

# New Tmax T4-T5, T Generation.



Preliminary - 1SDC210003B0201





## BE FREE!

**T**

*ry to think of an installation which needs 600 A.  
Have you done that?*

*Now think of sizing it, selecting the products, the accessories and of installing it.  
Right?*

*Now imagine being free to choose and free to work with much less, but really much less difficulty.  
Are you there?*

*If you've managed to imagine this, you're ready to enter a new generation.  
You're about to enter Tmax - the T Generation.*



## **A NEW FREEDOM.**

Tmax T4 and T5 are the new ABB molded case circuit breakers and now are available to provide the performances you've always wanted. High breaking capacity, high limitation of the short-circuit current peak and let-through energy - performances which you couldn't find until today in circuit breakers of these dimensions.

Developed since the beginning to work together, they also offer a complete series of interchangeable thermomagnetic and electronic trip units, as well as a new optimized range of accessories, like the new stored energy motor operator.

The new Tmax T4 and T5 are molded case circuit breