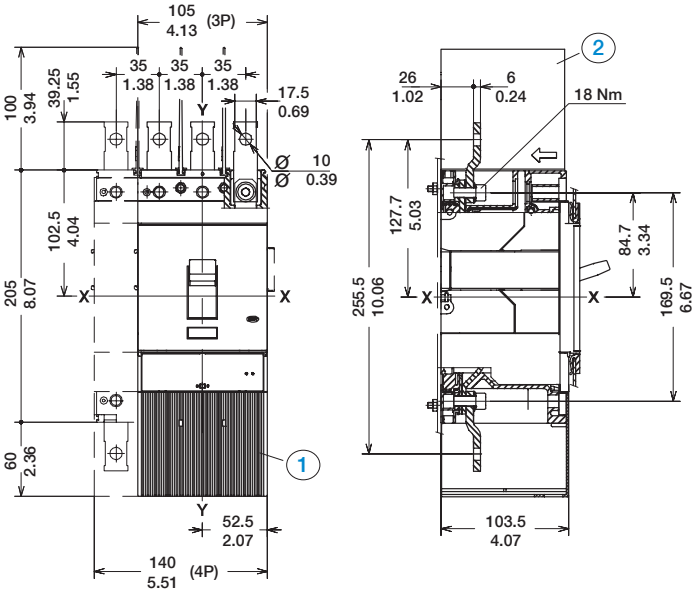
Overall dimensions

Molded Case Circuit Breakers

T4 FIXED VERSION

TERMINALS (continued)

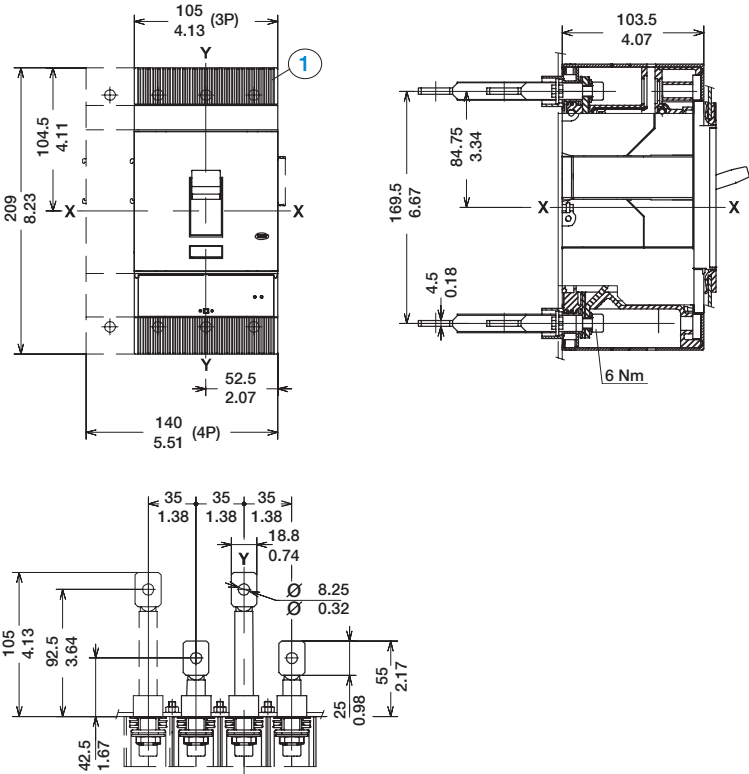
Front extended (EF)



Caption

- 1 High terminal covers with IP40 protection degree
- 2 Insulating barriers between phases (compulsory without 1)

Rear (R)



Caption

- 1 Low terminal covers with IP40 protection degree

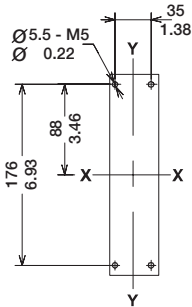
Overall dimensions

Molded Case Circuit Breakers

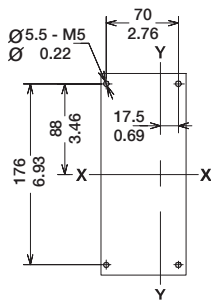
T4 FIXED VERSION

DRILLING TEMPLATES

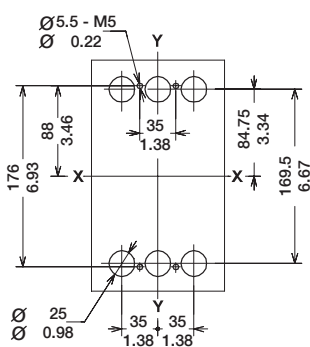
Support sheet



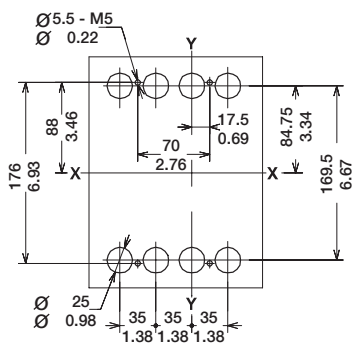
3 POLES
With front
terminals



4 POLES
With front
terminals



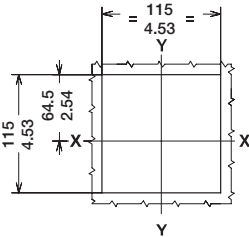
3 POLES
With rear
terminals



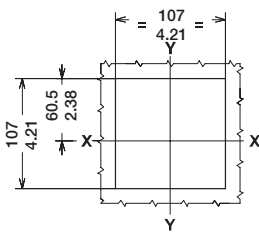
4 POLES
With rear
terminals

DRILLING TEMPLATES

Compartment door

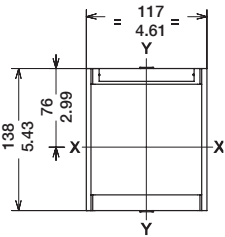


3 -4 POLE
With flange



3 -4 POLE
Without flange

Flange for the compartment door

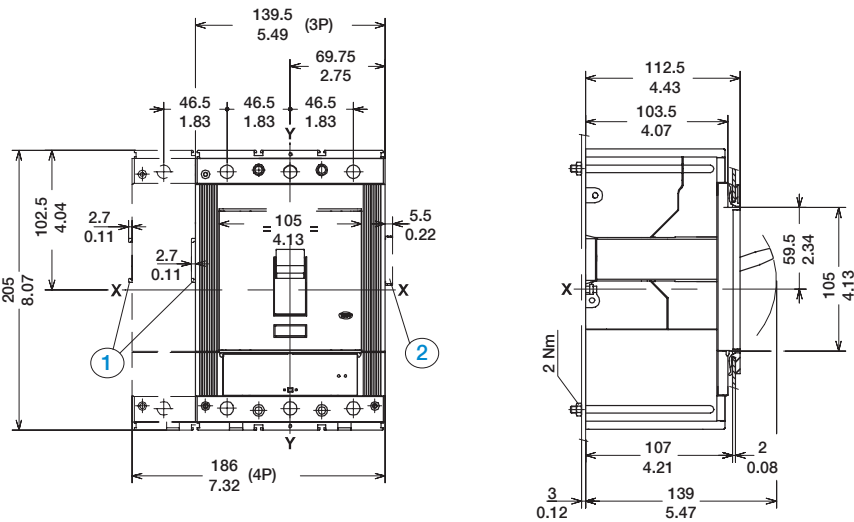


Overall dimensions

Molded Case Circuit Breakers

T5 (400) FIXED VERSION

T5 (400) 3P/4P
Fixing on sheet



Caption

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

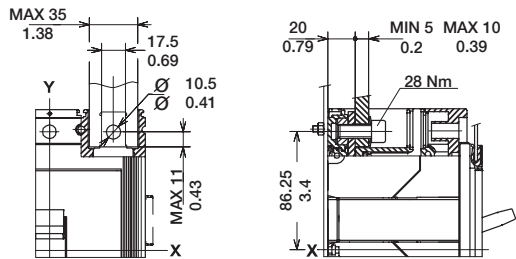
Overall dimensions

Molded Case Circuit Breakers

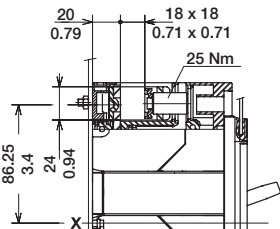
T5 (400) FIXED VERSION

TERMINALS

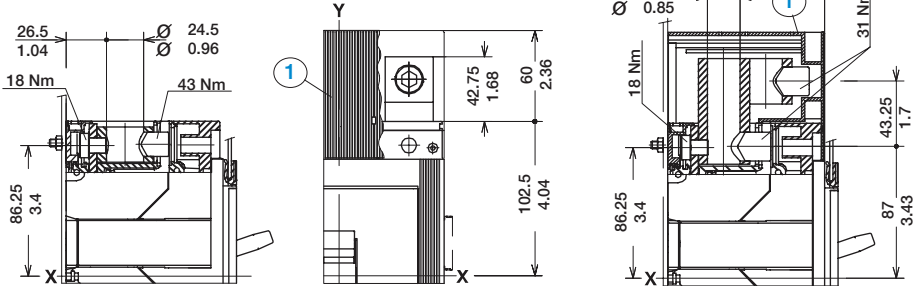
Front (F)



Front for Cu cables (FC Cu)



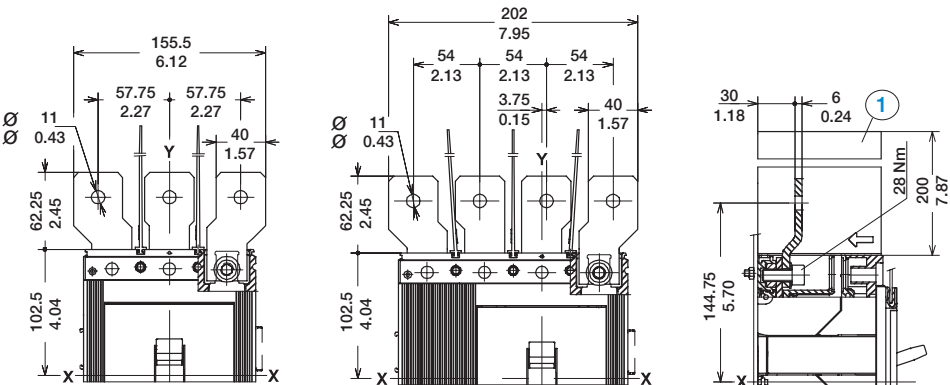
Front for CuAl cables (FC CuAl)



Caption

- ① High terminal covers with IP40 protection degree

Front extended spread (ES)



Caption

- ① Insulating barriers between phases (compulsory)

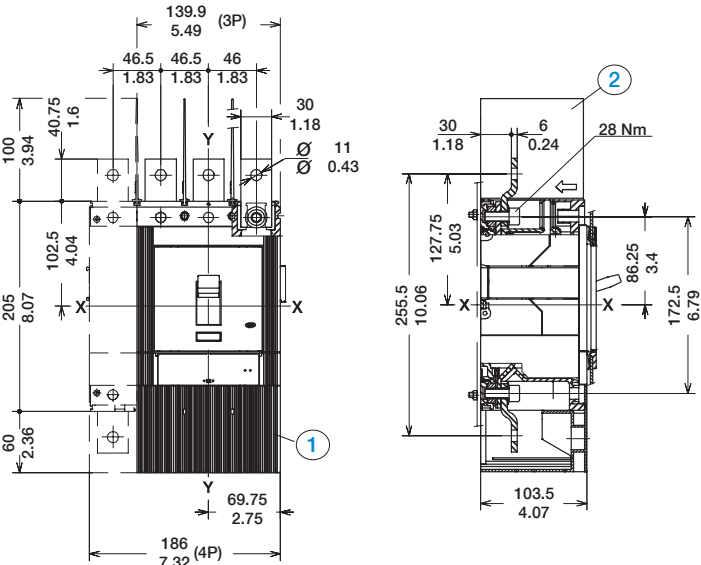
Overall dimensions

Molded Case Circuit Breakers

T5 (400) FIXED VERSION

TERMINALS (continued)

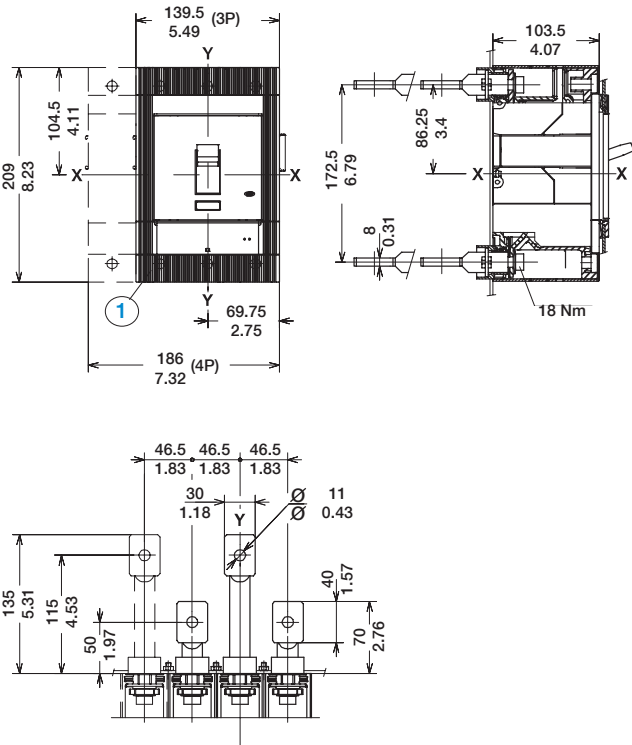
Front extended (EF)



Caption

- 1 High terminal covers with IP40 protection degree
- 2 Insulating barriers between phases (compulsory without 1)

Rear (R)



Caption

- 1 Low terminal covers with IP40 protection degree

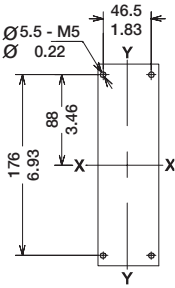
Overall dimensions

Molded Case Circuit Breakers

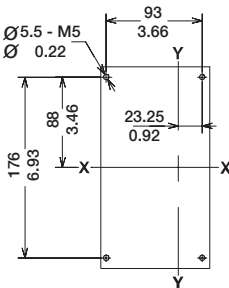
T5 (400) FIXED VERSION

DRILLING TEMPLATES

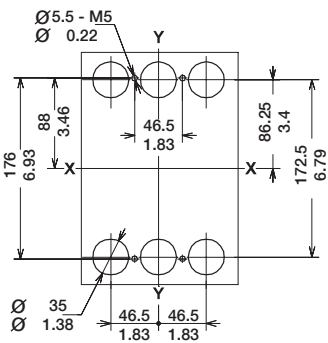
Support sheet



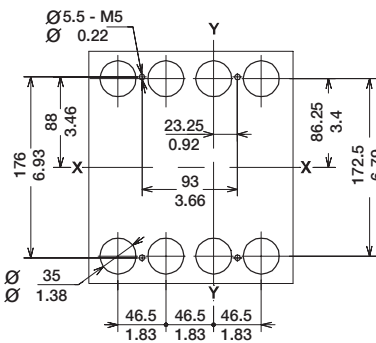
3 POLES
With front
terminals



4 POLES
With front
terminals



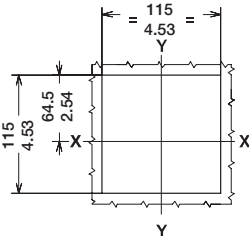
3 POLES
With rear
terminals



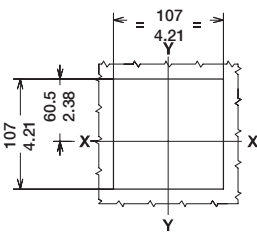
4 POLES
With rear
terminals

DRILLING TEMPLATES

Compartment door

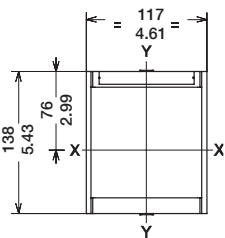


3 -4 POLE
With flange



3 -4 POLE
Without flange

Flange for the compartment door

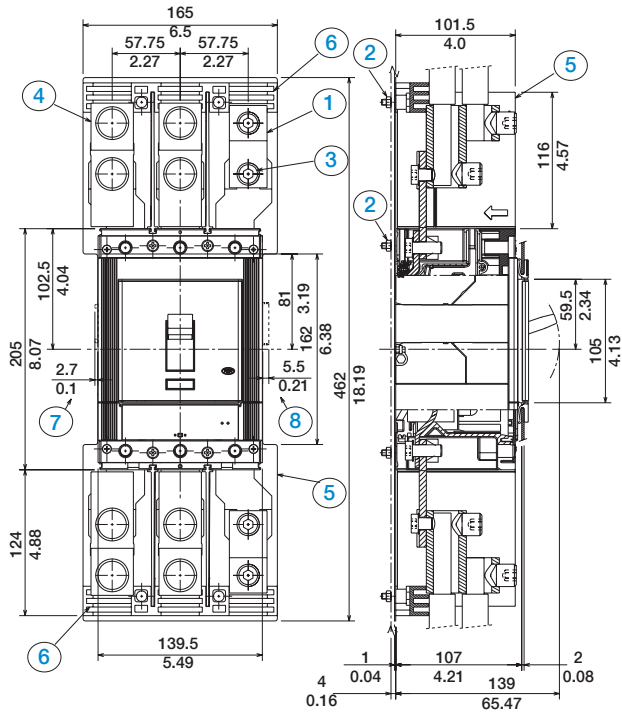


Overall dimensions

Molded Case Circuit Breakers

T5 (600) FIXED VERSION

T5 (600) 3P
Fixing on sheet



Caption

- ① Low terminal covers with IP40 protection degree
- ② Tightening torque 2 Nm
- ③ Tightening torque 31 Nm
- ④ Terminal cover
- ⑤ Insulating barrier + insulating plate
- ⑥ Terminals support
- ⑦ Spacing when equipped with SOR, UVR
- ⑧ Spacing when equipped with AUX (3Q+1SY only)

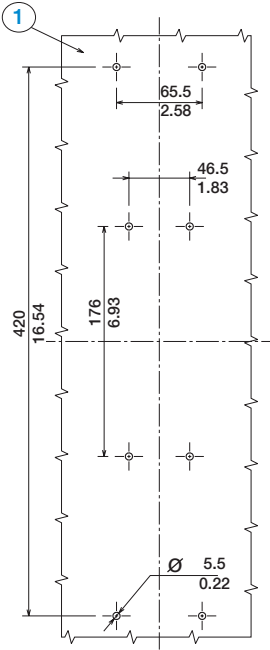
Overall dimensions

Molded Case Circuit Breakers

T5 (600) FIXED VERSION

DRILLING TEMPLATES

Support sheet

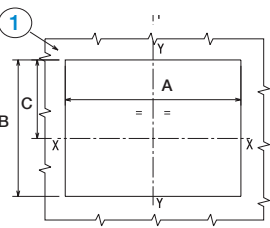


Caption

1 Fixing on sheet steel

DRILLING TEMPLATES

Compartment door

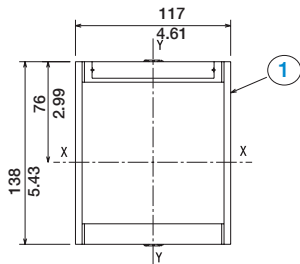


Dim.		With flange	Without flange
A	mm	115	107
	in	4.53	4.21
B	mm	115	107
	in	4.53	4.21
C	mm	64.5	60.5
	in	2.54	2.38

Caption

1 Compartment door sheet steel drilling

Flange for the compartment door



Caption

1 Flange for the compartment door

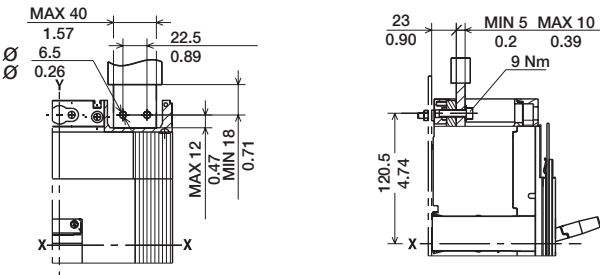
Overall dimensions

Molded Case Circuit Breakers

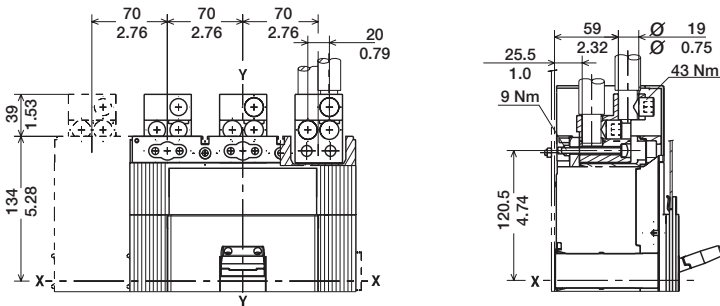
T6 FIXED VERSION

TERMINALS

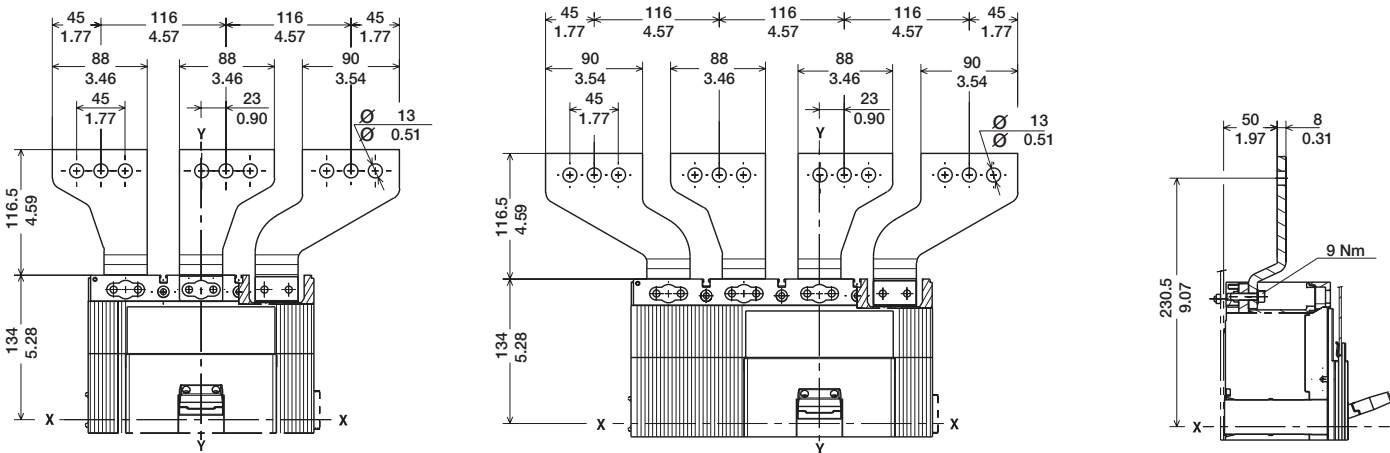
Front (F)



6 Front for CuAl cables (FC CuAl)



Front extended spread (ES)



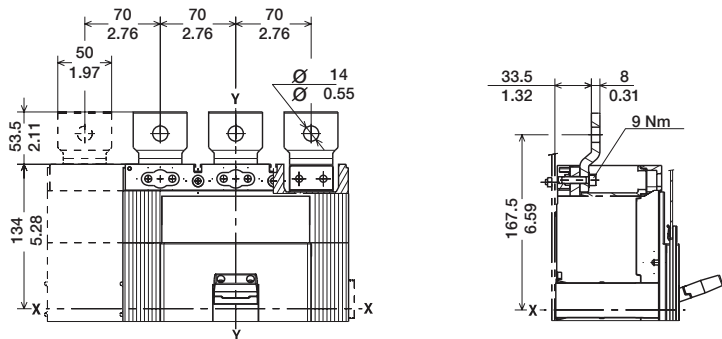
Overall dimensions

Molded Case Circuit Breakers

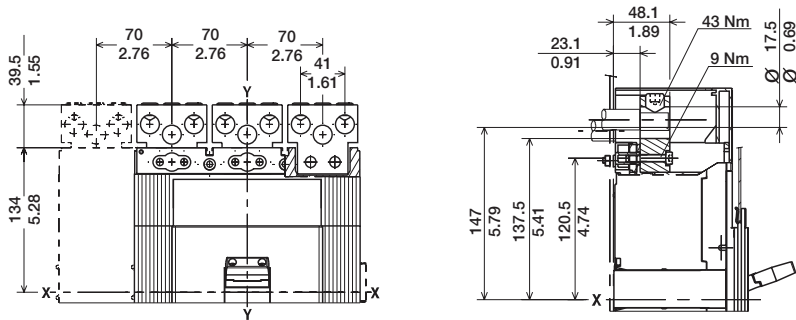
T6 FIXED VERSION

TERMINALS (continued)

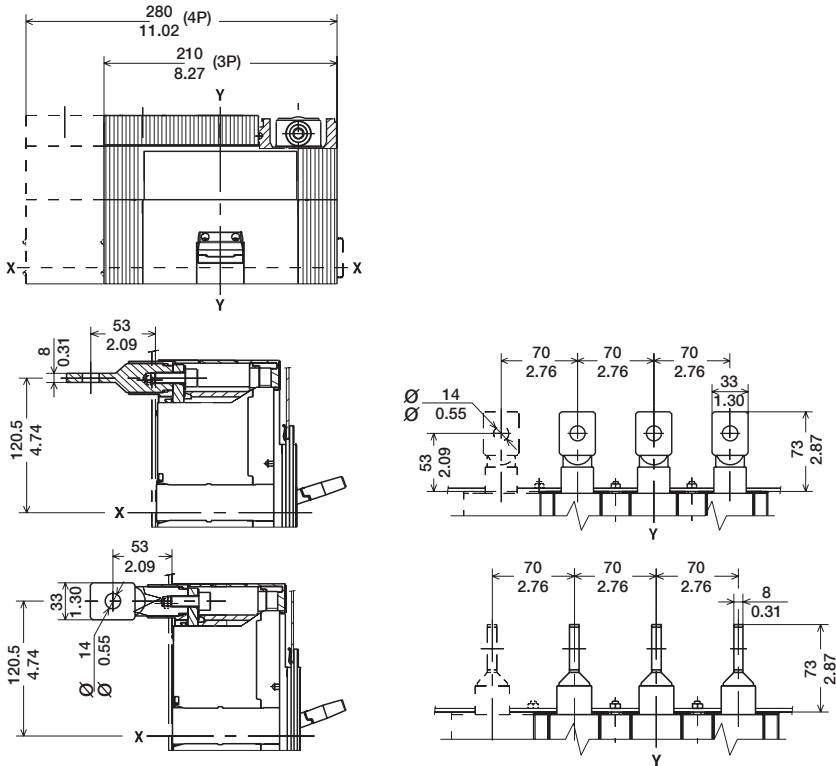
Front extended (EF)



Rear for CuAl cables



Rear (R)



3-4 POLES Horizontally oriented

3-4 POLES Vertically oriented

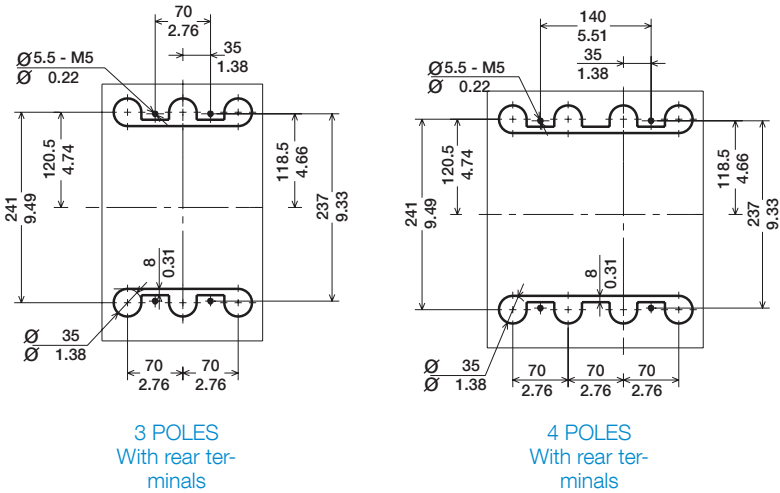
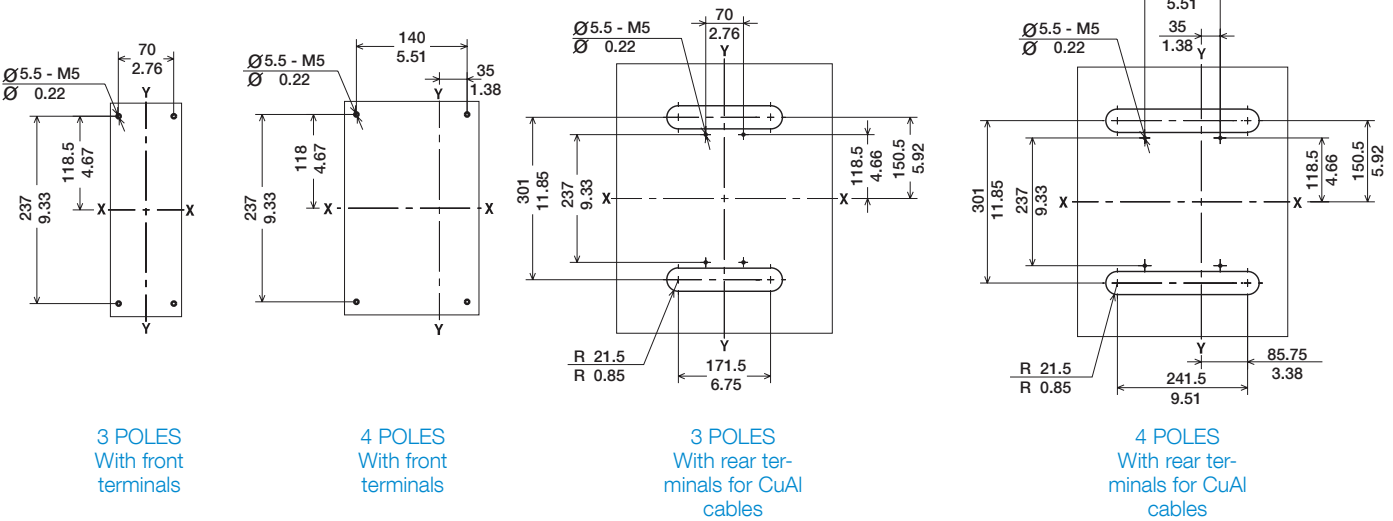
Overall dimensions

Molded Case Circuit Breakers

T6 FIXED VERSION

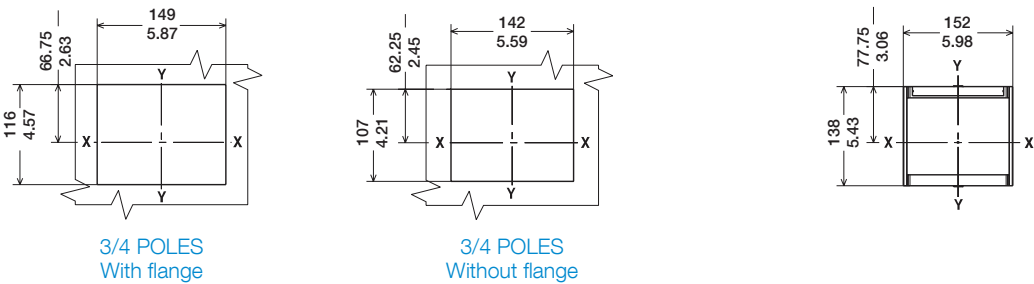
DRILLING TEMPLATES

Support sheet



DRILLING TEMPLATES

Compartment door



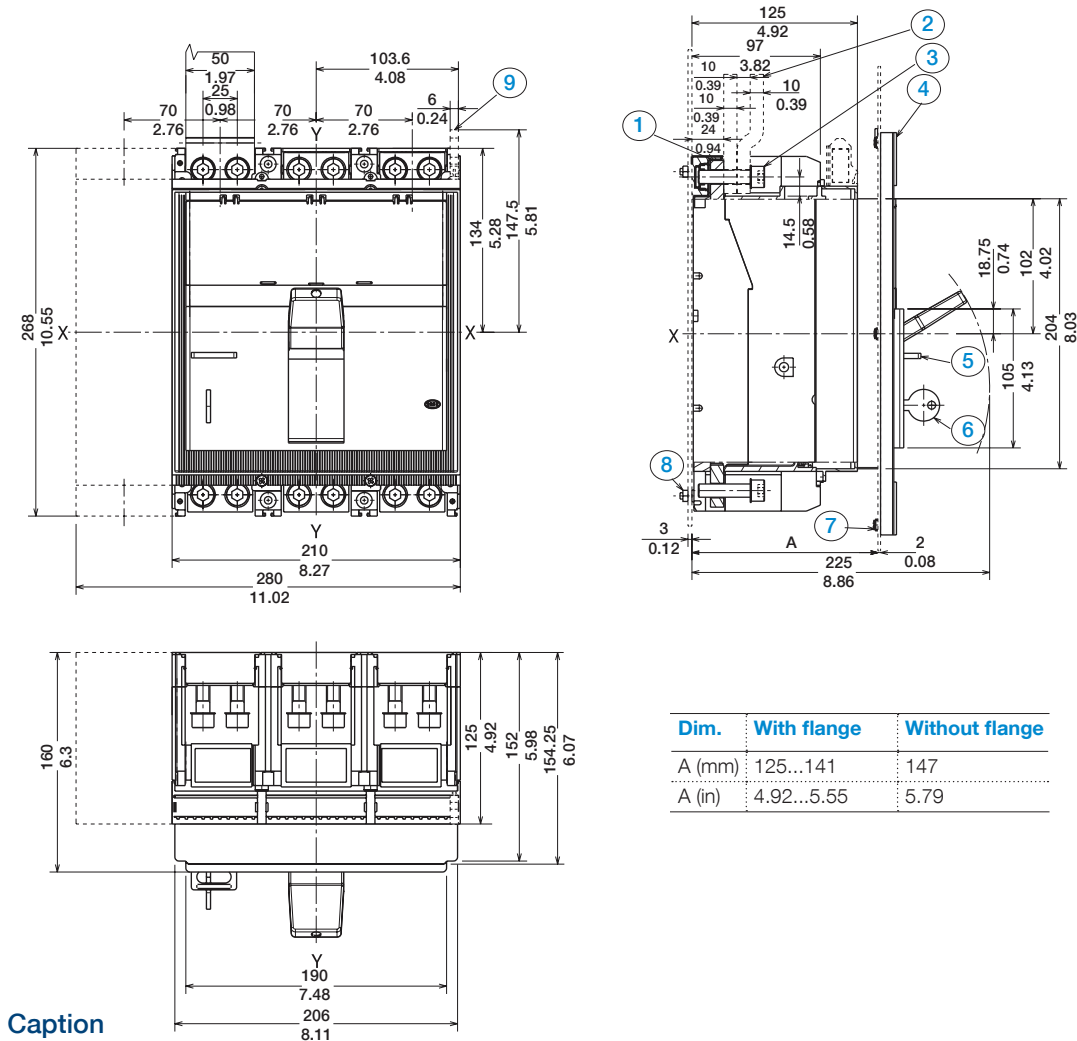
Overall dimensions

Molded Case Circuit Breakers

T7 FIXED VERSION

T7 3P/4P

Fixing on sheet with front terminals (F)



Caption

- ① Front terminals for flat connection
- ② Busbars
- ③ Tightening torque 18 Nm
- ④ Flange for the compartment door
- ⑤ Padlock (optional)
- ⑥ Key lock (optional)
- ⑦ Flange fixing screws
- ⑧ Tightening torque 2.5 Nm
- ⑨ Terminal for auxiliary contacts

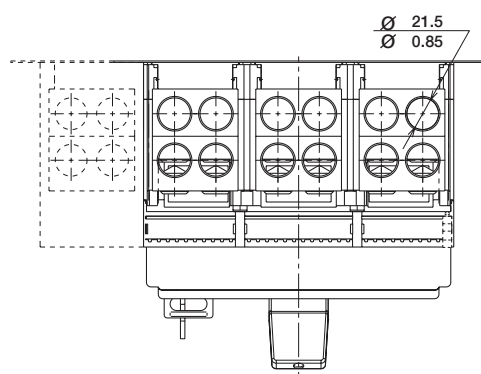
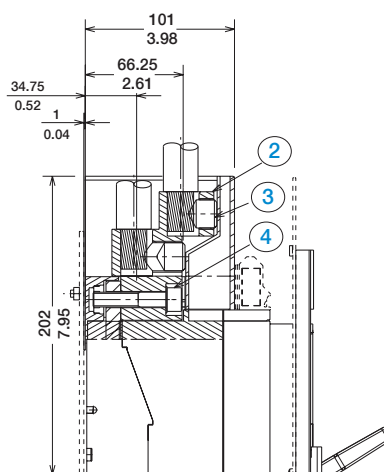
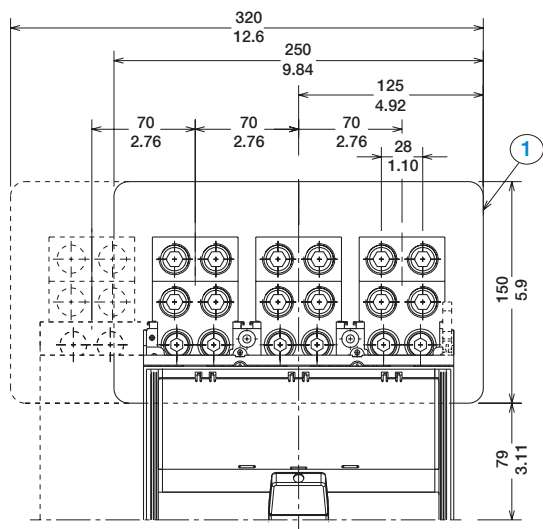
Overall dimensions

Molded Case Circuit Breakers

T7 FIXED VERSION

TERMINALS

Front for CuAl cables (FC CuAl)



Caption

- ① Protection plate
- ② Front terminals for cables FC CuAl
- ③ Tightening torque 43 Nm
- ④ Tightening torque 18 Nm

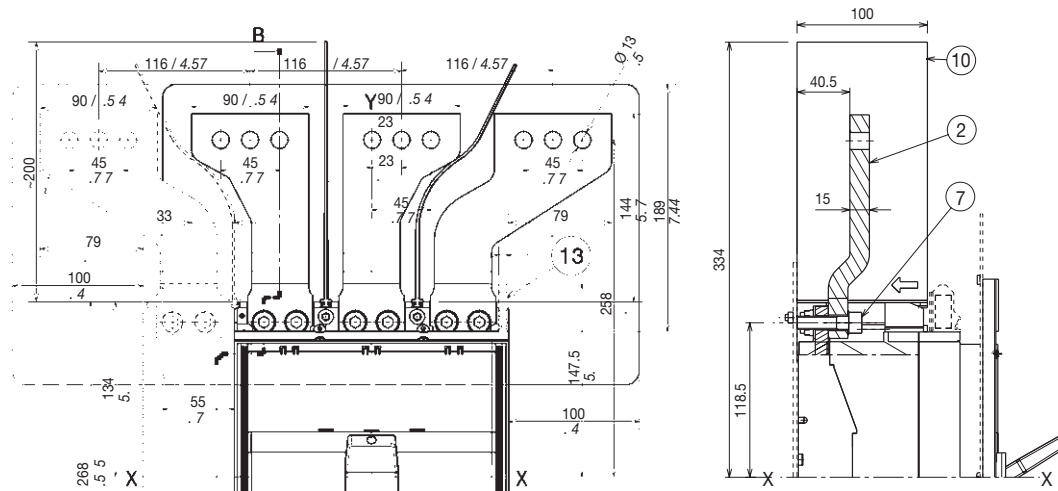
Overall dimensions

Molded Case Circuit Breakers

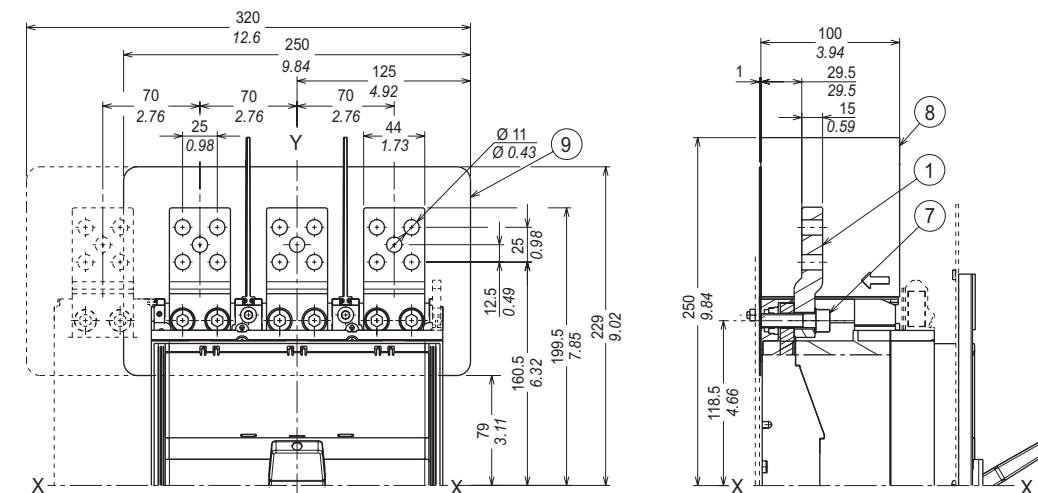
T7 FIXED VERSION

TERMINALS (continued)

Front extended spread (ES)



Front extended (EF)



Caption

- ① Extended front terminals EF
- ② Extended spread front terminals ES
- ⑥ Drilling template for fixing on support sheet
- ⑦ Tightening torque 18 Nm
- ⑧ Phase separator 100 mm
- ⑨ Protection plate
- ⑩ Phase separator 200 mm
- ⑬ Clamp for auxiliary contacts

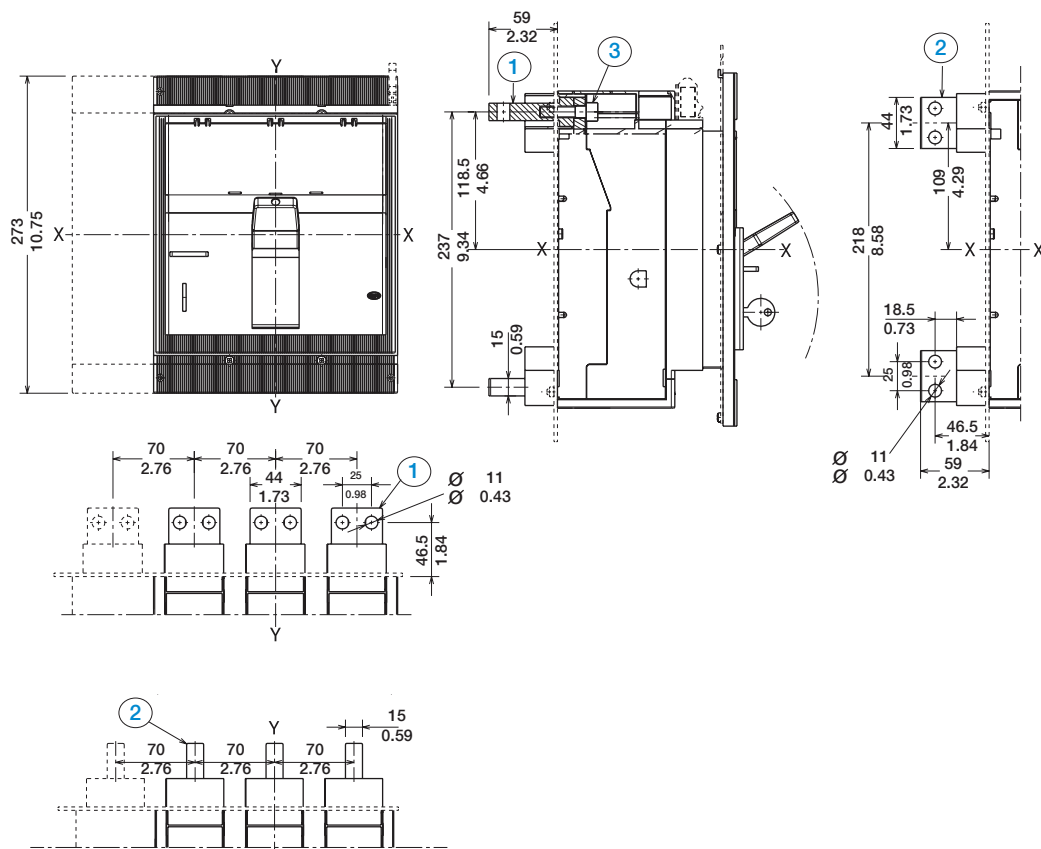
Overall dimensions

Molded Case Circuit Breakers

T7 FIXED VERSION

TERMINALS (continued)

Rear terminal HR or VR



Caption

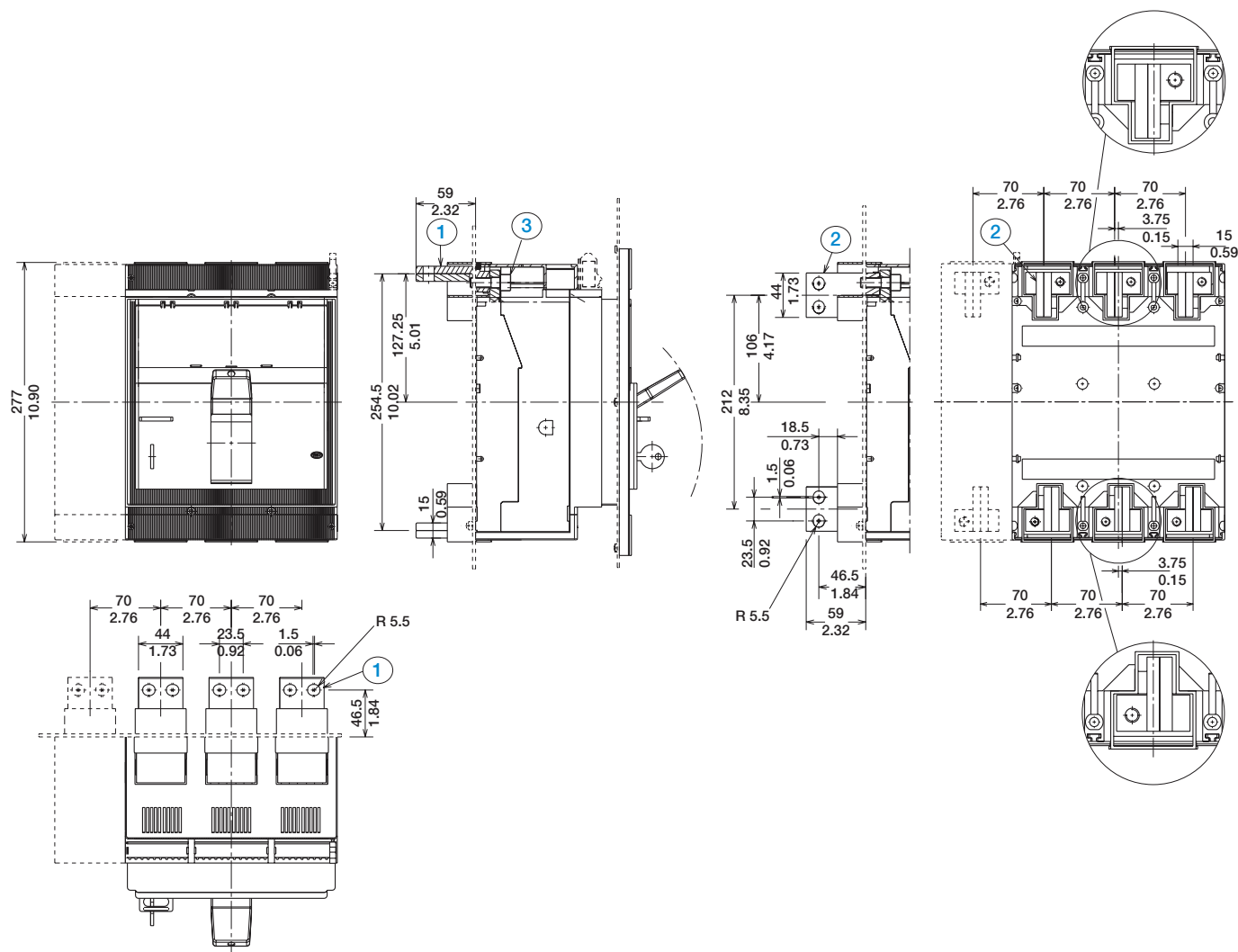
- ① Rear horizontal terminals
- ② Rear vertical terminals
- ③ Tightening torque 20 Nm

Molded Case Circuit Breakers

T7 FIXED VERSION

TERMINALS (continued)

Rear adjustable (R)



Caption

- 1 Rear horizontal terminals
- 2 Rear vertical terminals
- 3 Tightening torque 20 Nm

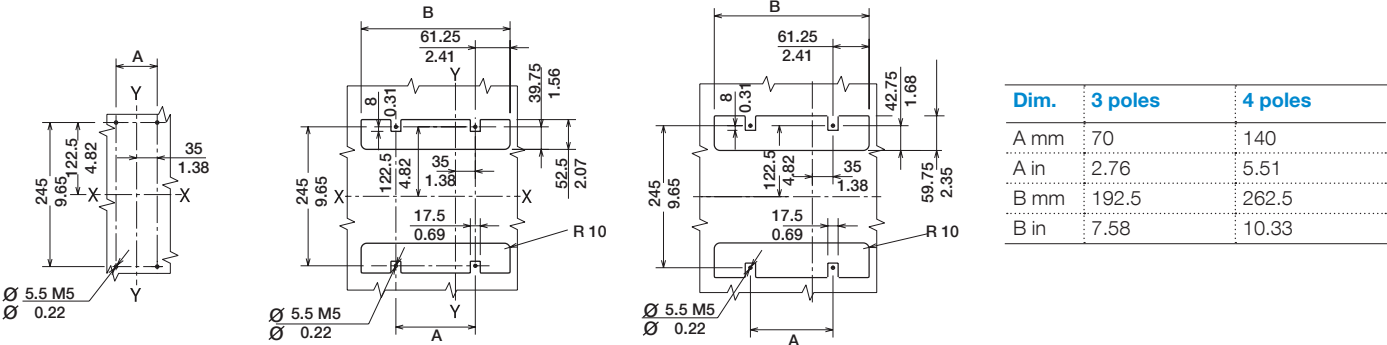
Overall dimensions

Molded Case Circuit Breakers

T7 FIXED VERSION

DRILLING TEMPLATES

Support sheet



6

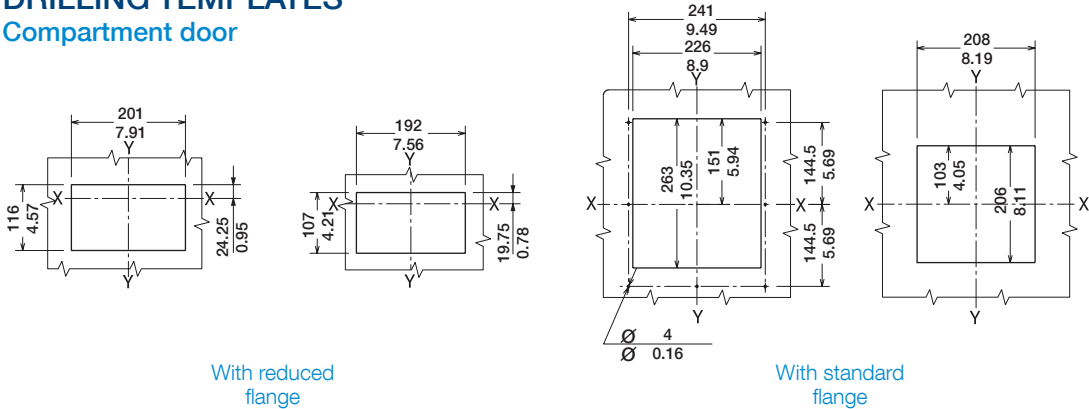
With front terminals
(F/ES/EF)

With rear terminals
(HR/VR)

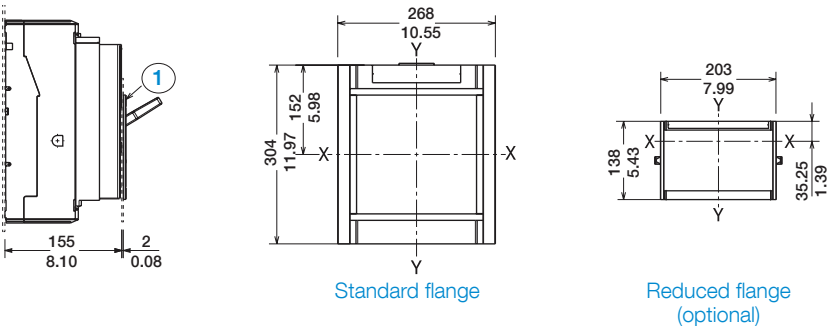
With rear adjustable
terminals (R)

DRILLING TEMPLATES

Compartment door



Flange for the compartment door (supplied as standard)



Caption

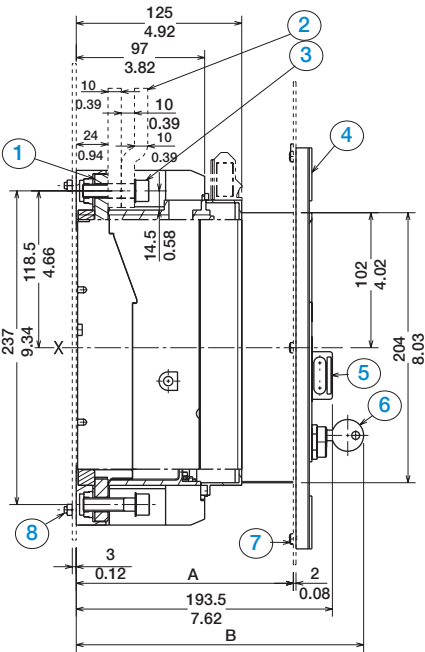
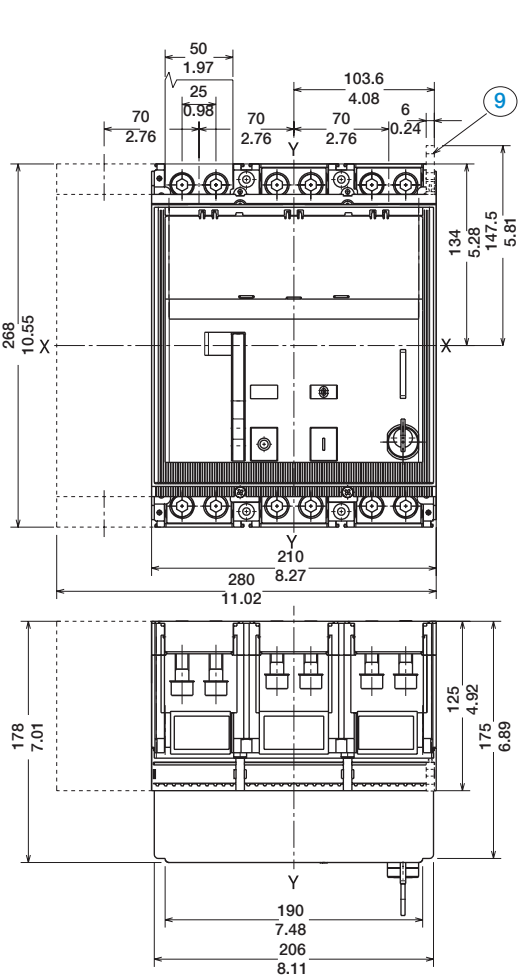
① Reduced flange (optional)

Overall dimensions

Molded Case Circuit Breakers

T7M FIXED VERSION

T7M 3P/4P
Fixing on sheet with front terminals (F)



Dim.	With flange	Without flange
A mm	125...184	170
A in	4.92...7.24	6.7

Dim.	Standard	Ronis	Profalux	Kirk	Castell
B mm	208	216	224	no	no
B in	8.19	8.5	8.82	no	no

Caption

- 1 Front terminals for flat connection
- 2 Busbars
- 3 Tightening torque 18 Nm
- 4 Flange for the compartment door
- 5 Padlock (optional)
- 6 Key lock (optional)
- 7 Flange fixing screws
- 8 Tightening torque 2.5 Nm
- 9 Terminal for auxiliary contacts

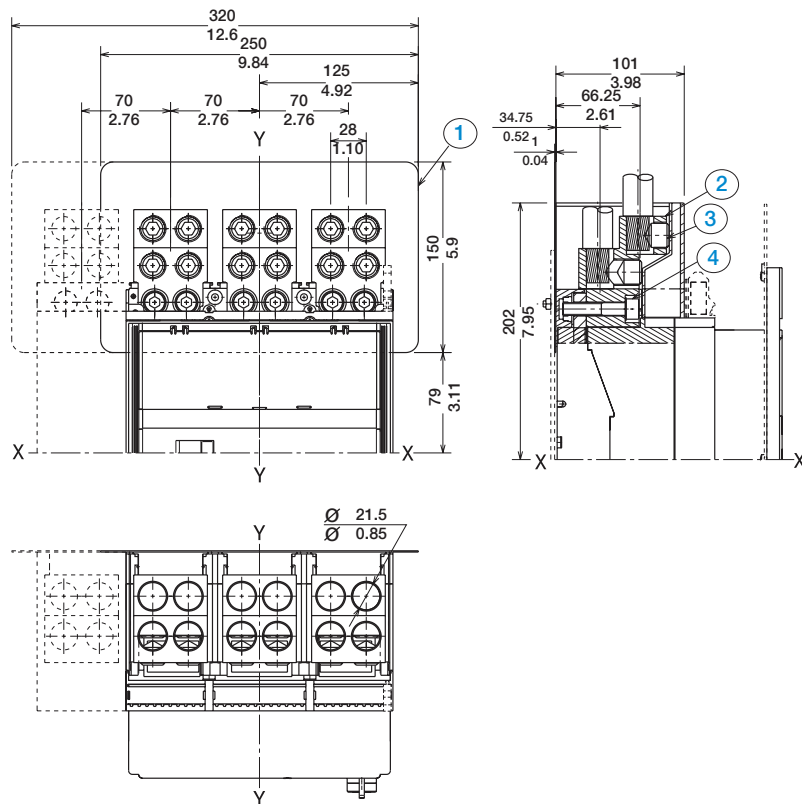
Overall dimensions

Molded Case Circuit Breakers

T7M FIXED VERSION

TERMINALS

Front for CuAl cables (FC CuAl)



Caption

- ① Protection plate
- ② Front terminals for cables FC CuAl
- ③ Tightening torque 43 Nm
- ④ Tightening torque 18 Nm

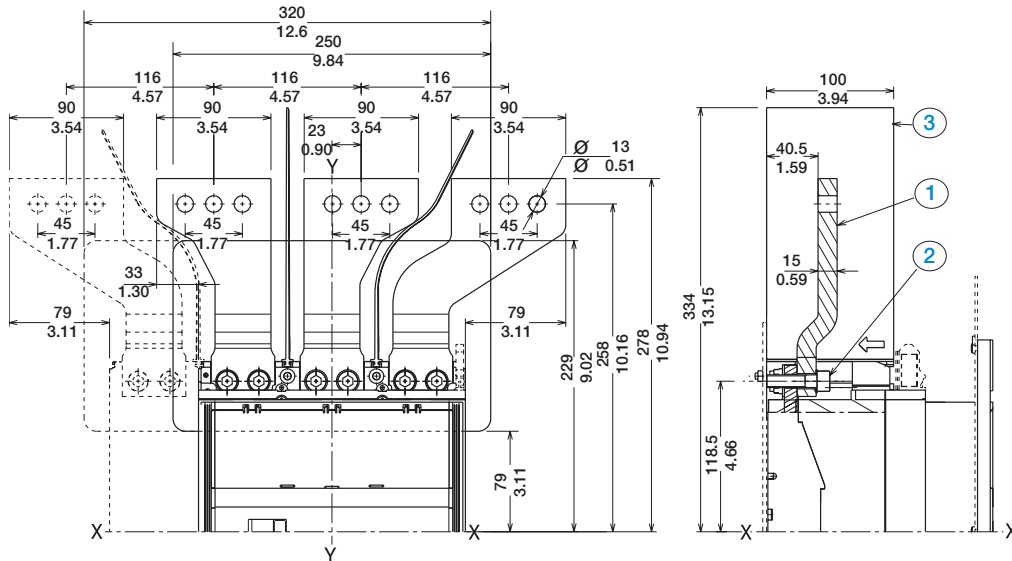
Overall dimensions

Molded Case Circuit Breakers

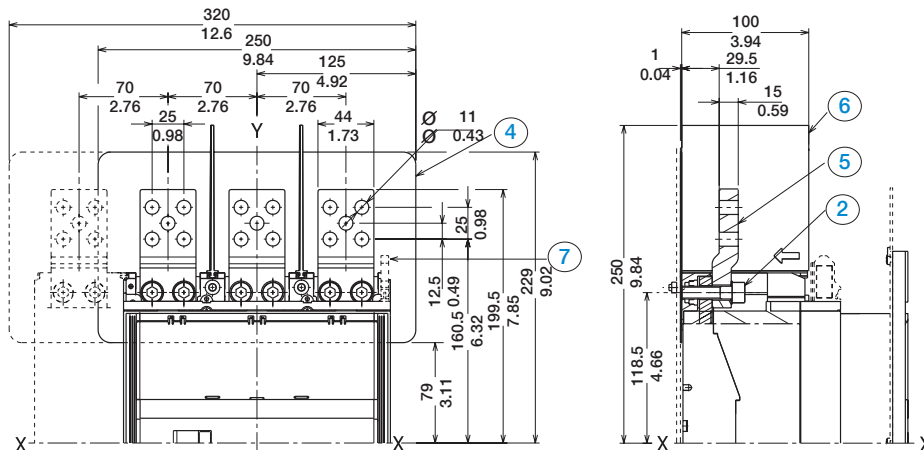
T7M FIXED VERSION

TERMINALS (continued)

Front extended spread (ES)



Front extended (EF)



Caption

- ① Rear spread terminals ES
- ② Tightening torque 18 Nm
- ③ Phase separators 200 mm
- ④ Protection plate
- ⑤ Extended front terminals EF
- ⑥ Phase separators 100 mm
- ⑦ Clamp for auxiliary contacts

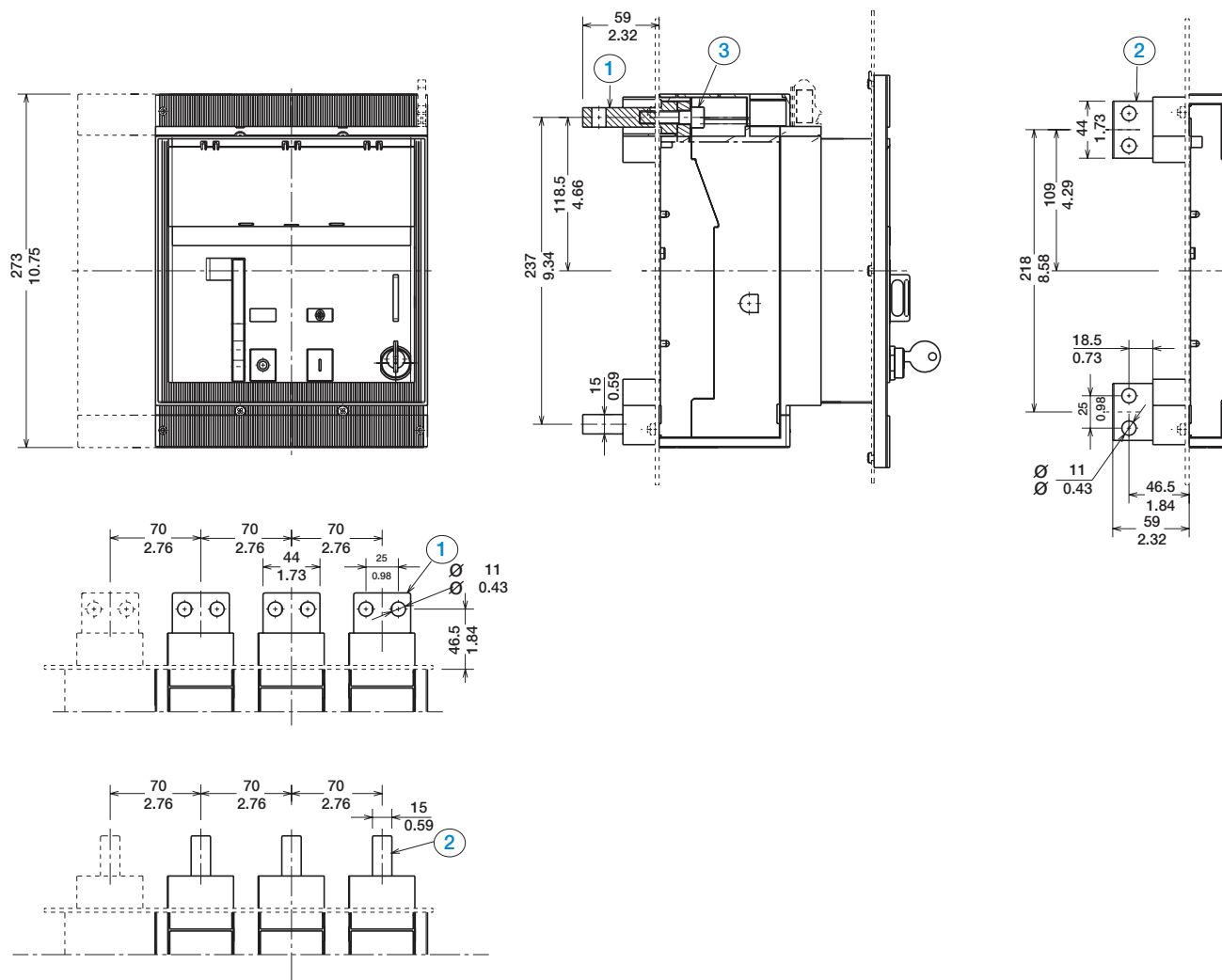
Overall dimensions

Molded Case Circuit Breakers

T7M FIXED VERSION

TERMINALS (continued)

Rear terminal HR or VR



Caption

- 1** Rear horizontal terminals
- 2** Rear vertical terminals
- 3** Tightening torque 20 Nm

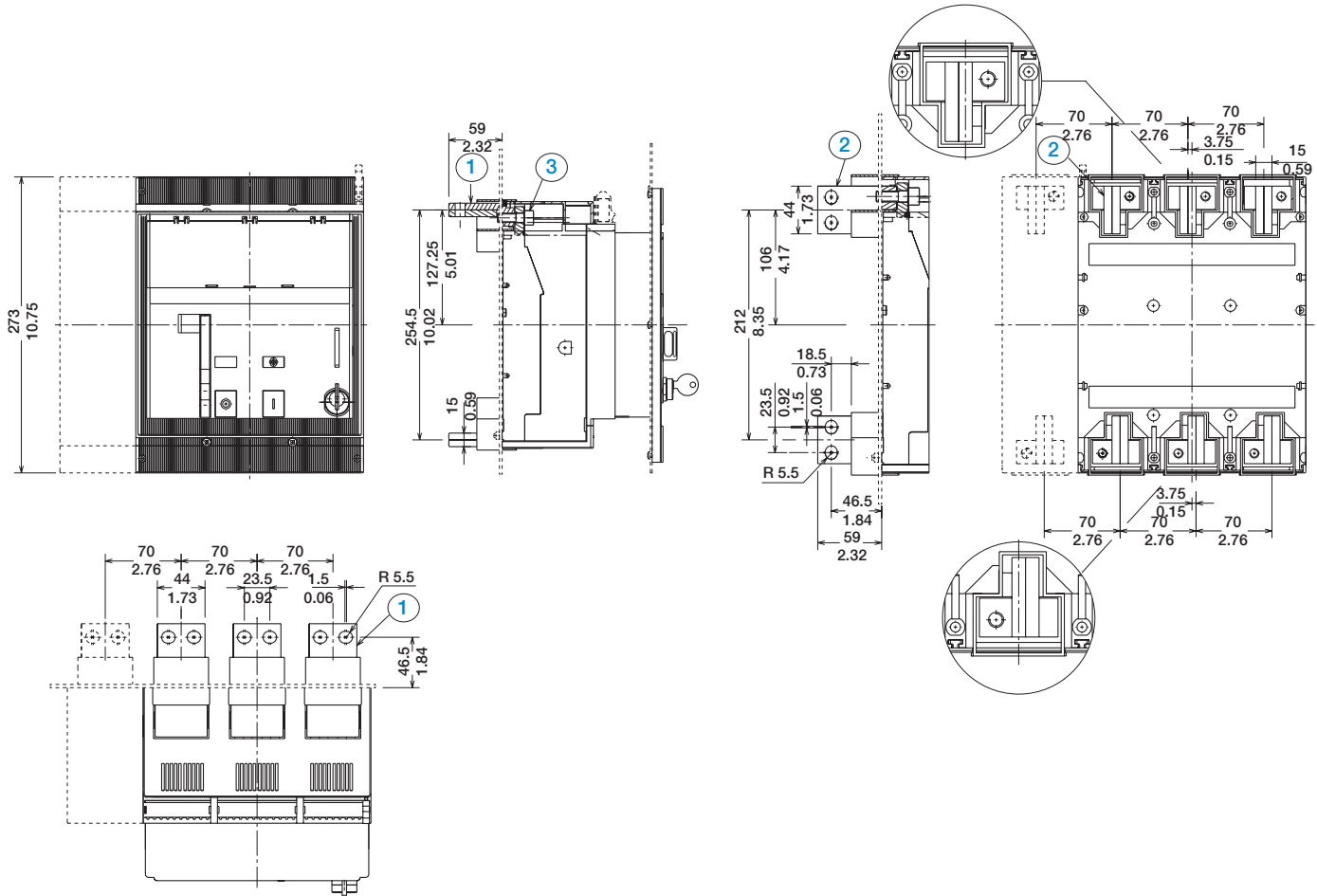
Overall dimensions

Molded Case Circuit Breakers

T7M FIXED VERSION

TERMINALS (continued)

Rear adjustable (R)



Caption

- 1 Rear horizontal terminals
- 2 Rear vertical terminals
- 3 Tightening torque 20 Nm

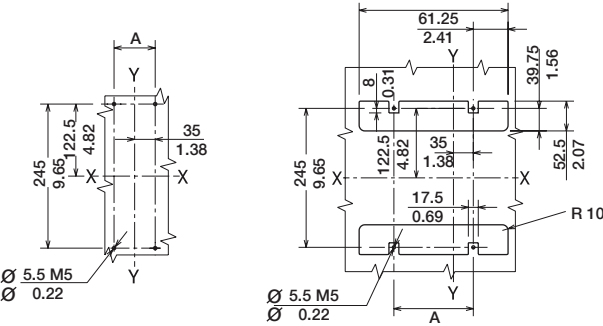
Overall dimensions

Molded Case Circuit Breakers

T7M FIXED VERSION

DRILLING TEMPLATES

Support sheet



	3 poles	4 poles
A mm	70	140
A in	2.76	5.51
B mm	192.5	262.5
B in	7.58	10.33

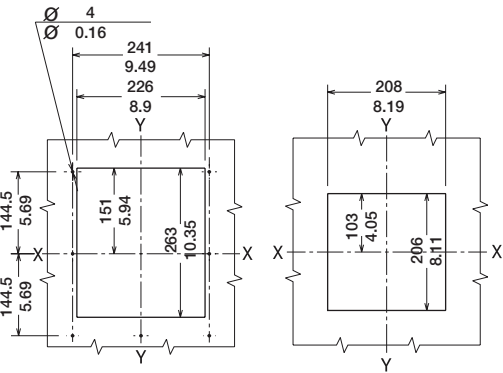
6

With front terminals
(F)

With rear terminals
(R/HR/VR)

DRILLING TEMPLATES

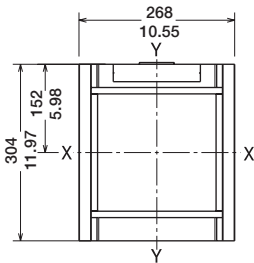
Compartment door



With flange

Without flange

Flange for the compartment door (supplied as standard)



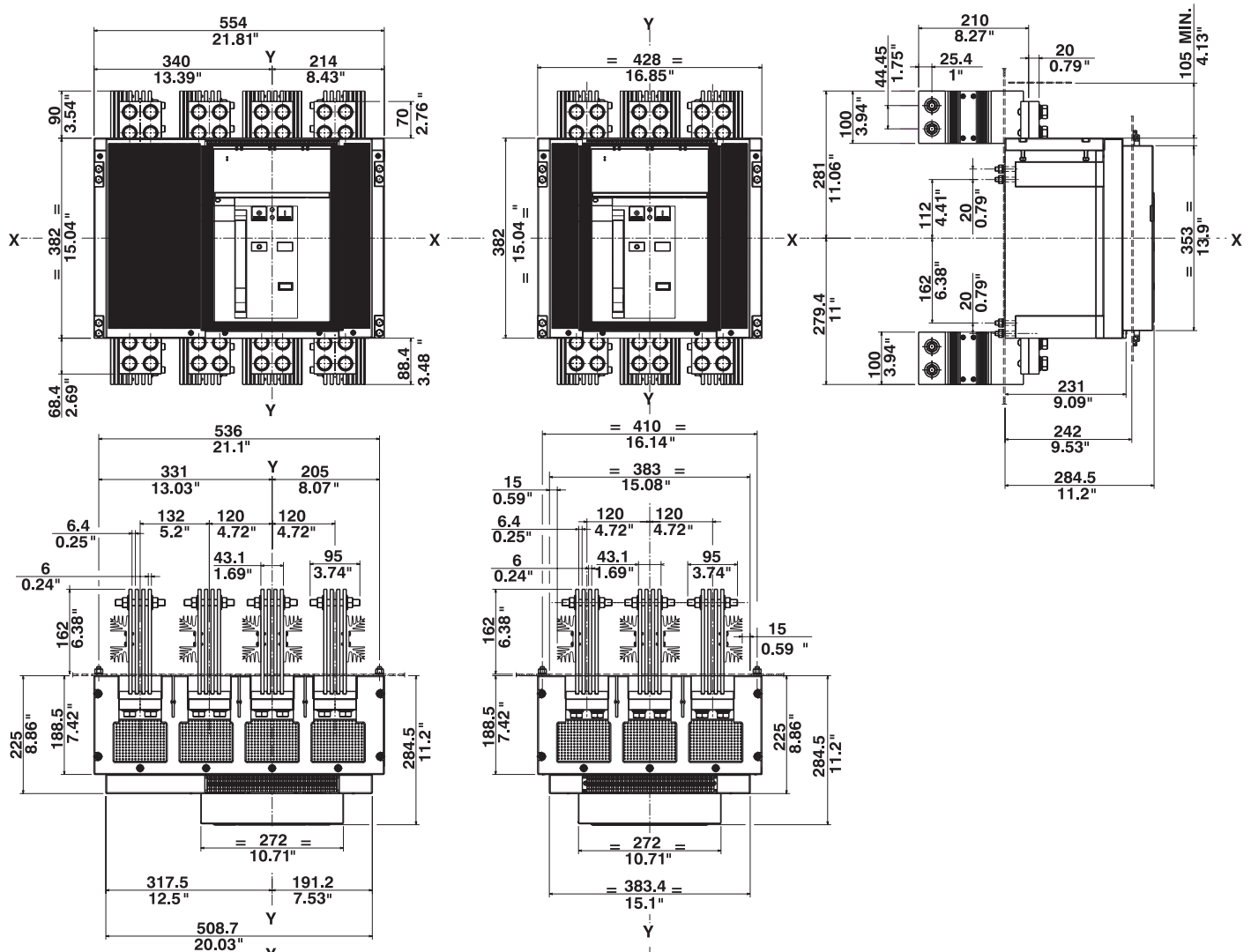
Overall dimensions

Molded Case Circuit Breakers

T8 FIXED VERSION

TERMINALS (continued)

Rear vertical terminals VR (3000A)



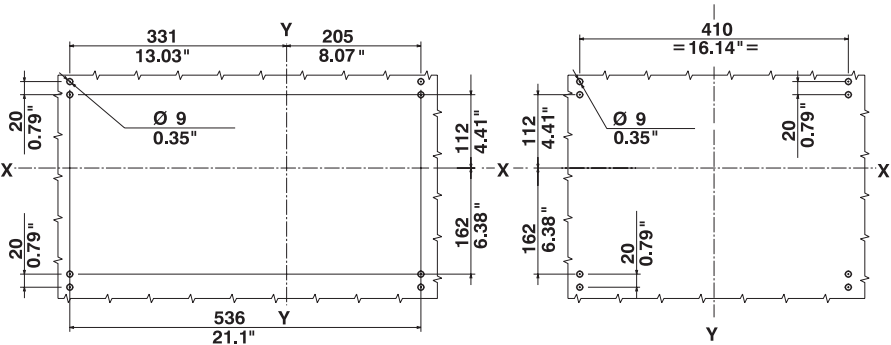
Overall dimensions

Molded Case Circuit Breakers

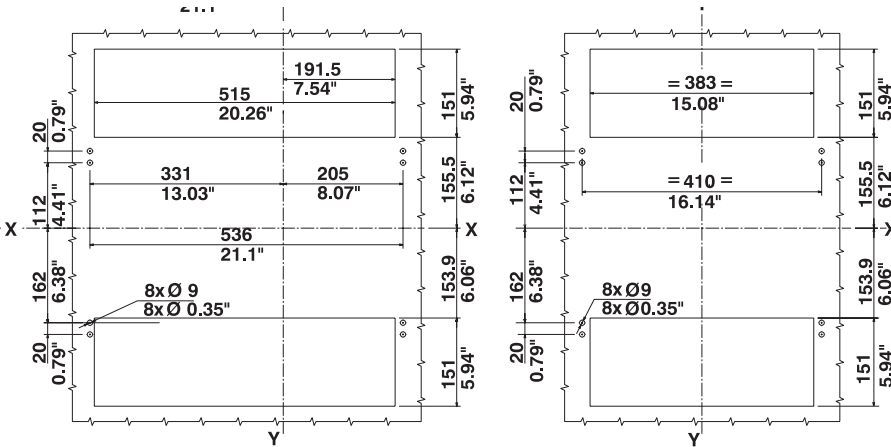
T8 FIXED VERSION

DRILLING TEMPLATES

Support sheet



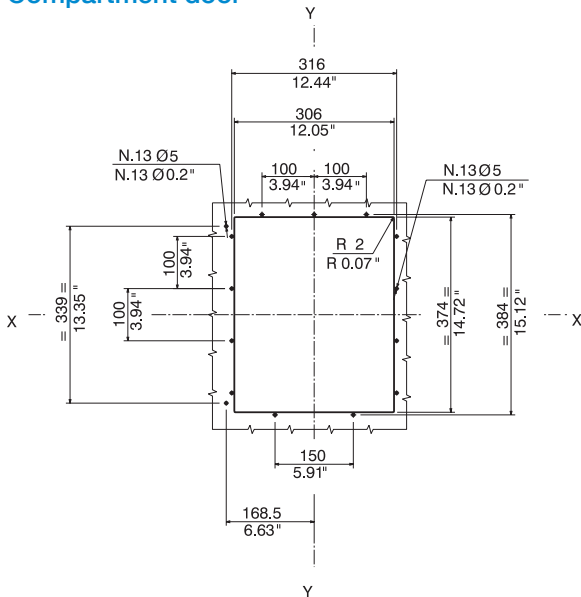
With front terminals
(F)



With rear terminals
(F)

DRILLING TEMPLATES

Compartment door

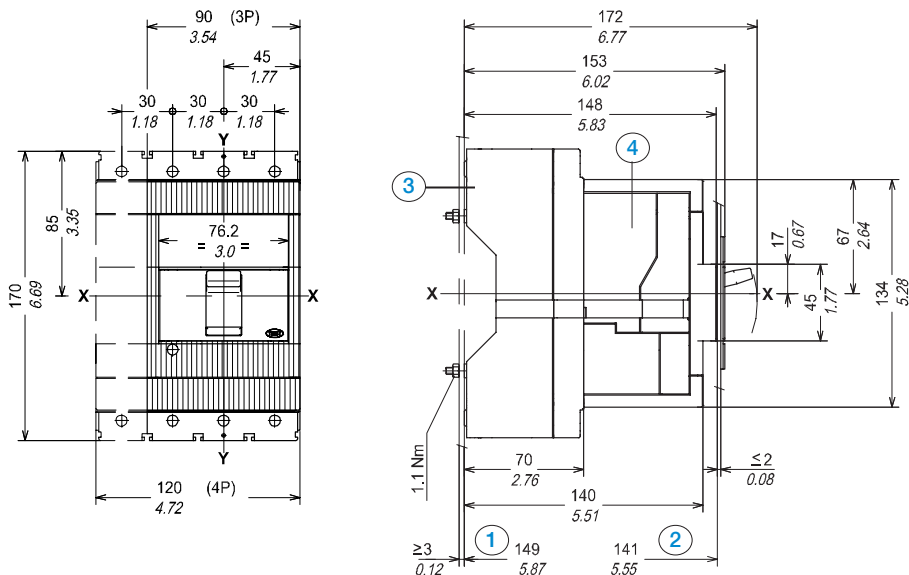


Molded Case Circuit Breakers

T2 PLUG-IN VERSION

T2 3P/4P

Fixing on sheet



Caption

- ① Depth of the switchboard in the case of circuit breaker with face not extending from the compartment door, with or without flange
- ② Depth of the switchboard in the case of circuit breaker with face extending from the compartment door, without flange
- ③ Cradle
- ④ Moving part with terminal covers, degree of protection IP40

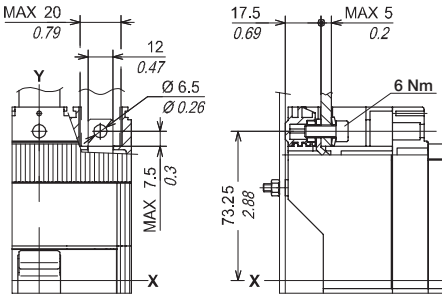
Overall dimensions

Molded Case Circuit Breakers

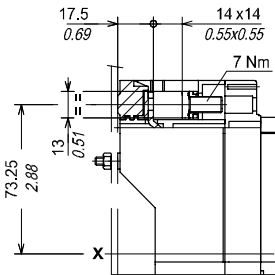
T2 PLUG-IN VERSION

TERMINALS

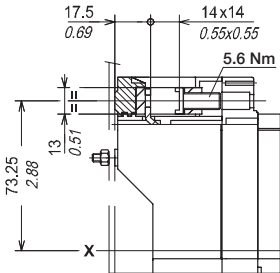
Front (F)



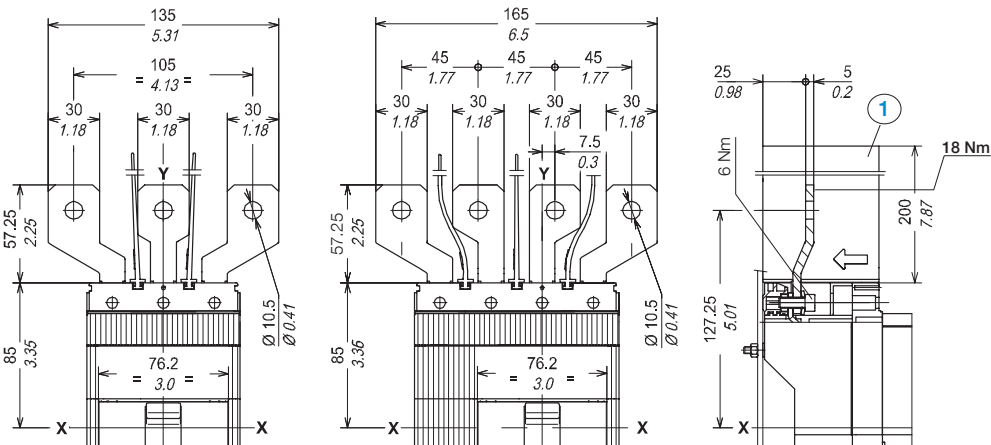
Front for Cu cables (FC Cu)



Front for CuAl cables (FC CuAl)



Front extended spread (ES)



Caption

- ① Insulating barrier between phases (compulsory)

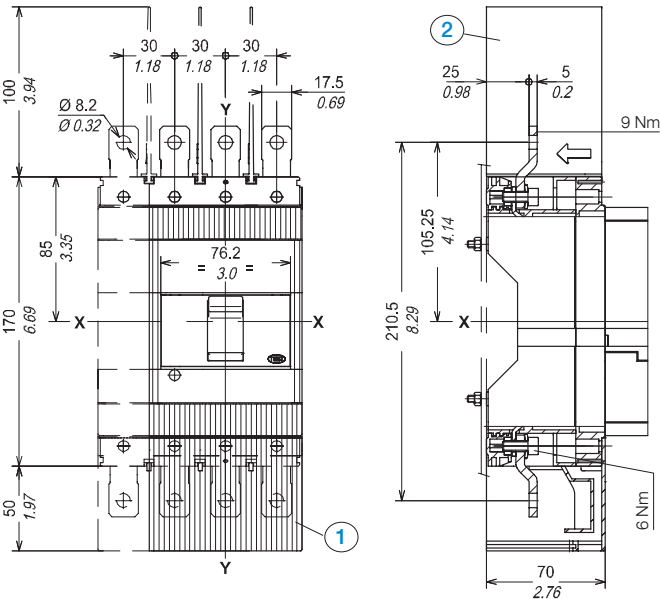
Overall dimensions

Molded Case Circuit Breakers

T2 PLUG-IN VERSION

TERMINALS (continued)

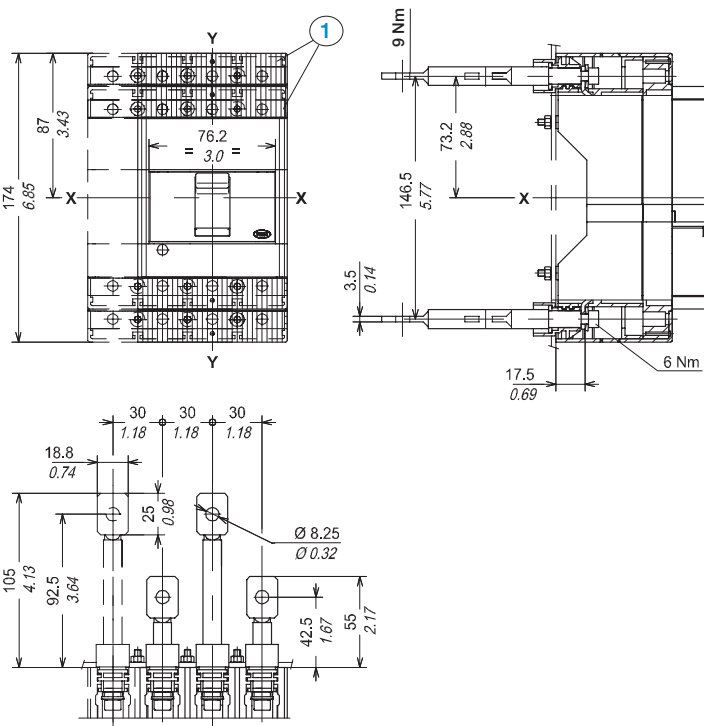
Front extended (EF)



Caption

- 1 High terminal covers with IP40 protection degree
- 2 Insulating barriers between phases (compulsory without 1)

Rear (R)



Caption

- 1 Low terminal covers with IP40 protection degree

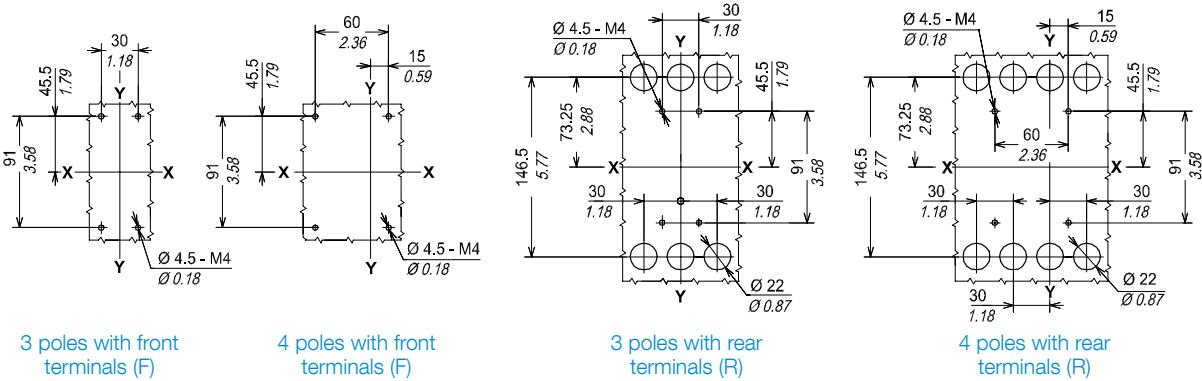
Overall dimensions

Molded Case Circuit Breakers

T2 PLUG-IN VERSION

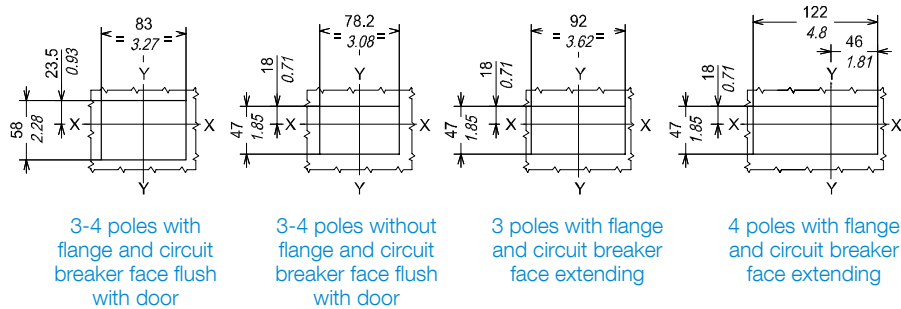
DRILLING TEMPLATES

Support sheet

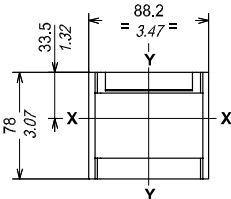


DRILLING TEMPLATES

Compartment door



Flange for the compartment door



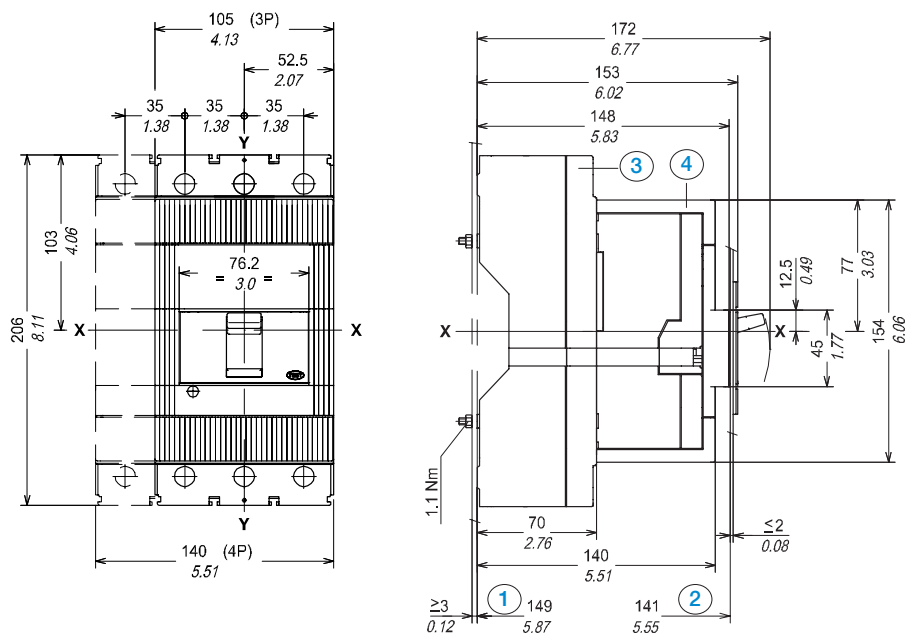
Overall dimensions

Molded Case Circuit Breakers

T3 PLUG-IN VERSION

T3 3P/4P

Fixing on sheet



Caption

- ① Depth of the switchboard in the case of circuit breaker with face not extending from the compartment door, with or without flange
- ② Depth of the switchboard in the case of circuit breaker with face extending from the compartment door, without flange
- ③ Cradle
- ④ Moving part with terminal covers, degree of protection IP40

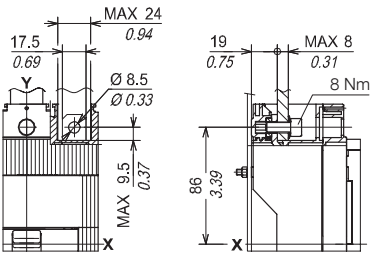
Overall dimensions

Molded Case Circuit Breakers

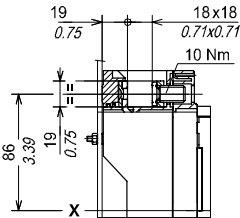
T3 PLUG-IN VERSION

TERMINALS

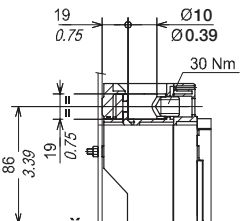
Front (F)



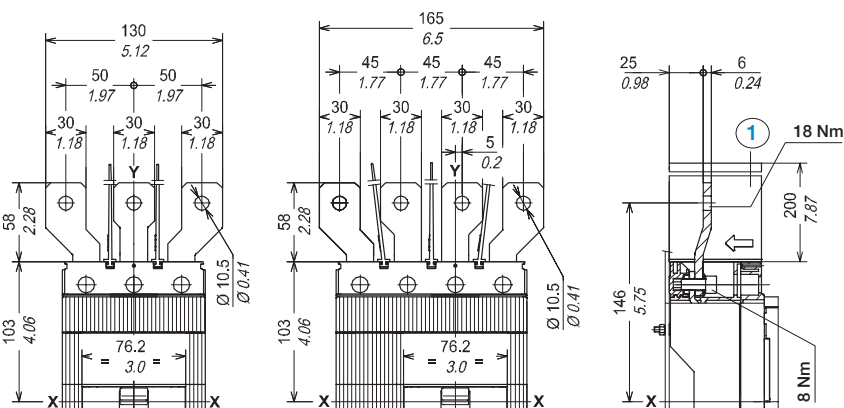
Front for Cu cables (FC Cu)



Front for CuAl cables (FC CuAl)



Front extended spread (ES)



Caption

- ① Insulating barrier between phases (compulsory)

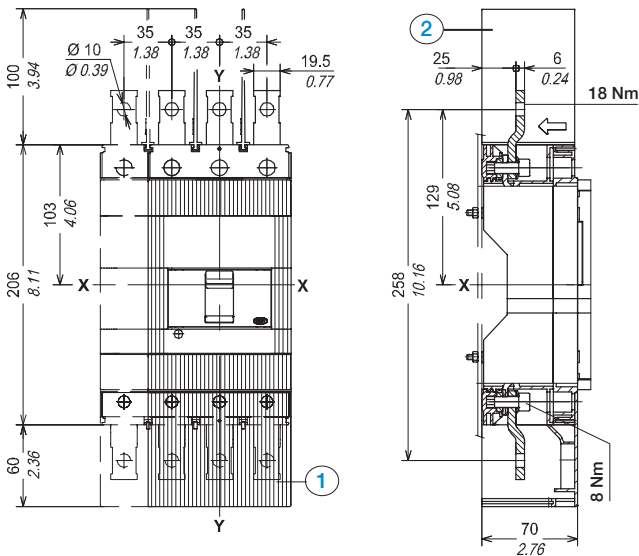
Overall dimensions

Molded Case Circuit Breakers

T3 PLUG-IN VERSION

TERMINALS (continued)

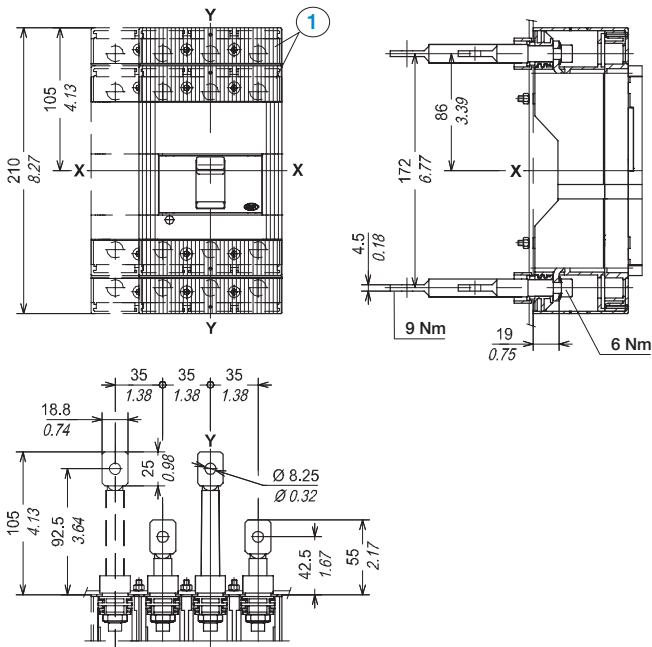
Front extended (EF)



Caption

- 1 High terminal covers with IP40 protection degree
- 2 Insulating barriers between phases (compulsory without 1)

Rear (R)



Caption

- 1 Low terminal covers with IP40 protection degree

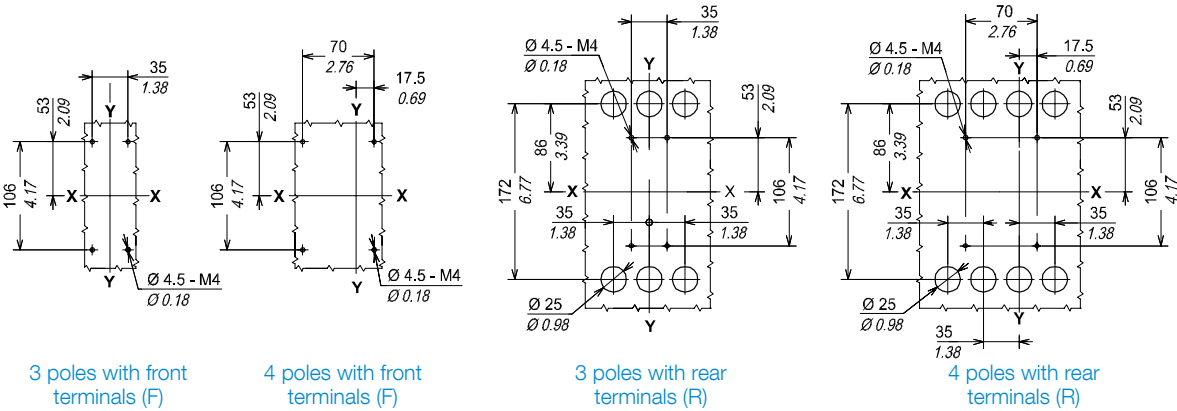
Overall dimensions

Molded Case Circuit Breakers

T3 PLUG-IN VERSION

DRILLING TEMPLATES

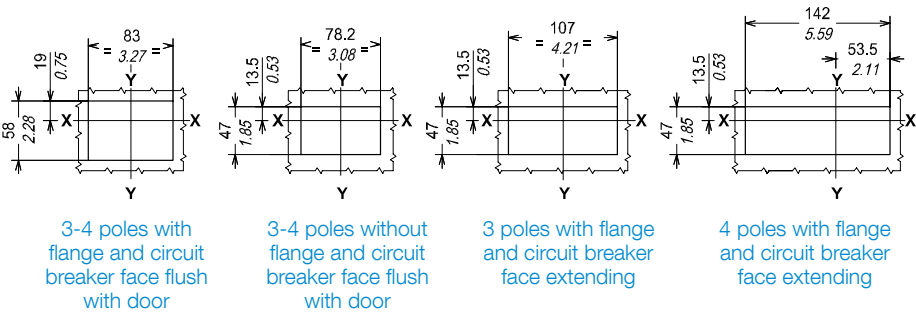
Support sheet



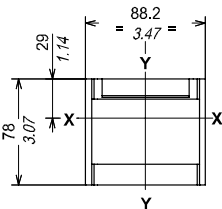
6

DRILLING TEMPLATES

Compartment door



Flange for the compartment door



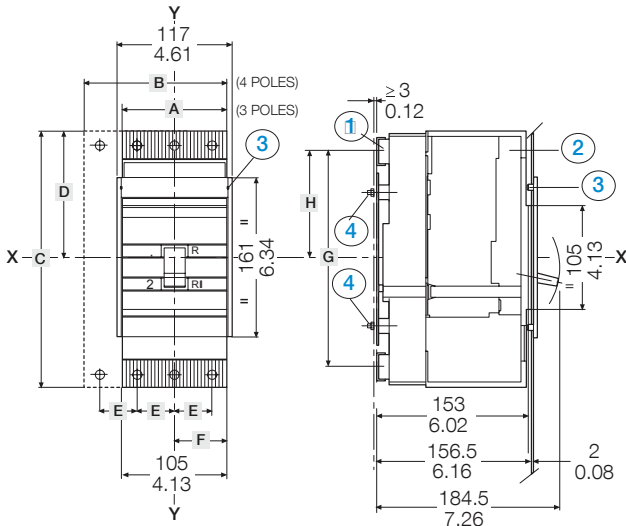
Overall dimensions

Molded Case Circuit Breakers

Ts3 PLUG-IN VERSION

Ts3 3P/4P

Fixing on sheet



Dim.	A	B	C	D	E	F	G	H
mm	105	140	175	89.75	35	52.5	143	84
in	4.13	5.51	6.89	3.53	1.38	2.07	5.63	3.31

Caption

- 1 Cradle
- 2 Moving part complete with IP20 protection terminal covers
- 3 Flange for compartment door
- 4 Tightening torque 1.1 Nm

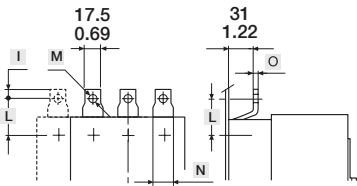
Overall dimensions

Molded Case Circuit Breakers

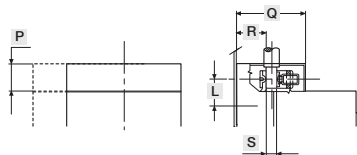
Ts3 PLUG-IN VERSION

TERMINALS

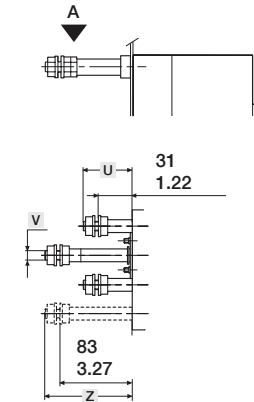
Front (F)



Front for Cu cables (FC Cu)



Rear threaded (R)



Dim.	I	L	M	N	O	P	Q	R	S	U	V	Z
mm	10	33.5	Ø8.5	20	5	37.5	79.5	36	18x18	48	M12	100
in	0.39	1.32	Ø0.33	0.79	0.20	1.48	3.13	1.42	0.71x0.71	1.89		3.94

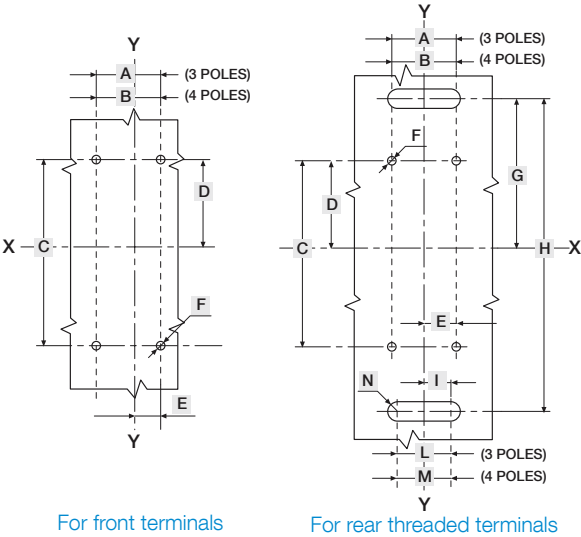
Overall dimensions

Molded Case Circuit Breakers

Ts3 PLUG-IN VERSION

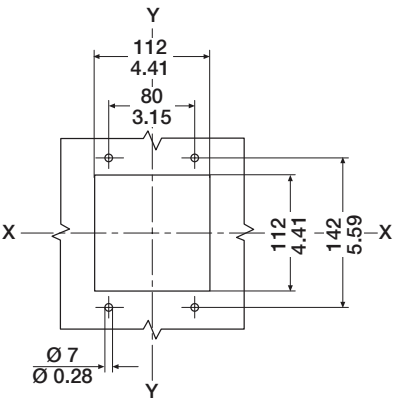
DRILLING TEMPLATES

Support sheet (minimum thickness of sheet metal 0.12" / 3mm)



DRILLING TEMPLATES

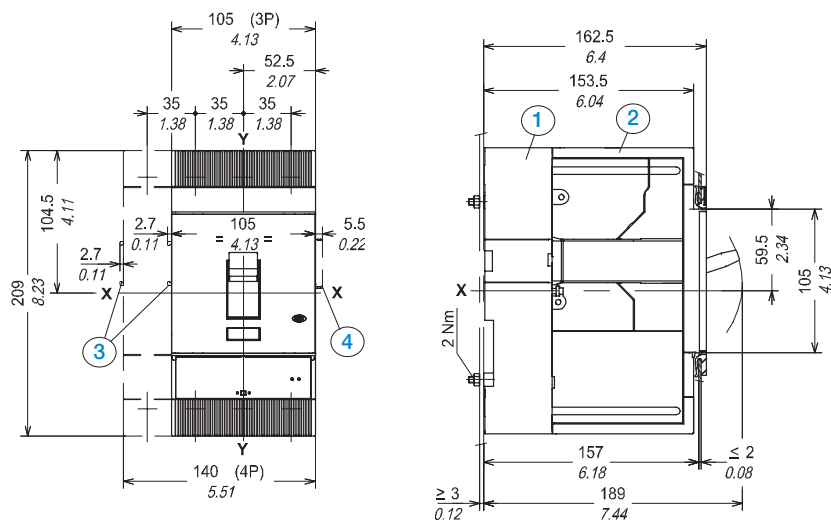
Compartment door (minimum thickness of sheet metal 0.08" / 2mm)



Letter	A	B	C	D	E	F	G	H	I	L	M	N
mm	70	105	100	52.25	25	M4-Ø5	73.75	143	35	70	105	R14
in	2.76	4.13	3.94	2.06	0.98	M4-Ø0.20	2.90	5.63	1.36	2.76	4.13	R0.55

T4 PLUG-IN VERSION

Fixing on sheet



- ① Fixed part
- ② Moving part with terminal covers with IP40 protection degree
- ③ Overall dimensions with cabled accessories mounted (SOR-C, UVR-C)
- ④ Overall dimensions with cabled auxiliary contacts mounted (only 3Q+1SY)

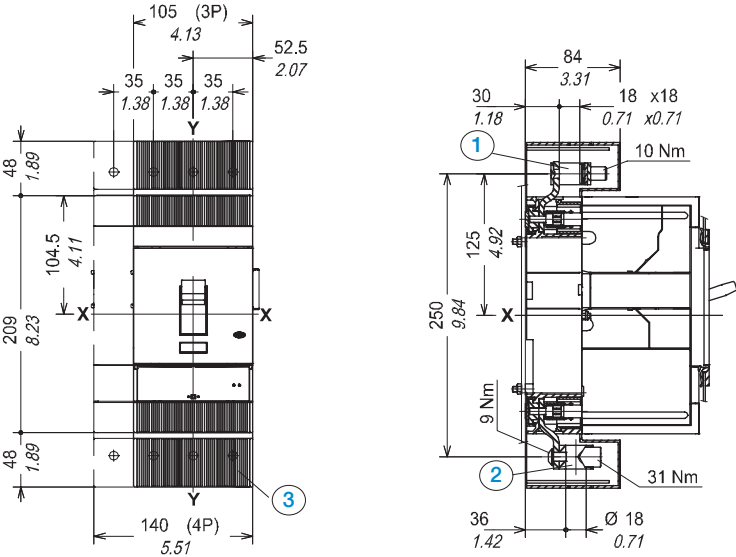
Overall dimensions

Molded Case Circuit Breakers

T4 PLUG-IN VERSION

TERMINALS

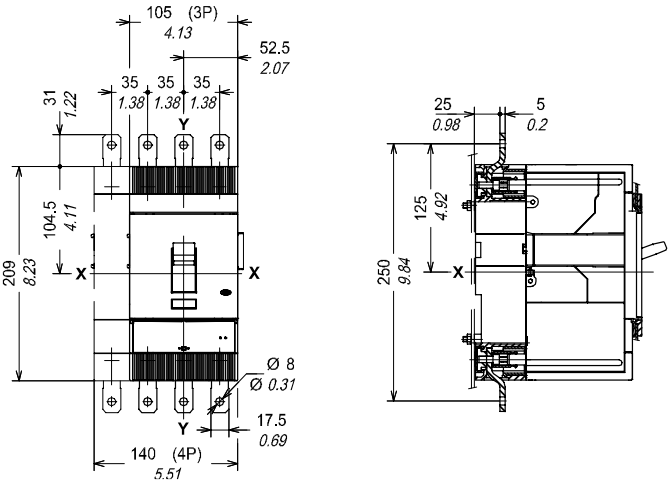
Front for Cu or CuAl cables (FC Cu or CuAl)



Caption

- ① For Cu cables
- ② For CuAl cables
- ③ High terminal covers with IP40 protection degree

Front extended (EF)



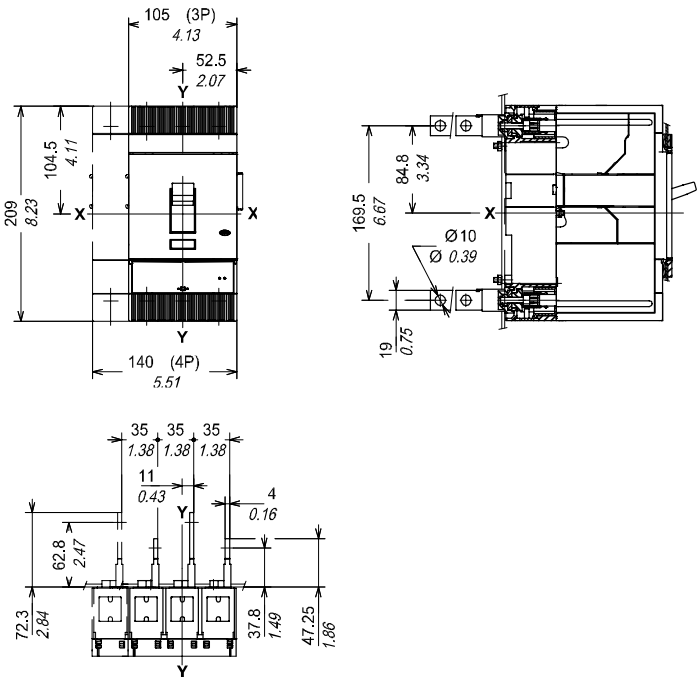
Overall dimensions

Molded Case Circuit Breakers

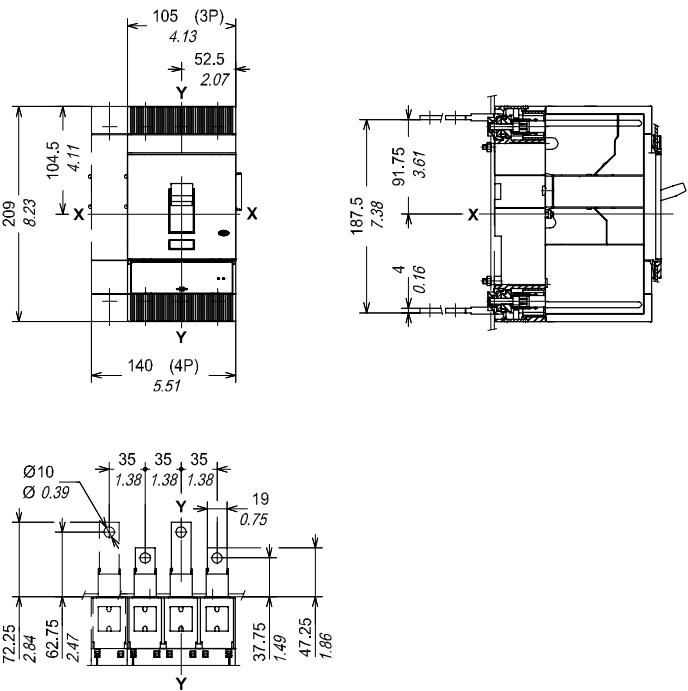
T4 PLUG-IN VERSION

TERMINALS (continued)

Rear vertical (VR)



Rear horizontal (HR)



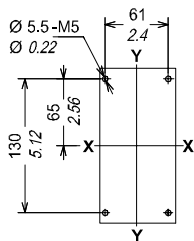
Overall dimensions

Molded Case Circuit Breakers

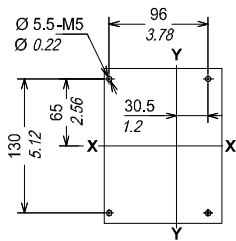
T4 PLUG-IN VERSION

DRILLING TEMPLATES

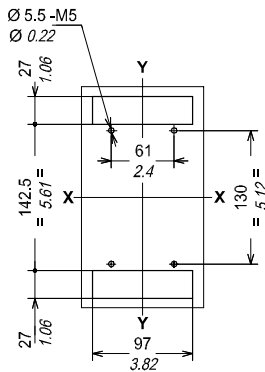
Support sheet



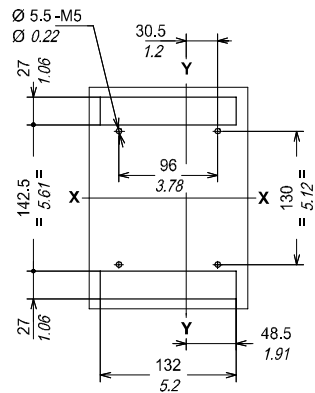
3 poles with front terminals (FC Cu/CuAl)



4 poles with front terminals (FC Cu/CuAl)



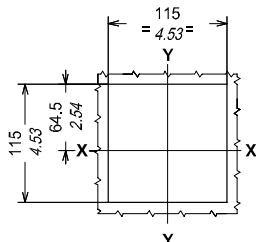
3 poles with rear terminals (HR/VR)



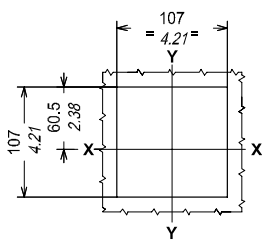
4 poles with rear terminals (HR/VR)

DRILLING TEMPLATES

Compartment door

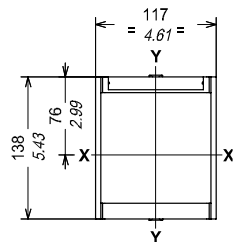


With flange



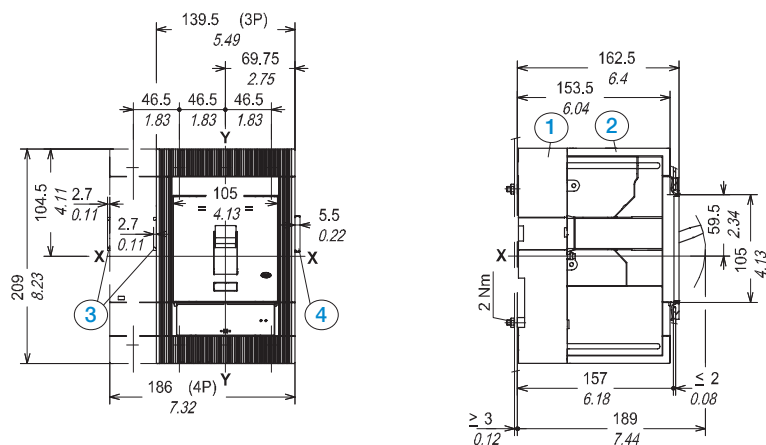
Without flange

Flange for the compartment door



T5 (400) PLUG-IN VERSION

Fixing on sheet



- ① Fixed part
- ② Moving part with terminal covers with IP40 protection degree
- ③ Overall dimensions with cabled accessories mounted (SOR-C, UVR-C)
- ④ Overall dimensions with cabled auxiliary contacts mounted (only 3Q+1SY)

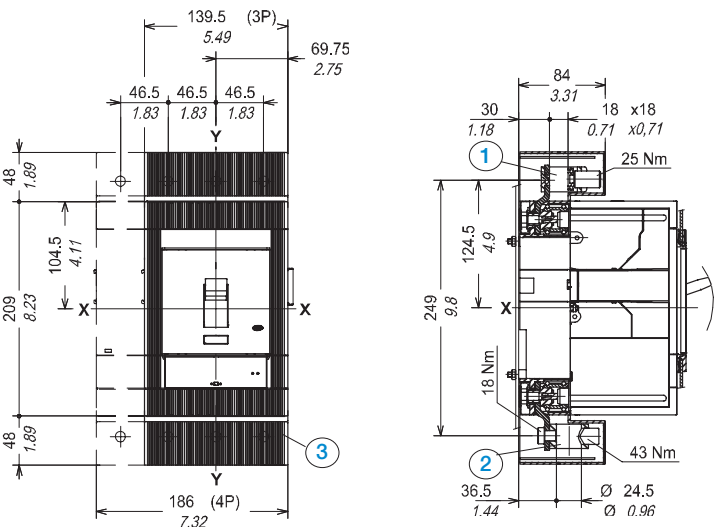
Overall dimensions

Molded Case Circuit Breakers

T5 (400) PLUG-IN VERSION

TERMINALS

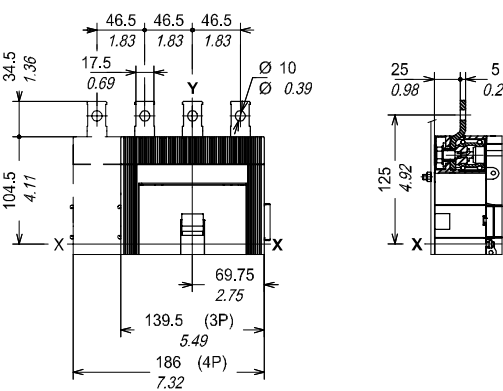
Front for Cu or CuAl cables (FC Cu or CuAl)



Caption

- 1 For Cu cables
- 2 For CuAl cables
- 3 High terminal covers with IP40 protection degree

Front extended (EF)



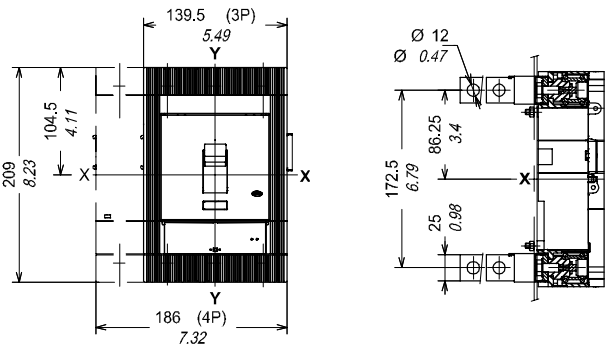
Overall dimensions

Molded Case Circuit Breakers

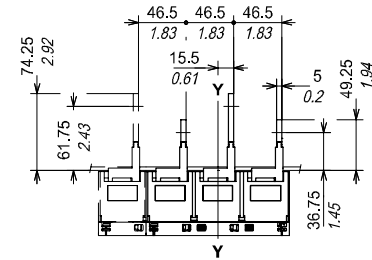
T5 (400) PLUG-IN VERSION

TERMINALS (continued)

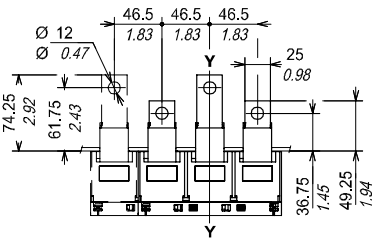
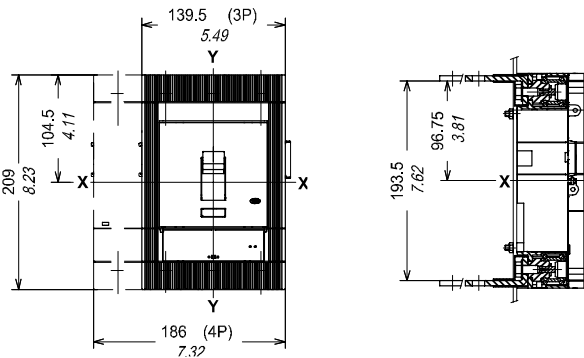
Rear vertical (VR)



6



Rear horizontal (HR)



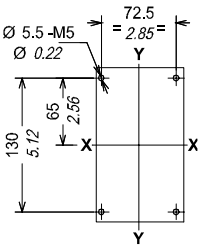
Overall dimensions

Molded Case Circuit Breakers

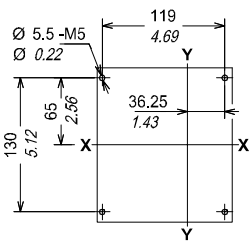
T5 (400) PLUG-IN VERSION

DRILLING TEMPLATES

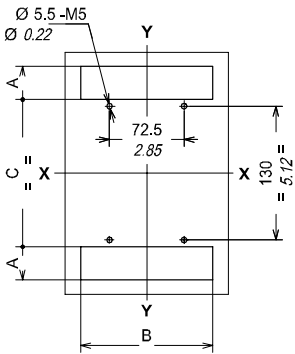
Support sheet



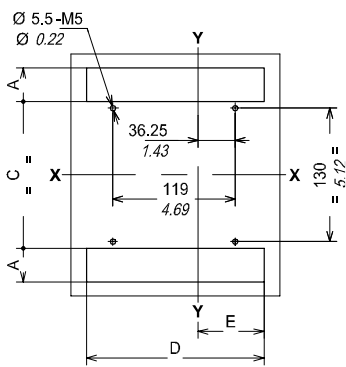
3 poles with front terminals (FC Cu/CuAl)



4 poles with front terminals (FC Cu/CuAl)



3 poles with rear terminals (HR/VR)

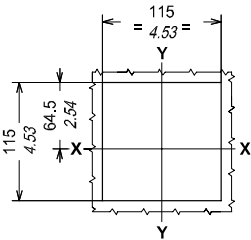


4 poles with rear terminals (HR/VR)

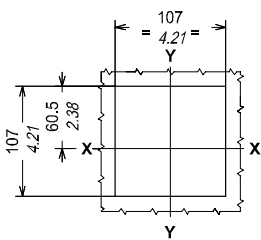
Dimensions	A	B	C	D	E
mm	32.5	128.5	143	172.5	64.5
in	1.28	5.06	5.63	6.79	2.54

DRILLING TEMPLATES

Compartment door

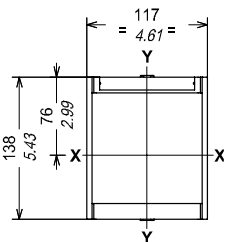


With flange



Without flange

Flange for the compartment door



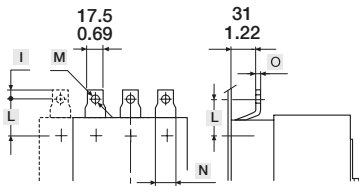
Overall dimensions

Molded Case Circuit Breakers

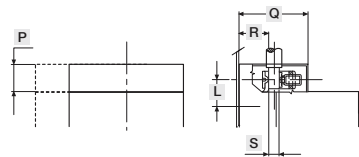
Ts3 DRAW OUT VERSION

TERMINALS

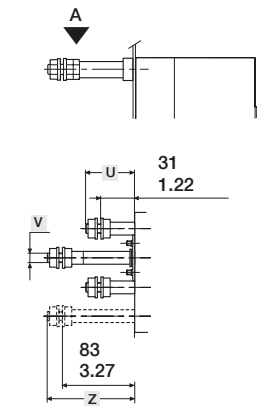
Front (F)



Front for Cu cables (FC Cu)



Rear threaded (R)



Dim.	I	L	M	N	O	P	Q	R	S	U	V	Z
mm	10	33.5	Ø8.5	20	5	37.5	79.5	36	18x18	48	M12	100
in	0.39	1.32	Ø0.33	0.79	0.20	1.48	3.13	1.42	0.71x0.71	1.89		3.94

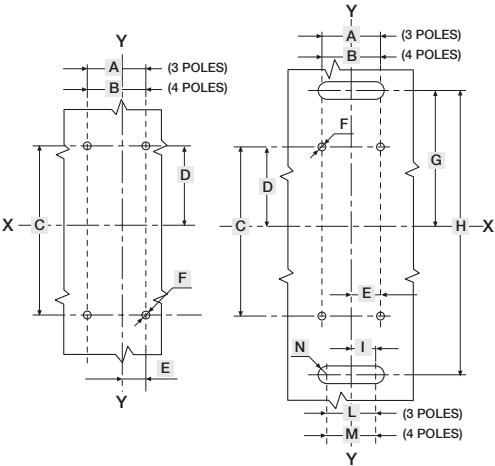
Overall dimensions

Molded Case Circuit Breakers

Ts3 DRAW OUT VERSION

DRILLING TEMPLATES

Support sheet (minimum thickness of sheet metal 0.12" / 3mm)

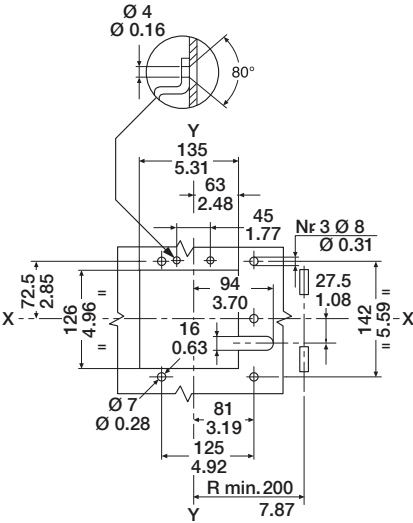


For front terminals

For rear threaded terminals

DRILLING TEMPLATES

Compartment door and fitting flange (minimum thickness of sheet metal 0.08" / 2mm)



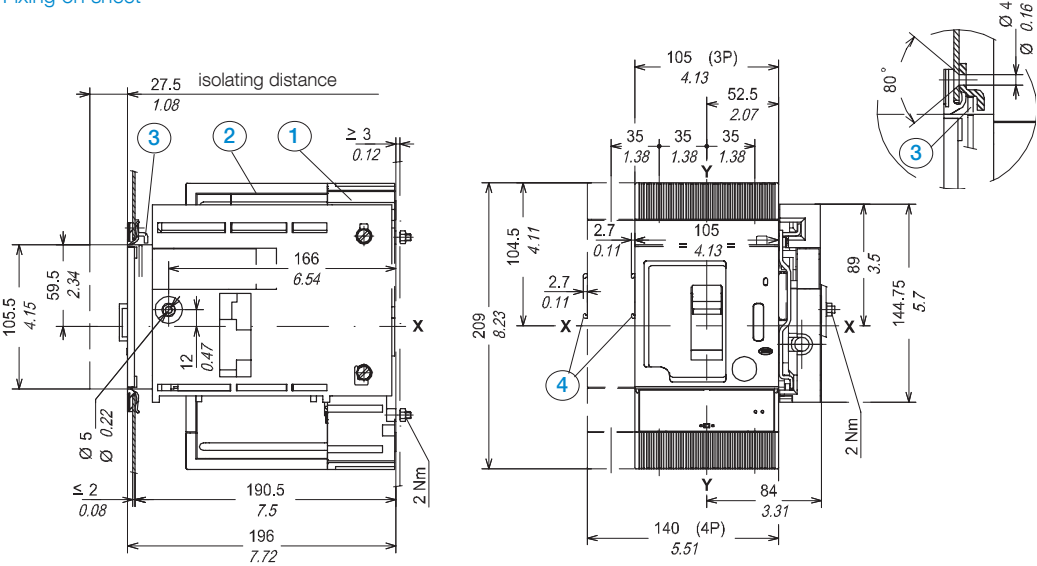
Dimensions	A	B	C	D	E	F	G	H	I	L	M	N
mm	70	105	100	52.25	25	M4-Ø5	73.75	143	35	70	105	R14
in	2.76	4.13	3.94	2.06	0.98	M4-Ø0.20	2.90	5.63	1.38	2.76	4.13	R0.55

Overall dimensions

Molded Case Circuit Breakers

T4 DRAW OUT VERSION

T4 3P/4P
Fixing on sheet



Caption

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

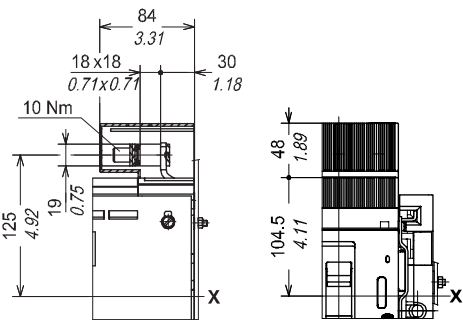
Overall dimensions

Molded Case Circuit Breakers

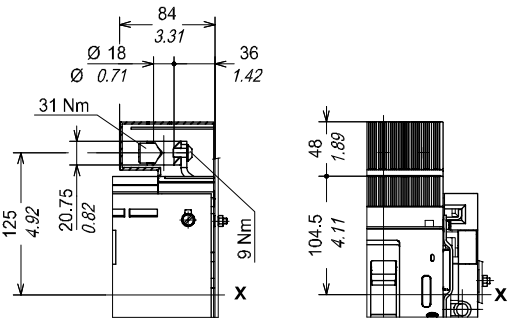
T4 DRAW OUT VERSION

TERMINALS

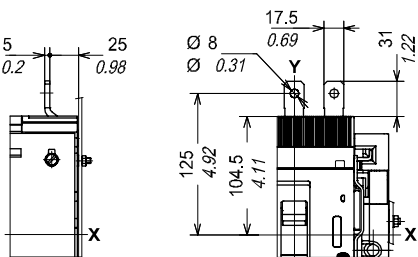
Front for Cu Cables (FC-Cu)



Front for CuAl cables (FC CuAl)



Front extended (EF)



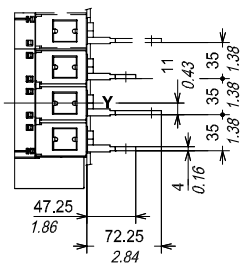
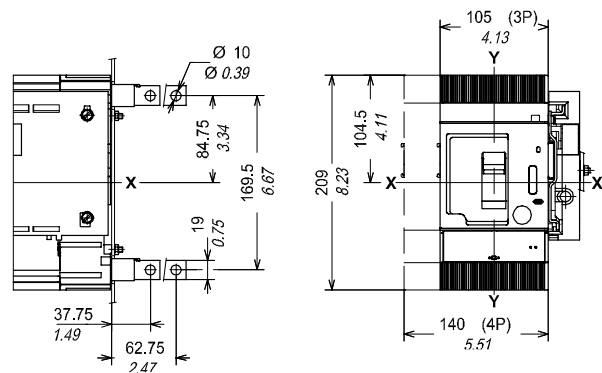
Overall dimensions

Molded Case Circuit Breakers

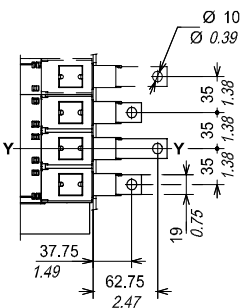
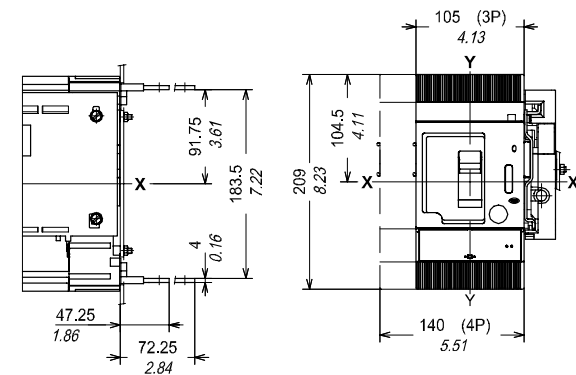
T4 DRAW OUT VERSION

TERMINALS (continued)

Rear vertical (VR)



Rear horizontal (HR)



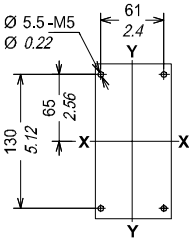
Overall dimensions

Molded Case Circuit Breakers

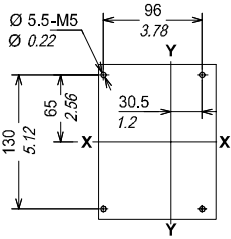
T4 DRAW OUT VERSION

DRILLING TEMPLATES

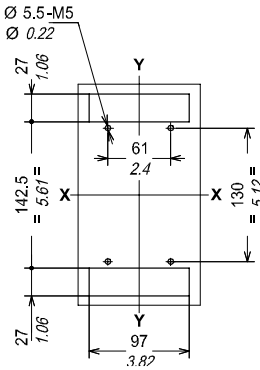
Support sheet



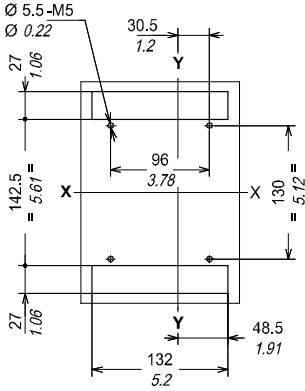
3 poles with front terminals



4 poles with front terminals



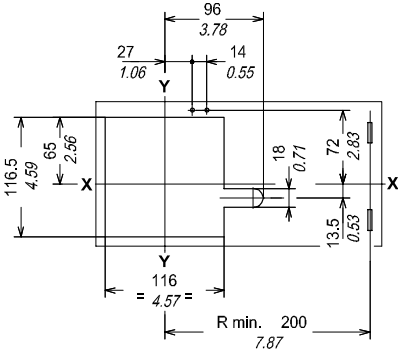
3 poles with rear terminals (HR/VR)



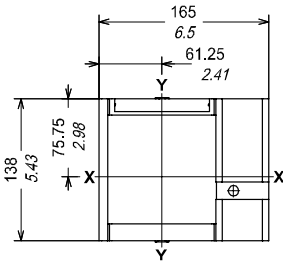
4 poles with rear terminals (HR/VR)

DRILLING TEMPLATES

Compartment door



Flange for the compartment door

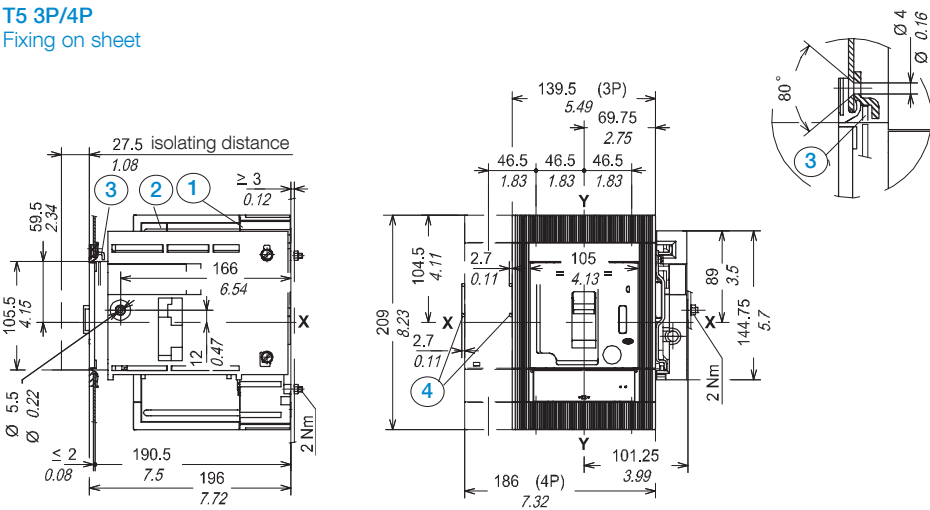


Overall dimensions

Molded Case Circuit Breakers

T5 DRAW OUT VERSION

T5 3P/4P
Fixing on sheet



Caption

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

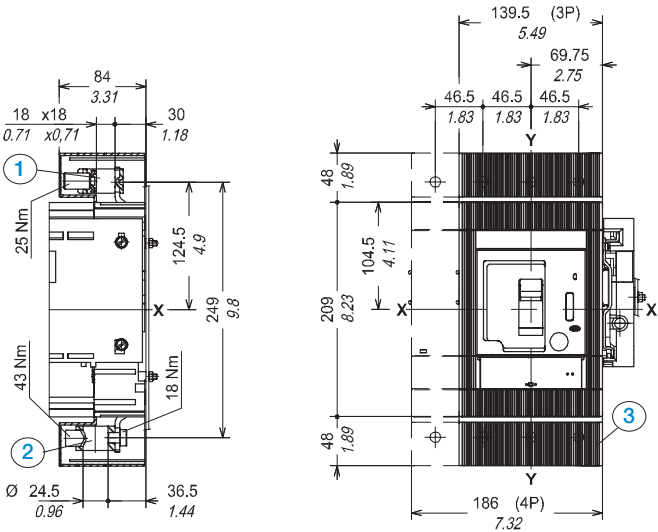
Overall dimensions

Molded Case Circuit Breakers

T5 DRAW OUT VERSION

TERMINALS

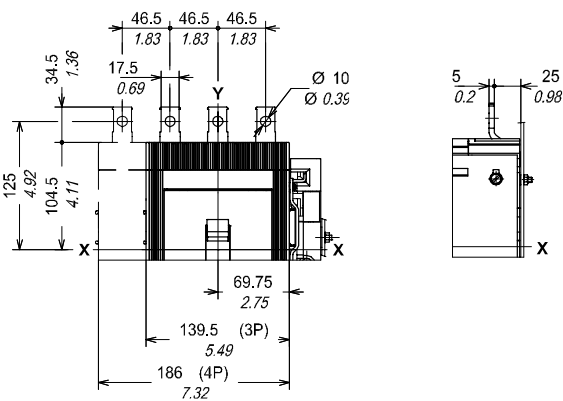
Front for Cu or CuAl Cables (FC-Cu/CuAL)



Caption

- 1 For Cu cables
- 2 For CuAl cables
- 3 High terminal covers with IP40 protection degree

Front extended (EF)



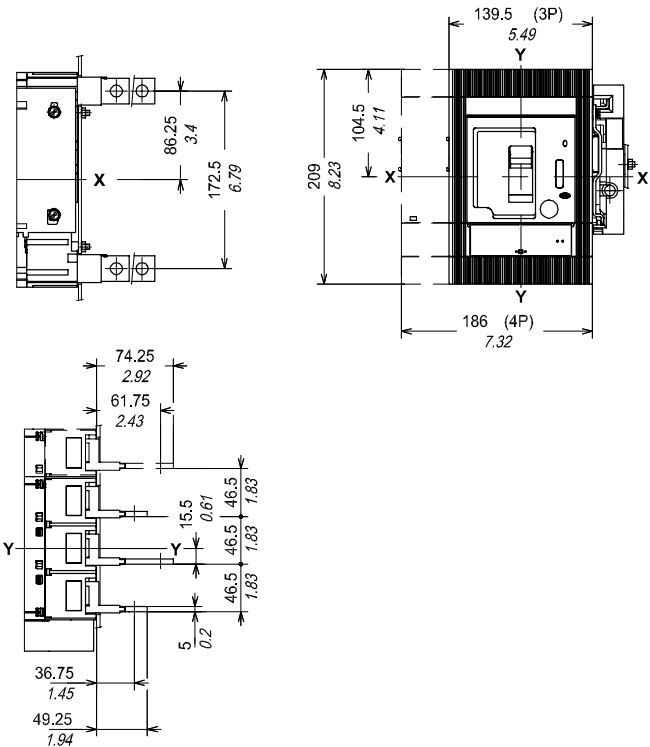
Overall dimensions

Molded Case Circuit Breakers

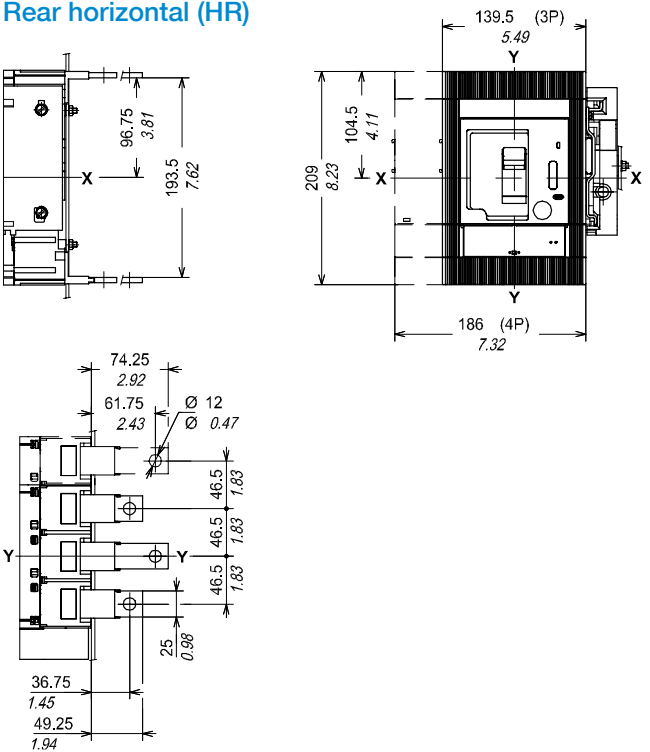
T5 DRAW OUT VERSION

TERMINALS (continued)

Rear vertical (VR)



Rear horizontal (HR)



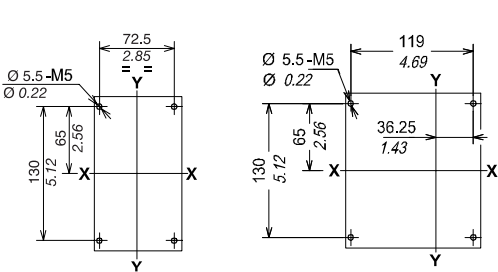
Overall dimensions

Molded Case Circuit Breakers

T5 DRAW OUT VERSION

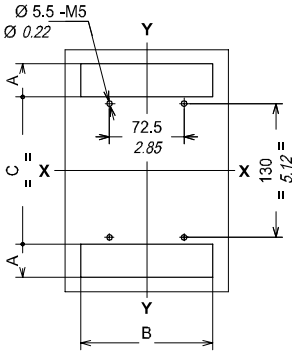
DRILLING TEMPLATES

Support sheet

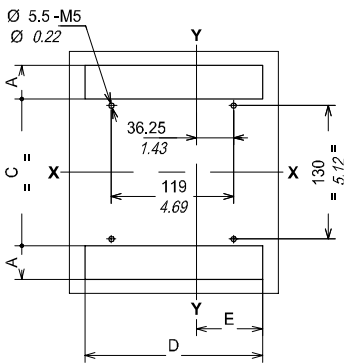


3 poles with front terminals (FC Cu/CuAl)

4 poles with front terminals (FC Cu/CuAl)



3 poles with rear terminals (HR/VR)

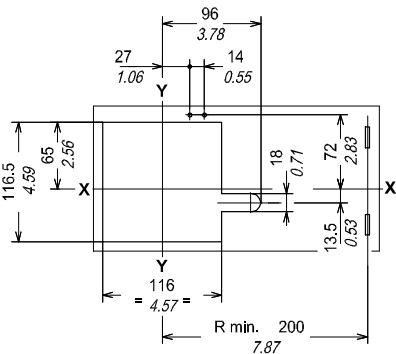


4 poles with rear terminals (HR/VR)

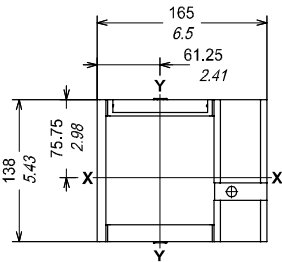
Dimensions	A	B	C	D	E
mm	32.5	128.5	143	172.5	64.5
in	1.28	5.06	5.63	6.79	2.54

DRILLING TEMPLATES

Compartment door



Flange for the compartment door



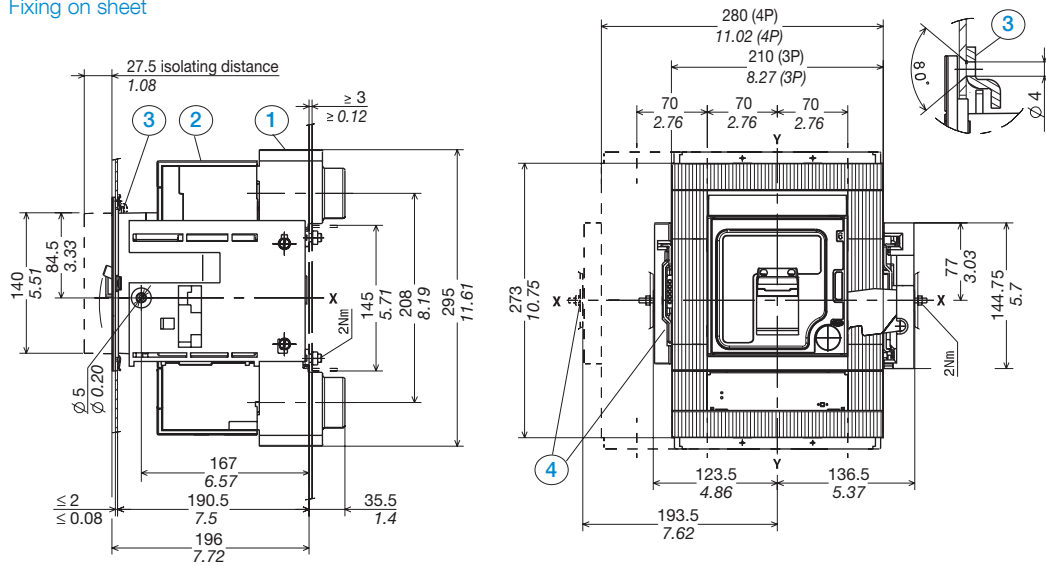
Overall dimensions

Molded Case Circuit Breakers

T6 DRAW OUT VERSION

T6 3P/4P

Fixing on sheet



Caption

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

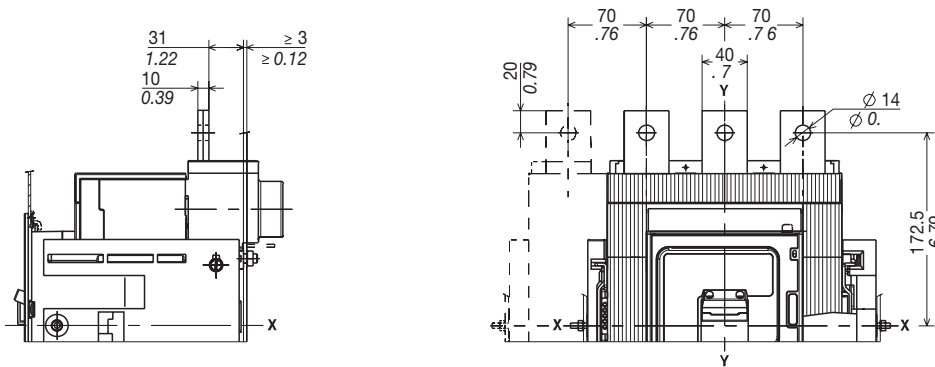
Overall dimensions

Molded Case Circuit Breakers

T6 DRAW OUT VERSION

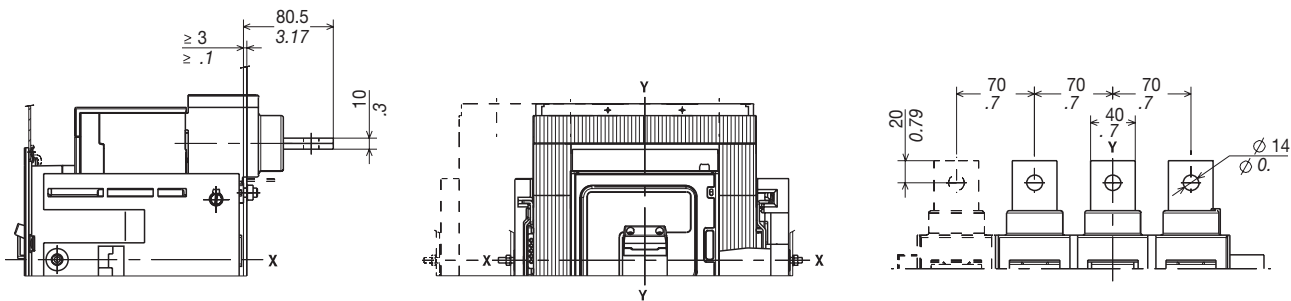
TERMINALS

Front extended (EF)

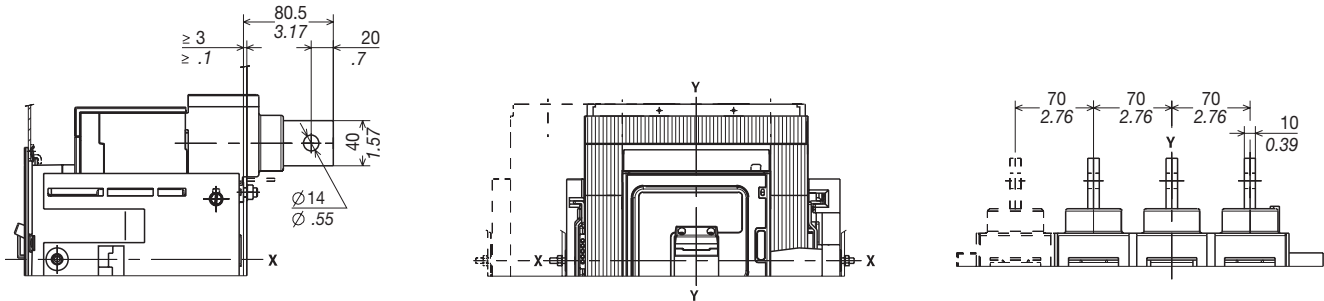


6

Rear vertical (VR)



Rear horizontal (HR)



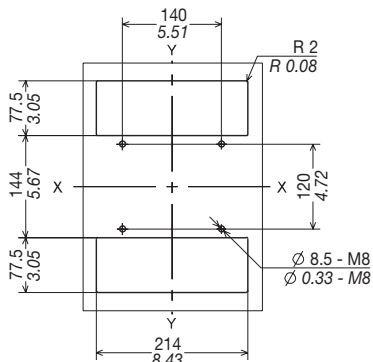
Overall dimensions

Molded Case Circuit Breakers

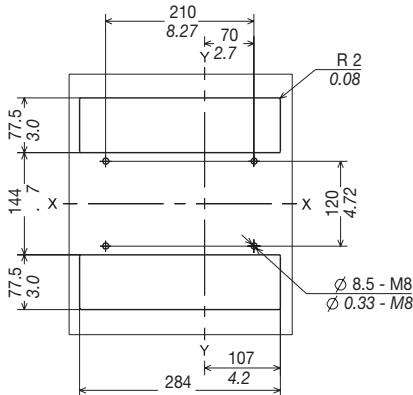
T6 DRAW OUT VERSION

DRILLING TEMPLATES

Support sheet



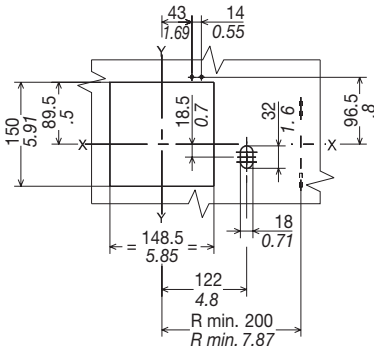
3 poles



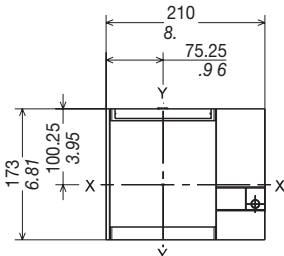
4 poles

DRILLING TEMPLATES

Compartment door



Flange for the compartment door



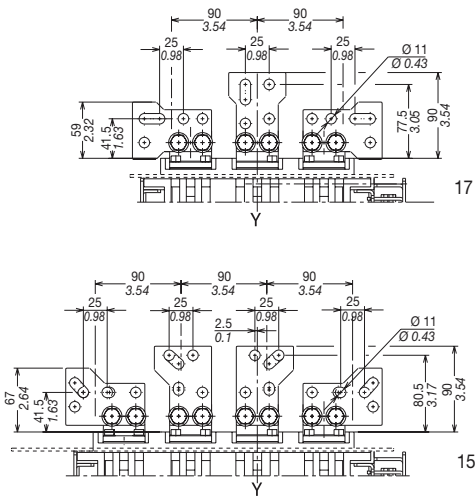
Overall dimensions

Molded Case Circuit Breakers

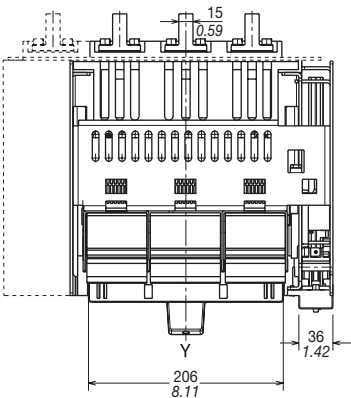
T7 DRAW OUT VERSION

TERMINALS

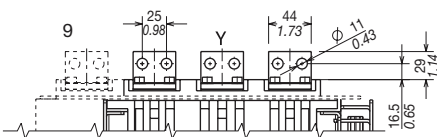
Rear spreaded (RS)



Rear vertical (VR)



Rear horizontal (HR)

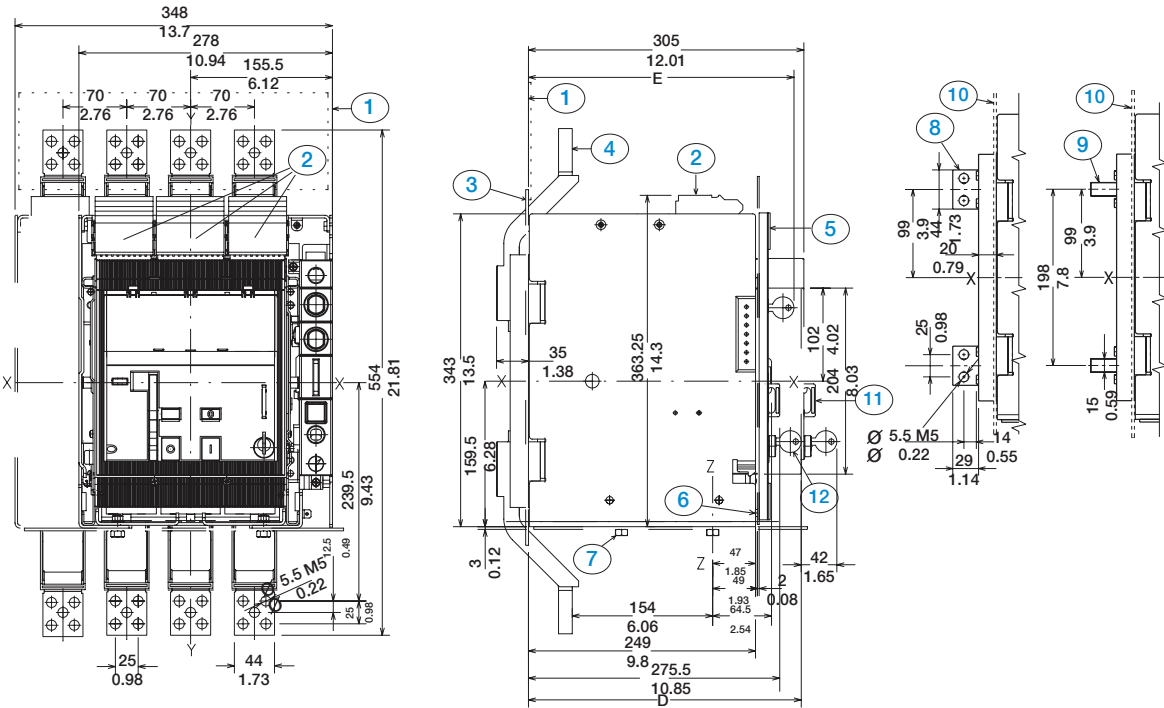


Overall dimensions

Molded Case Circuit Breakers

T7M DRAW OUT VERSION

T7 3P/4P
Fixing on sheet with front extended (EF)



Caption

- 1 Insulating protection
- 2 Auxiliary contact terminal
- 3 Rear segregation for front terminals
- 4 Front terminals
- 5 Flange for compartment door
- 6 Flange fixing screws (tightening torque 1.5 Nm)
- 7 Tightening torque 21 Nm
- 8 Rear vertical terminals
- 9 Rear horizontal terminals
- 10 Segregation for rear terminals
- 11 Padlock (optional)
- 12 Key lock (optional)

Dimensions	Standard	Ronis	Profalux	Kirk	Castell
D mm	290	298	306	-	-
D in	11.42	11.73	12.05	-	-
E mm	287	291	299	298	328
E in	11.3	11.46	11.77	11.73	12.91

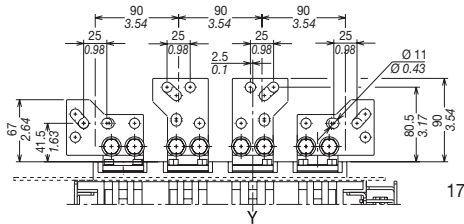
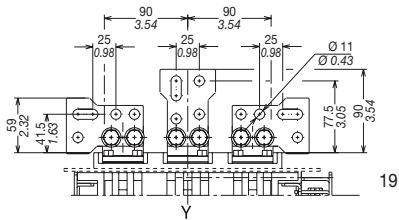
Overall dimensions

Molded Case Circuit Breakers

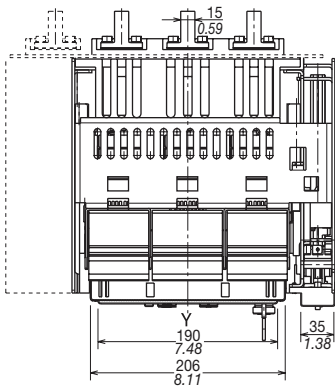
T7M DRAW OUT VERSION

TERMINALS

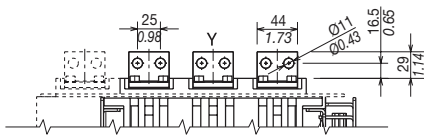
Rear spreaded (RS)



Rear vertical (VR)



Rear horizontal (HR)



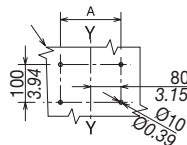
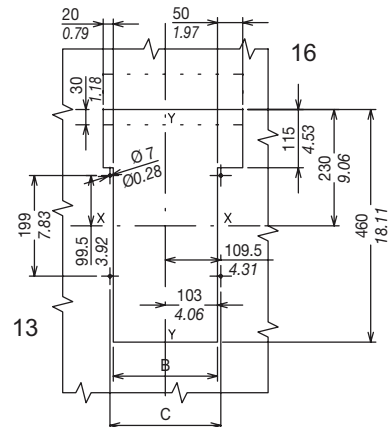
Overall dimensions

Molded Case Circuit Breakers

T7M DRAW OUT VERSION

DRILLING TEMPLATES

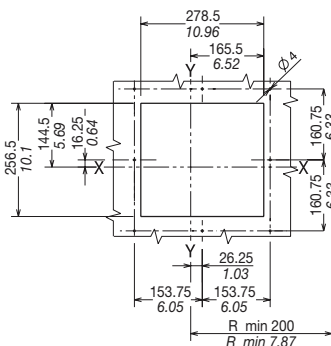
Support sheet



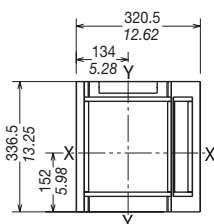
Dimensions	3 poles	4 poles
A mm	160	230
A in	6.3	9.05
B mm	206	276
B in	8.11	10.87
C mm	219	289
C in	8.62	11.38

DRILLING TEMPLATES

Compartment door



Flange for the compartment door



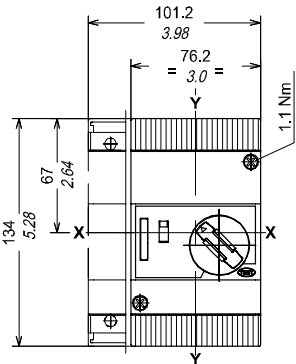
Overall dimensions

Molded Case Circuit Breakers

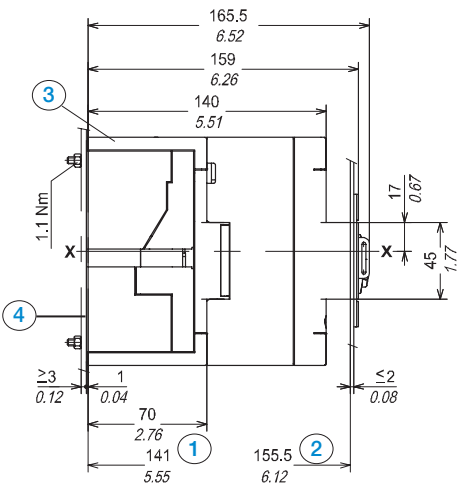
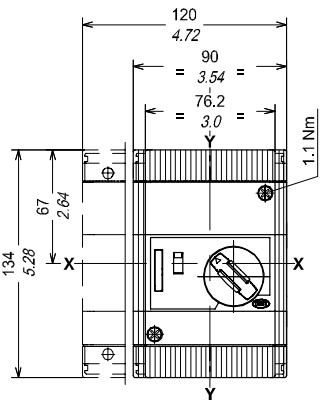
ACCESSORIES T1-T2-T3

Solenoid operator superimposed (fixed version)

T1



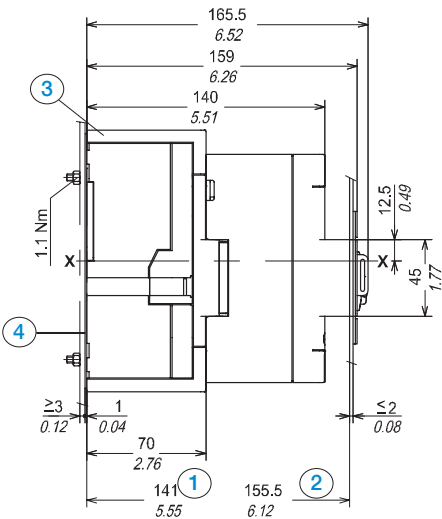
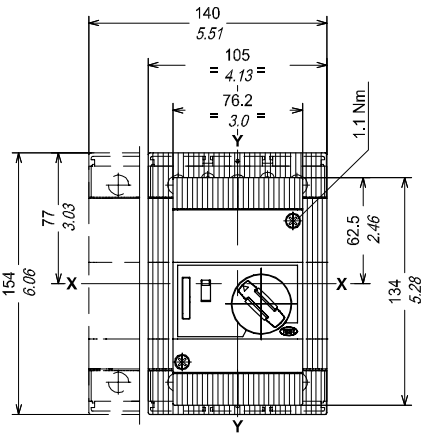
T2



Caption

- ① Depth of the switchboard with operating mechanism face extending
- ② Depth of the switchboard with operating mechanism face flush with door
- ③ Low terminal covers with IP40 protection degree
- ④ Insulating plate

T3



Caption

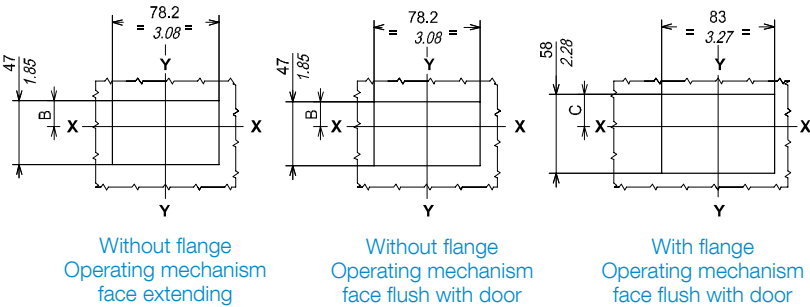
- ① Depth of the switchboard with operating mechanism face extending
- ② Depth of the switchboard with operating mechanism face flush with door
- ③ Low terminal covers with IP40 protection degree
- ④ Insulating plate

Overall dimensions

Molded Case Circuit Breakers

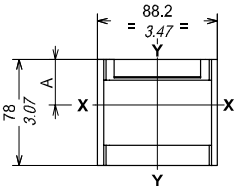
DRILLING TEMPLATES

Compartment door (for operating mechanism)



Dimensions	A	B	C
T1 mm	33.5	18	23.5
T1 in	1.32	0.71	0.93
T2 mm	33.5	18	23.5
T2 in	1.32	0.71	0.93
T3 mm	29	13.5	19
T3 in	1.14	0.53	0.75

Flange for the compartment door



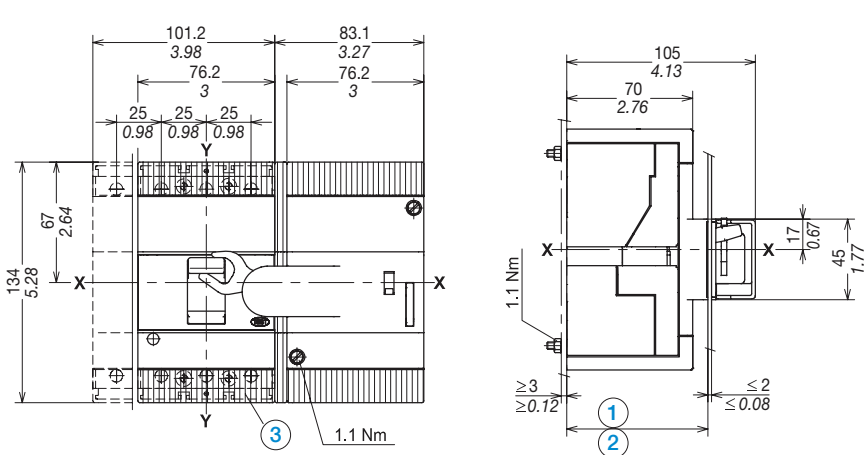
Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T1-T2-T3

Solenoid operator side by side (Fixed version)

T1



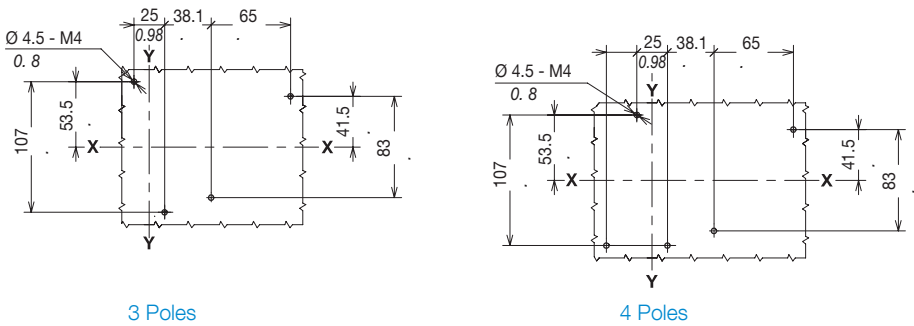
Dimensions	A
3P (1) mm	79
3P (1) in	3.11
3P (2) mm	71
3P (2) in	2.79
4P (1) mm	79
4P (1) in	3.11
4P (2) mm	71
4P (2) in	2.79

Caption

- 1 Circuit breaker with face extending
- 2 Circuit breaker with face flush with door
- 3 Low terminal covers with IP40 protection degree

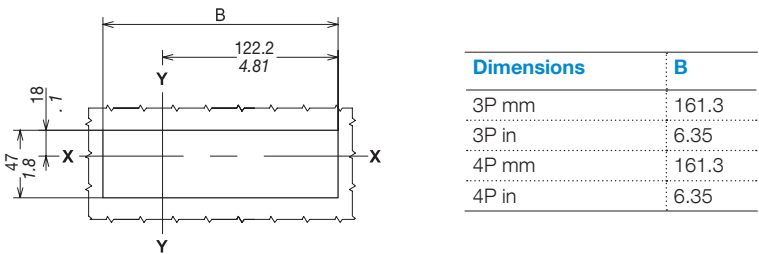
DRILLING TEMPLATES

Support sheet



DRILLING TEMPLATES

Compartment door (for operating mechanism)



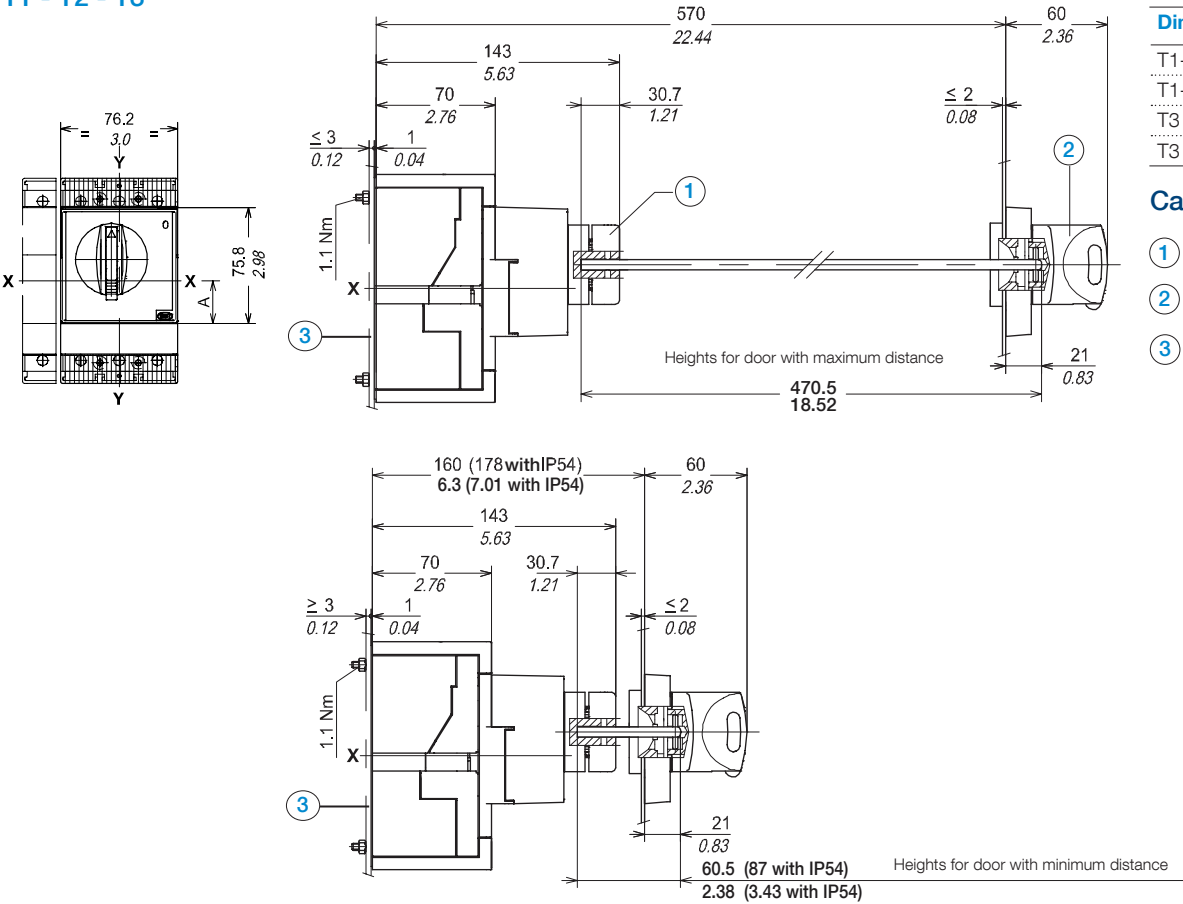
Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T1-T2-T3

Rotary handle on compartment door (mechanism + handle + shaft)

T1 - T2 - T3



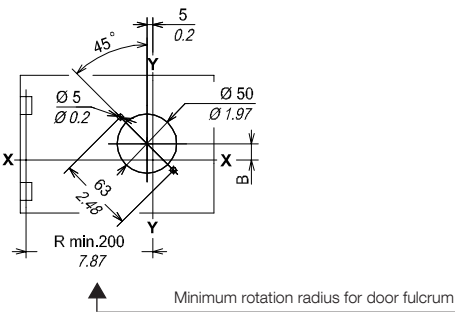
Dimensions	A
T1-T2 mm	28
T1-T2 in	1.10
T3 mm	32.5
T3 in	1.28

Caption

- 1 Mechanism
- 2 Rotary handle on door
- 3 Insulating plate

DRILLING TEMPLATES

Compartment door (for operating mechanism)



Dimensions	B
T1-T2 mm	14
T1-T2 in	0.55
T3 mm	9.5
T3 in	0.37

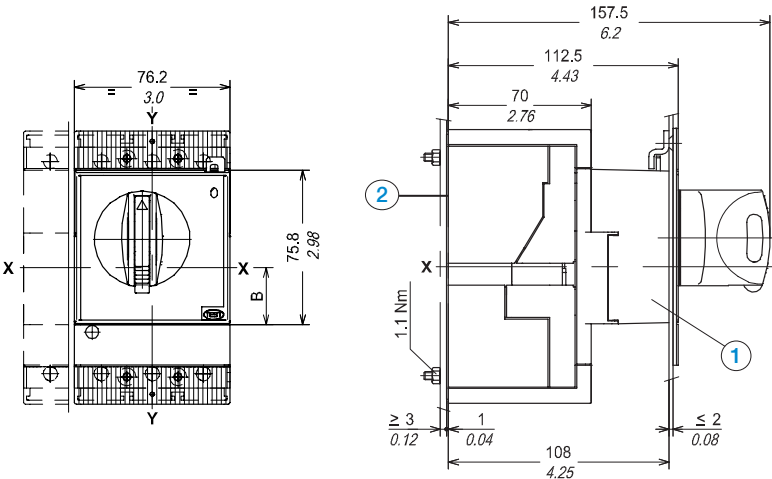
Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T1-T2-T3

Rotary handle on breaker

T1 - T2 - T3



Dimensions	B
T1-T2 mm	28
T1-T2 in	1.10
T3 mm	32.5
T3 in	1.28

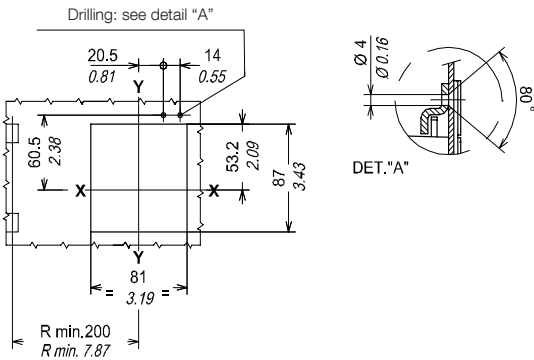
Caption

1 Rotary handle mechanism

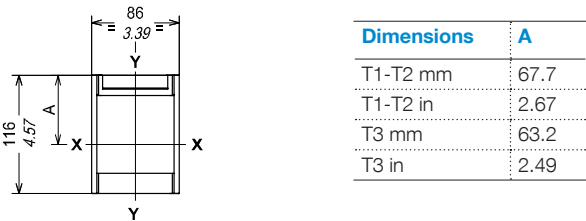
2 Insulating plate

DRILLING TEMPLATES

Compartment door



Flange for the compartment door



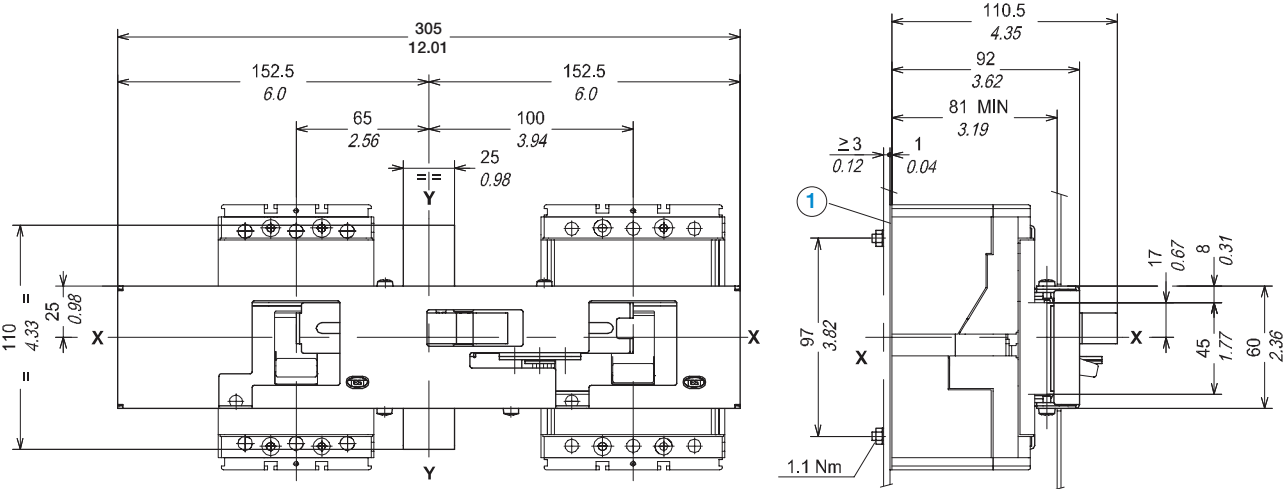
Dimensions	A
T1-T2 mm	67.7
T1-T2 in	2.67
T3 mm	63.2
T3 in	2.49

Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T1-T2-T3

Mechanical front interlock plate between 2 circuit breakers (T1-T2-T3)

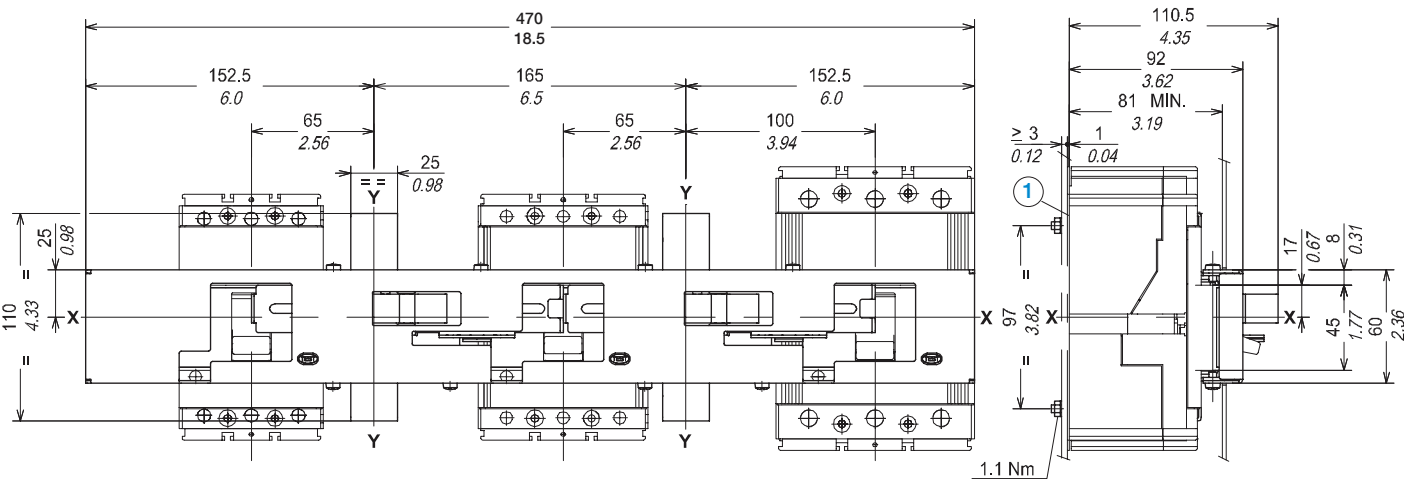


6

Caption

① Insulating plate

Mechanical front interlock plate between 3 circuit breakers (T1-T2-T3)



Caption

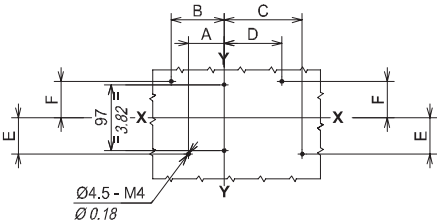
① Insulating plate

Overall dimensions

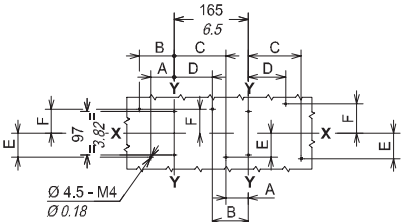
Molded Case Circuit Breakers

DRILLING TEMPLATES

Support sheet



For 2 circuit breakers

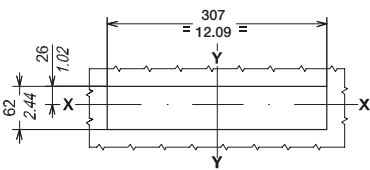


For 3 circuit breakers

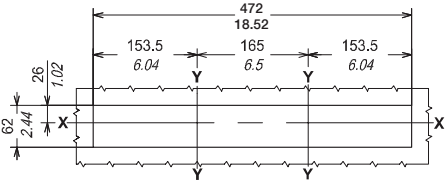
Dimensions	A	B	C	D	E	F
T1 mm	52.5	77.5	112.5	87.5	53.5	53.5
T1 in	2.07	3.05	4.43	3.44	2.11	2.11
T2 mm	50	80	115	85	53.5	53.5
T2 in	1.97	3.15	4.53	3.35	2.11	2.11
T3 mm	47.5	82.5	117.5	82.5	56.5	65.5
T3 in	1.87	3.25	4.63	3.25	2.22	2.58

DRILLING TEMPLATES

Compartment door



For 2 circuit breakers



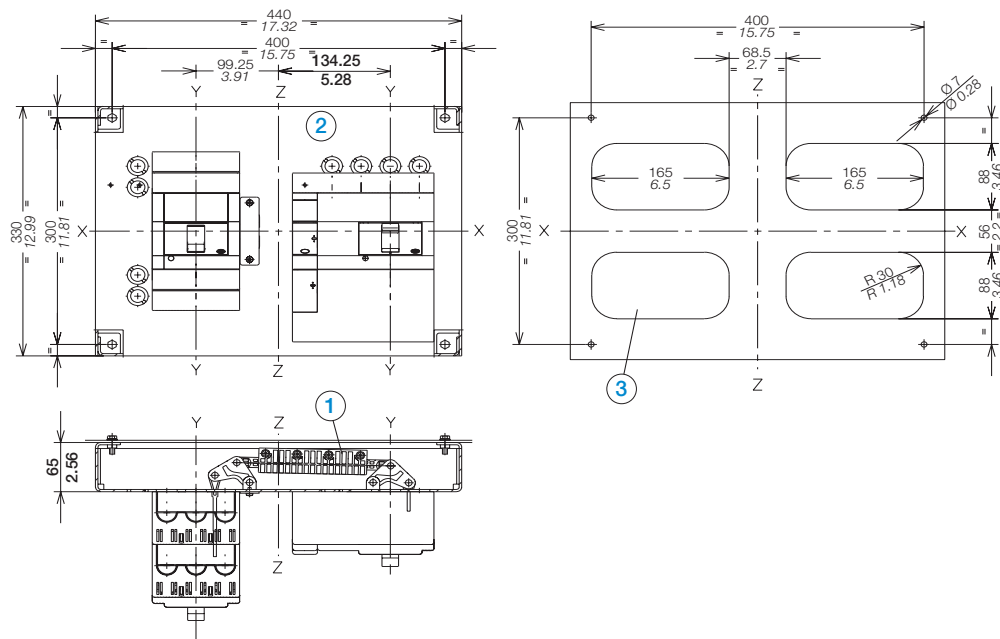
For 3 circuit breakers

Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T1-T2-T3

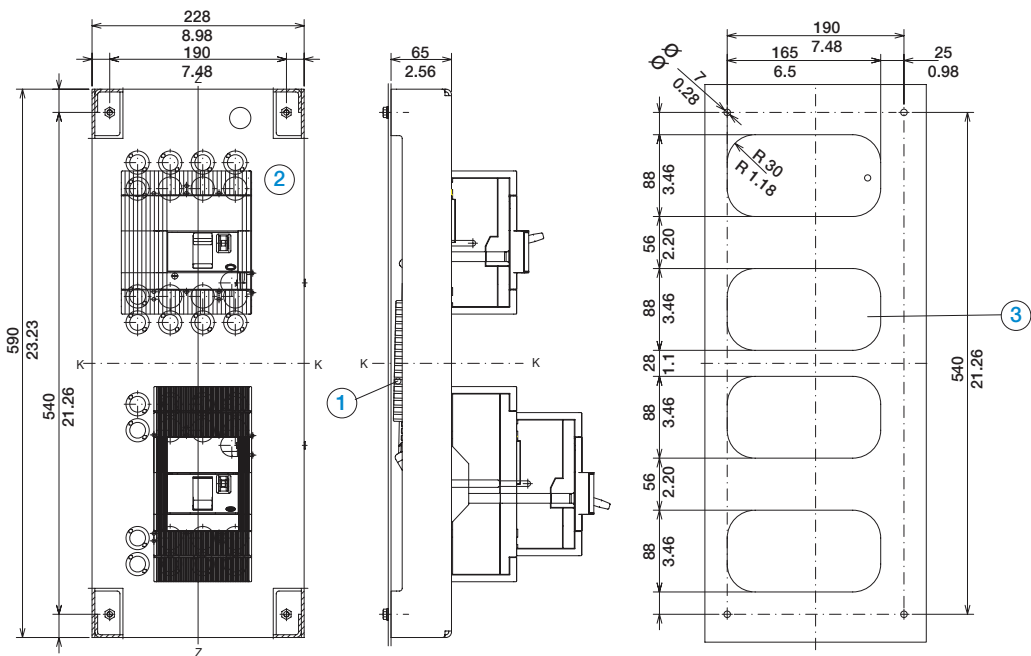
Mechanical rear horizontal interlock between 2 circuit breakers (T3)



Caption

- 1 Interlocking mech.
- 2 Adaptor plate
- 3 drilling template for all terminal versions

Mechanical rear vertical interlock between 2 circuit breakers (T3)



Caption

- 1 Interlocking mech.
- 2 Adaptor plate
- 3 drilling template for all terminal versions

The mechanical rear vertical interlock for Tmax T3 is not compatible with the RC221 and RC222 residual current releases

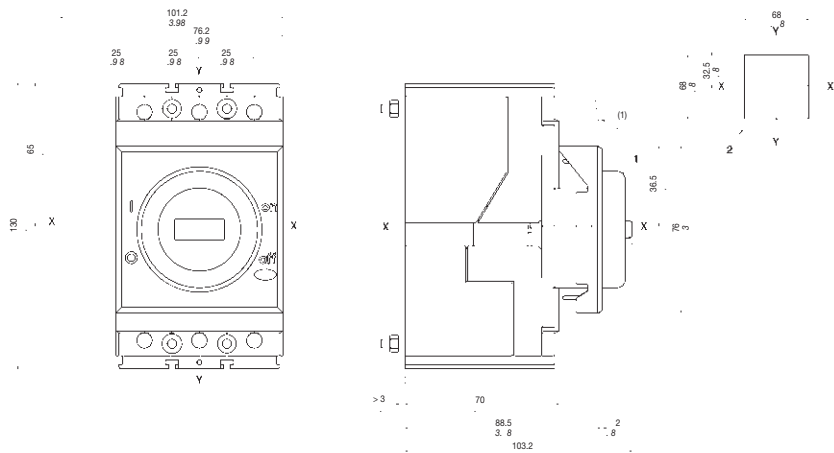
Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T1-T2-T3

Protection kit IP42

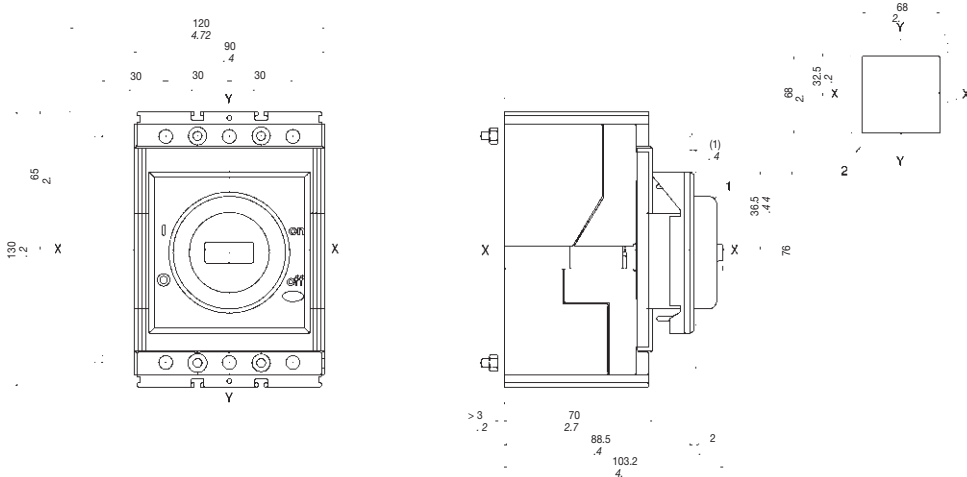
T1 Fixed



Caption

- 1 IP42 protection.
- 2 Compartment door drilling

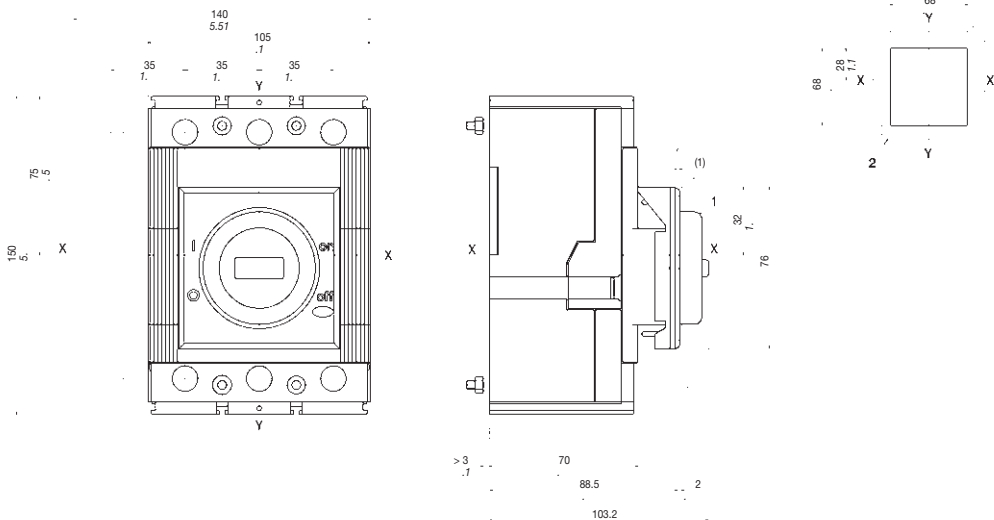
T2 Fixed



Caption

- 1 IP42 protection.
- 2 Compartment door drilling

T3 Fixed



Caption

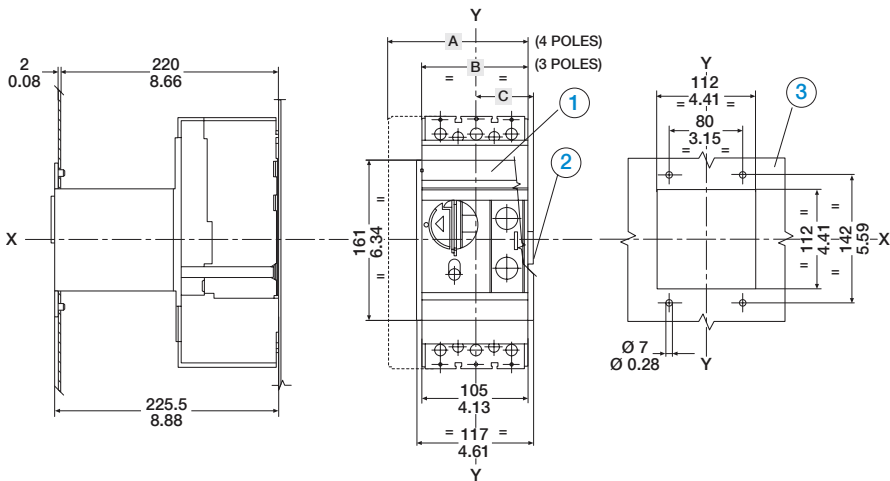
- 1 IP42 protection.
- 2 Compartment door drilling

Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES Ts3

Motor operator for fixed circuit breaker

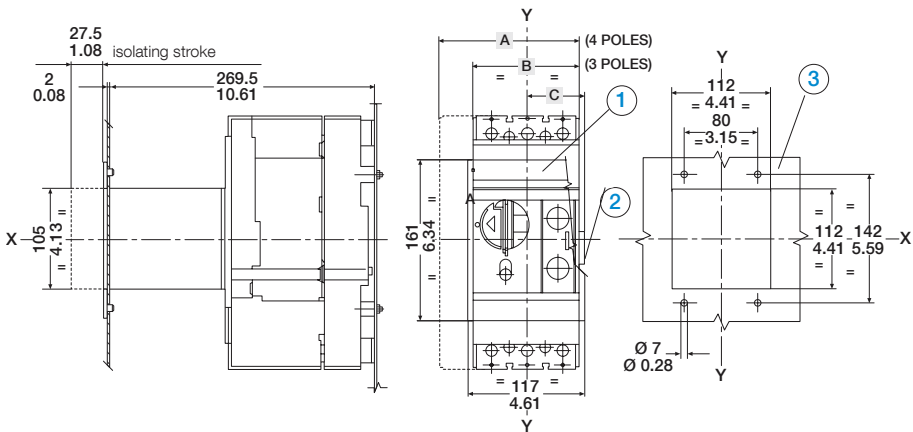


Caption

- 1 Flange for compartment door.
- 2 Dimensions with connectors
- 3 Drilling of compartment door

Dimensions	A	B	C
mm	140	105	58
in	5.51	4.13	2.28

6 Motor operator for plug in circuit breakers

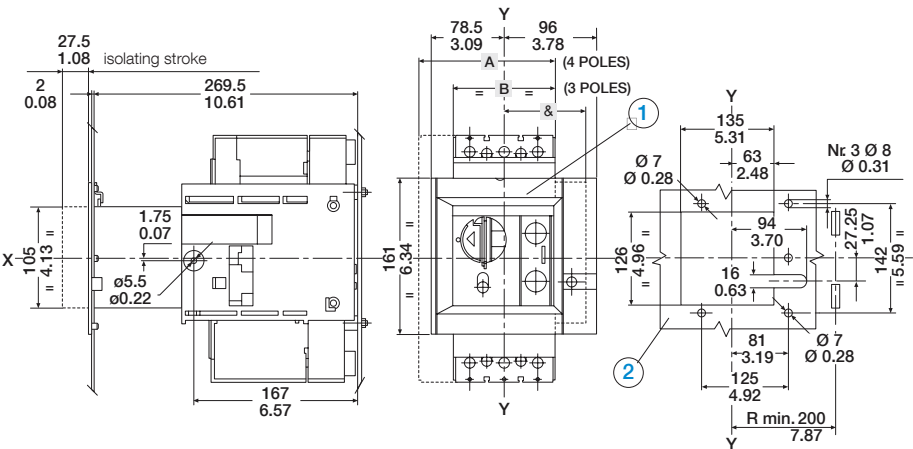


Caption

- 1 Flange for compartment door.
- 2 Dimensions with connectors
- 3 Drilling of compartment door

Dimensions	A	B	C
mm	140	105	58
in	5.51	4.13	2.28

Motor operator for draw out circuit breakers



Caption

- 1 Flange for compartment door.
- 2 Drilling of compartment door

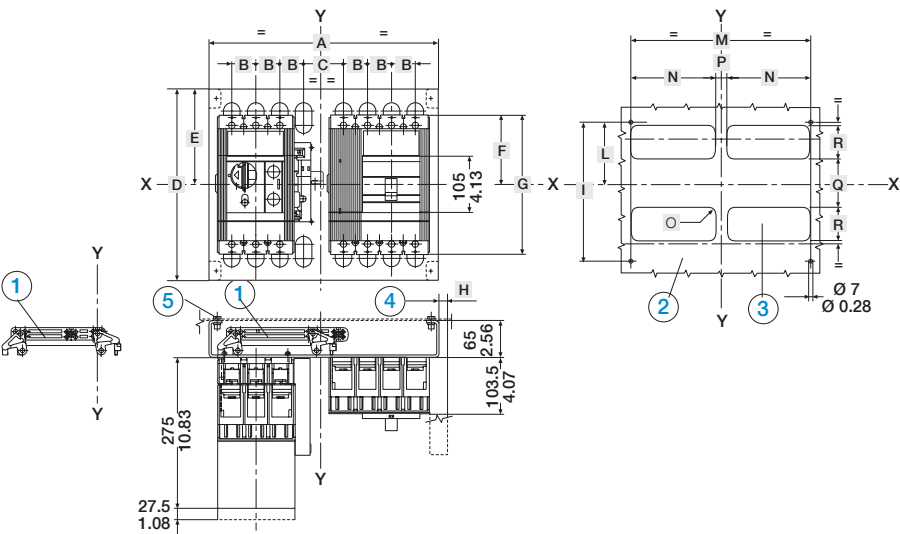
Dimensions	A	B	C
mm	140	105	58
in	5.51	4.13	2.28

Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES Ts3

Mechanical interlock between 2 horizontal circuit breakers

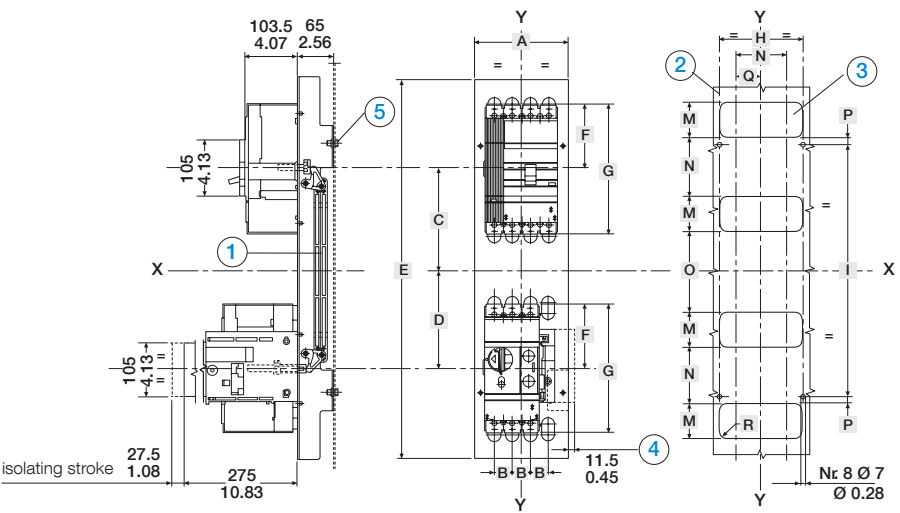


Caption

- 1 Interlock device
- 2 Drilling template mounting holes in sheet metal
- 3 Drilling template all versions with rear terminals
- 4 Dimensions with 4 pole drawout version mounted on right
- 5 Tightening torque 3.7 Nm

Dimensions	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	R
mm	350	35	66	265	134.5	87.2	170	12	227.5	116	324	155	R15	16	68	75
in	13.78	1.38	2.60	10.43	5.30	3.43	6.69	0.47	8.96	4.57	12.76	6.10	R0.59	0.63	2.68	2.95

Mechanical interlock between 2 vertical circuit breakers



Caption

- 1 Interlock device
- 2 Drilling template mounting holes in sheet metal
- 3 Drilling template all versions with rear terminals
- 4 Dimensions with 4 pole drawout version mounted on right
- 5 Tightening torque 3.7 Nm

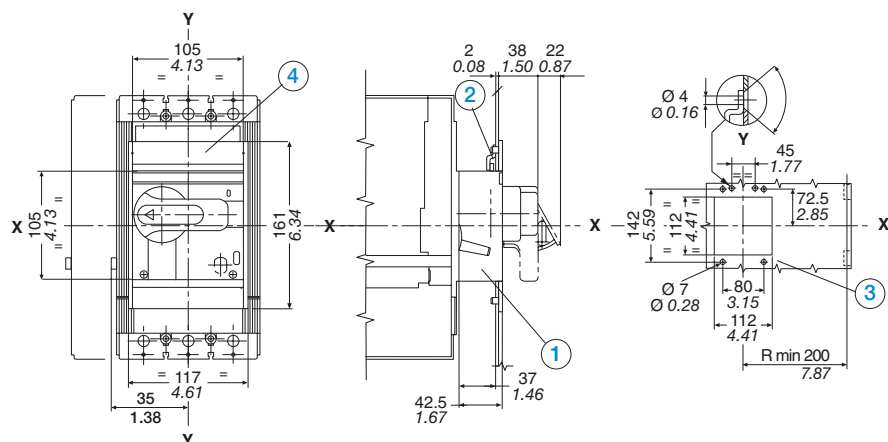
Dimensions	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	R
mm	180	35	152.5	157.5	578	87.5	170	157.5	350	155	75	68	92	14	77.5	R15
in	7.09	1.38	6.00	6.20	22.76	3.44	6.69	6.20	13.78	6.10	2.95	2.68	3.62	0.55	3.05	R0.59

Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES Ts3

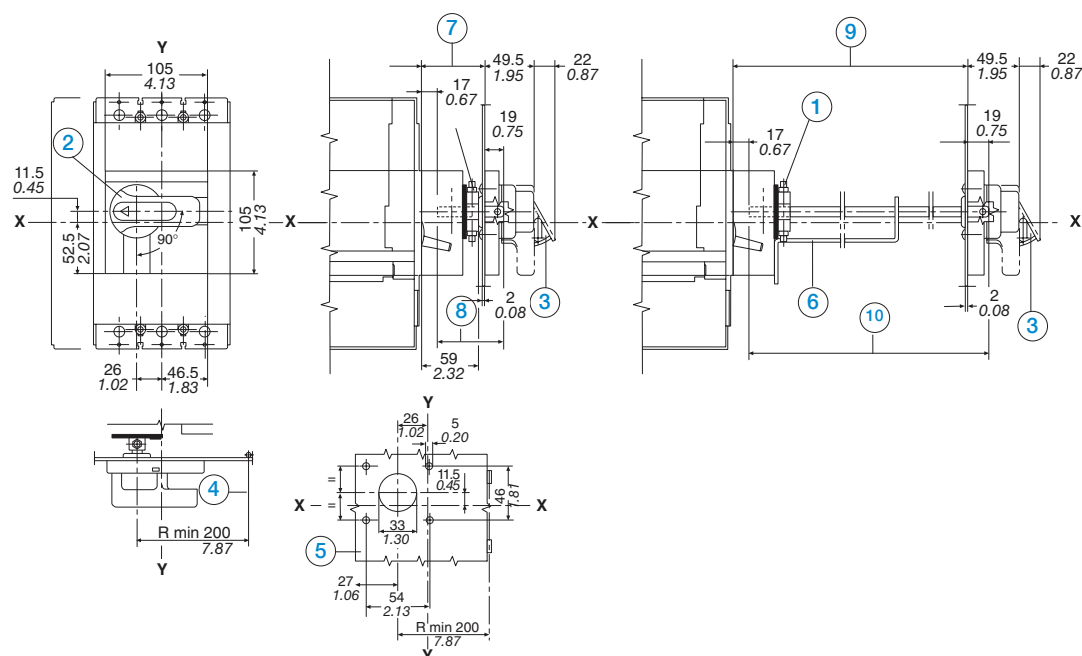
Rotary handle on breaker (fixed or plug in)



Caption

- ① Rotary handle mech.
- ② Lock for compartment door (optional)
- ③ Drilling of compartment door
- ④ Flange for compartment door

6 Rotary handle on compartment door (fixed or plug in with mechanism+shaft+handle)



Caption

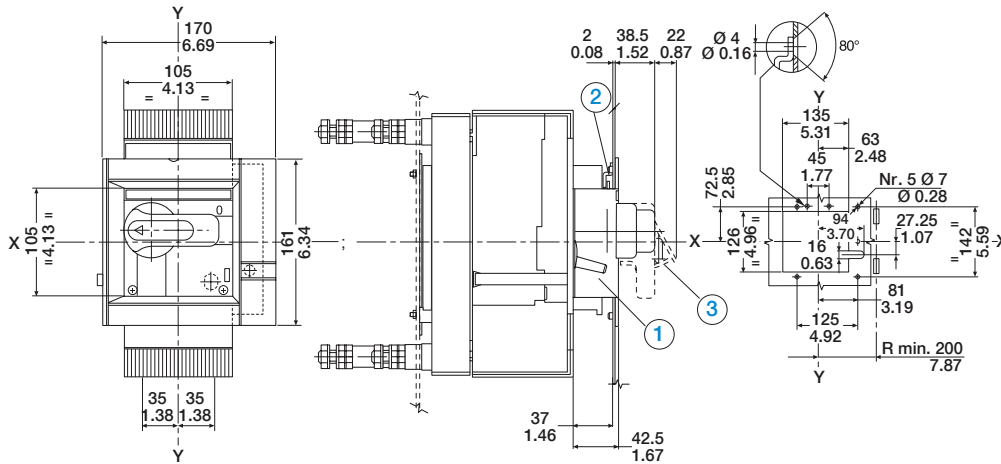
- ① Mechanism
- ② Rotary handle
- ③ Padlock device for open position
- ④ Minimum radius of rotation for fulcrum of door
- ⑤ Drilling of compartment door
- ⑥ Support for depths up to 19.69\" / 500 mm
- ⑦ 2.60\"...11.81\" / 66...300mm (with IP54 protection min. 90)
- ⑧ Distance ⑦ + 0.08\" / 2mm (shaft length)
- ⑨ 11.85\"...19.69\" / 301...500mm (with IP54 protection min. 325)
- ⑩ Distance ⑨ + 0.08\" / 2mm (shaft length)

Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES Ts3

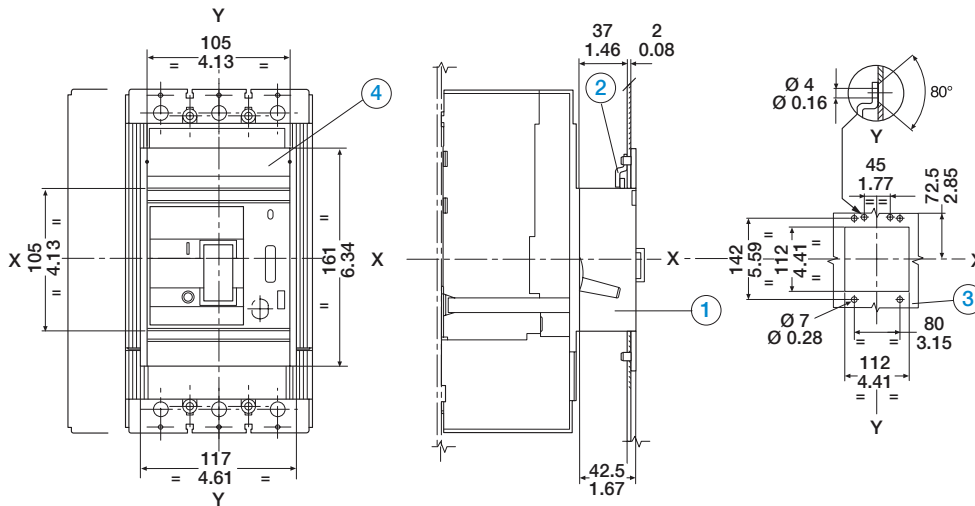
Rotary handle on breaker (Draw out)



Caption

- ① Rotary handle mech.
- ② Lock for compartment door (optional)
- ③ Padlock device for open position (max. 3 padlocks 0.24\"/>

Front flange for operating lever mechanism



Caption

- ① Front flange for operating mech.
- ② Lock for compartment door (optional)
- ③ Drilling of compartment door
- ④ Flange for compartment door

ACCESSORIES T4-T5

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

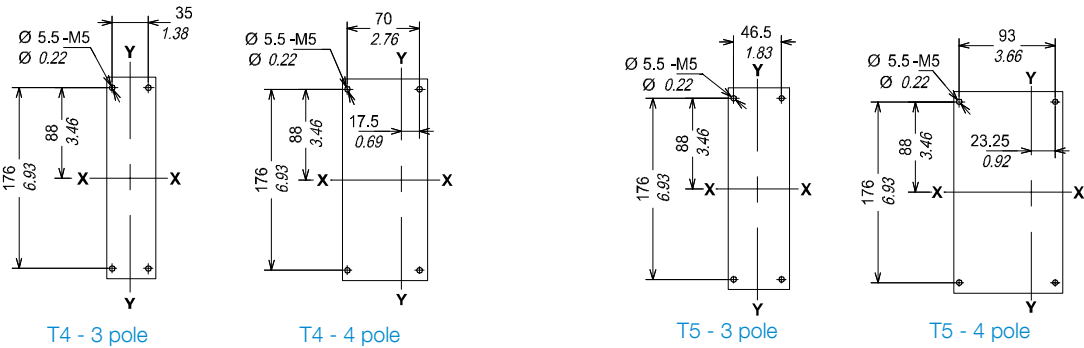
① Overall dimensions with cabled auxiliary contacts (3Q+1SY only)

Overall dimensions

Molded Case Circuit Breakers

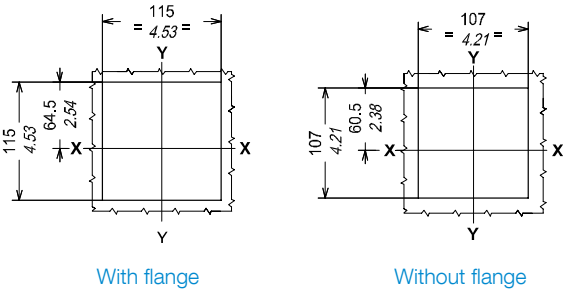
DRILLING TEMPLATES

Support sheet

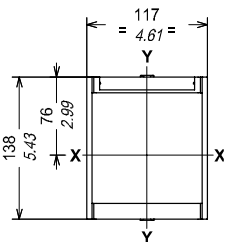


DRILLING TEMPLATES

Compartment door



Flange for the compartment door

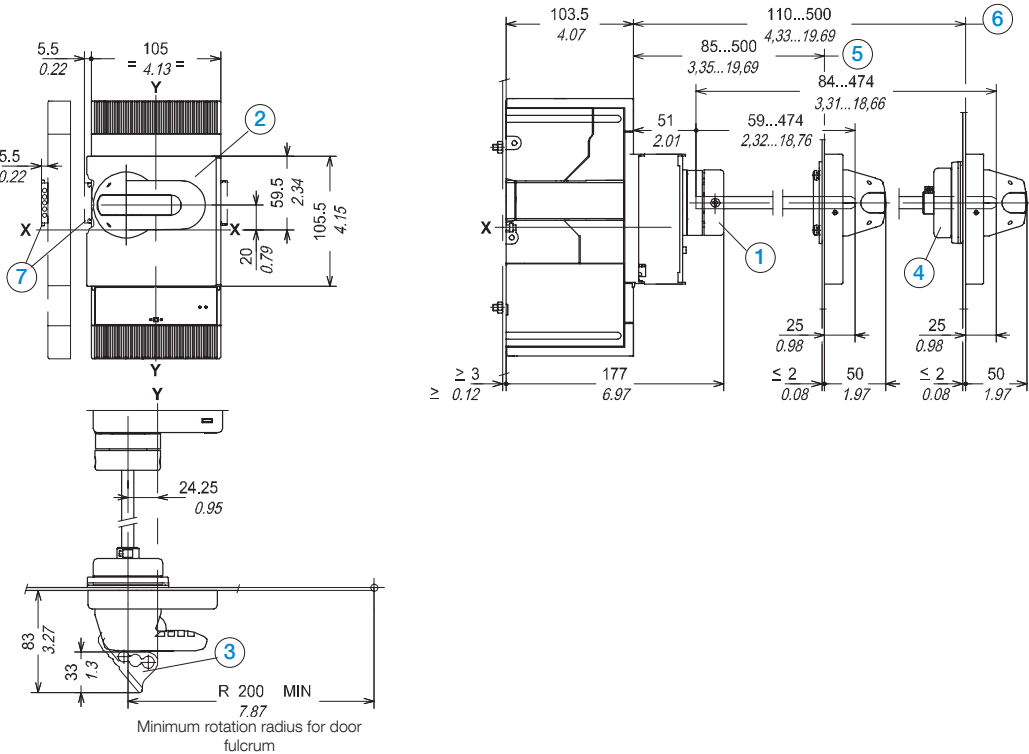


Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T4-T5

Rotary handle on compartment door (mechanism + shaft + handle)

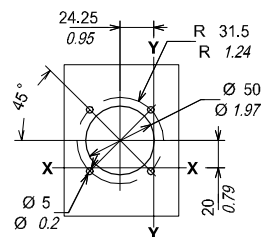


Caption

- 1 Mechanism
- 2 Rotary handle
- 3 Padlock device open position (3 padlock max.)
- 4 IP54 protection (supplied on request)
- 5 Min...Max distance from the front of the door without 4
- 6 Min...Max distance from the front of the door with 4
- 7 Dimension with AUE connector (early make contact)

DRILLING TEMPLATES

Compartment door

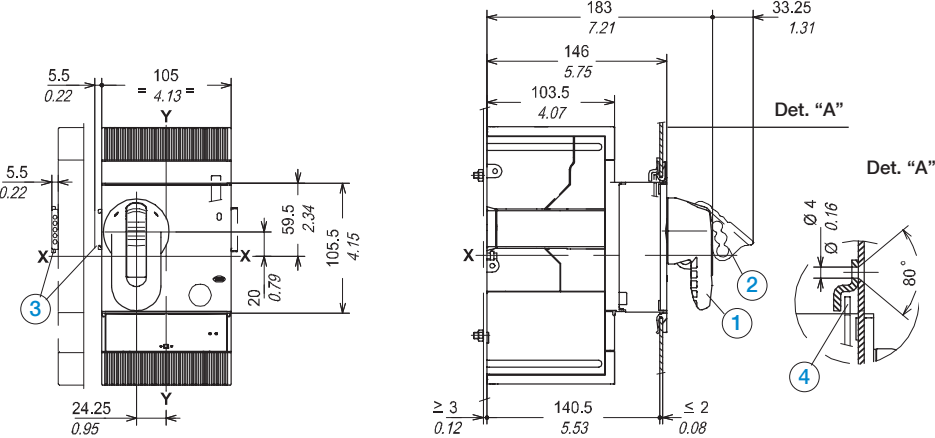


Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T4-T5

Rotary handle on breaker

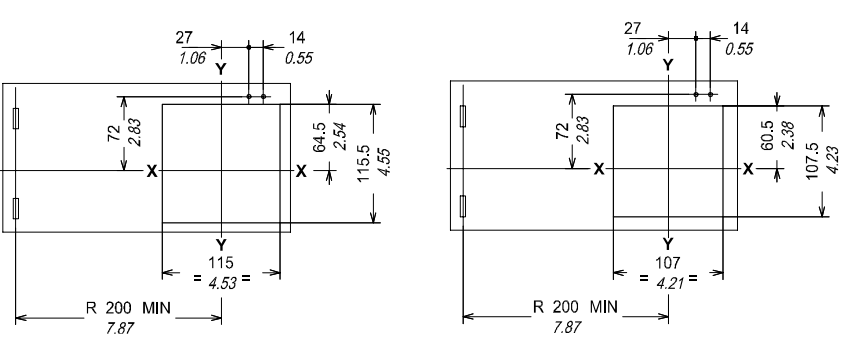


Caption

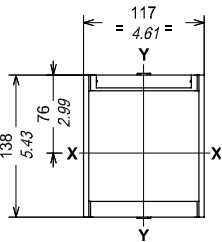
- 1 Rotary handle on breaker
- 2 Padlock device open position (3 padlock max)
- 3 Dimension with AUE connector (early make contact)
- 4 Compartment door lock

DRILLING TEMPLATES

Compartment door



Flange for the compartment door



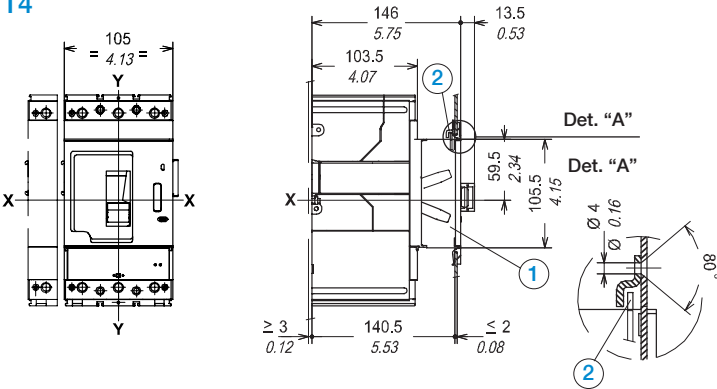
Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T4-T5

Front lever operating mechanism

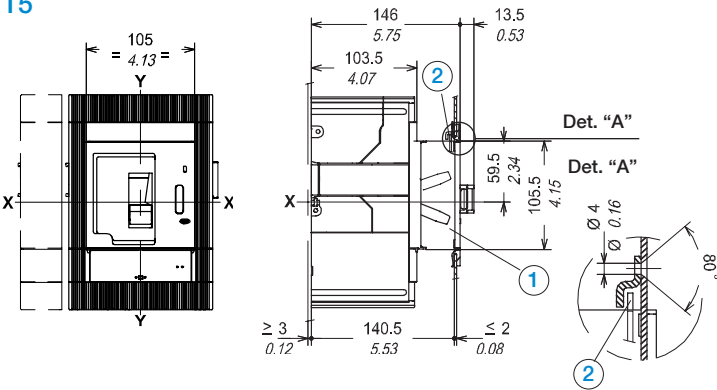
T4



Caption

- 1 Front lever operating mech.
- 2 Lock for compartment door (supplied on request)

T5



Caption

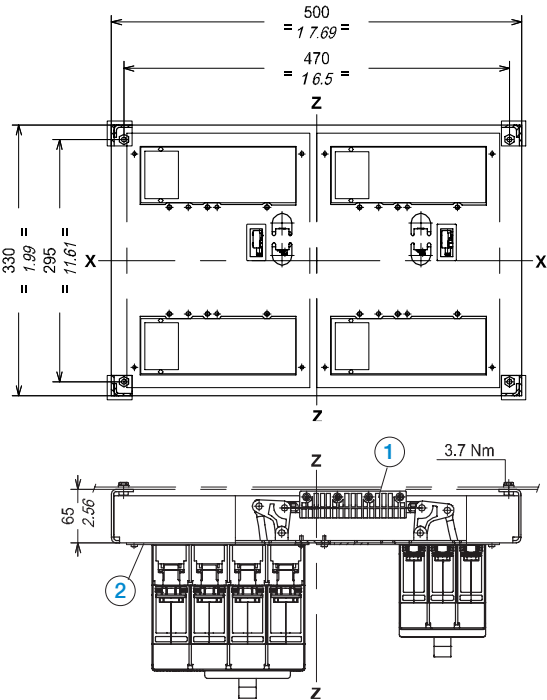
- 1 Front lever operating mech.
- 2 Lock for compartment door (supplied on request)

Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T4-T5

Mechanical interlock between 2 horizontal circuit breakers (fixed version)

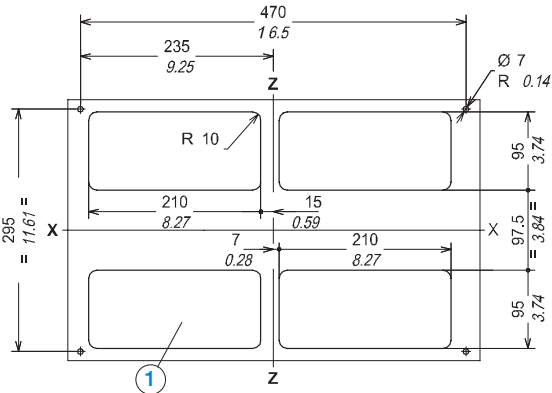


Caption

- 1 Interlocking mechanism
- 2 Coupling plate

DRILLING TEMPLATES

Support sheet



Caption

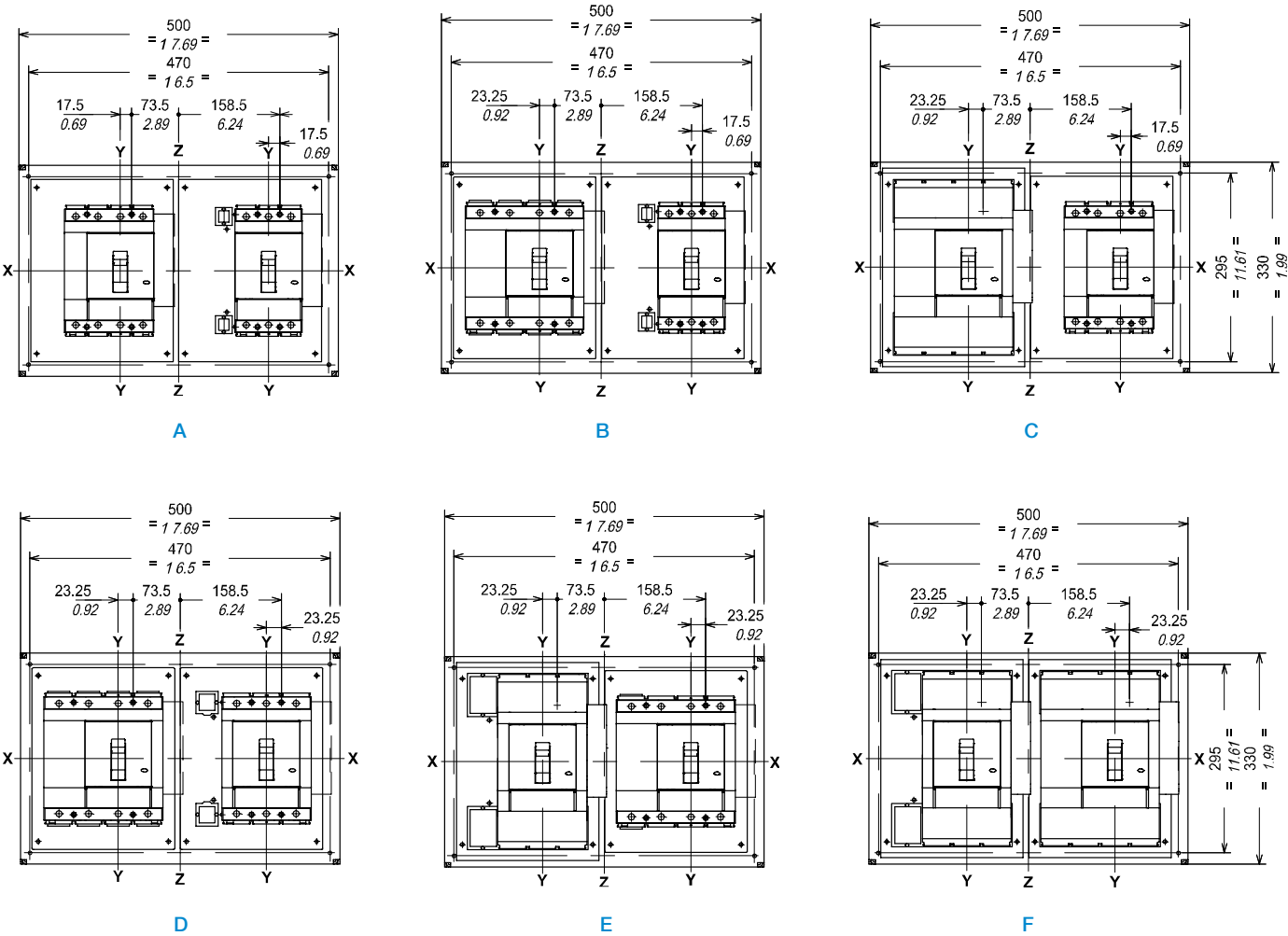
- 1 Drilling template for all versions with rear terminals

Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T4-T5

Mechanical interlock possibilities between 2 horizontal circuit breakers (fixed version)



Type	Circuit breakers combination
A	N° 1 T4 (F-P-W) N° 2 T4 (F-P-W)
B	N° 1 T4 (F-P-W) N° 2 T5 400 (F-P-W) or T5 600* (F)
C	N° 1 T4 (F-P-W) N° 2 T5 600* (P-W)
D	N° 1 T5 400 (F-P-W) or T5 600* (F) N° 2 T5 400 (F-P-W) or T5 600* (F)
E	N° 1 T5 400 (F-P-W) or T5 600* (F) N° 2 T5 600* (P-W)
F	N° 1 T5 600* (P-W) N° 2 T5 600* (P-W)

Note:
(F) Fixed circuit breaker
(P) Plug-in circuit breaker
(W) Draw out circuit breaker
* Please ask ABB for 600 A availability

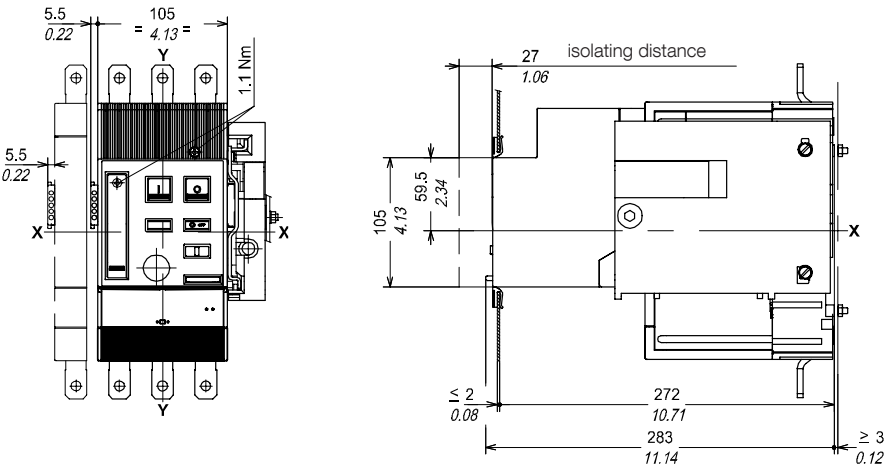
Overall dimensions

Molded Case Circuit Breakers

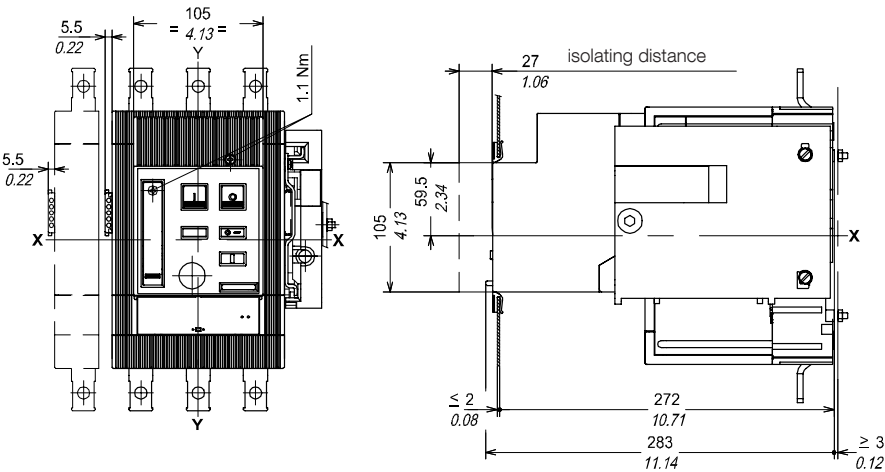
ACCESSORIES T4-T5

Motor operator (fixed version)

T4

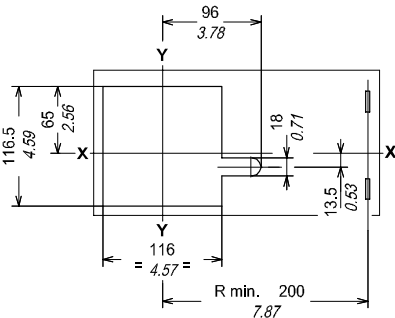


T5 (400A)

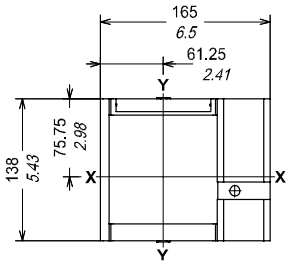


DRILLING TEMPLATES

Compartment door



Flange for the compartment door



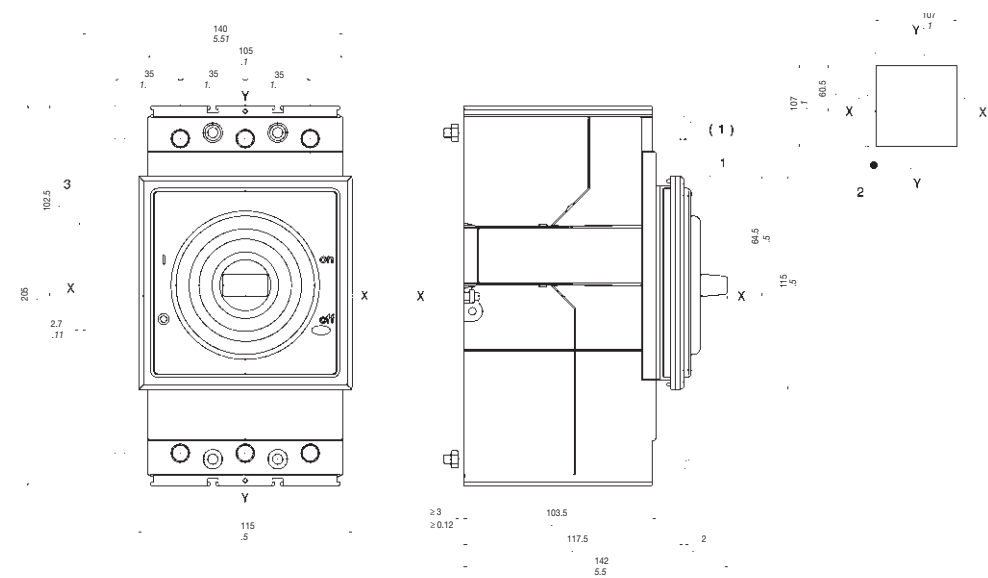
Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T4-T5

Protection kit IP42 (fixed version)

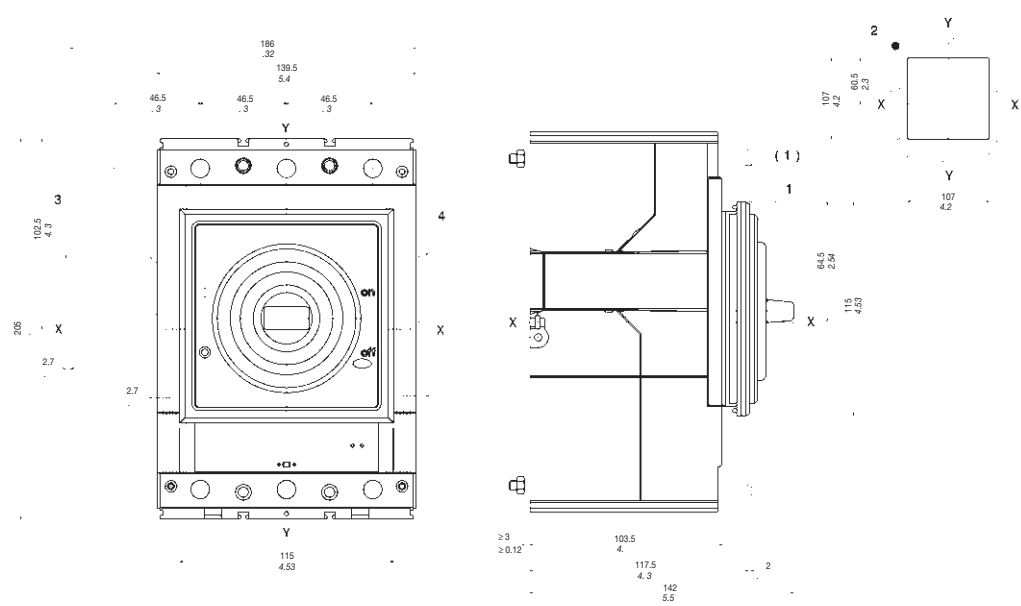
T4



Caption

- 1 IP42 protection
- 2 Compartment door sheet steel drilling
- 3 Spacing when equipped with SOR-C, UVR-C

T5



Caption

- 1 IP42 protection
- 2 Compartment door sheet steel drilling
- 3 Spacing when equipped with SOR-C, UVR-C
- 4 Spacing when equipped with AUX-C (3Q+1SY only)

ACCESSORIES T6



- 6

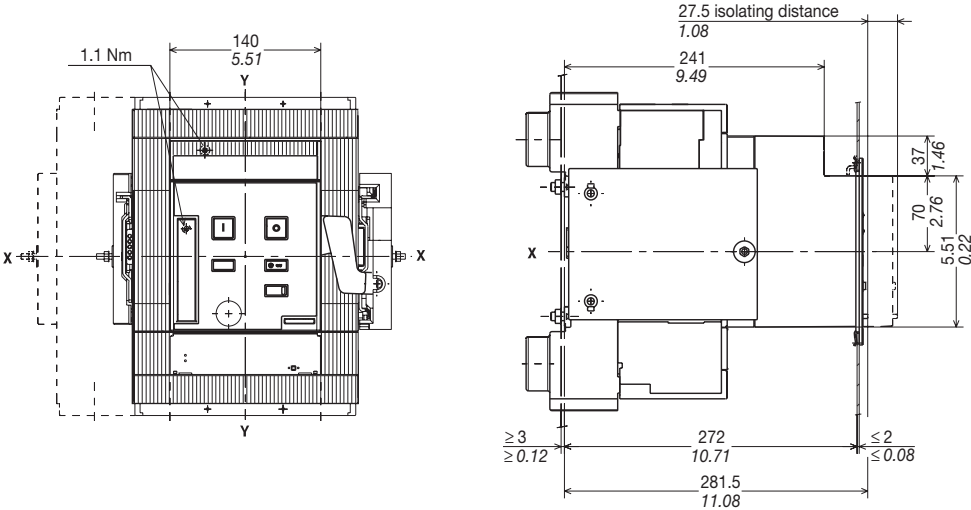
Technical drawing of a square frame. The overall width is 152, which is equal to 5.98 times the height. The overall height is 173, which is equal to 6.81 times the width. The inner square opening has a side length of 86.5. The frame thickness is 3.4. The center of the frame is marked with a crosshair. The labels 'X' and 'Y' are placed near the center of the frame.

Overall dimensions

Molded Case Circuit Breakers

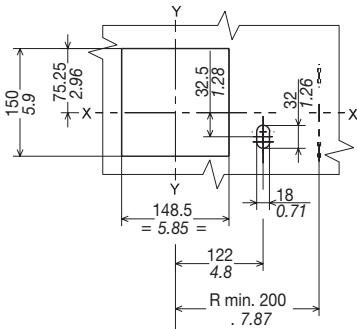
ACCESSORIES T6

Motor operator (Draw out version)

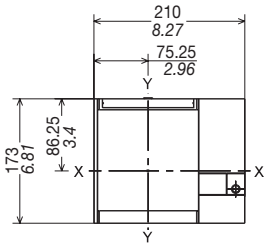


DRILLING TEMPLATES

Compartment door



Flange for the compartment door

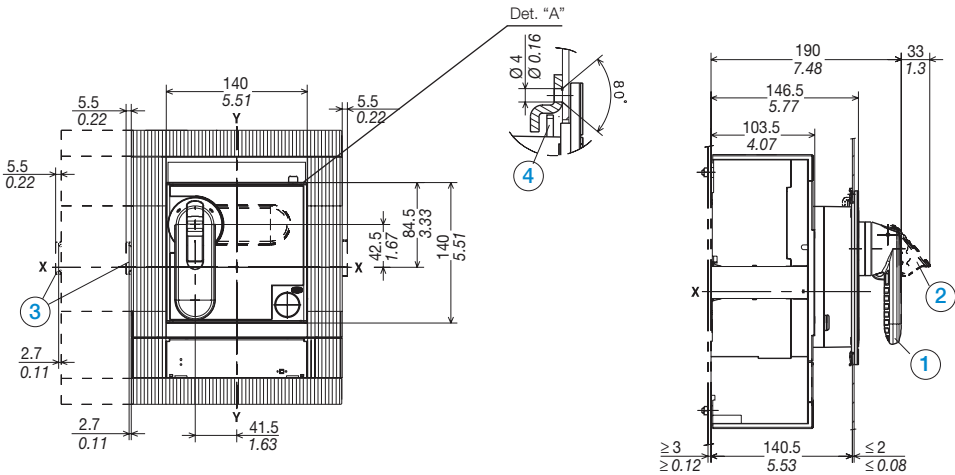


Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T6

Rotary handle on breaker (fixed version)

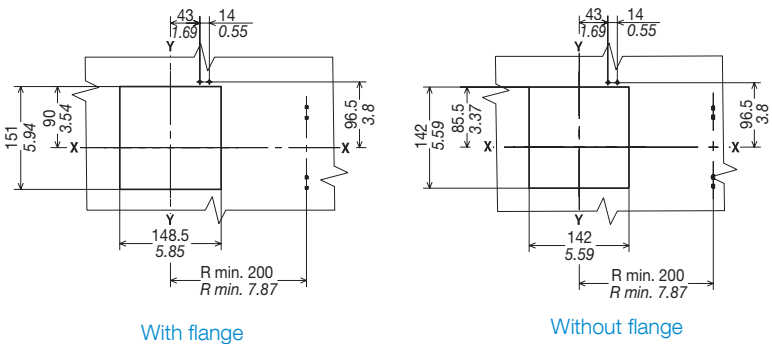


Caption

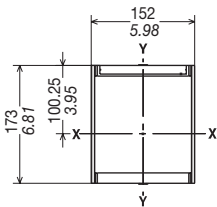
- 1 Rotary handle on breaker
- 2 Padlock device open position (3 padlock max)
- 3 Dimension with AUE connector (early make contact)
- 4 Compartment door lock

DRILLING TEMPLATES

Compartment door



Flange for the compartment door

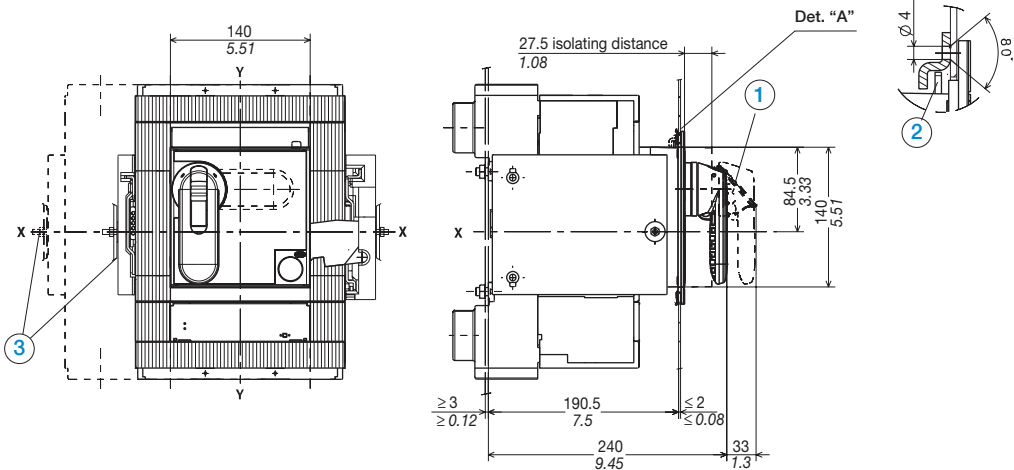


Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T6

Rotary handle on breaker (draw out version)

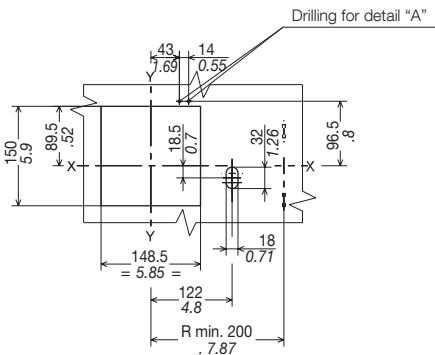


Caption

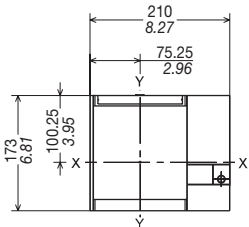
- 1 Padlock device for open position (max. 3 padlocks)
- 2 Compartment door lock
- 3 Dimensions with AUE connector (early make contact)

DRILLING TEMPLATES

Compartment door



Flange for the compartment door

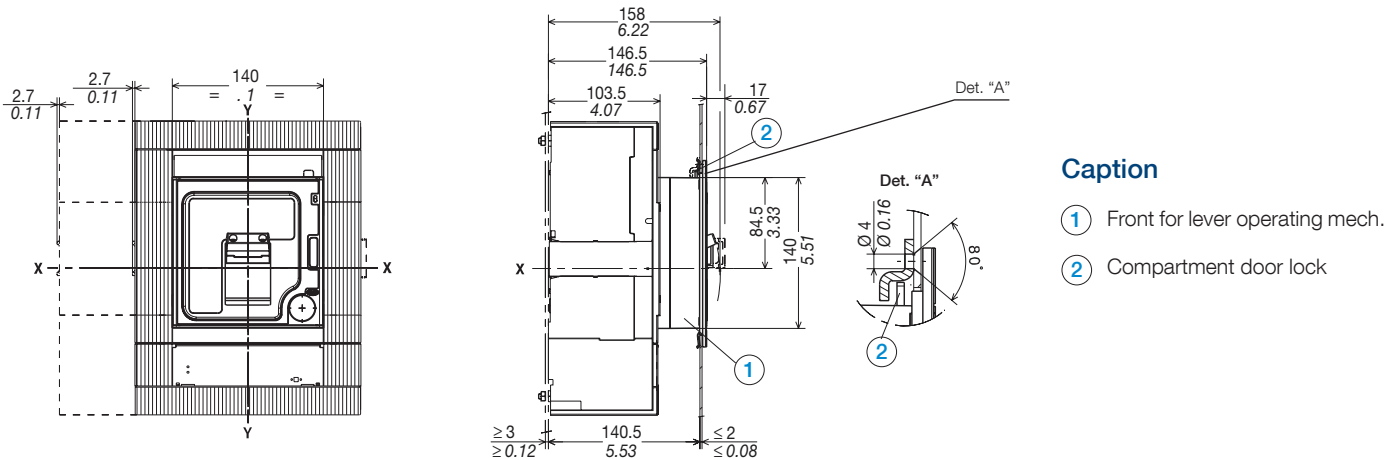


Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T6

Front for lever operating mechanism (Fixed)

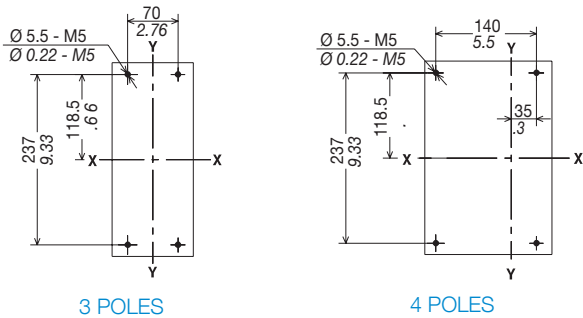


Caption

- 1 Front for lever operating mech.
- 2 Compartment door lock

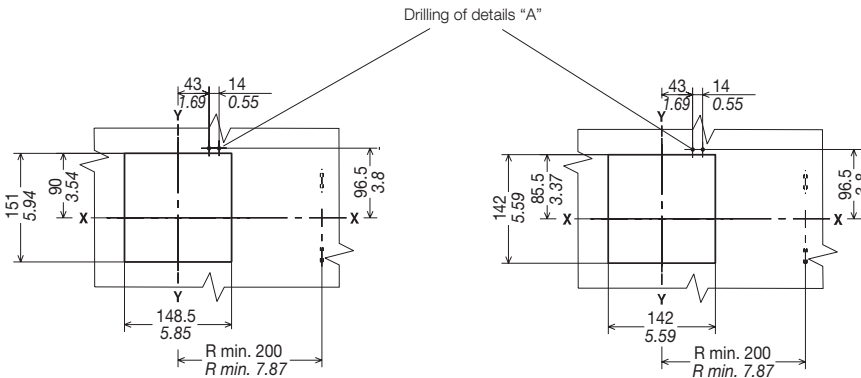
DRILLING TEMPLATES

Support sheet

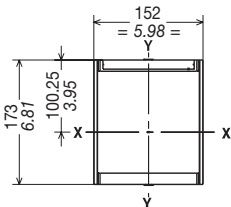


DRILLING TEMPLATES

Compartment door



Flange for the compartment door

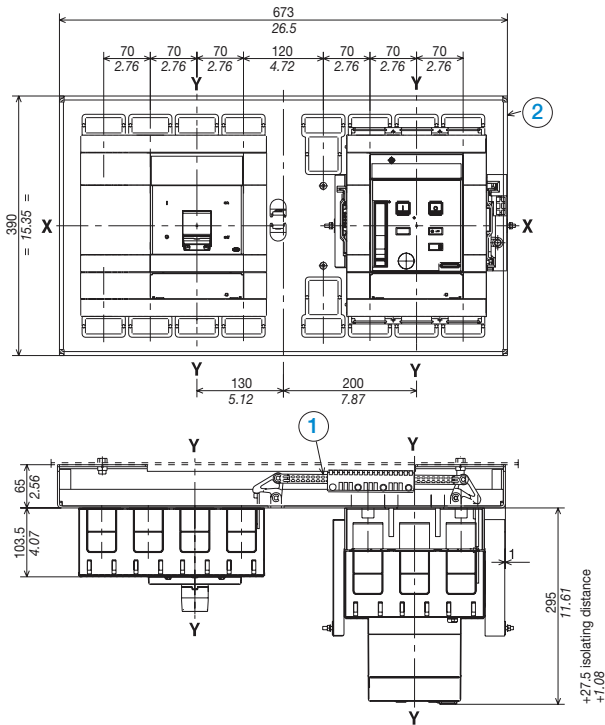


Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T6

Mechanical interlock between 2 horizontal circuit breakers



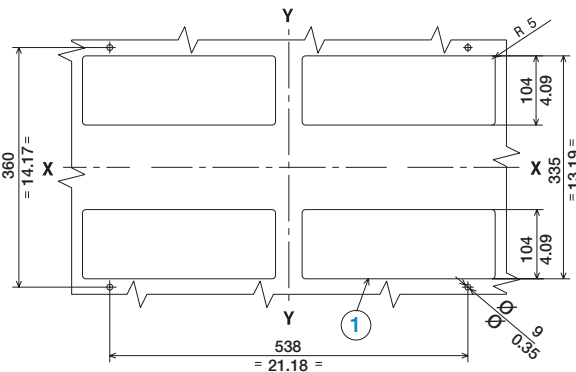
Caption

- 1 Interlocking mechanism
- 2 Coupling plate

6

DRILLING TEMPLATES

Support sheet



Caption

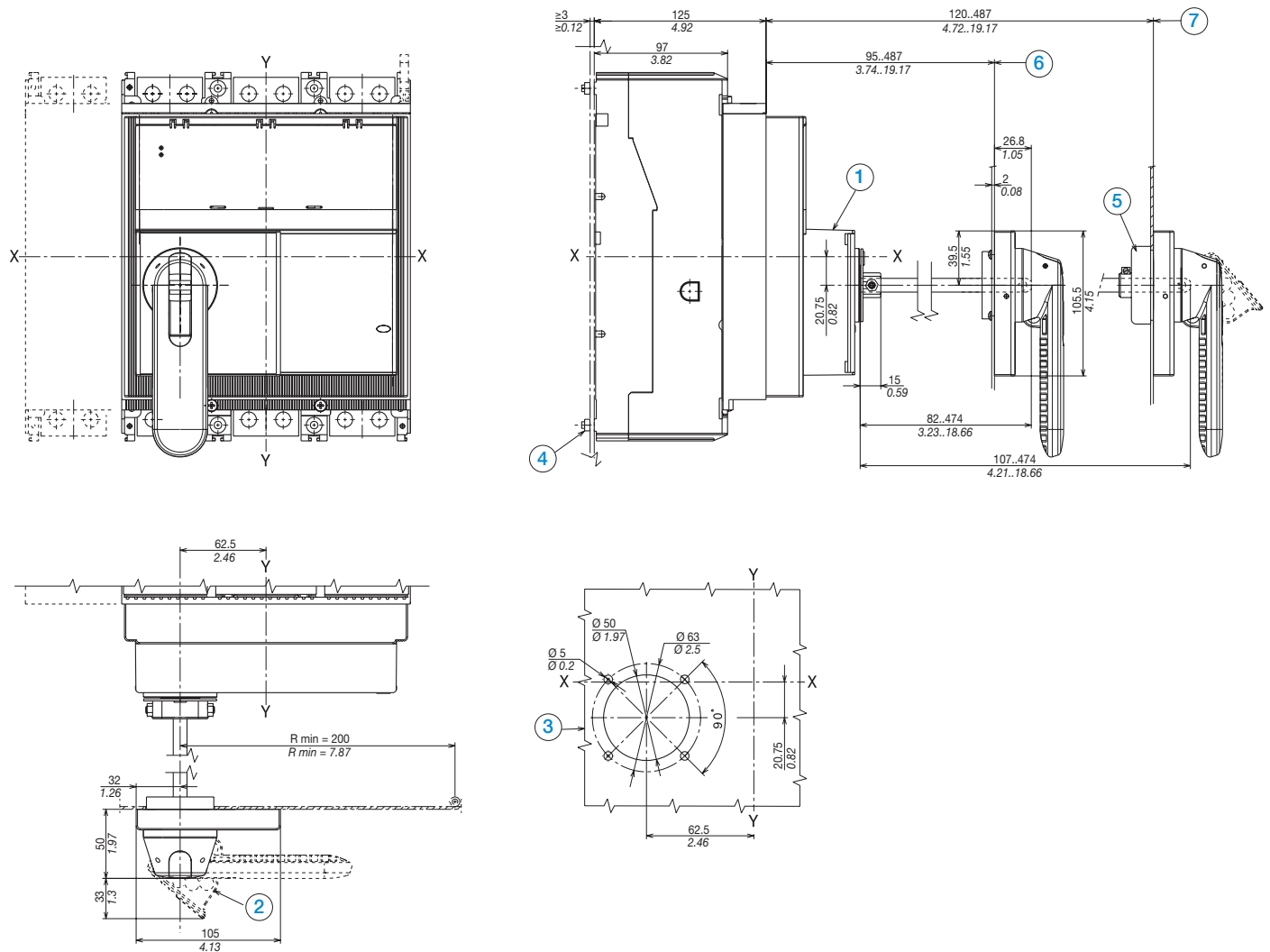
- 1 Drilling template for all versions with rear terminals

Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T7

Rotary handle on compartment door (fixed version with mechanism + shaft + handle)



Caption

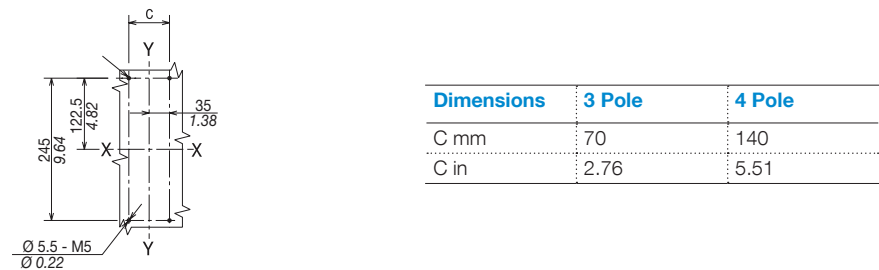
- ① Mechanism
- ② Padlock device in open position (max of 3 padlocks 7mm)
- ③ Drilling template for compartment door
- ④ Tightening torque 2.5 Nm
- ⑤ Accessory for IP54 protection degree (available on request)
- ⑥ Min...Max distance from the front of the door without ⑤
- ⑦ Min...Max distance from the front of the door with ⑤

Overall dimensions

Molded Case Circuit Breakers

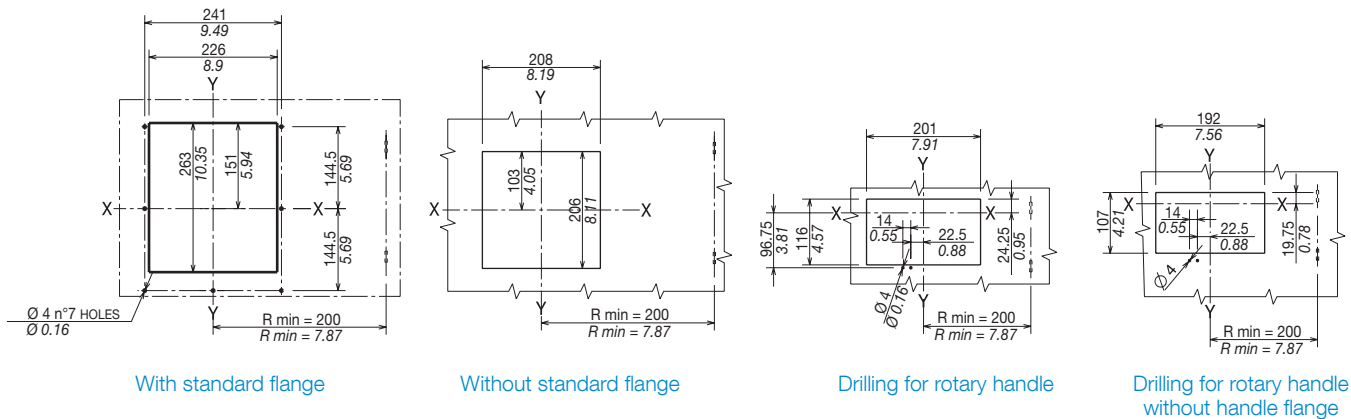
DRILLING TEMPLATES

Support sheet

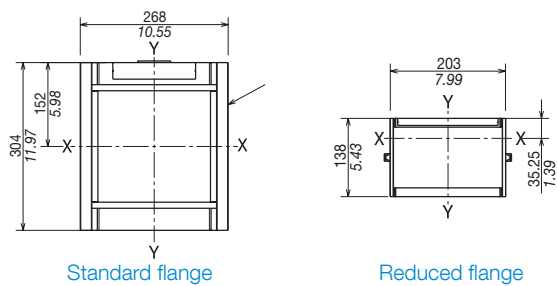


DRILLING TEMPLATES

Compartment door



Flange for the compartment door

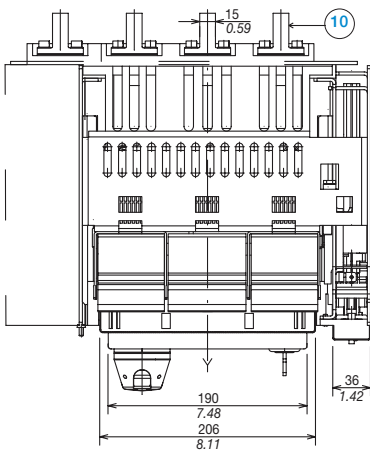
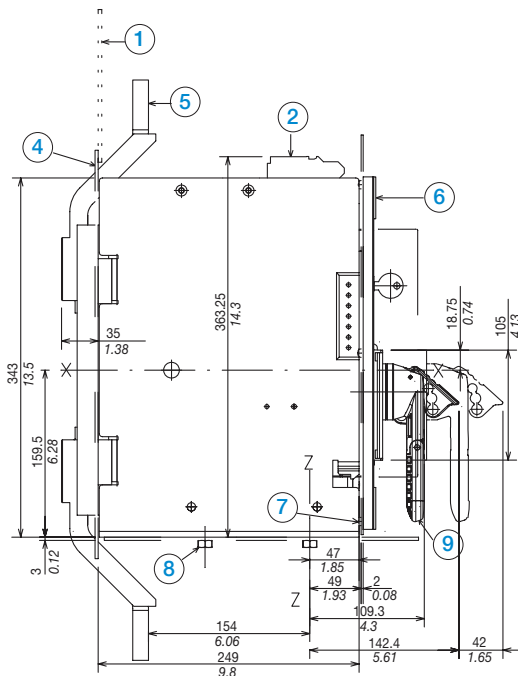
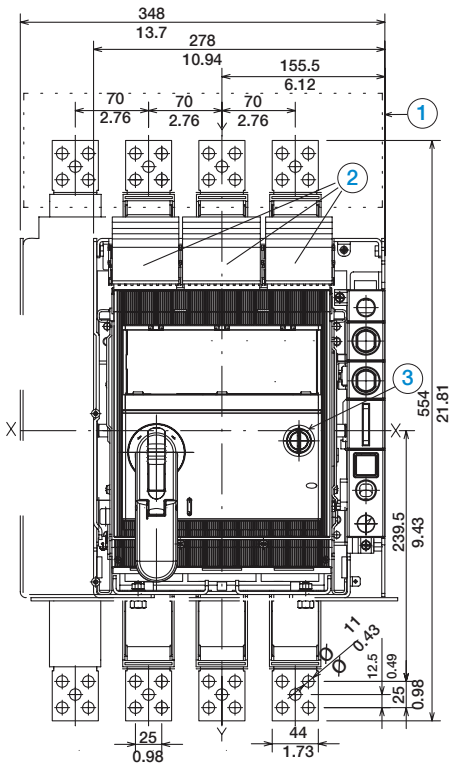


Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T7

Rotary handle on breaker (draw out version)



Caption

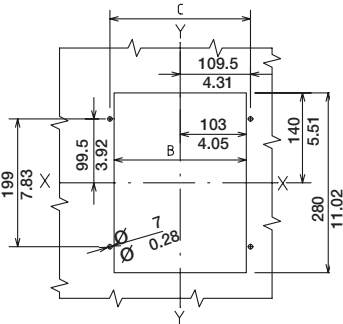
- ① Insulating protection
- ② Auxiliary contact terminal
- ③ Key lock (optional)
- ④ Rear segregation for front terminals
- ⑤ Front terminals
- ⑥ Flange for compartment door
- ⑦ Flange fixing screws (tightening torque 1.5 Nm)
- ⑧ Tightening torque 9 Nm
- ⑨ Rotary handle on breaker
- ⑩ Rear vertical terminals

Overall dimensions

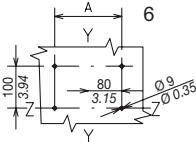
Molded Case Circuit Breakers

DRILLING TEMPLATES

Support sheet



Rear segregation for rear terminals

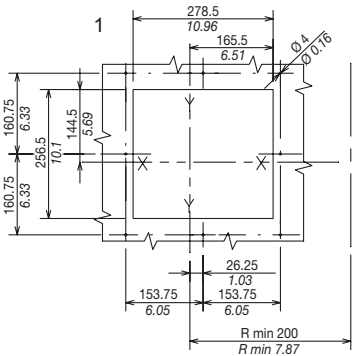


Support sheet

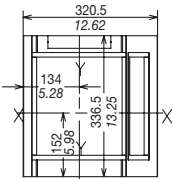
Dimensions	3 Pole	4 Pole
A mm	160	230
A in	6.3	9.05
B mm	206	276
B in	8.11	10.87
C mm	219	289
C in	8.62	11.38

DRILLING TEMPLATES

Compartment door



Flange for the compartment door

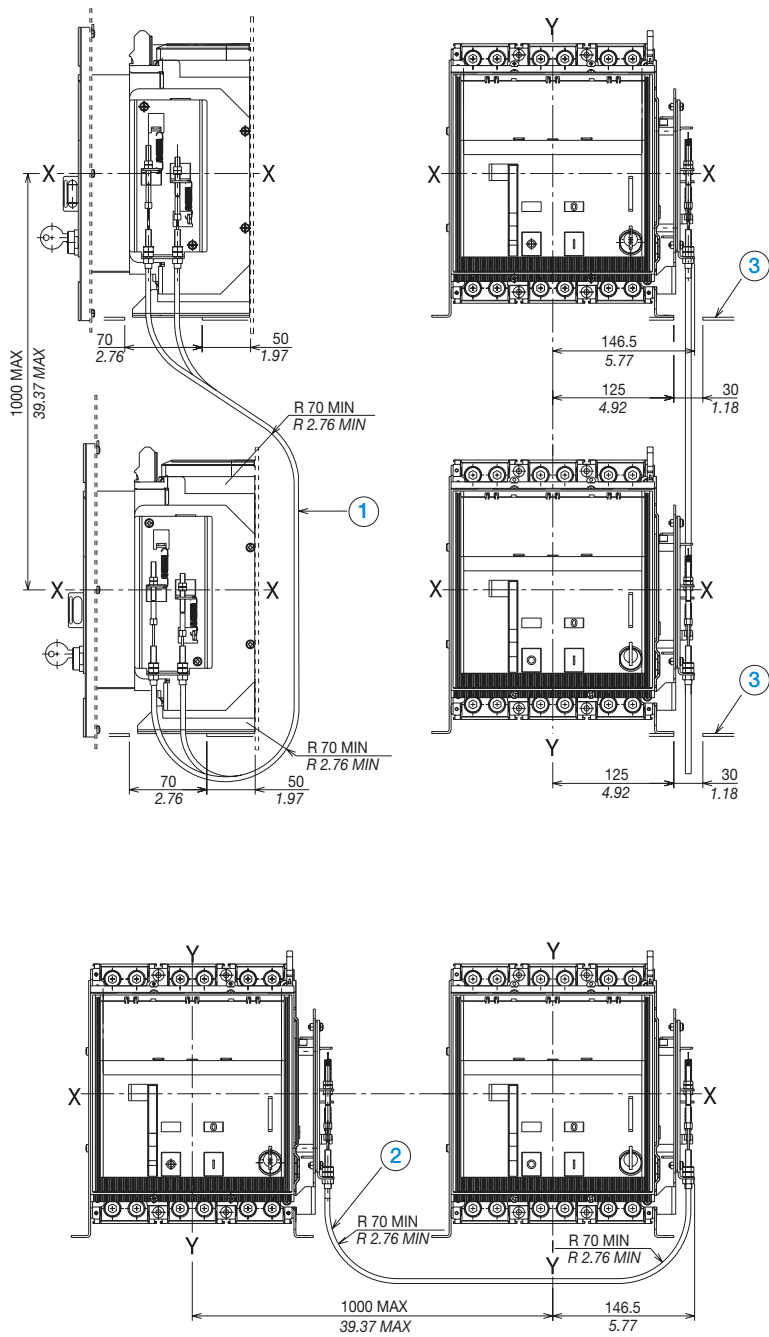


Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T7M

Mechanical interlock (fixed version)



Caption

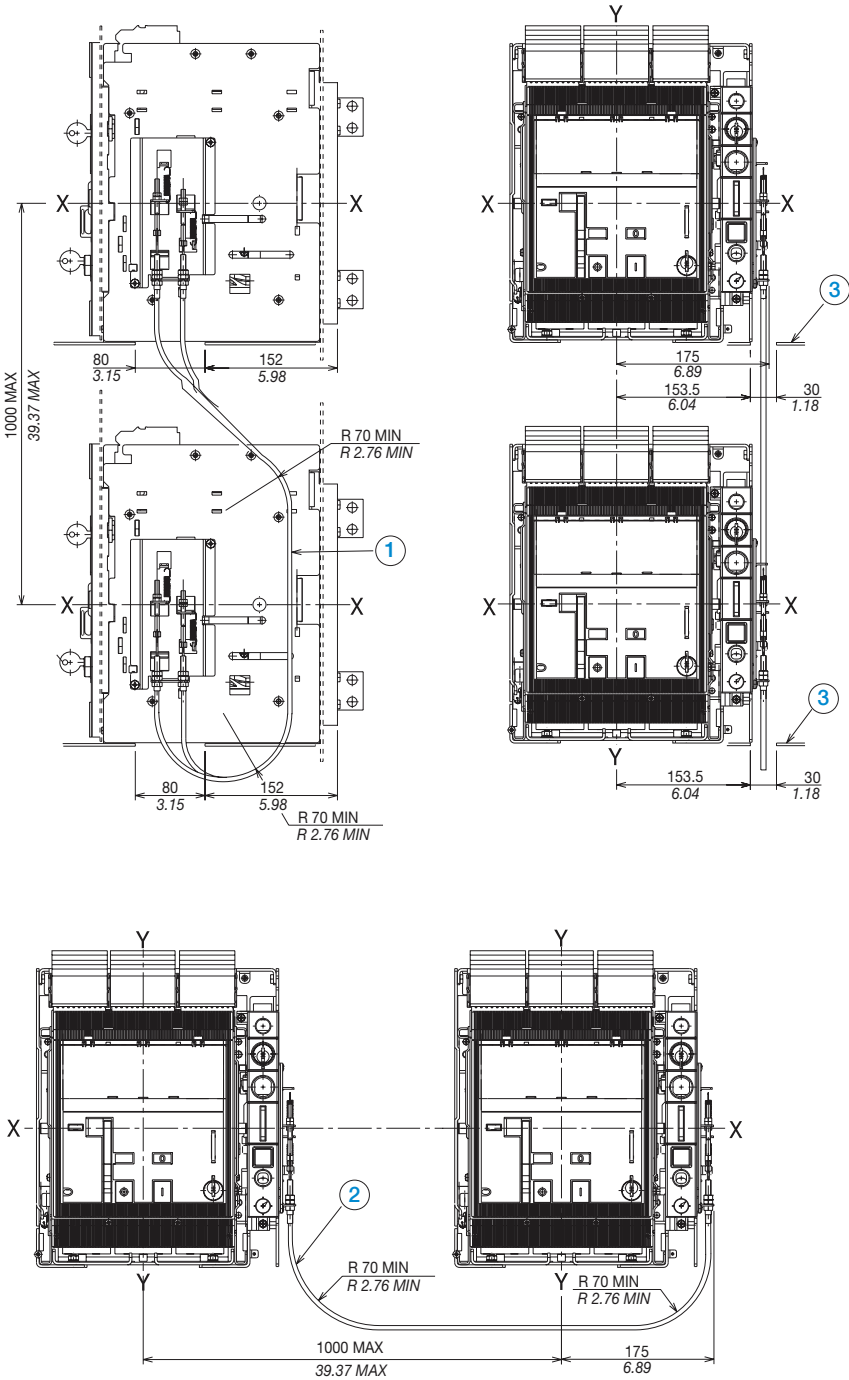
- 1 Mechanical vertical interlock for fixed breakers
- 2 Mechanical horizontal interlock for fixed circuit breakers
- 3 Sheet drilling for wire passage of the mechanical interlock

Overall dimensions

Molded Case Circuit Breakers

ACCESSORIES T7M

Mechanical interlock (draw out version)



Caption

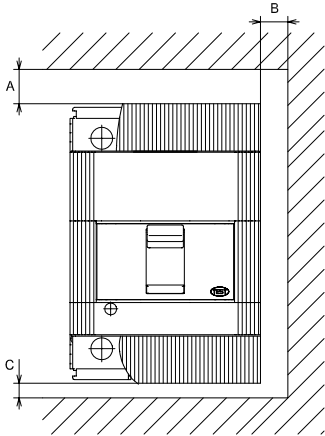
- 1 Mechanical vertical interlock for draw out breakers
- 2 Mechanical horizontal interlock for draw out circuit breakers
- 3 Sheet drilling for wire passage of the mechanical interlock

Overall dimensions

Molded Case Circuit Breakers

Distances to be respected

Insulation distances for installation in metallic cubicle

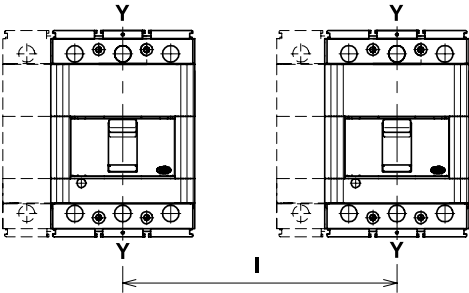


Breaker type	A [mm - in]	B [mm - in]	C [mm - in]
T1	25 - 0.98	20 - 0.79	25 - 0.98
T2	25 - 0.98	20 - 0.79	20 - 0.79
T3	50 - 1.97	25 - 0.98	25 - 0.98
Ts3	35 - 1.38	25 - 0.98	20 - 0.79
T4	30 ^(*) - 1.18	25 - 0.98	25 ^(**) - 0.98
T5	30 ^(**) - 1.18	25 - 0.98	25 ^(**) - 0.98
T6	35 ^(*) - 1.38	25 - 0.98	20 - 0.79
T7	50 ^(*) - 1.97	20 - 0.79	10 - 0.39
T8	200 ^(**) - 7.87	30 - 1.18	120 - 4.72

^(*) For $U_b \geq 480$ V and T6L all versions: distances A = 100 mm (3.94 in)
^(**) For $U_n \geq 480$ V and ≤ 600 V: A = 60 mm (2.36 in), C = 45 mm (1.77 in) and ≤ 600 V
^(**) For $U_b \geq 440$ V distance A = 100 mm (3.94 in)

6

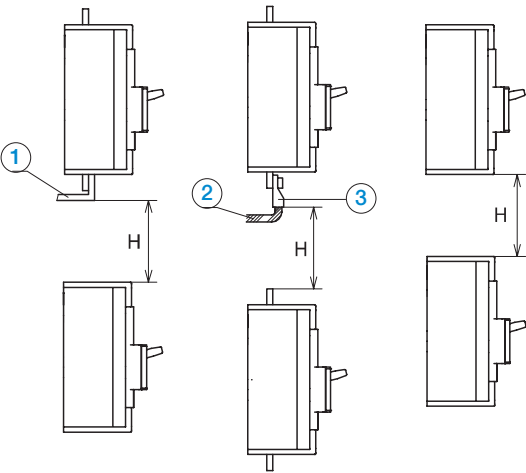
Minimum centre distance between 2 circuit breakers side by side



Breaker type	Circuit breaker width [mm - in]		Centre distance I [mm - in]	
	3 poles	4 poles	3 poles	4 poles
T1	76 - 2.99	102 - 4.02	76 - 2.99	102 - 4.02
T2	90 - 3.54	120 - 4.72	90 - 3.54	120 - 4.72
T3	105 - 4.13	140 - 5.51	105 - 4.13	140 - 5.51
Ts3	105 - 4.13	140 - 5.51	105 - 4.13	140 - 5.51
T4	105 - 4.13	140 - 5.51	105 ^(*) - 4.13	140 ^(*) - 5.51
T5	140 - 5.51	184 - 7.24	140 ^(*) - 5.51	184 ^(*) - 7.24
T6	210 - 8.27	280 - 11.02	210 - 8.27	280 - 11.02
T7	210 - 8.27	280 - 11.02	210 - 8.27	280 - 11.02
T8	427 - 16.81	553 - 21.77	456 - 17.95	582 - 22.91

^(*) For $U_b: \geq 480$ V and ≤ 600 V minimum centre I (mm) 3 poles 180, minimum centre I (mm) 4 poles 224

Minimum centre distance between 2 circuit breakers superimposed



Breaker type	H [mm - in]
T1	60 - 2.36
T2	90 - 3.54
T3	140 - 5.51
Ts3	140 - 5.51
T4	160 - 6.30
T5	160 - 6.30
T6	180 - 7.09
T7	180 - 7.09
T8	300 - 11.81

Caption

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

Note: For assembly side by side or superimposed, check that the connection busbars or cables do not reduce the air insulation distance. The dimensions shown apply for operating voltage U_b up to 690V. The dimensions to be respected must be added to the maximum dimensions of the various different versions of the circuit breakers, including terminals.

For your notes

Handwriting practice lines consisting of 20 horizontal dotted lines.

For your notes

6

Part numbers

Molded Case Circuit Breakers

Tmax molded case circuit breakers

General informations	7/2
Part numbering system for T7	7/3
Part numbering system for T8	7/4

Power distribution circuit breakers

Tmax T1 1p	7/5
Tmax T1	7/6
Tmax T2	7/8
Tmax T3	7/11
Tmax Ts3	7/12
Tmax T4	7/16
Tmax T5	7/20
Tmax T6	7/24
Tmax T7	7/27
Tmax T8	7/31

Motor control protection circuit breakers

Tmax T2 - T3 - Ts3	7/34
Tmax T4 - T5 - T6	7/35
Tmax T7	7/36

Molded case switch

Tmax T1 - T3	7/37
Tmax Ts3	7/38
Tmax T4 - T5	7/39
Tmax T6 - T7	7/40
Tmax T8	7/41

Current limiting circuit breakers

Tmax T2	7/42
Tmax T4	7/44
Tmax T5	7/46

Conversion kits and accessories

Plug-in bases for Tmax	7/48
Draw out cradles for Tmax	7/49
Breaker conversion kits for Tmax	7/50
Accessories for cradles and bases	7/50

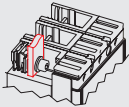
Tmax accessories

Electrical accessories	7/52
Mechanical accessories	7/62
Spare parts	7/71

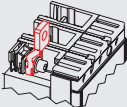
Part numbers

Molded Case Circuit Breakers


Abbreviations used to describe the apparatus



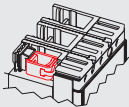
F = Front terminals



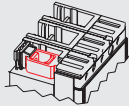
EF = Front extended terminals



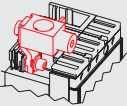
ES = Front extended spread terminals



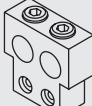
FC Cu = Front terminals for copper cables



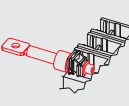
FC CuAl = Front terminals for Cu/Al cables



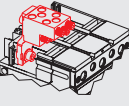
FC CuAl = Front terminals for Cu/Al cables (housed externally)



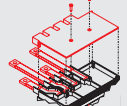
RC CuAl = Rear terminals for Cu/Al cables



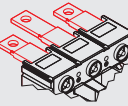
R = Rear terminals



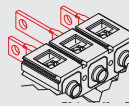
MC = Multi-cable terminals



HR for RC221/222 = Rear flat horizontal terminals



HR = Rear flat horizontal terminals



VR = Rear flat vertical terminals

HR/VR = Rear flat terminals

7

I_3

Magnetic trip current [A]

I_n

Rated current of the thermomagnetic trip unit [A]

I_u

Rated uninterrupted current of the circuit breaker [A]

I_{cu}

Rated ultimate short-circuit breaking capacity [A]

I_{cw}

Rated short-time withstand current for 1s

$N= 50\%$
 $N= 100\%$

Protection of the neutral at 50% or at 100% of that of the phases [A]

TMF

= Thermomagnetic trip unit with fixed thermal and magnetic threshold

TMD

= Thermomagnetic trip unit with adjustable thermal and fixed magnetic threshold

TMA

= Thermomagnetic trip unit with adjustable thermal and magnetic threshold

TMG

= Thermomagnetic trip unit for generator protection

MF

= Fixed magnetic only trip units

MA

= Adjustable magnetic only trip units

$PR22_$

= Electronic trip units

$PR23_$

= Electronic trip units

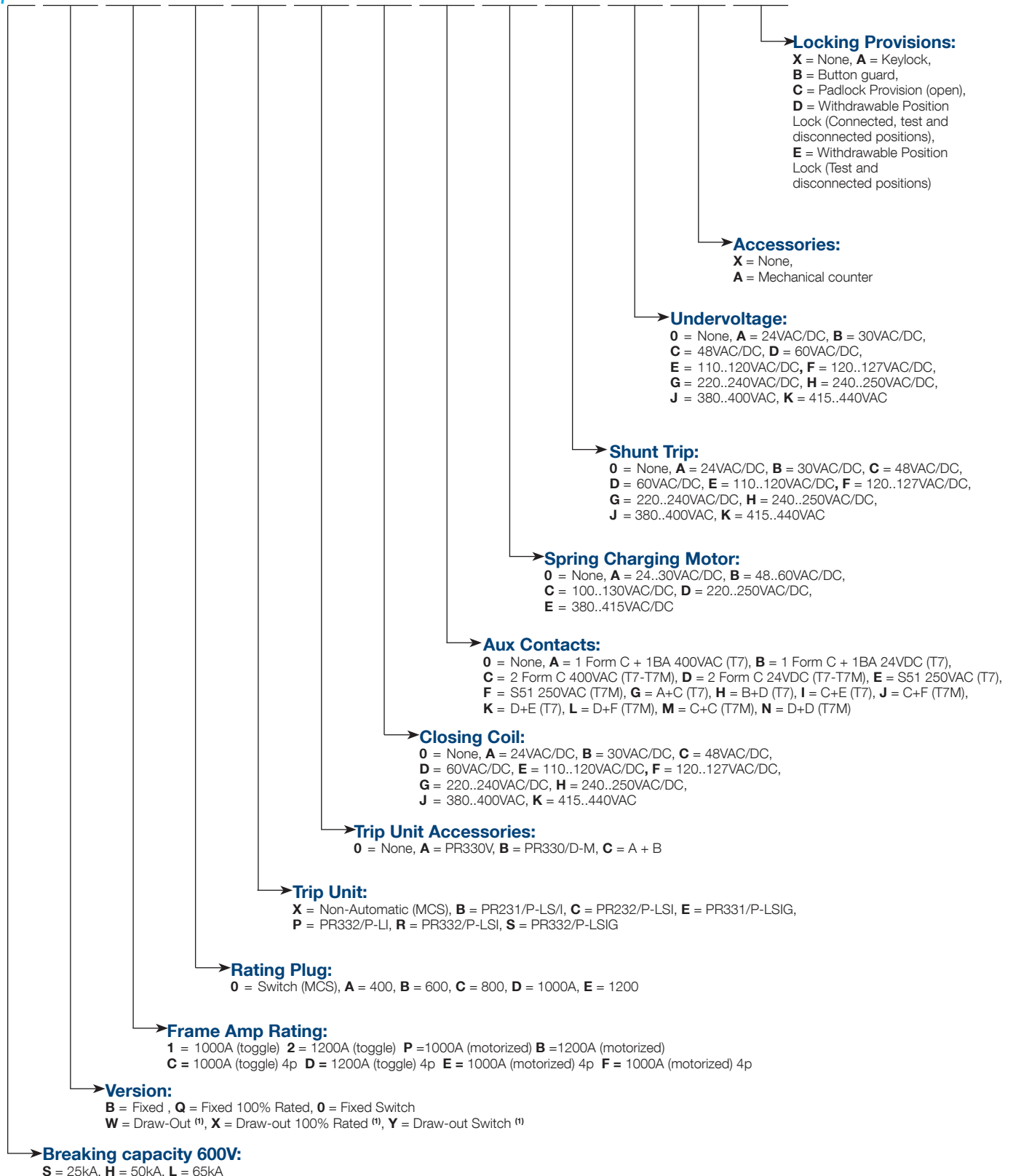
$PR33_$

= Electronic trip units

Part numbers

Molded Case Circuit Breakers

T7



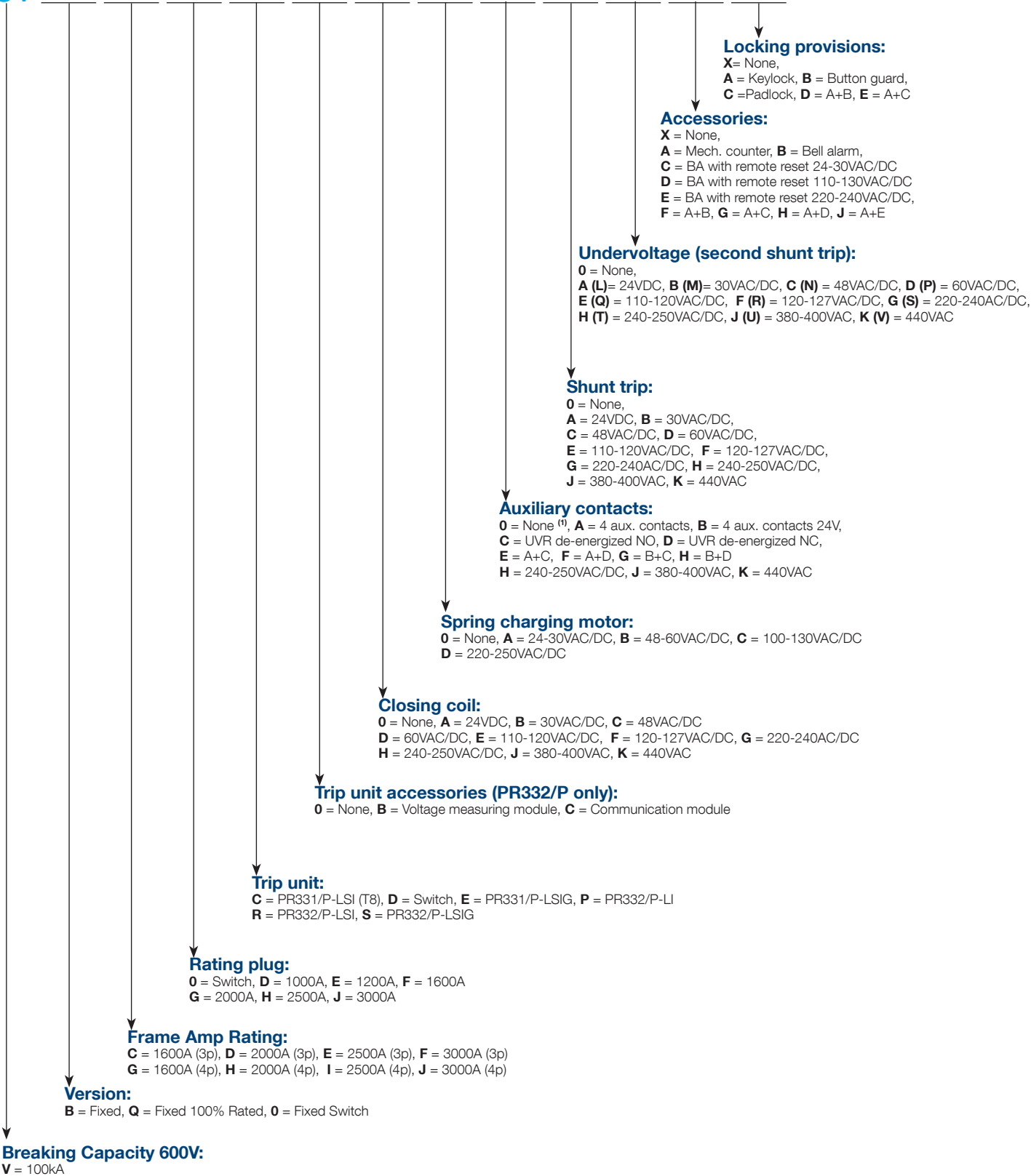
(1) Fixed part and accessories to be ordered separately, please consult you local ABB office

Part numbers

Molded Case Circuit Breakers

T8V

7



Part numbers

Molded Case Circuit Breakers

Tmax T1 100 A - FIXED (F) 1pole - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
 lu (40°C) = 100 A - Front terminals for copper/aluminum cables (FC CuAl)

Thermal-Magnetic trip unit with fixed tresholds - TMF - 347V AC	Nominal current		Part number B (14kA)
	In	I _Δ	
TMF	15 A ⁽¹⁾	1000 A	T1B015TL-1
TMF	20 A	1000 A	T1B020TL-1
TMF	25 A	1000 A	T1B025TL-1
TMF	30 A	1000 A	T1B030TL-1
TMF	40 A	1000 A	T1B040TL-1
TMF	50 A	1500 A	T1B050TL-1
TMF	60 A	1500 A	T1B060TL-1
TMF	70 A	1500 A	T1B070TL-1
TMF	80 A	1500 A	T1B080TL-1
TMF	90 A	1500 A	T1B090TL-1
TMF	100 A	1500 A	T1B100TL-1

(1) In 15A = 10 kA at 347V AC

Part numbers

Molded Case Circuit Breakers

Tmax T1 100 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
I_u (40°C) = 100 A - Front terminals for copper/aluminum cables (FC CuAl)

Thermal-Magnetic trip unit with fixed thresholds - TMF - 480V AC / 500V DC	Nominal current		Part number N (22kA)
	In	I _Δ	
TMF	15 A ⁽¹⁾	1000 A	T1N015TL
TMF	20 A	1000 A	T1N020TL
TMF	25 A	1000 A	T1N025TL
TMF	30 A	1000 A	T1N030TL
TMF	40 A	1000 A	T1N040TL
TMF	50 A	1500 A	T1N050TL
TMF	60 A	1500 A	T1N060TL
TMF	70 A	1500 A	T1N070TL
TMF	80 A	1500 A	T1N080TL
TMF	90 A	1500 A	T1N090TL
TMF	100 A	1500 A	T1N100TL

(1) In 15A = 14 kA at 480Y/277V AC

7

Tmax T1 100 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
I_u (40°C) = 100 A - Front terminals for copper/aluminum cables (FC CuAl)

Thermal-Magnetic trip unit with fixed thresholds - TMF - 480V AC / 500V DC	Nominal current		Part number N (22kA)
	In	I _Δ	
TMF	15 A ⁽¹⁾	1000 A	T1N015TL-4
TMF	20 A	1000 A	T1N020TL-4
TMF	25 A	1000 A	T1N025TL-4
TMF	30 A	1000 A	T1N030TL-4
TMF	40 A	1000 A	T1N040TL-4
TMF	50 A	1500 A	T1N050TL-4
TMF	60 A	1500 A	T1N060TL-4
TMF	70 A	1500 A	T1N070TL-4
TMF	80 A	1500 A	T1N080TL-4
TMF	90 A	1500 A	T1N090TL-4
TMF	100 A	1500 A	T1N100TL-4

(1) In 15A = 14 kA at 480Y/277V AC

Part numbers

Molded Case Circuit Breakers

Tmax T1 100 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)			
Iu (40°C) = 100 A - Front terminals for copper/aluminum cables (FC CuAl)			
Thermal-Magnetic trip unit with fixed tresholds - TMF - 480V AC / 500V DC	Nominal current		Part number
	In	I _Δ	NQ (22kA)
TMF	15 A ⁽¹⁾	1000 A	T1NQ015TL
TMF	20 A	1000 A	T1NQ020TL
TMF	25 A	1000 A	T1NQ025TL
TMF	30 A	1000 A	T1NQ030TL
TMF	40 A	1000 A	T1NQ040TL
TMF	50 A	1500 A	T1NQ050TL
TMF	60 A	1500 A	T1NQ060TL
TMF	70 A	1500 A	T1NQ070TL
TMF	80 A	1500 A	T1NQ080TL
TMF	90 A	1500 A	T1NQ090TL
TMF	100 A	1500 A	T1NQ100TL

(1) In 15A = 14 kA at 480Y/277V AC

Part numbers

Molded Case Circuit Breakers

Tmax T2 100 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
Iu (40°C) = 100 A - Front terminals (F)

Thermal-Magnetic trip unit with fixed thresholds - TMF - 480V AC	Nominal current		Part number	
	In	I _{Δn}	S (35kA)	H (65kA)
TMF	15 A	500 A	T2S015TL	T2H015TL
TMF	20 A	500 A	T2S020TL	T2H020TL
TMF	25 A	500 A	T2S025TL	T2H025TL
TMF	30 A	500 A	T2S030TL	T2H030TL
TMF	40 A	500 A	T2S040TL	T2H040TL
TMF	50 A	500 A	T2S050TL	T2H050TL
TMF	60 A	600 A	T2S060TL	T2H060TL
TMF	70 A	700 A	T2S070TL	T2H070TL
TMF	80 A	800 A	T2S080TL	T2H080TL
TMF	90 A	900 A	T2S090TL	T2H090TL
TMF	100 A	1000 A	T2S100TL	T2H100TL

Tmax T2 100 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
Iu (40°C) = 100 A - Front terminals (F)

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Electronic trip unit (AC only) - PR221DS-LS/I- 480V AC	Nominal current		Part number	
	In		S (35kA)	H (65kA)
PR221DS-LS/I	25 A (10...25 A)		T2S025BW	T2H025BW
PR221DS-LS/I	60 A (24...60 A)		T2S060BW	T2H060BW
PR221DS-LS/I	100 A (40...100 A)		T2S100BW	T2H100BW

Part numbers

Molded Case Circuit Breakers

Tmax T2 100 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
 lu (40°C) = 100 A - Front terminals (F)

Thermal-Magnetic trip unit with fixed tresholds - TMF - 480V AC	Nominal current		Part number	
	In	I _Δ	S (35kA)	H (65kA)
TMF	15 A	500 A	T2S015TL-4	T2H015TL-4
TMF	20 A	500 A	T2S020TL-4	T2H020TL-4
TMF	25 A	500 A	T2S025TL-4	T2H025TL-4
TMF	30 A	500 A	T2S030TL-4	T2H030TL-4
TMF	40 A	500 A	T2S040TL-4	T2H040TL-4
TMF	50 A	500 A	T2S050TL-4	T2H050TL-4
TMF	60 A	600 A	T2S060TL-4	T2H060TL-4
TMF	70 A	700 A	T2S070TL-4	T2H070TL-4
TMF	80 A	800 A	T2S080TL-4	T2H080TL-4
TMF	90 A	900 A	T2S090TL-4	T2H090TL-4
TMF	100 A	1000 A	T2S100TL-4	T2H100TL-4

Tmax T2 100 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
 lu (40°C) = 100 A - Front terminals (F)

Electronic trip unit (AC only) - PR221DS-LS/I- 480V AC	Nominal current	Part number	
	In	S (35kA)	H (65kA)
PR221DS-LS/I	25 A (10...25 A)	T2S025BW-4	T2H025BW-4
PR221DS-LS/I	60 A (24...60 A)	T2S060BW-4	T2H060BW-4
PR221DS-LS/I	100 A (40...100 A)	T2S100BW-4	T2H100BW-4

Part numbers

Molded Case Circuit Breakers

Tmax T2 100 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
Iu (40°C) = 100 A - Front terminals (F)

Thermal-Magnetic trip unit with fixed thresholds - TMF - 480V AC	Nominal current		Part number	
	In	I _Δ	SQ (35kA)	HQ (65kA)
TMF	15 A	500 A	T2SQ015TL	T2HQ015TL
TMF	20 A	500 A	T2SQ020TL	T2HQ020TL
TMF	25 A	500 A	T2SQ025TL	T2HQ025TL
TMF	30 A	500 A	T2SQ030TL	T2HQ030TL
TMF	40 A	500 A	T2SQ040TL	T2HQ040TL
TMF	50 A	500 A	T2SQ050TL	T2HQ050TL
TMF	60 A	600 A	T2SQ060TL	T2HQ060TL
TMF	70 A	700 A	T2SQ070TL	T2HQ070TL
TMF	80 A	800 A	T2SQ080TL	T2HQ080TL
TMF	90 A	900 A	T2SQ090TL	T2HQ090TL
TMF	100 A	1000 A	T2SQ100TL	T2HQ100TL

Tmax T2 100 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
Iu (40°C) = 100 A - Front terminals (F)

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Electronic trip unit (AC only) PR221DS-LS/I- 480V AC	Nominal current		Part number	
	In		SQ (35kA)	HQ (65kA)
LS/I	25 A (10...25 A)		T2SQ025BW	T2HQ025BW
LS/I	60 A (24...60 A)		T2SQ060BW	T2HQ060BW
LS/I	100 A (40...100 A)		T2SQ100BW	T2HQ100BW

Part numbers

Molded Case Circuit Breakers

Tmax T3 225 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 225 A - Front terminals (F)

Thermal-Magnetic trip unit with fixed thresholds - TMF - 480V AC / 500V DC	Nominal current		Part number	
	In	I ₃	N (25kA)	S (35kA)
TMF	60 A	600 A	T3N060TW	T3S060TW
TMF	70 A	700 A	T3N070TW	T3S070TW
TMF	80 A	800 A	T3N080TW	T3S080TW
TMF	90 A	900 A	T3N090TW	T3S090TW
TMF	100 A	1000 A	T3N100TW	T3S100TW
TMF	125 A	1250 A	T3N125TW	T3S125TW
TMF	150 A	1500 A	T3N150TW	T3S150TW
TMF	175 A	1750 A	T3N175TW	T3S175TW
TMF	200 A	2000 A	T3N200TW	T3S200TW
TMF	225 A	2250 A	T3N225TW	T3S225TW

Tmax T3 225 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 225 A - Front terminals (F)

Thermal-Magnetic trip unit with fixed thresholds - TMF - 480V AC / 500V DC	Nominal current		Part number	
	In	I ₃	N (25kA)	S (35kA)
TMF	60 A	600 A	T3N060TW-4	T3S060TW-4
TMF	70 A	700 A	T3N070TW-4	T3S070TW-4
TMF	80 A	800 A	T3N080TW-4	T3S080TW-4
TMF	90 A	900 A	T3N090TW-4	T3S090TW-4
TMF	100 A	1000 A	T3N100TW-4	T3S100TW-4
TMF	125 A	1250 A	T3N125TW-4	T3S125TW-4
TMF	150 A	1500 A	T3N150TW-4	T3S150TW-4
TMF	175 A	1750 A	T3N175TW-4	T3S175TW-4
TMF	200 A	2000 A	T3N200TW-4	T3S200TW-4
TMF	225 A	2250 A	T3N225TW-4	T3S225TW-4

Tmax T3 225 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 225 A - Front terminals (F)

Thermal-Magnetic trip unit with fixed thresholds - TMF - 480V AC / 500V DC	Nominal current		Part number	
	In	I ₃	NQ (25kA)	SQ (35kA)
TMF	60 A	600 A	T3NQ060TW	T3SQ060TW
TMF	70 A	700 A	T3NQ070TW	T3SQ070TW
TMF	80 A	800 A	T3NQ080TW	T3SQ080TW
TMF	90 A	900 A	T3NQ090TW	T3SQ090TW
TMF	100 A	1000 A	T3NQ100TW	T3SQ100TW
TMF	125 A	1250 A	T3NQ125TW	T3SQ125TW
TMF	150 A	1500 A	T3NQ150TW	T3SQ150TW
TMF	175 A	1750 A	T3NQ175TW	T3SQ175TW
TMF	200 A	2000 A	T3NQ200TW	T3SQ200TW
TMF	225 A	2250 A	T3NQ225TW	T3SQ225TW

Part numbers

Molded Case Circuit Breakers

Tmax Ts3 150 A - FIXED (F) 2 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
Iu (40°C) = 150 A - Front terminals (F)

Thermal-Magnetic trip unit with fixed thresholds - TMF - 600V AC / 500V DC	Nominal current		Part number		
	In	I _n	N (14kA)	H (14kA)	L (25kA)
TMF	15 A	500 A	Ts3N015TW-2	Ts3H015TW-2	Ts3L015TW-2
TMF	20 A	500 A	Ts3N020TW-2	Ts3H020TW-2	Ts3L020TW-2
TMF	25 A	500 A	Ts3N025TW-2	Ts3H025TW-2	Ts3L025TW-2
TMF	30 A	500 A	Ts3N030TW-2	Ts3H030TW-2	Ts3L030TW-2
TMF	35 A	500 A	Ts3N035TW-2	Ts3H035TW-2	Ts3L035TW-2
TMF	40 A	500 A	Ts3N040TW-2	Ts3H040TW-2	Ts3L040TW-2
TMF	50 A	500 A	Ts3N050TW-2	Ts3H050TW-2	Ts3L050TW-2
TMF	60 A	600 A	Ts3N060TW-2	Ts3H060TW-2	Ts3L060TW-2
TMF	70 A	700 A	Ts3N070TW-2	Ts3H070TW-2	Ts3L070TW-2
TMF	80 A	800 A	Ts3N080TW-2	Ts3H080TW-2	Ts3L080TW-2
TMF	90 A	900 A	Ts3N090TW-2	Ts3H090TW-2	Ts3L090TW-2
TMF	100 A	1000 A	Ts3N100TW-2	Ts3H100TW-2	Ts3L100TW-2
TMF	125 A	1250 A	Ts3N125TW-2	Ts3H125TW-2	Ts3L125TW-2
TMF	150 A	1500 A	Ts3N150TW-2	Ts3H150TW-2	Ts3L150TW-2

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Tmax Ts3 225 A - FIXED (F) 2 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
Iu (40°C) = 225 A - Front terminals (F)

Thermal-Magnetic trip unit with fixed thresholds - TMF - 480V AC / 500V DC	Nominal current		Part number		
	In	I _n	N (25kA)	H (50kA)	L (65kA)
TMF	175 A	1750 A	Ts3N175TW-2	Ts3H175TW-2	Ts3L175TW-2
TMF	200 A	2000 A	Ts3N200TW-2	Ts3H200TW-2	Ts3L200TW-2
TMF	225 A	2250 A	Ts3N225TW-2	Ts3H225TW-2	Ts3L225TW-2

Part numbers

Molded Case Circuit Breakers

Tmax Ts3 150 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 150 A - Front terminals (F)

Thermal-Magnetic trip unit with fixed thresholds - TMF - 600V AC / 600V DC	Nominal current		Part number		
	In	I ₃	N (14kA)	H (14kA)	L (25kA)
TMF	15 A	500 A	Ts3N015TW	Ts3H015TW	Ts3L015TW
TMF	20 A	500 A	Ts3N020TW	Ts3H020TW	Ts3L020TW
TMF	25 A	500 A	Ts3N025TW	Ts3H025TW	Ts3L025TW
TMF	30 A	500 A	Ts3N030TW	Ts3H030TW	Ts3L030TW
TMF	35 A	500 A	Ts3N035TW	Ts3H035TW	Ts3L035TW
TMF	40 A	500 A	Ts3N040TW	Ts3H040TW	Ts3L040TW
TMF	50 A	500 A	Ts3N050TW	Ts3H050TW	Ts3L050TW
TMF	60 A	600 A	Ts3N060TW	Ts3H060TW	Ts3L060TW
TMF	70 A	700 A	Ts3N070TW	Ts3H070TW	Ts3L070TW
TMF	80 A	800 A	Ts3N080TW	Ts3H080TW	Ts3L080TW
TMF	90 A	900 A	Ts3N090TW	Ts3H090TW	Ts3L090TW
TMF	100 A	1000 A	Ts3N100TW	Ts3H100TW	Ts3L100TW
TMF	125 A	1250 A	Ts3N125TW	Ts3H125TW	Ts3L125TW
TMF	150 A	1500 A	Ts3N150TW	Ts3H150TW	Ts3L150TW

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Tmax Ts3 225 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 225 A - Front terminals (F)

Thermal-Magnetic trip unit with fixed thresholds - TMF - 480V AC / 500V DC	Nominal current		Part number		
	In	I ₃	N (25kA)	H (50kA)	L (65kA)
TMF	175 A	1750 A	Ts3N175TW	Ts3H175TW	Ts3L175TW
TMF	200 A	2000 A	Ts3N200TW	Ts3H200TW	Ts3L200TW
TMF	225 A	2250 A	Ts3N225TW	Ts3H225TW	Ts3L225TW

Part numbers

Molded Case Circuit Breakers

Tmax Ts3 150 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
Iu (40°C) = 150 A - Front terminals (F)

Thermal-Magnetic trip unit with fixed thresholds - TMF - 600V AC / 600V DC	Nominal current		Part number N (14kA)
	In	I ₃	
TMF	15 A	500 A	Ts3N015TW-4
TMF	20 A	500 A	Ts3N020TW-4
TMF	25 A	500 A	Ts3N025TW-4
TMF	30 A	500 A	Ts3N030TW-4
TMF	35 A	500 A	Ts3N035TW-4
TMF	40 A	500 A	Ts3N040TW-4
TMF	50 A	500 A	Ts3N050TW-4
TMF	60 A	600 A	Ts3N060TW-4
TMF	70 A	700 A	Ts3N070TW-4
TMF	80 A	800 A	Ts3N080TW-4
TMF	90 A	900 A	Ts3N090TW-4
TMF	100 A	1000 A	Ts3N100TW-4
TMF	125 A	1250 A	Ts3N125TW-4
TMF	150 A	1500 A	Ts3N150TW-4

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Tmax Ts3 225 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
Iu (40°C) = 225 A - Front terminals (F)

Thermal-Magnetic trip unit with fixed thresholds - TMF - 480V AC / 500V DC	Nominal current		Part number N (25kA)
	In	I ₃	
TMF	175 A	1750 A	Ts3N175TW-4
TMF	200 A	2000 A	Ts3N200TW-4
TMF	225 A	2250 A	Ts3N225TW-4

Part numbers

Molded Case Circuit Breakers

Tmax Ts3 150 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (DiscountDS-ST)

Iu (40°C) = 150 A - Front terminals (F)

Thermal-Magnetic trip unit with fixed thresholds - TMF - 600V AC / 600V DC	Nominal current		Part number		
	In	I ₃	NQ (14kA)	HQ (14kA)	LQ (25kA)
TMF	15 A	500 A	Ts3NQ015TW	Ts3HQ015TW	Ts3LQ015TW
TMF	20 A	500 A	Ts3NQ020TW	Ts3HQ020TW	Ts3LQ020TW
TMF	25 A	500 A	Ts3NQ025TW	Ts3HQ025TW	Ts3LQ025TW
TMF	30 A	500 A	Ts3NQ030TW	Ts3HQ030TW	Ts3LQ030TW
TMF	35 A	500 A	Ts3NQ035TW	Ts3HQ035TW	Ts3LQ035TW
TMF	40 A	500 A	Ts3NQ040TW	Ts3HQ040TW	Ts3LQ040TW
TMF	50 A	500 A	Ts3NQ050TW	Ts3HQ050TW	Ts3LQ050TW
TMF	60 A	600 A	Ts3NQ060TW	Ts3HQ060TW	Ts3LQ060TW
TMF	70 A	700 A	Ts3NQ070TW	Ts3HQ070TW	Ts3LQ070TW
TMF	80 A	800 A	Ts3NQ080TW	Ts3HQ080TW	Ts3LQ080TW
TMF	90 A	900 A	Ts3NQ090TW	Ts3HQ090TW	Ts3LQ090TW
TMF	100 A	1000 A	Ts3NQ100TW	Ts3HQ100TW	Ts3LQ100TW
TMF	125 A	1250 A	Ts3NQ125TW	Ts3HQ125TW	Ts3LQ125TW
TMF	150 A	1500 A	Ts3NQ150TW	Ts3HQ150TW	Ts3LQ150TW

Tmax Ts3 225 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 225 A - Front terminals (F)

Thermal-Magnetic trip unit with fixed thresholds - TMF - 480V AC / 500V DC	Nominal current		Part number		
	In	I ₃	NQ (25kA)	HQ (50kA)	LQ (65kA)
TMF	175 A	1750 A	Ts3NQ175TW	Ts3HQ175TW	Ts3LQ175TW
TMF	200 A	2000 A	Ts3NQ200TW	Ts3HQ200TW	Ts3LQ200TW
TMF	225 A	2250 A	Ts3NQ225TW	Ts3HQ225TW	Ts3LQ225TW

Part numbers

Molded Case Circuit Breakers

Tmax T4 250 A - FIXED (F) 2 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

I_u (40°C) = 250 A - Front terminals (F)

Thermal-Magnetic trip unit - TMD/TMA - 600V AC / 500V DC	Nominal current		Part number N (18kA)
	In	I ₃	
TMD	30 A (21...30 A)	500 A	T4N030TW-2
TMD	40 A (28...40 A)	500 A	T4N040TW-2
TMD	50 A (36...50 A)	500 A	T4N050TW-2
TMA	80 A (56...80 A)	800 A (400...800A)	T4N080TW-2
TMA	100 A (70...100 A)	1000 A (500...1000A)	T4N100TW-2
TMA	125 A (88...125 A)	1250 A (625...1250 A)	T4N125TW-2
TMA	150 A (100...150 A)	1500 A (750...1500 A)	T4N150TW-2
TMA	200 A (140...200 A)	2000 A (1000...2000 A)	T4N200TW-2
TMA	250 A (175...250 A)	2500 A (1250...2500 A)	T4N250TW-2

Tmax T4 100 A - FIXED (F) 2 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

I_u (40°C) = 100 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number N (18kA)
	In		
PR221DS-LS/I	100 A (40...100 A)		T4N100BW-2
PR222DS-LSI	100 A (40...100 A)		T4N100CW-2
PR222DS-LSIG	100 A (40...100 A)		T4N100EW-2

Tmax T4 150 A - FIXED (F) 2 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

I_u (40°C) = 150 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number N (18kA)
	In		
PR221DS-LS/I	150 A (60...150 A)		T4N150BW-2
PR222DS-LSI	150 A (60...150 A)		T4N150CW-2
PR222DS-LSIG	150 A (60...150 A)		T4N150EW-2

Tmax T4 250 A - FIXED (F) 2 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

I_u (40°C) = 250 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number N (18kA)
	In		
PR221DS-LS/I	250 A (60...150 A)		T4N250BW-2
PR222DS-LSI	250 A (60...150 A)		T4N250CW-2
PR222DS-LSIG	250 A (60...150 A)		T4N250EW-2

Part numbers

Molded Case Circuit Breakers

Tmax T4 250 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 250 A - Front terminals (F)

Thermal-Magnetic trip unit - TMF/TMD/TMA - 600V AC / 600V DC	Nominal current		Part number				
	In	I ₃	N (18kA)	S (25kA)	H (35kA)	L (65kA)	V (100kA)
TMF	20 A	500 A	T4N020TW	T4S020TW	T4H020TW	T4L020TW	T4V020TW
TMD	30 A (21...30 A)	500 A	T4N030TW	T4S030TW	T4H030TW	T4L030TW	T4V030TW
TMD	40 A (28...40 A)	500 A	T4N040TW	T4S040TW	T4H040TW	T4L040TW	T4V040TW
TMD	50 A (36...50 A)	500 A	T4N050TW	T4S050TW	T4H050TW	T4L050TW	T4V050TW
TMA	80 A (56...80 A)	800 A (400...800A)	T4N080TW	T4S080TW	T4H080TW	T4L080TW	T4V080TW
TMA	100 A (70...100 A)	1000 A (500...1000A)	T4N100TW	T4S100TW	T4H100TW	T4L100TW	T4V100TW
TMA	125 A (88...125 A)	1250 A (625...1250 A)	T4N125TW	T4S125TW	T4H125TW	T4L125TW	T4V125TW
TMA	150 A (100...150 A)	1500 A (750...1500 A)	T4N150TW	T4S150TW	T4H150TW	T4L150TW	T4V150TW
TMA	200 A (140...200 A)	2000 A (1000...2000 A)	T4N200TW	T4S200TW	T4H200TW	T4L200TW	T4V200TW
TMA	250 A (175...250 A)	2500 A (1250...2500 A)	T4N250TW	T4S250TW	T4H250TW	T4L250TW	T4V250TW

Tmax T4 100 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 100 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number				
	In		N (18kA)	S (25kA)	H (35kA)	L (65kA)	V (100kA)
PR221DS-LS/I	100 A (40...100 A)		T4N100BW	T4S100BW	T4H100BW	T4L100BW	T4V100BW
PR222DS-LSI	100 A (40...100 A)		T4N100CW	T4S100CW	T4H100CW	T4L100CW	T4V100CW
PR222DS-LSIG	100 A (40...100 A)		T4N100EW	T4S100EW	T4H100EW	T4L100EW	T4V100EW

Tmax T4 150 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 150 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number				
	In		N (18kA)	S (25kA)	H (35kA)	L (65kA)	V (100kA)
PR221DS-LS/I	150 A (60...150 A)		T4N150BW	T4S150BW	T4H150BW	T4L150BW	T4V150BW
PR222DS-LSI	150 A (60...150 A)		T4N150CW	T4S150CW	T4H150CW	T4L150CW	T4V150CW
PR222DS-LSIG	150 A (60...150 A)		T4N150EW	T4S150EW	T4H150EW	T4L150EW	T4V150EW

Tmax T4 250 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 250 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number				
	In		N (18kA)	S (25kA)	H (35kA)	L (65kA)	V (100kA)
PR221DS-LS/I	250 A (100...250 A)		T4N250BW	T4S250BW	T4H250BW	T4L250BW	T4V250BW
PR222DS-LSI	250 A (100...250 A)		T4N250CW	T4S250CW	T4H250CW	T4L250CW	T4V250CW
PR222DS-LSIG	250 A (100...250 A)		T4N250EW	T4S250EW	T4H250EW	T4L250EW	T4V250EW

Part numbers

Molded Case Circuit Breakers

Tmax T4 250 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 250 A - Front terminals (F)

Thermal-Magnetic trip unit - TMF/TMD/TMA - 600V AC / 600V DC	Nominal current		Part number	
	In	I _Δ	N (18kA)	H (35kA)
TMF	20 A	500 A	T4N020TW-4	T4H020TW-4
TMD	30 A (21...30 A)	500 A	T4N030TW-4	T4H030TW-4
TMD	40 A (28...40 A)	500 A	T4N040TW-4	T4H040TW-4
TMD	50 A (36...50 A)	500 A	T4N050TW-4	T4H050TW-4
TMA	80 A (56...80 A)	800 A (400...800A)	T4N080TW-4	T4H080TW-4
TMA	100 A (70...100 A)	1000 A (500...1000A)	T4N100TW-4	T4H100TW-4
TMA	125 A (88...125 A)	1250 A (625...1250 A)	T4N125TW-4	T4H125TW-4
TMA	150 A (100...150 A)	1500 A (750...1500 A)	T4N150TW-4	T4H150TW-4
TMA	200 A (140...200 A)	2000 A (1000...2000 A)	T4N200TW-4	T4H200TW-4
TMA	250 A (175...250 A)	2500 A (1250...2500 A)	T4N250TW-4	T4H250TW-4

Tmax T4 100 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 100 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number	
	In		N (18kA)	H (35kA)
PR221DS-LS/I	100 A (40...100 A)		T4N100BW-4	T4H100BW-4
PR222DS-LSI	100 A (40...100 A)		T4N100CW-4	T4H100CW-4
PR222DS-LSIG	100 A (40...100 A)		T4N100EW-4	T4H100EW-4

Tmax T4 150 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 150 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number	
	In		N (18kA)	H (35kA)
PR221DS-LS/I	150 A (60...150 A)		T4N150BW-4	T4H150BW-4
PR222DS-LSI	150 A (60...150 A)		T4N150CW-4	T4H150CW-4
PR222DS-LSIG	150 A (60...150 A)		T4N150EW-4	T4H150EW-4

Tmax T4 250 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 250 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number	
	In		N (18kA)	H (35kA)
PR221DS-LS/I	250 A (100...250 A)		T4N250BW-4	T4H250BW-4
PR222DS-LSI	250 A (100...250 A)		T4N250CW-4	T4H250CW-4
PR222DS-LSIG	250 A (100...250 A)		T4N250EW-4	T4H250EW-4

Part numbers

Molded Case Circuit Breakers

Tmax T4 250 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 250 A - Front terminals (F)

Thermal-Magnetic trip unit - TMF/ TMD/TMA - 600V AC / 600V DC	Nominal current		Part number				
	In	I ₃	NQ (18kA)	SQ (25kA)	HQ (35kA)	LQ (65kA)	VQ (100kA)
TMF	20 A	500 A	T4NQ020TW	T4SQ020TW	T4HQ020TW	T4LQ020TW	T4VQ020TW
TMD	30 A (21...30 A)	500 A	T4NQ030TW	T4SQ030TW	T4HQ030TW	T4LQ030TW	T4VQ030TW
TMD	40 A (28...40 A)	500 A	T4NQ040TW	T4SQ040TW	T4HQ040TW	T4LQ040TW	T4VQ040TW
TMD	50 A (36...50 A)	500 A	T4NQ050TW	T4SQ050TW	T4HQ050TW	T4LQ050TW	T4VQ050TW
TMA	80 A (56...80 A)	800 A (400...800A)	T4NQ080TW	T4SQ080TW	T4HQ080TW	T4LQ080TW	T4VQ080TW
TMA	100 A (70...100 A)	1000 A (500...1000A)	T4NQ100TW	T4SQ100TW	T4HQ100TW	T4LQ100TW	T4VQ100TW
TMA	125 A (88...125 A)	1250 A (625...1250 A)	T4NQ125TW	T4SQ125TW	T4HQ125TW	T4LQ125TW	T4VQ125TW
TMA	150 A (100...150 A)	1500 A (750...1500 A)	T4NQ150TW	T4SQ150TW	T4HQ150TW	T4LQ150TW	T4VQ150TW
TMA	200 A (140...200 A)	2000 A (1000...2000 A)	T4NQ200TW	T4SQ200TW	T4HQ200TW	T4LQ200TW	T4VQ200TW
TMA	250 A (175...250 A)	2500 A (1250...2500 A)	T4NQ250TW	T4SQ250TW	T4HQ250TW	T4LQ250TW	T4VQ250TW

Tmax T4 100 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 100 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number				
	In		NQ (18kA)	SQ (25kA)	HQ (35kA)	LQ (65kA)	VQ (100kA)
PR221DS-LS/I	100 A (40...100 A)		T4NQ100BW	T4SQ100BW	T4HQ100BW	T4LQ100BW	T4VQ100BW
PR222DS-LSI	100 A (40...100 A)		T4NQ100CW	T4SQ100CW	T4HQ100CW	T4LQ100CW	T4VQ100CW
PR222DS-LSIG	100 A (40...100 A)		T4NQ100EW	T4SQ100EW	T4HQ100EW	T4LQ100EW	T4VQ100EW

Tmax T4 150 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 150 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number				
	In		NQ (18kA)	SQ (25kA)	HQ (35kA)	LQ (65kA)	VQ (100kA)
PR221DS-LS/I	150 A (60...150 A)		T4NQ150BW	T4SQ150BW	T4HQ150BW	T4LQ150BW	T4VQ150BW
PR222DS-LSI	150 A (60...150 A)		T4NQ150CW	T4SQ150CW	T4HQ150CW	T4LQ150CW	T4VQ150CW
PR222DS-LSIG	150 A (60...150 A)		T4NQ150EW	T4SQ150EW	T4HQ150EW	T4LQ150EW	T4VQ150EW

Tmax T4 250 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 250 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number				
	In		NQ (18kA)	SQ (25kA)	HQ (35kA)	LQ (65kA)	VQ (100kA)
PR221DS-LS/I	250 A (100...250 A)		T4NQ250BW	T4SQ250BW	T4HQ250BW	T4LQ250BW	T4VQ250BW
PR222DS-LSI	250 A (100...250 A)		T4NQ250CW	T4SQ250CW	T4HQ250CW	T4LQ250CW	T4VQ250CW
PR222DS-LSIG	250 A (100...250 A)		T4NQ250EW	T4SQ250EW	T4HQ250EW	T4LQ250EW	T4VQ250EW

Part numbers

Molded Case Circuit Breakers

Tmax T5 300 A - FIXED (F) 2 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

I_u (40°C) = 300 A - Front terminals (F)

Thermal-Magnetic trip unit - TMA - 600V AC / 500V DC	Nominal current		Part number N (18kA)
	In	I ₃	
TMA	300 A (210...300 A)	3000 A (1500...3000 A)	T5N300TW-2

Tmax T5 300 A - FIXED (F) 2 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

I_u (40°C) = 300 A - Front terminals (F)

Electronic trip unit (AC only)- 600V AC	Nominal current		Part number N (18kA)
	In	I ₃	
PR221DS-LS/I	300 A (120...300 A)		T5N300BW-2
PR222DS-LSI	300 A (120...300 A)		T5N300CW-2
PR222DS-LSIG	300 A (120...300 A)		T5N300EW-2

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Tmax T5 400 A - FIXED (F) 2 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

I_u (40°C) = 400 A - Front terminals (F)

Thermal-Magnetic trip unit - TMA - 600V AC / 500V DC	Nominal current		Part number N (18kA)
	In	I ₃	
TMA	400 A (280...400 A)	4000 A (2000...4000 A)	T5N400TW-2

Tmax T5 400 A - FIXED (F) 2 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

I_u (40°C) = 400 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number N (18kA)
	In	I ₃	
PR221DS-LS/I	400 A (160...400 A)		T5N400BW-2
PR222DS-LSI	400 A (160...400 A)		T5N400CW-2
PR222DS-LSIG	400 A (160...400 A)		T5N400EW-2

Part numbers

Molded Case Circuit Breakers

Tmax T5 300 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 300 A - Front terminals (F)

Thermal-Magnetic trip unit - TMA - 600V AC / 600V DC	Nominal current		Part number				
	In	I ₃	N (18kA)	S (25kA)	H (35kA)	L (65kA)	V (100kA)
TMA	300 A (210...300 A)	3000 A (1500...3000 A)	T5N300TW	T5S300TW	T5H300TW	T5L300TW	T5V300TW

Tmax T5 300 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 300 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number				
	In	I ₃	N (18kA)	S (25kA)	H (35kA)	L (65kA)	V (100kA)
PR221DS-LS/I	300 A (120...300 A)		T5N300BW	T5S300BW	T5H300BW	T5L300BW	T5V300BW
PR222DS-LSI	300 A (120...300 A)		T5N300CW	T5S300CW	T5H300CW	T5L300CW	T5V300CW
PR222DS-LSIG	300 A (120...300 A)		T5N300EW	T5S300EW	T5H300EW	T5L300EW	T5V300EW

Tmax T5 400 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 400 A - Front terminals (F)

Thermal-Magnetic trip unit - TMA - 600V AC / 600V DC	Nominal current		Part number				
	In	I ₃	N (18kA)	S (25kA)	H (35kA)	L (65kA)	V (100kA)
TMA	400 A (280...400 A)	4000 A (2000...4000 A)	T5N400TW	T5S400TW	T5H400TW	T5L400TW	T5V400TW

Tmax T5 400 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 400 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number				
	In	I ₃	N (18kA)	S (25kA)	H (35kA)	L (65kA)	V (100kA)
PR221DS-LS/I	400 A (160...400 A)		T5N400BW	T5S400BW	T5H400BW	T5L400BW	T5V400BW
PR222DS-LSI	400 A (160...400 A)		T5N400CW	T5S400CW	T5H400CW	T5L400CW	T5V400CW
PR222DS-LSIG	400 A (160...400 A)		T5N400EW	T5S400EW	T5H400EW	T5L400EW	T5V400EW

Tmax T5 600 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 600 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number				
	In	I ₃	N (18kA)	S (25kA)	H (35kA)	L (65kA)	V (100kA)
PR221DS-LS/I	600 A (240...600 A)		T5N600BW	T5S600BW	T5H600BW	T5L600BW	T5V600BW
PR222DS-LSI	600 A (240...600 A)		T5N600CW	T5S600CW	T5H600CW	T5L600CW	T5V600CW
PR222DS-LSIG	600 A (240...600 A)		T5N600EW	T5S600EW	T5H600EW	T5L600EW	T5V600EW

Part numbers

Molded Case Circuit Breakers

Tmax T5 300 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 300 A - Front terminals (F)

Thermal-Magnetic trip unit - TMA - 600V AC / 600V DC	Nominal current		Part number				
	In	I ₃	N (18kA)	S (25kA)	H (35kA)	L (65kA)	V (100kA)
TMA	300 A (210...300 A)	3000 A (1500...3000 A)	T5N300TW-4	T5S300TW-4	T5H300TW-4	T5L300TW-4	T5V300TW-4

Tmax T5 300 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 300 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number				
	In		N (18kA)	S (25kA)	H (35kA)	L (65kA)	V (100kA)
PR221DS-LS/I	300 A (120...300 A)		T5N300BW-4	T5S300BW-4	T5H300BW-4	T5L300BW-4	T5V300BW-4
PR222DS-LSI	300 A (120...300 A)		T5N300CW-4	T5S300CW-4	T5H300CW-4	T5L300CW-4	T5V300CW-4
PR222DS-LSIG	300 A (120...300 A)		T5N300EW-4	T5S300EW-4	T5H300EW-4	T5L300EW-4	T5V300EW-4

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Tmax T5 400 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 400 A - Front terminals (F)

Thermal-Magnetic trip unit - TMA - 600V AC / 600V DC	Nominal current		Part number				
	In	I ₃	N (18kA)	S (25kA)	H (35kA)	L (65kA)	V (100kA)
TMA	400 A (280...400 A)	4000 A (2000...4000 A)	T5N400TW-4	T5S400TW-4	T5H400TW-4	T5L400TW-4	T5V400TW-4

Tmax T5 400 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 400 A - Front terminals (F)



Electronic trip unit (AC only) - 600V AC	Nominal current		Part number				
	In		N (18kA)	S (25kA)	H (35kA)	L (65kA)	V (100kA)
PR221DS-LS/I	400 A (160...400 A)		T5N400BW-4	T5S400BW-4	T5H400BW-4	T5L400BW-4	T5V400BW-4
PR222DS-LSI	400 A (160...400 A)		T5N400CW-4	T5S400CW-4	T5H400CW-4	T5L400CW-4	T5V400CW-4
PR222DS-LSIG	400 A (160...400 A)		T5N400EW-4	T5S400EW-4	T5H400EW-4	T5L400EW-4	T5V400EW-4

Part numbers

Molded Case Circuit Breakers


Tmax T5 300 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 300 A - Front terminals (F)

Thermal-Magnetic trip unit - TMA - 600V AC / 600V DC	Nominal current		Part number				
			NQ (18kA)	SQ (25kA)	HQ (35kA)	LQ (65kA)	VQ (100kA)
TMA	300 A (210...300 A)	3000 A (1500...3000 A)	T5NQ300TW	T5SQ300TW	T5HQ300TW	T5LQ300TW	T5VQ300TW



Tmax T5 300 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 300 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number				
			NQ (18kA)	SQ (25kA)	HQ (35kA)	LQ (65kA)	VQ (100kA)
PR221DS-LS/I	300 A (120...300 A)		T5NQ300BW	T5SQ300BW	T5HQ300BW	T5LQ300BW	T5VQ300BW
PR222DS-LSI	300 A (120...300 A)		T5NQ300CW	T5SQ300CW	T5HQ300CW	T5LQ300CW	T5VQ300CW
PR222DS-LSIG	300 A (120...300 A)		T5NQ300EW	T5SQ300EW	T5HQ300EW	T5LQ300EW	T5VQ300EW


Tmax T5 400 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 400 A - Front terminals (F)

Thermal-Magnetic trip unit - TMA - 600V AC / 600V DC	Nominal current		Part number				
			NQ (18kA)	SQ (25kA)	HQ (35kA)	LQ (65kA)	VQ (100kA)
TMA	400 A (280...400 A)	4000 A (2000...4000 A)	T5NQ400TW	T5SQ400TW	T5HQ400TW	T5LQ400TW	T5VQ400TW

Tmax T5 400 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 400 A - Front terminals (F)



Electronic trip unit (AC only) - 600V AC	Nominal current		Part number				
			NQ (18kA)	SQ (25kA)	HQ (35kA)	LQ (65kA)	VQ (100kA)
PR221DS-LS/I	400 A (160...400 A)		T5NQ400BW	T5SQ400BW	T5HQ400BW	T5LQ400BW	T5VQ400BW
PR222DS-LSI	400 A (160...400 A)		T5NQ400CW	T5SQ400CW	T5HQ400CW	T5LQ400CW	T5VQ400CW
PR222DS-LSIG	400 A (160...400 A)		T5NQ400EW	T5SQ400EW	T5HQ400EW	T5LQ400EW	T5VQ400EW

Part numbers

Molded Case Circuit Breakers


Tmax T6 600 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 600 A - Front terminals (F)

Thermal-Magnetic trip unit - TMA - 600V AC / 600V DC	Nominal current		Part number			
			N (20kA)	S (25kA)	H (35kA)	L (42kA)
TMA	600 A (420...600 A)	6000 A (3000...6000 A)	T6N600TW	T6S600TW	T6H600TW	T6L600TW

Tmax T6 600 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)



Iu (40°C) = 600 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number			
			N (20kA)	S (25kA)	H (35kA)	L (42kA)
PR221DS-LS/I	600 A (240...600 A)		T6N600BW	T6S600BW	T6H600BW	T6L600BW
PR222DS-LSI	600 A (240...600 A)		T6N600CW	T6S600CW	T6H600CW	T6L600CW
PR222DS-LSIG	600 A (240...600 A)		T6N600EW	T6S600EW	T6H600EW	T6L600EW

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Tmax T6 800 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 800 A - Front terminals (F)

Thermal-Magnetic trip unit - TMA - 600V AC / 600V DC	Nominal current		Part number			
			N (20kA)	S (25kA)	H (35kA)	L (42kA)
TMA	800 A (560...800 A)	8000 A (4000...8000 A)	T6N800TW	T6S800TW	T6H800TW	T6L800TW

Tmax T6 800 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 800 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number			
			N (20kA)	S (25kA)	H (35kA)	L (42kA)
PR221DS-LS/I	800 A (320...800 A)		T6N800BW	T6S800BW	T6H800BW	T6L800BW
PR222DS-LSI	800 A (320...800 A)		T6N800CW	T6S800CW	T6H800CW	T6L800CW
PR222DS-LSIG	800 A (320...800 A)		T6N800EW	T6S800EW	T6H800EW	T6L800EW

Part numbers

Molded Case Circuit Breakers

Tmax T6 600 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 600 A - Front terminals (F)

Thermal-Magnetic trip unit - TMA - 600V AC / 600V DC	Nominal current		Part number	
	In	I ₃	N (20kA)	H (35kA)
TMA	600 A (420...600 A)	6000 A (3000...6000 A)	T6N600TW-4	T6H600TW-4

Tmax T6 600 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 600 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number	
	In	I ₃	N (20kA)	H (35kA)
PR221DS-LS/I	600 A (240...600 A)		T6N600BW-4	T6H600BW-4
PR222DS-LSI	600 A (240...600 A)		T6N600CW-4	T6H600CW-4
PR222DS-LSIG	600 A (240...600 A)		T6N600EW-4	T6H600EW-4

Tmax T6 800 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 800 A - Front terminals (F)

Thermal-Magnetic trip unit - TMA - 600V AC / 600V DC	Nominal current		Part number	
	In	I ₃	N (20kA)	H (35kA)
TMA	800 A (560...800 A)	8000 A (4000...8000 A)	T6N800TW-4	T6H800TW-4

Tmax T6 800 A - FIXED (F) 4 poles - CSA C22.2 / UL listed (Discount DS-ST)

Iu (40°C) = 800 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number	
	In	I ₃	N (20kA)	H (35kA)
PR221DS-LS/I	800 A (320...800 A)		T6N800BW-4	T6H800BW-4
PR222DS-LSI	800 A (320...800 A)		T6N800CW-4	T6H800CW-4
PR222DS-LSIG	800 A (320...800 A)		T6N800EW-4	T6H800EW-4

Part numbers

Molded Case Circuit Breakers

Tmax T6 600 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 600 A - Front terminals (F)

Thermal-Magnetic trip unit - TMA - 600V AC / 600V DC	Nominal current		Part number			
	In	I _n	NQ (20kA)	SQ (25kA)	HQ (35kA)	LQ (42kA)
TMA	600 A (420...600 A)	6000 A (3000...6000 A)	T6NQ600TW	T6SQ600TW	T6HQ600TW	T6LQ600TW

Tmax T6 600 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 600 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number			
	In	I _n	NQ (20kA)	SQ (25kA)	HQ (35kA)	LQ (42kA)
PR221DS-LS/I	600 A (240...600 A)		T6NQ600BW	T6SQ600BW	T6HQ600BW	T6LQ600BW
PR222DS-LSI	600 A (240...600 A)		T6NQ600CW	T6SQ600CW	T6HQ600CW	T6LQ600CW
PR222DS-LSIG	600 A (240...600 A)		T6NQ600EW	T6SQ600EW	T6HQ600EW	T6LQ600EW

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Tmax T6 800 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 800 A - Front terminals (F)

Thermal-Magnetic trip unit - TMA - 600V AC / 600V DC	Nominal current		Part number			
	In	I _n	NQ (20kA)	SQ (25kA)	HQ (35kA)	LQ (42kA)
TMA	800 A (560...800 A)	8000 A (4000...8000 A)	T6NQ800TW	T6SQ800TW	T6HQ800TW	T6LQ800TW

Tmax T6 800 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 800 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number			
	In	I _n	NQ (20kA)	SQ (25kA)	HQ (35kA)	LQ (42kA)
PR221DS-LS/I	800 A (320...800 A)		T6NQ800BW	T6SQ800BW	T6HQ800BW	T6LQ800BW
PR222DS-LSI	800 A (320...800 A)		T6NQ800CW	T6SQ800CW	T6HQ800CW	T6LQ800CW
PR222DS-LSIG	800 A (320...800 A)		T6NQ800EW	T6SQ800EW	T6HQ800EW	T6LQ800EW

Part numbers

Molded Case Circuit Breakers

Tmax T7 1000 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 1000 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	S (25kA)	H (50kA)	L (65kA)
PR231/P-LS/I	1000 A (400...1000 A)	T7S1000BW	T7H1000BW	T7L1000BW
PR232/P-LSI	1000 A (400...1000 A)	T7S1000CW	T7H1000CW	T7L1000CW
PR331/P-LSIG	1000 A (400...1000 A)	T7S1000EW	T7H1000EW	T7L1000EW
PR332/P-LI	1000 A (400...1000 A)	T7S1000PW	T7H1000PW	T7L1000PW
PR332/P/LSI	1000 A (400...1000 A)	T7S1000RW	T7H1000RW	T7L1000RW
PR332/P-LSIG	1000 A (400...1000 A)	T7S1000SW	T7H1000SW	T7L1000SW

Tmax T7 1000 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 1000 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	SQ (25kA)	HQ (50kA)	LQ (65kA)
PR231/P-LS/I	1000 A (400...1000 A)	T7SQ1000BW	T7HQ1000BW	T7LQ1000BW
PR232/P-LSI	1000 A (400...1000 A)	T7SQ1000CW	T7HQ1000CW	T7LQ1000CW
PR331/P-LSIG	1000 A (400...1000 A)	T7SQ1000EW	T7HQ1000EW	T7LQ1000EW
PR332/P-LI	1000 A (400...1000 A)	T7SQ1000PW	T7HQ1000PW	T7LQ1000PW
PR332/P/LSI	1000 A (400...1000 A)	T7SQ1000RW	T7HQ1000RW	T7LQ1000RW
PR332/P-LSIG	1000 A (400...1000 A)	T7SQ1000SW	T7HQ1000SW	T7LQ1000SW

Tmax T7 1000 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 1000 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	S (25kA)	H (50kA)	L (65kA)
PR231/P-LS/I	1000 A (400...1000 A)	T7S1000BW-4	T7H1000BW-4	T7L1000BW-4
PR232/P-LSI	1000 A (400...1000 A)	T7S1000CW-4	T7H1000CW-4	T7L1000CW-4
PR331/P-LSIG	1000 A (400...1000 A)	T7S1000EW-4	T7H1000EW-4	T7L1000EW-4
PR332/P-LI	1000 A (400...1000 A)	T7S1000PW-4	T7H1000PW-4	T7L1000PW-4
PR332/P/LSI	1000 A (400...1000 A)	T7S1000RW-4	T7H1000RW-4	T7L1000RW-4
PR332/P-LSIG	1000 A (400...1000 A)	T7S1000SW-4	T7H1000SW-4	T7L1000SW-4

Part numbers

Molded Case Circuit Breakers

Tmax T7 1200 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 1200 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	S (25kA)	H (50kA)	L (65kA)
PR231/P-LS/I	1200 A (400...1200 A)	T7S1200BW	T7H1200BW	T7L1200BW
PR232/P-LSI	1200 A (400...1200 A)	T7S1200CW	T7H1200CW	T7L1200CW
PR331/P-LSIG	1200 A (400...1200 A)	T7S1200EW	T7H1200EW	T7L1200EW
PR332/P-LI	1200 A (400...1200 A)	T7S1200PW	T7H1200PW	T7L1200PW
PR332/P/LSI	1200 A (400...1200 A)	T7S1200RW	T7H1200RW	T7L1200RW
PR332/P-LSIG	1200 A (400...1200 A)	T7S1200SW	T7H1200SW	T7L1200SW

Tmax T7 1200 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 1200 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	SQ (25kA)	HQ (50kA)	LQ (65kA)
PR231/P-LS/I	1200 A (400...1200 A)	T7SQ1200BW	T7HQ1200BW	T7LQ1200BW
PR232/P-LSI	1200 A (400...1200 A)	T7SQ1200CW	T7HQ1200CW	T7LQ1200CW
PR331/P-LSIG	1200 A (400...1200 A)	T7SQ1200EW	T7HQ1200EW	T7LQ1200EW
PR332/P-LI	1200 A (400...1200 A)	T7SQ1200PW	T7HQ1200PW	T7LQ1200PW
PR332/P/LSI	1200 A (400...1200 A)	T7SQ1200RW	T7HQ1200RW	T7LQ1200RW
PR332/P-LSIG	1200 A (400...1200 A)	T7SQ1200SW	T7HQ1200SW	T7LQ1200SW

Tmax T7 1200 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 1200 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	S (25kA)	H (50kA)	L (65kA)
PR231/P-LS/I	1200 A (400...1200 A)	T7S1200BW-4	T7H1200BW-4	T7L1200BW-4
PR232/P-LSI	1200 A (400...1200 A)	T7S1200CW-4	T7H1200CW-4	T7L1200CW-4
PR331/P-LSIG	1200 A (400...1200 A)	T7S1200EW-4	T7H1200EW-4	T7L1200EW-4
PR332/P-LI	1200 A (400...1200 A)	T7S1200PW-4	T7H1200PW-4	T7L1200PW-4
PR332/P/LSI	1200 A (400...1200 A)	T7S1200RW-4	T7H1200RW-4	T7L1200RW-4
PR332/P-LSIG	1200 A (400...1200 A)	T7S1200SW-4	T7H1200SW-4	T7L1200SW-4

Part numbers

Molded Case Circuit Breakers

Tmax T7M 1000 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 1000 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	S (25kA)	H (50kA)	L (65kA)
PR231/P-LS/I	1000 A (400...1000 A)	T7MS1000BW	T7MH1000BW	T7ML1000BW
PR232/P-LSI	1000 A (400...1000 A)	T7MS1000CW	T7MH1000CW	T7ML1000CW
PR331/P-LSIG	1000 A (400...1000 A)	T7MS1000EW	T7MH1000EW	T7ML1000EW
PR332/P-LI	1000 A (400...1000 A)	T7MS1000PW	T7MH1000PW	T7ML1000PW
PR332/P/LSI	1000 A (400...1000 A)	T7MS1000RW	T7MH1000RW	T7ML1000RW
PR332/P-LSIG	1000 A (400...1000 A)	T7MS1000SW	T7MH1000SW	T7ML1000SW

Tmax T7M 1000 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 1000 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	SQ (25kA)	HQ (50kA)	LQ (65kA)
PR231/P-LS/I	1000 A (400...1000 A)	T7MSQ1000BW	T7MHQ1000BW	T7MLQ1000BW
PR232/P-LSI	1000 A (400...1000 A)	T7MSQ1000CW	T7MHQ1000CW	T7MLQ1000CW
PR331/P-LSIG	1000 A (400...1000 A)	T7MSQ1000EW	T7MHQ1000EW	T7MLQ1000EW
PR332/P-LI	1000 A (400...1000 A)	T7MSQ1000PW	T7MHQ1000PW	T7MLQ1000PW
PR332/P/LSI	1000 A (400...1000 A)	T7MSQ1000RW	T7MHQ1000RW	T7MLQ1000RW
PR332/P-LSIG	1000 A (400...1000 A)	T7MSQ1000SW	T7MHQ1000SW	T7MLQ1000SW

Tmax T7M 1000 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 1000 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	S (25kA)	H (50kA)	L (65kA)
PR231/P-LS/I	1000 A (400...1000 A)	T7MS1000BW-4	T7MH1000BW-4	T7ML1000BW-4
PR232/P-LSI	1000 A (400...1000 A)	T7MS1000CW-4	T7MH1000CW-4	T7ML1000CW-4
PR331/P-LSIG	1000 A (400...1000 A)	T7MS1000EW-4	T7MH1000EW-4	T7ML1000EW-4
PR332/P-LI	1000 A (400...1000 A)	T7MS1000PW-4	T7MH1000PW-4	T7ML1000PW-4
PR332/P/LSI	1000 A (400...1000 A)	T7MS1000RW-4	T7MH1000RW-4	T7ML1000RW-4
PR332/P-LSIG	1000 A (400...1000 A)	T7MS1000SW-4	T7MH1000SW-4	T7ML1000SW-4

Part numbers

Molded Case Circuit Breakers

Tmax T7M 1200 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 1200 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	S (25kA)	H (50kA)	L (65kA)
PR231/P-LS/I	1200 A (400...1200 A)	T7MS1200BW	T7MH1200BW	T7ML1200BW
PR232/P-LSI	1200 A (400...1200 A)	T7MS1200CW	T7MH1200CW	T7ML1200CW
PR331/P-LSIG	1200 A (400...1200 A)	T7MS1200EW	T7MH1200EW	T7ML1200EW
PR332/P-LI	1200 A (400...1200 A)	T7MS1200PW	T7MH1200PW	T7ML1200PW
PR332/P/LSI	1200 A (400...1200 A)	T7MS1200RW	T7MH1200RW	T7ML1200RW
PR332/P-LSIG	1200 A (400...1200 A)	T7MS1200SW	T7MH1200SW	T7ML1200SW

Tmax T7M 1200 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 1200 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	SQ (25kA)	HQ (50kA)	LQ (65kA)
PR231/P-LS/I	1200 A (400...1200 A)	T7MSQ1200BW	T7MHQ1200BW	T7MLQ1200BW
PR232/P-LSI	1200 A (400...1200 A)	T7MSQ1200CW	T7MHQ1200CW	T7MLQ1200CW
PR331/P-LSIG	1200 A (400...1200 A)	T7MSQ1200EW	T7MHQ1200EW	T7MLQ1200EW
PR332/P-LI	1200 A (400...1200 A)	T7MSQ1200PW	T7MHQ1200PW	T7MLQ1200PW
PR332/P/LSI	1200 A (400...1200 A)	T7MSQ1200RW	T7MHQ1200RW	T7MLQ1200RW
PR332/P-LSIG	1200 A (400...1200 A)	T7MSQ1200SW	T7MHQ1200SW	T7MLQ1200SW

Tmax T7M 1200 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 1200 A - Front terminals (F)


Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	S (25kA)	H (50kA)	L (65kA)
PR231/P-LS/I	1200 A (400...1200 A)	T7MS1200BW-4	T7MH1200BW-4	T7ML1200BW-4
PR232/P-LSI	1200 A (400...1200 A)	T7MS1200CW-4	T7MH1200CW-4	T7ML1200CW-4
PR331/P-LSIG	1200 A (400...1200 A)	T7MS1200EW-4	T7MH1200EW-4	T7ML1200EW-4
PR332/P-LI	1200 A (400...1200 A)	T7MS1200PW-4	T7MH1200PW-4	T7ML1200PW-4
PR332/P/LSI	1200 A (400...1200 A)	T7MS1200RW-4	T7MH1200RW-4	T7ML1200RW-4
PR332/P-LSIG	1200 A (400...1200 A)	T7MS1200SW-4	T7MH1200SW-4	T7ML1200SW-4

Part numbers

Molded Case Circuit Breakers


Tmax T8 1600 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST8)

Iu (40°C) = 1600 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current 	Part number V (100kA)
PR331/P-LSI	1600 A (640...1600 A)	T8V16CW
PR331/P-LSIG	1600 A (640...1600 A)	T8V16EW
PR332/P-LI	1600 A (640...1600 A)	T8V16PW
PR332/P-LSI	1600 A (640...1600 A)	T8V16RW
PR332/P-LSIG	1600 A (640...1600 A)	T8V16SW


Tmax T8 2000 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST8)

Iu (40°C) = 2000 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current 	Part number V (100kA)
PR331/P-LSI	2000 A (800...2000 A)	T8V20CW
PR331/P-LSIG	2000 A (800...2000 A)	T8V20EW
PR332/P-LI	2000 A (800...2000 A)	T8V20PW
PR332/P-LSI	2000 A (800...2000 A)	T8V20RW
PR332/P-LSIG	2000 A (800...2000 A)	T8V20SW


Tmax T8 2500 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST8)

Iu (40°C) = 2500 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current 	Part number V (100kA)
PR331/P-LSI	2500 A (1000...2500 A)	T8V25CW
PR331/P-LSIG	2500 A (1000...2500 A)	T8V25EW
PR332/P-LI	2500 A (1000...2500 A)	T8V25PW
PR332/P-LSI	2500 A (1000...2500 A)	T8V25RW
PR332/P-LSIG	2500 A (1000...2500 A)	T8V25SW

Tmax T8 3000 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST8)

Iu (40°C) = 3000 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current 	Part number V (100kA)
PR331/P-LSI	3000 A (1200...3000 A)	T8V30CW
PR331/P-LSIG	3000 A (1200...3000 A)	T8V30EW
PR332/P-LI	3000 A (1200...3000 A)	T8V30PW
PR332/P-LSI	3000 A (1200...3000 A)	T8V30RW
PR332/P-LSIG	3000 A (1200...3000 A)	T8V30SW

Part numbers

Molded Case Circuit Breakers

Tmax T8 1600 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST8)

Iu (40°C) = 1600 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number
	In	V (100kA)
PR331/P-LSI	1600 A (640...1600 A)	T8V16CW-4
PR331/P-LSIG	1600 A (640...1600 A)	T8V16EW-4
PR332/P-LI	1600 A (640...1600 A)	T8V16PW-4
PR332/P-LSI	1600 A (640...1600 A)	T8V16RW-4
PR332/P-LSIG	1600 A (640...1600 A)	T8V16SW-4

Tmax T8 2000 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST8)

Iu (40°C) = 2000 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number
	In	V (100kA)
PR331/P-LSI	2000 A (800...2000 A)	T8V20CW-4
PR331/P-LSIG	2000 A (800...2000 A)	T8V20EW-4
PR332/P-LI	2000 A (800...2000 A)	T8V20PW-4
PR332/P-LSI	2000 A (800...2000 A)	T8V20RW-4
PR332/P-LSIG	2000 A (800...2000 A)	T8V20SW-4

Tmax T8 2500 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST8)

Iu (40°C) = 2500 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number
	In	V (100kA)
PR331/P-LSI	2500 A (1000...2500 A)	T8V25CW-4
PR331/P-LSIG	2500 A (1000...2500 A)	T8V25EW-4
PR332/P-LI	2500 A (1000...2500 A)	T8V25PW-4
PR332/P-LSI	2500 A (1000...2500 A)	T8V25RW-4
PR332/P-LSIG	2500 A (1000...2500 A)	T8V25SW-4

Tmax T8 3000 A - FIXED (F) 4 poles - CSA C22.2 No 5/ UL489 listed (Discount DS-ST8)

Iu (40°C) = 3000 A - Front terminals (F)


Electronic trip unit (AC only) - 600V AC	Nominal current	Part number
	In	V (100kA)
PR331/P-LSI	3000 A (1200...3000 A)	T8V30CW-4
PR331/P-LSIG	3000 A (1200...3000 A)	T8V30EW-4
PR332/P-LI	3000 A (1200...3000 A)	T8V30PW-4
PR332/P-LSI	3000 A (1200...3000 A)	T8V30RW-4
PR332/P-LSIG	3000 A (1200...3000 A)	T8V30SW-4

Part numbers

Molded Case Circuit Breakers


Tmax T8 1600 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST8)

Iu (40°C) = 1600 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current 	Part number VQ (100kA)
PR331/P-LSI	1600 A (640...1600 A)	T8VQ16CW
PR331/P-LSIG	1600 A (640...1600 A)	T8VQ16EW
PR332/P-LI	1600 A (640...1600 A)	T8VQ16PW
PR332/P-LSI	1600 A (640...1600 A)	T8VQ16RW
PR332/P-LSIG	1600 A (640...1600 A)	T8VQ16SW


Tmax T8 2000 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST8)

Iu (40°C) = 2000 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current 	Part number VQ (100kA)
PR331/P-LSI	2000 A (800...2000 A)	T8VQ20CW
PR331/P-LSIG	2000 A (800...2000 A)	T8VQ20EW
PR332/P-LI	2000 A (800...2000 A)	T8VQ20PW
PR332/P-LSI	2000 A (800...2000 A)	T8VQ20RW
PR332/P-LSIG	2000 A (800...2000 A)	T8VQ20SW


Tmax T8 2500 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST8)

Iu (40°C) = 2500 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current 	Part number VQ (100kA)
PR331/P-LSI	2500 A (1000...2500 A)	T8VQ25CW
PR331/P-LSIG	2500 A (1000...2500 A)	T8VQ25EW
PR332/P-LI	2500 A (1000...2500 A)	T8VQ25PW
PR332/P-LSI	2500 A (1000...2500 A)	T8VQ25RW
PR332/P-LSIG	2500 A (1000...2500 A)	T8VQ25SW

Tmax T8 3000 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5/ UL489 listed (Discount DS-ST8)

Iu (40°C) = 3000 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current 	Part number VQ (100kA)
PR331/P-LSI	3000 A (1200...3000 A)	T8VQ30CW
PR331/P-LSIG	3000 A (1200...3000 A)	T8VQ30EW
PR332/P-LI	3000 A (1200...3000 A)	T8VQ30PW
PR332/P-LSI	3000 A (1200...3000 A)	T8VQ30RW
PR332/P-LSIG	3000 A (1200...3000 A)	T8VQ30SW

Part numbers

Molded Case Circuit Breakers

Tmax T2 100 A - FIXED (F) 3 poles - CSA / UL recognized (Discount DS-ST)

I_u (40°C) = 100 A - Front terminals (F)

Magnetic only trip unit - MA - 480V AC	Nominal current		Part number	
	In	I ₃	S (35kA)	H (65kA)
MA	20 A	240 A (120...240 A)	T2S020MW	T2H020MW
MA	50 A	600 A (300...600 A)	T2S050MW	T2H050MW
MA	100 A	1200 A (600...1200 A)	T2S100MW	T2H100MW

Tmax T2 100 A - FIXED (F) 3 poles - CSA / UL recognized (Discount DS-ST)

I_u (40°C) = 100 A - Front terminals (F)

Instantaneous only electronic trip unit - 480V AC	Nominal current		Part number	
	In	I ₃	S (35kA)	H (65kA)
PR221DS-I	25 A	250 A (25...250 A)	T2S020E5W	T2H020E5W
PR221DS-I	60 A	600 A (60...600 A)	T2S050E5W	T2H050E5W
PR221DS-I	100 A	1000 A (100...1000 A)	T2S100E5W	T2H100E5W

Tmax T3 225 A - FIXED (F) 3 poles - CSA / UL recognized (Discount DS-ST)

I_u (40°C) = 225 A - Front terminals (F)

Magnetic only trip unit - MA - 480V AC / 500V DC	Nominal current		Part number	
	In	I ₃	S (35kA)	
MA	100 A	1200 A (600...1200 A)	T3S100MW	
MA	125 A	1500 A (750...1500 A)	T3S125MW	
MA	150 A	1800 A (900...1800 A)	T3S150MW	
MA	200 A	2400 A (1200...2400 A)	T3S200MW	

Tmax Ts3 150 A - FIXED (F) 3 poles - CSA / UL recognized (Discount DS-ST)

I_u (40°C) = 150 A - Front terminals (F)

Magnetic only trip unit - MA - 600V AC / 600V DC	Nominal current		Part number	
	In	I ₃	L (10kA)	L (25kA)
MA	3 A	36 A (12...36 A)	Ts3L003MW	-
MA	5 A	60 A (20...60 A)	Ts3L005MW	-
MA	10 A	120 A (40...120 A)	Ts3L010MW	-
MA	25 A	300 A (100...300 A)	Ts3L025MW	-
MA	50 A	600 A (200...600 A)	-	Ts3L050MW
MA	100 A	1200 A (400...1200 A)	-	Ts3L100MW
MA	125 A	1500 A (500...1500 A)	-	Ts3L125MW
MA	150 A	1800 A (600...1800 A)	-	Ts3L150MW

Tmax Ts3 225 A - FIXED (F) 3 poles - CSA / UL recognized (Discount DS-ST)

I_u (40°C) = 225 A - Front terminals (F)

Magnetic only trip unit - MA - 480V AC / 500V DC	Nominal current		Part number	
	In	I ₃	L (65kA)	
MA	175 A	2100 A (700...2100 A)	Ts3L175MW	
MA	225 A	2400 A (800...2400 A)	Ts3L225MW	

Part numbers

Molded Case Circuit Breakers

Tmax T4 250 A - FIXED (F) 3 poles - CSA / UL recognized (Discount DS-ST)

Iu (40°C) = 250 A - Front terminals (F)

Instantaneous only electronic trip unit - 600V AC	Nominal current		Part number			
	In	I ₃	N (18kA)	S (25kA)	H (35kA)	L (65kA)
PR221DS-I	100 A	1000 A (100...1000 A)	T4N100E5W	T4S100E5W	T4H100E5W	T4L100E5W
PR221DS-I	150 A	1500 A (150...1500 A)	T4N150E5W	T4S150E5W	T4H150E5W	T4L150E5W
PR221DS-I	250 A	2500 A (250...2500 A)	T4N250E5W	T4S250E5W	T4H250E5W	T4L250E5W

Tmax T5 400 A - FIXED (F) 3 poles - CSA / UL recognized (Discount DS-ST)

Iu (40°C) = 400 A - Front terminals (F)

Instantaneous only electronic trip unit - 600V AC	Nominal current		Part number			
	In	I ₃	N (18kA)	S (25kA)	H (35kA)	L (65kA)
PR221DS-I	300 A	3000 A (300...3000 A)	T5N300E5W	T5S300E5W	T5H300E5W	T5L300E5W
PR221DS-I	400 A	4000 A (400...4000 A)	T5N400E5W	T5S400E5W	T5H400E5W	T5L400E5W

Tmax T5 600 A - FIXED (F) 3 poles - CSA / UL recognized (Discount DS-ST)

Iu (40°C) = 600 A - Front terminals (F)

Instantaneous only electronic trip unit - 600V AC	Nominal current		Part number			
	In	I ₃	N (18kA)	S (25kA)	H (35kA)	L (65kA)
PR221DS-I	600 A	6000 A (600...6000 A)	T5N600E5W	T5S600E5W	T5H600E5W	T5L600E5W

Tmax T6 800 A - FIXED (F) 3 poles - CSA / UL recognized (Discount DS-ST)

Iu (40°C) = 800 A - Front terminals (F)

Instantaneous only electronic trip unit - 600V AC	Nominal current		Part number			
	In	I ₃	N (20kA)	S (25kA)	H (35kA)	L (42kA)
PR221DS-I	600 A	6000 A (600...6000 A)	T6N600E5W	T6S600E5W	T6H600E5W	T6L600E5W
PR221DS-I	800 A	8000 A (800...8000 A)	T6N800E5W	T6S800E5W	T6H800E5W	T6L800E5W

Part numbers

Molded Case Circuit Breakers

Tmax T7 1000 A - FIXED (F) 3 poles - CSA / UL recognized (Discount DS-ST)

Iu (40°C) = 1000 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	S (25kA)	H (50kA)	L (65kA)
PR231/P-I	10000 A (1000...10000 A)	T7S1000MW	T7H1000MW	T7L1000MW

Tmax T7 1200 A - FIXED (F) 3 poles - CSA / UL recognized (Discount DS-ST)

Iu (40°C) = 1200 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	S (25kA)	H (50kA)	L (65kA)
PR231/P-I	12000 A (1200...12000 A)	T7S1200MW	T7H1200MW	T7L1200MW

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Tmax T7M 1000 A - FIXED (F) 3 poles - CSA / UL recognized (Discount DS-ST)

Iu (40°C) = 1000 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	S (25kA)	H (50kA)	L (65kA)
PR231/P-I	10000 A (1000...10000 A)	T7MS1000MW	T7MH1000MW	T7ML1000MW

Tmax T7M 1200 A - FIXED (F) 3 poles - CSA / UL recognized (Discount DS-ST)

Iu (40°C) = 1200 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current	Part number		
	In	S (25kA)	H (50kA)	L (65kA)
PR231/P-I	12000 A (1200...12000 A)	T7M1200MW	T7MH1200MW	T7ML1200MW

Part numbers

Molded Case Circuit Breakers

Tmax T1 100 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST) lu (40°C) = 100 A - Front terminals for copper/aluminium cables (FC CuAl)			
Molded case switch - 347V AC / 500V DC	Nominal current		Part number
	In	I ₃	N (2kA)
MCS	100 A	1000 A ⁽¹⁾	T1N100DL
(1) Magnetic override			

Tmax T1 100 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST) lu (40°C) = 100 A - Front terminals for copper/aluminium cables (FC CuAl)			
Molded case switch - 347V AC / 500V DC	Nominal current		Part number
			N (2kA)
MCS	100 A	1000 A ⁽¹⁾	T1N100DL-4
(1) Magnetic override			

Tmax T3 225 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST) lu (40°C) = 225 A - Front terminals (F)			
Molded case switch - 347V AC / 500V DC	Nominal current		Part number
	In	I ₃	S (3.6kA)
MCS	150 A	1500 A ⁽¹⁾	T3S150DW
MCS	225 A	2250 A ⁽¹⁾	T3S225DW
(1) Magnetic override			

Tmax T3 225 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST) lu (40°C) = 225 A - Front terminals (F)			
Molded case switch - 347V AC / 500V DC	Nominal current		Part number
	In	I ₃	S (3.6kA)
MCS	150 A	1500 A ⁽¹⁾	T3S150DW-4
MCS	225 A	2250 A ⁽¹⁾	T3S225DW-4
(1) Magnetic override			

Part numbers

Molded Case Circuit Breakers

Tmax Ts3 150 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
Iu (40°C) = 150 A - Front terminals (F)

Molded case switch - 600V AC / 600V DC	Nominal current		Part number
	In	I ₃	H (6.5kA)
MCS	150 A	1500 A ⁽¹⁾	Ts3H150DW
(1) Magnetic override			

Tmax Ts3 150 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
Iu (40°C) = 150 A - Front terminals (F)

Molded case switch - 600V AC / 600V DC	Nominal current		Part number
	In	I ₃	H (6.5kA)
MCS	150 A	1500 A ⁽¹⁾	Ts3H150DW-4
(1) Magnetic override			

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Tmax Ts3 225 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
Iu (40°C) = 225 A - Front terminals (F)

Molded case switch - 480V AC / 500V DC	Nominal current		Part number
	In	I ₃	H (6.5kA)
MCS	150 A	1500 A ⁽¹⁾	Ts3H225DW
(1) Magnetic override			

Tmax Ts3 225 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
Iu (40°C) = 225 A - Front terminals (F)

Molded case switch - 480V AC / 500V DC	Nominal current		Part number
	In	I ₃	H (6.5kA)
MCS	150 A	1500 A ⁽¹⁾	Ts3H225DW-4
(1) Magnetic override			

Part numbers

Molded Case Circuit Breakers

Tmax T4 250 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 250 A - Front terminals (F)

Molded case switch - 600V AC / 600V DC	Nominal current		Part number				
	In	I ₃	N (3.6kA)	S (3.6kA)	H (3.6kA)	L (3.6kA)	V (3.6kA)
MCS	250 A	3000 A ⁽¹⁾	T4N250DW	T4S250DW	T4H250DW	T4L250DW	T4V250DW

(1) Magnetic override

Tmax T4 250 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 250 A - Front terminals (F)

Molded case switch - 600V AC / 600V DC	Nominal current		Part number				
	In	I ₃	H (3.6kA)				
MCS	250 A	3000 A ⁽¹⁾	T4H250DW-4				

(1) Magnetic override

Tmax T5 400 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 400 A - Front terminals (F)

Molded case switch - 600V AC / 600V DC	Nominal current		Part number				
	In	I ₃	N (6kA)	S (6kA)	H (6kA)	L (6kA)	V (6kA)
MCS	400 A	5000 A ⁽¹⁾	T5N400DW	T5S400DW	T5H400DW	T5L400DW	T5V400DW

(1) Magnetic override

Tmax T5 400 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 400 A - Front terminals (F)

Molded case switch - 600V AC / 600V DC	Nominal current		Part number				
	In	I ₃	H (6kA)				
MCS	400 A	5000 A ⁽¹⁾	T5H400DW-4				

(1) Magnetic override

Tmax T5 600 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)



Iu (40°C) = 600 A - Front terminals (F)



Molded case switch - 600V AC / 600V DC	Nominal current		Part number				
	In	I ₃	N (6kA)	S (6kA)	H (6kA)	L (6kA)	V (6kA)
MCS	600 A	6000 A ⁽¹⁾	T5N600DW	T5S600DW	T5H600DW	T5L600DW	T5V600DW

(1) Magnetic override



Part numbers



Molded Case Circuit Breakers

Tmax T6 800 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)			
Iu (40°C) = 800 A - Front terminals (F)			
Molded case switch - 600V AC / 600V DC	Nominal current		Part number
			H (15kA)
MCS	800 A	10000 A ⁽¹⁾	T6H800DW
(1) Magnetic override			

Tmax T6 800 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)			
Iu (40°C) = 800 A - Front terminals (F)			
Molded case switch - 600V AC / 600V DC	Nominal current		Part number
			H (15kA)
MCS	800 A	10000 A ⁽¹⁾	T6H800DW-4
(1) Magnetic override			



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Tmax T7 1200 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)			
Iu (40°C) = 1200 A - Front terminals (F)			
Molded case switch - 600V AC	Nominal current		Part number
			H (20kA)
MS (T7)	1200 A	12000 A ⁽¹⁾	T7H1200DW
MS (T7M)	1200 A	12000 A ⁽¹⁾	T7MH1200DW
(1) Magnetic override			



Tmax T7 1200 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)			
Iu (40°C) = 1200 A - Front terminals (F)			
Molded case switch - 600V AC	Nominal current		Part number
			H (20kA)
MS (T7)	1200 A	12000 A ⁽¹⁾	T7H1200DW-4
MS (T7M)	1200 A	12000 A ⁽¹⁾	T7MH1200DW-4
(1) Magnetic override			

Part numbers

Molded Case Circuit Breakers

Tmax T8 2000/2500/3000 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST8)			
Iu (40°C) = 2000/2500/3000 A - Front terminals (F)			
Molded case switch - 600V AC	Nominal current		Part number
			V (40kA)
MCS	2000 A	40000 A ⁽¹⁾	T8V20DW
MCS	2500 A	40000 A ⁽¹⁾	T8V25DW
MCS	3000 A	40000 A ⁽¹⁾	T8V30DW

(1) Magnetic override

Tmax T8 2000/2500/3000 A - FIXED (F) 4 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST8)			
Iu (40°C) = 2000/2500/3000 A - Front terminals (F)			
Molded case switch - 600V AC	Nominal current		Part number
			V (40kA)
MCS	2000 A	40000 A ⁽¹⁾	T8V20DW-4
MCS	2500 A	40000 A ⁽¹⁾	T8V25DW-4
MCS	3000 A	40000 A ⁽¹⁾	T8V30DW-4

(1) Magnetic override

Part numbers

Molded Case Circuit Breakers

Tmax T2 100 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
 Iu (40°C) = 100 A - Front terminals (F)

Thermal-Magnetic trip unit with fixed tresholds - 480V AC	Nominal current		Part number
	In	I ₃	H (65kA)
TMF	15 A	500 A	T2H015TW
TMF	20 A	500 A	T2H020TW
TMF	25 A	500 A	T2H025TW
TMF	30 A	500 A	T2H030TW
TMF	40 A	500 A	T2H040TW
TMF	50 A	500 A	T2H050TW
TMF	60 A	600 A	T2H060TW
TMF	70 A	700 A	T2H070TW
TMF	80 A	800 A	T2H080TW
TMF	90 A	900 A	T2H090TW
TMF	100 A	1000 A	T2H100TW

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Tmax T2 100 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)
 Iu (40°C) = 100 A - Front terminals (F)

Electronic trip unit (AC only) - 480V AC	Nominal current		Part number
	In		H (65kA)
PR221DS-LS/I	25 A (10...25 A)		T2H025BW
PR221DS-LS/I	60 A (24...60 A)		T2H060BW
PR221DS-LS/I	100 A (40...100 A)		T2H100BW

Part numbers

Molded Case Circuit Breakers

Tmax T2 100 A - FIXED (F) 3 poles 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)			
Iu (40°C) = 100 A - Front terminals (F)			
Thermal-Magnetic trip unit with fixed tresholds - 480V AC	Nominal current		Part number
	In	I ₃	HQ (65kA)
TMF	15 A	500 A	T2HQ015TW
TMF	20 A	500 A	T2HQ020TW
TMF	25 A	500 A	T2HQ025TW
TMF	30 A	500 A	T2HQ030TW
TMF	40 A	500 A	T2HQ040TW
TMF	50 A	500 A	T2HQ050TW
TMF	60 A	600 A	T2HQ060TW
TMF	70 A	700 A	T2HQ070TW
TMF	80 A	800 A	T2HQ080TW
TMF	90 A	900 A	T2HQ090TW
TMF	100 A	1000 A	T2HQ100TW

Tmax T2 100 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)		
Iu (40°C) = 100 A - Front terminals (F)		
Electronic trip unit (AC only) - 480V AC	Nominal current	Part number
	In	HQ (65kA)
PR221DS-LS/I	25 A (10...25 A)	T2HQ025BW
PR221DS-LS/I	60 A (24...60 A)	T2HQ060BW
PR221DS-LS/I	100 A (40...100 A)	T2HQ100BW

Part numbers

Molded Case Circuit Breakers

Tmax T4 250 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 100 A - Front terminals (F)

Thermal-Magnetic trip unit TMF/TMD/TMA - 600V AC / 600V DC	Nominal current		Part number	
	In	I _Δ	H (35kA)	V (100kA)
TMF	20 A	500 A	T4H020TW	T4V020TW
TMD	30 A (21...30 A)	500 A	T4H030TW	T4V030TW
TMD	40 A (28...40 A)	500 A	T4H040TW	T4V040TW
TMD	50 A (35...50 A)	500 A	T4H050TW	T4V050TW
TMA	80 A (56...80 A)	800 A (400...800 A)	T4H080TW	T4V080TW
TMA	100 A (70...100 A)	1000 A (500...1000 A)	T4H100TW	T4V100TW
TMA	125 A (88...125 A)	1250 A (625...1250 A)	T4H125TW	T4V125TW
TMA	150 A (105...150 A)	1500 A (750...1500 A)	T4H150TW	T4V150TW
TMA	200 A (140...200 A)	2000 A (1000...2000 A)	T4H200TW	T4V200TW
TMA	250 A (175...250 A)	2500 A (1250...2500 A)	T4H250TW	T4V250TW

Tmax T4 100 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 100 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number	
	In		H (35kA)	V (100kA)
PR221DS-LS/I	100 A (40...100 A)		T4H100BW	T4V100BW
PR222DS-LSI	100 A (40...100 A)		T4H100CW	T4V100CW
PR222DS-LSIG	100 A (40...100 A)		T4H100EW	T4V100EW

Tmax T4 150 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (60°C) = 150 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number	
	In		H (35kA)	V (100kA)
PR221DS-LS/I	150 A (60...150 A)		T4H150BW	T4V150BW
PR222DS-LSI	150 A (60...150 A)		T4H150CW	T4V150CW
PR222DS-LSIG	150 A (60...150 A)		T4H150EW	T4V150EW

Tmax T4 250 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (60°C) = 250 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number	
	In		H (35kA)	V (100kA)
PR221DS-LS/I	250 A (100...250 A)		T4H250BW	T4V250BW
PR222DS-LSI	250 A (100...250 A)		T4H250CW	T4V250CW
PR222DS-LSIG	250 A (100...250 A)		T4H250EW	T4V250EW

Part numbers

Molded Case Circuit Breakers

Tmax T4 250 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 100 A - Front terminals (F)

Thermal-Magnetic trip unit TMF/TMD/TMA - 600V AC / 600V DC	Nominal current		Part number	
	In	I ₃	HQ (35kA)	VQ (100kA)
TMF	20 A	500 A	T4HQ020TW	T4VQ020TW
TMD	30 A (21...30 A)	500 A	T4HQ030TW	T4VQ030TW
TMD	40 A (28...40 A)	500 A	T4HQ040TW	T4VQ040TW
TMD	50 A (35...50 A)	500 A	T4HQ050TW	T4VQ050TW
TMA	80 A (56...80 A)	800 A (400...800 A)	T4HQ080TW	T4VQ080TW
TMA	100 A (70...100 A)	1000 A (500...1000 A)	T4HQ100TW	T4VQ100TW
TMA	125 A (88...125 A)	1250 A (625...1250 A)	T4HQ125TW	T4VQ125TW
TMA	150 A (105...150 A)	1500 A (750...1500 A)	T4HQ150TW	T4VQ150TW
TMA	200 A (140...200 A)	2000 A (1000...2000 A)	T4HQ200TW	T4VQ200TW
TMA	250 A (175...250 A)	2500 A (1250...2500 A)	T4HQ250TW	T4VQ250TW

Tmax T4 100 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 100 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number	
	In		HQ (35kA)	VQ (100kA)
PR221DS-LS/I	100 A (40...100 A)		T4HQ100BW	T4VQ100BW
PR222DS-LSI	100 A (40...100 A)		T4HQ100CW	T4VQ100CW
PR222DS-LSIG	100 A (40...100 A)		T4HQ100EW	T4VQ100EW

Tmax T4 150 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (60°C) = 150 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number	
	In		HQ (35kA)	VQ (100kA)
PR221DS-LS/I	150 A (60...150 A)		T4HQ150BW	T4VQ150BW
PR222DS-LSI	150 A (60...150 A)		T4HQ150CW	T4VQ150CW
PR222DS-LSIG	150 A (60...150 A)		T4HQ150EW	T4VQ150EW

Tmax T4 250 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (60°C) = 250 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number	
	In		HQ (35kA)	VQ (100kA)
PR221DS-LS/I	250 A (100...250 A)		T4HQ250BW	T4VQ250BW
PR222DS-LSI	250 A (100...250 A)		T4HQ250CW	T4VQ250CW
PR222DS-LSIG	250 A (100...250 A)		T4HQ250EW	T4VQ250EW

Part numbers

Molded Case Circuit Breakers

Tmax T5 300 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

I_u (40°C) = 300 A - Front terminals (F)

Thermal-Magnetic trip unit TMA - 600V AC / 600V DC	Nominal current		Part number	
	In	I _s	H (35kA)	V (100kA)
TMA	300 A (210...300 A)	3000 A (1500...3000 A)	T5H300TW	T5V300TW

Tmax T5 300 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

I_u (40°C) = 300 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number	
	In		H (35kA)	V (100kA)
PR221DS-LS/I	300 A (120...300 A)		T5H300BW	T5V300BW
PR222DS-LSI	300 A (120...300 A)		T5H300CW	T5V300CW
PR222DS-LSIG	300 A (120...300 A)		T5H300EW	T5V300EW

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Tmax T5 400 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

I_u (40°C) = 400 A - Front terminals (F)

Thermal-Magnetic trip unit TMA - 600V AC / 600V DC	Nominal current		Part number	
	In	I _s	H (35kA)	V (100kA)
TMA	400 A (280...400 A)	4000 A (2000...4000 A)	T5H400TW	T5V400TW

Tmax T5 400 A - FIXED (F) 3 poles - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

I_u (40°C) = 400 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number	
	In		H (35kA)	V (100kA)
PR221DS-LS/I	400 A (160...400 A)		T5H400BW	T5V400BW
PR222DS-LSI	400 A (160...400 A)		T5H400CW	T5V400CW
PR222DS-LSIG	400 A (160...400 A)		T5H400EW	T5V400EW

Part numbers

Molded Case Circuit Breakers

Tmax T5 300 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 300 A - Front terminals (F)

Thermal-Magnetic trip unit TMA - 600V AC / 600V DC	Nominal current		Part number	
	In	I ₃	HQ (35kA)	VQ (100kA)
TMA	300 A (210...300 A)	3000 A (1500...3000 A)	T5HQ300TW	T5VQ300TW

Tmax T5 300 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 300 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number	
	In		HQ (35kA)	VQ (100kA)
PR221DS-LS/I	300 A (120...300 A)		T5HQ300BW	T5VQ300BW
PR222DS-LSI	300 A (120...300 A)		T5HQ300CW	T5VQ300CW
PR222DS-LSIG	300 A (120...300 A)		T5HQ300EW	T5VQ300EW

Tmax T5 400 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 400 A - Front terminals (F)

Thermal-Magnetic trip unit TMA - 600V AC / 600V DC	Nominal current		Part number	
	In	I ₃	HQ (35kA)	VQ (100kA)
TMA	400 A (280...400 A)	4000 A (2000...4000 A)	T5HQ400TW	T5VQ400TW

Tmax T5 400 A - FIXED (F) 3 poles - 100% rated - CSA C22.2 No 5 / UL489 listed (Discount DS-ST)

Iu (40°C) = 400 A - Front terminals (F)

Electronic trip unit (AC only) - 600V AC	Nominal current		Part number	
	In		HQ (35kA)	VQ (100kA)
PR221DS-LS/I	400 A (160...400 A)		T5HQ400BW	T5VQ400BW
PR222DS-LSI	400 A (160...400 A)		T5HQ400CW	T5VQ400CW
PR222DS-LSIG	400 A (160...400 A)		T5HQ400EW	T5VQ400EW

Part numbers

Molded Case Circuit Breakers



Tmax Plug-in base with front terminals (F) - T2...T3 (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	3 poles	4 poles
T2	KT2PFF	KT2PFF-4
T3	KT3PFF	KT3PFF-4

Tmax Plug-in base with front extended terminals (EF) - Ts3...T5 (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	3 poles	4 poles
Ts3	KTs3PFF	KTs3PFF-4
T4	KT4PFEF	KT4PFEF-4
T5 400 A	KT5PFEF	KT5PFEF-4
T5 600 A	KT5PFEF6	KT5PFEF6-4

Tmax Plug-in base with rear vertical terminals (VR) - T4...T5 (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	3 poles	4 poles
T4	KT4PFVR	KT4PFVR-4
T5 400 A	KT5PFVR	KT5PFVR-4
T5 600 A	KT5PFVR6	KT5PFVR6-4

Tmax Plug-in base with rear horizontal terminals (HR) - T4...T5 (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	3 poles	4 poles
T4	KT4PFHR	KT4PFHR-4
T5 400 A	KT5PFHR	KT5PFHR-4
T5 600 A	KT5PFHR6	KT5PFHR6-4

Tmax Plug-in base with rear threaded terminals (R) - Ts3 (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	3 poles	4 poles
Ts3	KTs3PFR	KTs3PFR-4

Tmax accessory connectors and adaptors - T2...T6 (Discount DS-STA)

Required when adding accessories to plug-in type breakers



Accessory type	Part number	
	T2...T3	T4...T6
Shunt trip / Undervoltage	KT3PC-3	KT6ADP-5
1 form C + 1 BA	KT3PC-6	KT6ADP-6
3 form C + 1BA	KT3PC-12	KT6ADP-12
Stored energy motor	-	KT6ADP-10
Stored energy motor + Shunt trip / Undervoltage	-	KT6ADP-10

Part numbers

Molded Case Circuit Breakers



Tmax Draw-out cradle with front terminals (F) - Ts3 (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	3 poles	4 poles
Ts3	KTs3WFC	KTs3WFC-4

Tmax Draw-out cradle with rear terminals (R) - Ts3 (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	3 poles	4 poles
Ts3	KTs3WFR	KTs3WFR-4

Tmax Draw-out cradle with front extended terminals (EF) - Ts3...T6 (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	3 poles	4 poles
Ts3	KTs3WFF	KTs3WFF-4
T4	KT4WFEF	KT4WFEF-4
T5 400 A	KT5WFEF	KT5WFEF-4
T5 600 A	KT5WFEF6	KT5WFEF6-4
T6	KT6WFEF	KT6WFEF

Tmax Draw-out cradle with rear vertical terminals (VR) - T4...T6 (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	3 poles	4 poles
T4	KT4WFVR	KT4WFVR-4
T5 400 A	KT5WFVR	KT5WFVR-4
T5 600 A	KT5WFVR6	KT5WFVR6-4
T6	KT6WFVR	KT6WFVR-4

Tmax Draw-out cradle with rear horizontal terminals (HR) - T4...T6 (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	3 poles	4 poles
T4	KT4WFHR	KT4WFHR-4
T5 400 A	KT5WFHR	KT5WFHR-4
T5 600 A	KT5WFHR6	KT5WFHR6-4
T6	KT6WFHR	KT6WFHR-4



Tmax Draw-out cradle with rear adjustable terminals (RC) - T7 / T7M (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	3 poles	4 poles
T7...T7M	KT7WFRC	KT7WFRC-4

Part numbers

Molded Case Circuit Breakers



Tmax conversion kits from FIXED into moving part of PLUG-IN - Ts3...T5 (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	3 poles	4 poles
Ts3	KTs3PMK	KTs3PMK-4
T2	KT2PMK	KT2PMK-4
T3	KT3PMK	KT3PMK-4
T4	KT4PMK	KT4PMK-4
T5 400 A	KT5PMK	KT5PMK-4
T5 600 A	KT5PMK6	KT5PMK6-4

The plug-in version must be composed as follow:

- a) Fixed circuit-breaker
- b) Conversion kit for fixed into moving part of plug-in
- c) Plug-in base



Tmax conversion kits from FIXED into moving part of DRAW-OUT - Ts3...T7 (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	3 poles	4 poles
Ts3	KTs3WMK	KTs3WMK-4
T4	KT4WMK	KT4WMK-4
T5 400 A	KT5WMK	KT5WMK-4
T5 600 A	KT5WMK6	KT5WMK6-4
T6	KT6WMK	KT6WMK-4
T7...T7M	KT7WMK	KT7WMK-4

The plug-in version must be composed as follow:

- a) Fixed circuit-breaker
- b) Conversion kit for fixed into moving part of draw out
- c) Cradle
- d) Front lever, rotary handle or motor operator (only for T4, T5 and T6)
- e) Sliding contact blocks if circuit breaker is automatic or fitted with electrical accessories (only for T7)



Sliding contact blocks for DRAW-OUT type - T7 / T7M (Discount DS-STA)

CSA / UL listed

Description	Part number	
	T7	T7M
Left block for breaker MP	KT7XSCMP-L	KT7XSCMP-L
Center block for breaker MP	KT7XSCMP-C	KT7XSCMP-C
Right block for breaker MP	KT7XSCMP-R	KT7XSCMP-R
Left block for cradle	KT7XSCFP-L	KT7MXSCFP-L
Center block for cradle	KT7XSCFP-C	KT7XSCFP-C
Right block for cradle	KT7XSCFP-R	KT7XSCFP-R

Note: Moving part of a circuit breaker fitted with electronic accessories or PR331/P and PR332/P electronic trip units is supplied as standard with blocks for the connection, while blocks for cradle must always be ordered

Part numbers

Molded Case Circuit Breakers



HR/VR terminals for cradle - T7 / T7M (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	3 poles	4 poles
T7...T7M	KT7XHRVR-3	KT7XHRVR-4



Terminal covers for cradle TCFP - Ts3...T5 (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	3 poles	4 poles
Ts3	KTs3TCFP-3	KTs3TCFP-4
T4	KT4TCFP-3	KT4TCFP-4
T5	KT5TCFP-3	KT5TCFP-4

Part numbers

Molded Case Circuit Breakers



Shunt trip SOR - T1...T6 (Discount DS-STA)		
CSA / UL listed		
Control voltage	Part number	
	T1...T3	T4...T6
12V DC	KT3S9	KT6S9
24...30V AC/DC	KT3S8	KT6S8
48...60V AC/DC	KT3S7	KT6S7
110...125V AC/DC	KT3S4	KT6S4
380...440V AC	KT3S3	KT6S3
220...250V AC/DC	KT3S2	KT6S2
480...500V AC	KT3S1	KT6S1



Shunt trip SOR - Ts3. Connector required (Discount DS-STA)		
CSA / UL listed		
Control voltage	Part number	
	Ts3	
12V DC	KTs3S9	
24V AC/DC	KTs3S8	
48V AC/DC	KTs3S7	
110...125V AC/DC	KTs3S4*	
220...250V AC/DC	KTs3S2	
480V AC	KTs3S1	

* Connector for fixed mounted included

Shunt trip connector - Ts3. Required (Discount DS-STA)		
CSA / UL listed		
Breaker type	Part number	
	Fixed	Draw-out
Ts3	KTs3C-SU	KTs3C-SUP

Shunt trip with permanent supply:
For remote opening of circuit breaker.
Guaranteed operation between
75-110% of the rated power
supply voltage.
These shunt trips have much
lower power consumption.

Shunt trip with permanent operation PS-SOR - T4...T6 (Discount DS-STA)		
CSA / UL listed		
Control voltage	Part number	
	T4...T6	
24...30V DC	KT6SP4	
110...120V AC/DC	KT6SP8	

Shunt trip with permanent operation PS-SOR - Ts3. Connector required (Discount DS-STA)		
CSA / UL listed		
Control voltage	Part number	
	Ts3	
24V DC	KTs3SP4	
120V AC	KTs3SP8	

Part numbers

Molded Case Circuit Breakers



Shunt trip YO - T7 / T7M (Discount DS-STa)
CSA / UL listed

Control voltage	Part number	
	T7...T7M	
24V AC/DC	KT7XS0	
30V AC/DC	KT7XS9	
48V AC/DC	KT7XS8	
60V AC/DC	KT7XS7	
110...120V AC/DC	KT7XS6	
120...127V AC/DC	KT7XS5	
220...240V AC/DC	KT7XS4	
250V AC/DC	KT7XS3	
380...440V AC	KT7XS2	
440...480V AC	KT7XS1	



Shunt trip YO/YO2 - T8 (Discount DS-ST8)
CSA / UL listed

Control voltage	Part number	
	YO-T8	YO2-T8
24V AC/DC	KT8ES0	KT8ES0-2
30V AC/DC	KT8ES9	KT8ES9-2
48V AC/DC	KT8ES8	KT8ES8-2
60V AC/DC	KT8ES7	KT8ES7-2
110...120V AC/DC	KT8ES6	KT8ES6-2
120...127V AC/DC	KT8ES5	KT8ES5-2
220...240V AC/DC	KT8ES4	KT8ES4-2
250V AC/DC	KT8ES3	KT8ES3-2
380...440V AC	KT8ES2	KT8ES2-2
440...480V AC	KT8ES1	KT8ES1-2

Part numbers

Molded Case Circuit Breakers



Undervoltage release UVR - T1...T6 (Discount DS-STA)

CSA / UL listed

Control voltage	Part number	
	T1...T3	T4...T6
24...30V AC/DC	KT3U8	KT6U8
48V AC/DC	KT3U7	KT6U7
60V AC/DC	KT3U5	KT6U5
110...125V AC/DC	KT3U4	KT6U4
380...440V AC	KT3U3	KT6U3
220...250V AC/DC	KT3U2	KT6U2
480...500V AC	KT3U1	KT6U1

Undervoltage release UVR - Ts3. Connector required (Discount DS-STA)

CSA / UL listed

Control voltage	Part number	
	T7...T7M	
24V AC/DC	KTs3U8	
48V AC/DC	KTs3U7	
110...125V DC	KTs3U6	
220...250V DC	KTs3U5	
110...127V AC	KTs3U4	
24V AC	KTs3U3	
220...250V AC	KTs3U2	
480V AC	KTs3U1	

Undervoltage connector - Ts3. Required (Discount DS-STA)

CSA / UL listed

Breaker type	Part number	
	Fixed	Draw-out
Ts3	KTs3C-SU	KTs3C-SUP

Part numbers

Molded Case Circuit Breakers



Undervoltage release UVR - T7 / T7M (Discount DS-STA)
CSA / UL listed

Control voltage	Part number
	T7...T7M
24V AC/DC	KT7XU0
30V AC/DC	KT7XU9
48V AC/DC	KT7XU8
60V AC/DC	KT7XU7
110...120V AC/DC	KT7XU6
120...127V AC/DC	KT7XU5
220...240V AC/DC	KT7XU4
250V AC/DC	KT7XU3
380...440V AC	KT7XU2
440...480V AC	KT7XU1



Undervoltage release UVR - T8 (Discount DS-ST8)
CSA / UL listed

Control voltage	Part number
	T8
24V AC/DC	KT8EU0
30V AC/DC	KT8EU9
48V AC/DC	KT8EU8
60V AC/DC	KT8EU7
110...120V AC/DC	KT8EU6
120...127V AC/DC	KT8EU5
220...240V AC/DC	KT8EU4
250V AC/DC	KT8EU3
380...440V AC	KT8EU2
440...480V AC	KT8EU1

Part numbers

Molded Case Circuit Breakers



Shunt closing release YC - T7M (Discount DS-STA)

CSA / UL listed

Control voltage	Part number
	T7M
24V AC/DC	KT7MXC0
30V AC/DC	KT7MXC9
48V AC/DC	KT7MXC8
60V AC/DC	KT7MXC7
110...120V AC/DC	KT7MXC6
120...127V AC/DC	KT7MXC5
220...240V AC/DC	KT7MXC4
250V AC/DC	KT7MXC3
380...440V AC	KT7MXC2
440...480V AC	KT7MXC1

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Shunt closing release YC - T8 (Discount DS-ST8)

CSA / UL listed

Control voltage	Part number
	T8
24V AC/DC	KT8EC0
30V AC/DC	KT8EC9
48V AC/DC	KT8EC8
60V AC/DC	KT8EC7
110...120V AC/DC	KT8EC6
120...127V AC/DC	KT8EC5
220...240V AC/DC	KT8EC4
250V AC/DC	KT8EC3
380...440V AC	KT8EC2
440...480V AC	KT8EC1

Part numbers

Molded Case Circuit Breakers



Auxiliary contacts AUX - T1...T6 (Discount DS-STa)

CSA / UL listed

Control voltage	Part number	
	T1...T3	T4...T6
1 form C + 1 BA 250V AC/DC	KT3AS ⁽¹⁾	KT6AS
3 form C + 1 BA 250V AC/DC	KT3AS3 ⁽¹⁾	KT6AS3
2 form C 400V AC	-	KT6AS2
3 form C + 1 BA 24V DC	-	KT6AS3L
Manual / Remote signalling contact for stored energy motor operator	-	KT6MA

(1) Can't be fitted with T2 equipped with PR221DS electronic trip unit

Auxiliary contacts AUX - T2 with PR221DS (Discount DS-STa)

Control voltage	Part number
	T2
2 form C + 1 BA for PR221DS	KT2AS2-E
1 form C + 1 BA + 1S51 for PR221DS	KT2AS-E

Auxiliary contacts AUX - T4...T6 with PR222DS/PD-A only (Discount DS-STa)

Control voltage	Part number	
	T4...T5	T6
1 form C + 1 BA for PR222DS/PD-A	KT5AS-E	KT6AS-E

Auxiliary contacts AUX - Ts3. Connector required (Discount DS-STa)

CSA / UL listed

Control voltage	Part number
	Ts3
2 form C 250V AC/DC	KTs3AS
1 form C + 1 BA 250V AC/DC	KTs3BA

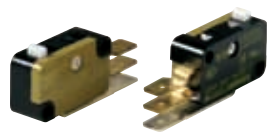
Auxiliary contacts connector - Ts3. Required (Discount DS-STa)

CSA / UL listed

Breaker type	Part number	
	Fixed	Draw-out
Ts3	KTs3C-AB	KTs3C-ABP

Part numbers

Molded Case Circuit Breakers



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Auxiliary contacts AUX - T7 / T7M (Discount DS-STA)

CSA / UL listed

Type	Part number	
	T7	T7M
1 form C + 1 BA 400V AC	KT7AS	-
2 form C 400V AC	KT7AS2	KT7XAS2
1 form C + 1 BA 24V DC	KT7ASL	-
2 form C 24V DC	KT7XAS2L	KT7XAS2L
1 S51 250V AC	KT7S51	KT7XS51
Ready to close contact 24V DC	-	KT7XRTC24
Ready to close contact 250V AC/DC	-	KT7XRTC250
Spring charged 24 V DC	-	KT7XSC24
Spring charged 250V AC/DC	-	KT7XSC250
1 BA + remote reset 24...30V AC/DC	-	KT7XETBAR9
1 BA + remote reset 110...130V AC/DC	-	KT7XETBAR5
1 BA + remote reset 200...240V AC/DC	-	KT7XETBAR4

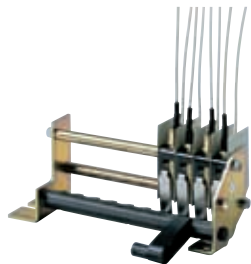
Note: For T7/T7M in draw-out version, sliding contact blocks for cradle and breaker are necessary

Possible standard combinations are (excluding S51, RTC and SC):

- T7: a) 2 form C + 1 BA
b) 3 form C + 1 BA
c) 2 form C
- T7M: a) 2 form C
b) 4 form C

Auxiliary contacts AUX - T8 (Discount DS-ST8)

CSA / UL listed



Type	Part number	
	T8	
4 form C for PR232-PR331	KT8AS4	
4 form C for PR332 ⁽¹⁾	KT8AS4-332	
4 form C for PR232-PR331 low voltage 24V	KT8AS4L	
4 form C for PR332 low voltage 24V	KT8AS4L-332	
1 BA	KT8ETBA	
1 BA + remote reset 24...30V AC/DC	KT8ETBAR9	
1 BA + remote reset 110...130V AC/DC	KT8ETBAR5	
1 BA + remote reset 220...240V AC/DC	KT8ETBAR4	
1 NC contact for UVR de-energized	KT8EUE10	
1 NO contact for UVR de-energized	KT8EUE01	

(1) 4 auxiliary contacts supplied standard on T8 equipped with PR332. To be ordered as spare part.

Part numbers

Molded Case Circuit Breakers



Early auxiliary contacts AUE - T1...T7 (Discount DS-STA)				
Type	Part number			
	T1...T3	T4...T5	T6	T7
Early make contact on rotary handle	KT3EM	KT5EM	KT6EM	KT7EM

Note: For T7 in draw-out version, sliding contact blocks for cradle and breaker are necessary



Auxiliary position contacts AUP - T4...T6 (Discount DS-STA)	
Type	Part number
	T4...T6
1 form C RACKED-IN contact 400V AC/DC	KT6AUPI
1 form C RACKED-IN contact 24V DC	KT6AUPI24V
1 form C RACKED-OUT contact 400V AC/DC	KT6AUPP
1 form C RACKED-OUT contact 24V DC	KT6AUPP24V



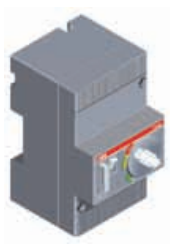
Auxiliary position contacts AUP - T7 / T7M (Discount DS-STA)	
CSA / UL listed	
Type	Part number
	T7...T7M
Position contacts 24V DC	KT7XAUP24
Position conacts 250V AC	KT7XAUP250



Mechanical counter - T7M...T8 (Discount DS-STA & DS-ST8)		
Type	Part number	
	T7M	T8
Operation counter	KT7XEMC	KT8EMC

Part numbers

Molded Case Circuit Breakers



Solenoid motor operator MOS - T1...T3 (Discount DS-STA)	
CSA / UL listed	
Control voltage	Part number
	T1...T3
TOP mounted 48...60V DC	KT3M1
TOP mounted 110...250V AC/DC	KT3M2



Direct action motor operator - Ts3. Connector required (Discount DS-STA)	
CSA / UL listed	
Control voltage	Part number
	Ts3
24V DC	KTs3M8
48V DC	KTs3M7
100...125V AC/DC	KTs3M4
220...250V AC/DC	KTs3M2

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Direct action motor operator connector - Ts3. Required (Discount DS-STA)		
CSA / UL listed		
Breaker type	Part number	
	Fixed	Draw-out
Ts3	KTs3C-M	KTs3C-MP



Stored energy motor operator MOE - T4...T6 (Discount DS-STA)		
CSA / UL listed		
Control voltage	Part number	
	T4...T5	T6
24V DC	KT5M8	KT6M8
48...60V DC	KT5M7	KT6M7
110...125V AC/DC	KT5M4	KT6M4
380V AC	KT5M3	KT6M3
220...250V AC/DC	KT5M2	KT6M2

Stored energy motor operator with electronics MOE-E - T4...T6 (Discount DS-STA)		
IEC listed		
Control voltage	Part number	
	T4...T5	T6
24V DC	KT5M8-E	KT6M8-E
48...60V DC	KT5M7-E	KT6M7-E
110...125V AC/DC	KT5M4-E	KT6M4-E
380V AC	KT5M3-E	KT6M3-E
220...250V AC/DC	KT5M2-E	KT6M2-E

Part numbers

Molded Case Circuit Breakers

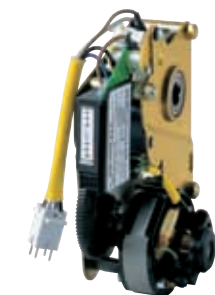


Spring charging motor - T7M (Discount DS-STA)

CSA / UL listed

Control voltage	Part number
	T7M
24...30V AC/DC	KT7MXM9
48...60V AC/DC	KT7MXM7
100...130V AC/DC	KT7MXM5
220...250V AC/DC	KT7MXM3
380...415V AC	KT7MXM2

Note: For T7M in draw-out version, sliding contact blocks for cradle and breaker are necessary



Spring charging motor - T8 (Discount DS-ST8)

CSA / UL listed

Control voltage	Part number
	T8
24...30V AC/DC	KT8EM9
48...60V AC/DC	KT8EM7
100...130V AC/DC	KT8EM5
220...250V AC/DC	KT8EM3



CT for external neutral - T4...T6 (Discount DS-STA)

UL / CSA listed

Type	Part number		
	T4	T5	T6
CT for external neutral 100 A ⁽¹⁾	KT4NCT-100	-	-
CT for external neutral 150 A ⁽¹⁾	KT4NCT-150	-	-
CT for external neutral 250 A ⁽¹⁾	KT4NCT-250	-	-
CT for external neutral 300 A ⁽¹⁾	-	KT5NCT-300	-
CT for external neutral 400 A ⁽¹⁾	-	KT5NCT-400	-
CT for external neutral 600 A ⁽¹⁾	-	KT5NCT-600	KT6NCT-600
CT for external neutral 800 A ⁽¹⁾	-	-	KT6NCT-800

(1) X4 connector required to connect to trip unit

Current sensors for external neutral - T7...T8 (Discount DS-STA & DS-ST8)

UL / CSA listed

Type	Part number	
	T7...T7M	T8
Current sensors for external neutral 400...1200 A	KT7XNCT-1200	-
Current sensors for external neutral 1000...3000 A	-	KT8NCT-3000

X3-X4 connectors for external neutral - T4...T6 (Discount DS-STA)

UL / CSA listed

Type	Part number	
	Fixed	Plug-in / Draw-out
X3 connector for T4...T6 equipped with PR222DS trip unit	KT6CX3	KT6CX3-P
X4 connector for T4...T6 equipped with PR222DS trip unit	KT6CX4	KT6CX4-P

Part numbers

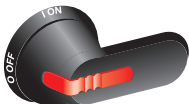
Molded Case Circuit Breakers



Rotary handle operators (Direct mounted) RHD - T1...T7 (Discount DS-STA)				
CSA / UL listed				
Type	Part number			
	T1...T3	T4...T5	T6	T7
Rotary handle FIXED / PLUG-IN	KT3RH	KT5RH	KT6RH	KT7RH
Rotary handle DRAW-OUT	-	KT5RHW	KT6RHW	KT7RH



KT3VD-M + KT3VD-S + KT3VD-H



OHB pistol type handle

Rotary handle operators (Variable depth) RHD - T1...T7 (Discount DS-STA)				
CSA / UL listed				
Type	Part number			
	T1...T3	T4...T5	T6	T7
Mechanism	KT3VD-M	KT5VD-M	KT6VD-M	KT7VD-M
NEMA 1 square type handle	KT3VD-H	KT5VD-H	KT6VD-H	KT7VD-H
NEMA 4, 4x pistol type black handle	OHB80L6	OHB125L10	OHB125L10	OHB175L10
NEMA 4, 4x pistol type yellow handle	OHY80L6	-	-	-
NEMA 1,3R,12 pistol type black handle	OHB65L6	OHB125J10X	OHB125J10X	OHB125J10X
NEMA 1,3R,12 pistol type yellow handle	OHY65L6	-	-	-
Shaft for pistol type handle	EXP6X430	EXP10X500	EXP10X500	EXP10X500
Shaft for square type handle	KT3VD-S	KT5VD-S	KT5VD-S	KT7VD-S

Note: A complete kit consists in 1 mechanism + 1 shaft + 1 handle. KT*VD-S shall only be used with KT*VD-H handle type



KTs3VD-M + KTs3VD-S + KTs3VD-H



OHB pistol type handle

Rotary handle operators (Direct mounted) RHD - Ts3 (Discount DS-STA)	
Type	Part number
	Ts3
Rotary handle FIXED / PLUG-IN	KTs3RH
Rotary handle DRAW-OUT	KTs3RHW

Rotary handle operators (Variable depth) RHD - Ts3 (Discount DS-STA)	
Type	Part number
	Ts3
Mechanism	KTs3VD-M
NEMA 1 square type handle	KTs3VD-H
NEMA 4, 4x pistol type black handle	OHB125L10
NEMA 1,3R,12 pistol type black handle	OHB125J10X
Shaft for pistol type handle	EXP10X500
Shaft for square type handle	KTs3VD-S

Note: A complete kit consists in 1 mechanism + 1 shaft + 1 handle. KTs3VD-S shall only be used with KTs3VD-H handle type

Part numbers

Molded Case Circuit Breakers



Cable operated flange handles - T1...T5 (Discount DS-STA & DS-HT)

CSA / UL listed

Type	Part number			
	T1...T2	T3	Ts3...T4	T5
Mechanism	MKCT2	MKCT3	MKCT4	MKCT5
NEMA 1,3R,12 grey painted handle	OHF1C12T	OHF1C12T	OHF1C12 ⁽¹⁾	OHF1C12 ⁽¹⁾
NEMA 4, 4x nickel plated handle	OHF1C4T	OHF1C4T	OHF1C4 ⁽¹⁾	OHF1C4 ⁽¹⁾

⁽¹⁾ Discount DS-H

Cables for flange handles - T1...T5 (Discount DS-H)

CSA / UL listed

Type	Part number	
	T1...T5	
Cable 91 cm (36")	OXC1L36	
Cable 122 cm (48")	OXC1L48	
Cable 152 cm (60")	OXC1L60	
Cable 183 cm (72")	OXC1L72	
Cable 213 cm (84")	OXC1L84	
Cable 244 cm (96")	OXC1L96	
Cable 305 cm (108")	OXC1L108	

The flange handle must be composed as follow:

- a) 1x Fixed circuit-breaker
- b) 1x Mechanism
- c) 1x Handle
- d) 1x Cable



Padlock lever lock PLL - T1...T3 (Discount DS-STA)

CSA / UL listed

Type	Part number	
	T1...T3	
Padlock in OPEN-CLOSED for fixed version only	KT3LD	
Padlock in OPEN for fixed version only	KT3LDO	



Front lever operating mechanism FLD - Ts3 (Discount DS-STA)

Type	Part number	
	Ts3	
Padlock in OPEN for fixed / plug-in version	KTs3FLD	
Padlock in OPEN for draw-out version	KTs3LDW	

Front lever operating mechanism FLD - T4...T6 (Discount DS-STA)

CSA / UL listed

Type	Part number	
	T4...T5	T6
Padlock in OPEN for fixed / plug-in version	KT5FLD	KT6FLD
Padlock in OPEN for draw-out version	KT5FLDW	KT6FLDW

Part numbers

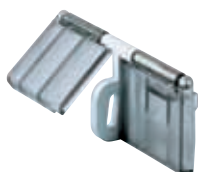
Molded Case Circuit Breakers



Padlock lever lock PLL - T7 / T7M (Discount DS-STA)

CSA / UL listed

Type	Part number	
	T7	T7M
Padlock in OPEN for fixed / Draw-out version	KT7LDO	KT7MLDO



Padlock - T8 (Discount DS-ST8)

CSA / UL listed

Type	Part number	
	T8	
Padlock in OPEN position	KT8EPD1	
Padlock in OPEN position HD	KT8EPDHD1	



Pushbutton protection - T7M...T8 (Discount DS-STA & DS-ST8)

Type	Part number	
	T7M	T8
Pushbutton protection	KT7XTPC	KT8EPG
Pushbutton protection independent cover	KT7XTPCI	-



Key lock for rotary handle mechanism RHL - T1...T3 (Discount DS-STA)

Type	Part number	
	T1...T3	
Different keys in OPEN position	KT3RHL3	

Key lock for rotary handle mechanism KLF - Ts3 (Discount DS-STA)

Type	Part number	
	T1...T3	
Different keys in OPEN position	KTs3KLFD	
Same keys in OPEN position	KTs3KLFD-2	

Key lock for rotary handle mechanism KLF - T4...T6 (Discount DS-STA)

Type	Part number	
	T4...T5	T6
Different keys in OPEN position	KT5KL-D	KT6KLFD
Same keys in OPEN position # 20005	KT5KL-20005	KT6KLFS-20005
Same keys in OPEN position # 20006	KT5KL-20006	KT6KLFS-20006
Same keys in OPEN position # 20007	KT5KL-20007	KT6KLFS-20007
Same keys in OPEN position # 20008	KT5KL-20008	KT6KLFS-20008

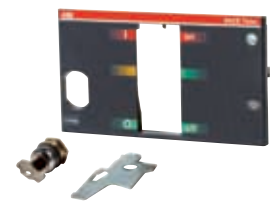
Part numbers

Molded Case Circuit Breakers



Key lock for rotary handle mechanism KLF - T7 (Discount DS-STa)

Type	Part number
	Ts3
Different keys in OPEN position	KT7KLFD
Same keys in OPEN position # 20005	KT7KLFS-20005
Same keys in OPEN position # 20006	KT7KLFS-20006
Same keys in OPEN position # 20007	KT7KLFS-20007
Same keys in OPEN position # 20008	KT7KLFS-20008



Key lock on circuit breaker KLC - T7 / T7M (Discount DS-STa)

Type	Part number	
	T7	T7M
Different keys in OPEN position	KT7KLCD	KT7MKLCD
Same keys in OPEN position # 20005	KT7KLCS-20005	KT7MKLCS-20005
Same keys in OPEN position # 20006	KT7KLCS-20006	KT7MKLCS-20006
Same keys in OPEN position # 20007	KT7KLCS-20007	KT7MKLCS-20007
Same keys in OPEN position # 20008	KT7KLCS-20008	KT7MKLCS-20008

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Key lock on circuit breaker - T8 (Discount DS-ST8)

Type	Part number
	Ts3
Different keys in OPEN position	KT8KL-D
Same keys in OPEN position # 20005	KT8KL-20005
Same keys in OPEN position # 20006	KT8KL-20006
Same keys in OPEN position # 20007	KT8KL-20007
Same keys in OPEN position # 20008	KT8KL-20008

Key lock for motor operator MOL - Ts3 (Discount DS-STa)

Type	Part number
	Ts3
Different keys in OPEN position	KTs3KL-EO
Same keys in OPEN position	KTs3KL-EO-2

Key lock for motor operator MOL - T4...T6 (Discount DS-STa)

Type	Part number	
	T7M	T8
Different keys in OPEN position	KT5KL-MO-D	KT6KL-MO-D
Same keys in OPEN position # 20005	KT5KL-MO-20005	KT6KL-MO-20005
Same keys in OPEN position # 20006	KT5KL-MO-20006	KT6KL-MO-20006
Same keys in OPEN position # 20007	KT5KL-MO-20007	KT6KL-MO-20007
Same keys in OPEN position # 20008	KT5KL-MO-20008	KT6KL-MO-20008

Part numbers

Molded Case Circuit Breakers



Key lock in RACKED-IN/TEST/RACKED-OUT position - T7 / T7M (Discount DS-STA)	
Type	Part number
	T7...T7M
For 1 circuit brearer, different key	KT7XPL-D
For group of circuit breakers, same key # 20005	KT7XPL-20005
For group of circuit breakers, same key # 20006	KT7XPL-20006
For group of circuit breakers, same key # 20007	KT7XPL-20007
For group of circuit breakers, same key # 20008	KT7XPL-20008
Provision for Ronis key lock	KT7XPL-R
Provision for Profalux key lock	KT7XPL-P
Provision for Castell key lock	KT7XPL-C
Provision for Kirk key lock	KT7XPL-K
Note: the cradle can be equipped with 2 different keylocks	



Accessory for lock in RACKED-OUT position - T7 / T7M (Discount DS-STA)	
Type	Part number
	T7...T7M
Lock in racked-out position	KT7XPLA



Mechanical compartment door lock - T7 / T7M (Discount DS-STA)	
Type	Part number
	T7...T7M
Door lock with cables ⁽¹⁾	KT7XMLCD
Door lock (wall fixing)	KT7XMLWMCB
Door lock (floor fixing)	KT7XMLFMCB
Door lock for DRAW-OUT type	KT7XMLDOCB
Note: a circuit breaker equipped with mechanical compartment door lock, can't be interlocked with another circuit breaker	
(1) To be ordered with cable kit for interlock and plate for interlock consistent with the circuit breaker	



Mechanical interlock MIF - T1...T3 (Discount DS-STA)	
CSA / UL listed	
Type	Part number
	T1...T3
Front interlock piece for 2 circuit breakers	KT3MIF2
Front interlock piece for 3 circuit breakers	KT3MIF3

Mechanical interlock MIR - T3...Ts3 (Discount DS-STA)		
CSA / UL listed		
Type	Part number	
	T3	Ts3
Cable kit	KT3MI-H	KTs3MI-H
Plate for fixed unit (on rear plate)	KT3MI-V	KTs3MI-V

Part numbers

Molded Case Circuit Breakers



Mechanical interlock MIR - T4...T5 (Discount DS-STA)

CSA / UL listed

Type	Part number	
	T4...T5	
Horizontal interlock	KT5MI-H	
Vertical interlock	KT5MI-V	
Interlock plate Type A T4 (FPW) + T4 (FPW)	KT5MIP-A	
Interlock plate Type B T4 (FPW) + T5 400 (FPW) or T5 600 (F)	KT5MIP-B	
Interlock plate Type C T4 (FPW) + T5 600 (PW)	KT5MIP-C	
Interlock plate Type D T5 400 (FPW) or T5 600 (F) + T5 400 (FPW) or T5 600 (F)	KT5MIP-D	
Interlock plate Type E T5 400 (FPW) or T5 600 (F) + T5 600 (PW)	KT5MIP-E	
Interlock plate Type F T5 600 (PW) + T5 600 (PW)	KT5MIP-F	

Note: to interlock 2 circuit breakers you have to order a frame unit interlock (H or V) and the interlock plate

Mechanical interlock MIR - T6 (Discount DS-STA)

CSA / UL listed

Type	Part number	
	T6	
Horizontal interlock	KT6MI-H	
Vertical interlock	KT6MI-V	



Mechanical interlock with cables between 2 circuit breakers - T7 / T7M (Discount DS-STA)

CSA / UL listed

Type	Part number	
	T7...T7M	
Cable kit	KT7XMLC	
Plate for fixed unit (on rear plate)	KT7XIPB	
Wiring kit for interlock with Emax	KT7XCI	
Plate for FIXED type	KT7XMLPW	
Plate for DRAW-OUT type	KT7XMLPF	

Note: to interlock 2 circuit breakers you have to order a cable kit and 2 plates in function of the version of the circuit breaker

IP54 door protection - T7M...T8 (Discount DS-STA & DS-ST8)

Type	Part number	
	T7M	T8
IP54 protection door	KT7XDC	KT8EDC

Part numbers

Molded Case Circuit Breakers



Din rail adapters - T1...T3 (Discount DS-STa)		
Type	Part number	
	T1...T2	T3
35mm din rail adapter	KT2DIN	KT3DIN

Din rail adapters - Ts3 (Discount DS-STa)		
Type	Part number	
	Ts3	
75mm din rail adapter	KTs3DMB	



High insulating terminal covers (kit of 2) HTC - T1...T7 (Discount DS-STa)		
Breaker type	Part number	
	3 poles	4 poles
T1	KT1HTC-3	KT1HTC-4
T2	KT2HTC-3	KT2HTC-4
T3	KT3HTC-3	KT3HTC-4
Ts3	KTs3HTC-3	KTs3HTC-4
T4	KT4HTC-3	KT4HTC-4
T5	KT5HTC-3	KT5HTC-4
T6	KT6HTC-3	KT6HTC-4
T7...T7M	KT7XHTC-3	KT7XHTC-4



Low insulating terminal covers (kit of 2) LTC - T1...T7 (Discount DS-STa)		
Breaker type	Part number	
	3 poles	4 poles
T1	KT1LTC-3	KT1LTC-4
T2	KT2LTC-3	KT2LTC-4
T3	KT3LTC-3	KT3LTC-4
Ts3	KTs3LTC-3	KTs3LTC-4
T4	KT4LTC-3	KT4LTC-4
T5	KT5LTC-3	KT5LTC-4
T6	KT6LTC-3	KT6LTC-4
T7...T7M	KT7XLTC-3	KT7XLTC-4



Sealable screws for terminal covers - T1...T7M (Discount DS-STa)		
Type	Part number	
	T1...T5	T6...T7M
Sealable screws	KT5LC-S	K6LC-S

Sealable screws for terminal covers - Ts3 (Discount DS-STa)		
Type	Part number	
	Ts3	
Sealable screws	KT6LC-S	

Part numbers

Molded Case Circuit Breakers



Phase barriers PB - T1...T7M (Discount DS-STa)

Type	Part number			
	T1...T3	T4...T5	T6	T7...T7M
Low - 4 pieces (for 3 pole circuit breakers)	KT3PBL-3	KT5PBL-3	KT6PBL-3	KT7PBL-3
High - 4 pieces (for 3 pole circuit breakers)	KT3PBH-3	KT5PBH-3	-	KT7PBH-3
Low - 6 pieces (for 4 pole circuit breakers)	KT3PBL-4	KT5PBL-4	KT6PBL-4	KT7PBL-4
High - 6 pieces (for 4 pole circuit breakers)	KT3PBH-4	KT5PBH-4	-	KT7PBH-4

Phase barriers PB - T8 (Required for lugs) (Discount DS-ST8)

Type	Part number			
	T8			
Low - 2 pieces (for 3 pole circuit breakers)	KT8PBL-3			
High - 2 pieces (for 3 pole circuit breakers)	KT8PBH-3			
Low - 3 pieces (for 4 pole circuit breakers)	KT8PBL-4			
High - 3 pieces (for 4 pole circuit breakers)	KT8PBH-4			



Front terminals for copper / aluminium cables FC CuAl - T1...T8 (Discount DS-STa & DS-ST8)

CSA / UL listed

Breaker type	Part number		
	2 poles	3 poles	4 poles
T2 100 A (14 AWG - 1/0)	KT2100-2	KT2100-3	KT2100-4
T3 100 A (14 AWG - 1/0)	KT3100-2	KT3100-3	KT3100-4
T3 225 A (4 AWG - 300 kcmil)	KT3225-2	KT3225-3	KT3225-4
Ts3 100 A (14 AWG - 1/0)	KTs3100-2	KTs3100-3	KTs3100-4
Ts3 150 A (2 AWG - 4/0)	KTs3150-2	KTs3150-3	KTs3150-4
Ts3 225 A (4 AWG - 300 kcmil)	KTs3225-2	KTs3225-3	KTs3225-4
T4 100 A (14 AWG - 1/0)	-	KT4100-3	KT4100-4
T4 250 A (6 AWG - 350 kcmil)	KT4250-2	KT4250-3	KT4250-4
T5 300 A (250 kcmil - 500 kcmil)	KT5300-2	KT5300-3	KT5300-4
T5 400 A (2x 3/0 - 2x 250 kcmil) ⁽¹⁾	KT5400-2	KT5400-3	KT5400-4
T5 600 A (2x 3/0 - 2x 500 kcmil)	-	KT5600-3	KT5600-4
T6 600 A (2x 250 kcmil - 2x 500 kcmil)	KT6600-2	KT6600-3	KT6600-4
T6 800 A (3x 2/0 - 3x 400 kcmil) ⁽¹⁾	KT6800-2	KT6800-3	KT6800-4
T7...T7M 1200 A (4x 4/0 - 4x 500 kcmil)	-	KT7X1200-3	KT7X1200-4
T8 1600 A (4x 1/0 - 4x 750 kcmil)	-	KT8TL	-
T8 2500 A (6x 1/0 - 6x 750 kcmil)	-	KT8TM	-

Note: 1 kit consists of 3 lugs for 3 pole and 4 lugs for 4 pole. 2 kits required per breaker for line and load connection

(1) Comes with high profile terminal covers



Front extended terminals EF - T1...T7M (Discount DS-STa)

Breaker type	Part number	
	3 poles	4 poles
T2	KT2EF-3	KT2EF-4
T3	KT3EF-3	KT3EF-4
Ts3	KTs3EF-3	KTs3EF-4
T4	KT4EF	KT4EF-4
T5	KT5EF	KT5EF-4
T6 800 A	KT6EF-3	KT6EF-4
T7...T7M	KT7EF-3	KT7EF-4

Note: 1 kit consists of 3 lugs for 3 pole and 4 lugs for 4 pole. 2 kits required per breaker for line and load connection

Part numbers

Molded Case Circuit Breakers



Rear terminals R - T2...T7M (Discount DS-STA)

Breaker type	Part number	
	3 poles	4 poles
T2	KT2R-3	KT2R-4
T3	KT3R-3	KT3R-4
Ts3	KTs3R-3	KTs3R-4
T4	KT4R-3	KT4R-4
T5	KT5R-3	KT5R-4
T6 800 A	KT6R-3	KT6R-4
T7...T7M	KT7XR-3	KT7XR-4

Note: 1 kit consists of 3 lugs for 3 pole and 4 lugs for 4 pole. 2 kits required per breaker for line and load connection

Rear “T” terminals - T8 (Discount DS-ST8)

Breaker type	Part number	
	Kit of 6	Kit of 8
T8 (2500 A max)	KT8VR2500	KT8VR2500-4

Rear flat horizontal terminals HR - T7 / T7M (Discount DS-STA)

Breaker type	Part number	
	3 poles	4 poles
T7...T7M	KT7XHR-3	KT7XHR-4

Note: 1 kit consists of 3 lugs for 3 pole and 4 lugs for 4 pole. 2 kits required per breaker for line and load connection

Rear flat vertical terminals HR - T7 / T7M (Discount DS-STA)

Breaker type	Part number	
	3 poles	4 poles
T7...T7M	KT7XVR-3	KT7XVR-4

Note: 1 kit consists of 3 lugs for 3 pole and 4 lugs for 4 pole. 2 kits required per breaker for line and load connection

Front terminal adapters (6 plugs and 6 screws) F - T2...T7M (Discount DS-STA)

Breaker type	Part number	
	T2...T7M	
T2	KT2FC-6	
T3	KT3FC-6	
Ts3	KTs3FC-6	
T4	KT4FC-6	
T5	KT5FC-6	
T6	KT6FC-6	
T7...T7M	KT7XF-6	

Note: to be requested as loose kit only.



Part numbers

Molded Case Circuit Breakers



Front display unit FDU - T4...T6 (Discount DS-STA)

Type	Part number	
	T4...T5	T6
Front display unit for PR222	KT5FDU	KT6FDU



Modules for PR33x electronic trip units - T7...T8 (Discount DS-STA & DS-ST8)

UL / CSA listed

Type	Part number		
	T7	T7M	T8
PR330/V voltage measuring module ⁽¹⁾	KT7PR330V	KT7XPR330V	KT8PR330V-3
PR330/V voltage measuring module for 4P ⁽¹⁾	-	-	KT8PR330V-4
PR330/D-M Modbus RTU communication module ⁽¹⁾	KT8330DMOD	KT8330DMOD	KT8330DMOD
PR330/R actuator module ⁽¹⁾	1SDA063146R1	1SDA063146R1	-
BT030 external bluetooth device	1SDA058259R1	1SDA058259R1	1SDA058259R1
PR030B battery unit	1SDA058258R1	1SDA058258R1	1SDA058258R1

(1) Can't be ordered loose. To be assembled at factory



Rating plug - T7...T8 (Discount DS-STA & DS-ST8)

Plug type	Part number	
	T7...T7M	T8
In = 400 A	KT70400RP	-
In = 600 A	KT70600RP	-
In = 800 A	KT70800RP	-
In = 1000 A	KT71000RP	KT81000RP
In = 1200 A	KT71200RP	KT81200RP
In = 1600 A	-	KT81600RP
In = 2000 A	-	KT82000RP
In = 2500 A	-	KT82500RP
In = 3000 A	-	KT83000RP



Flange for compartment door - T1...T6 (Discount DS-STA)

Type	Part number		
	T1...T3	Ts3, T4...T5	T6
Flange for compartment door for fixed version	KT3FCD	KT5FCD	KT6FCD

Flange for compartment door - T7...T8 (Discount DS-STA & DS-ST8)

Type	Part number	
	T7...T7M	T8
Flange for compartment door for fixed version	KT7XFCD	KT8FCD

For your notes

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For your notes

Handwriting practice lines consisting of 20 horizontal dotted lines.

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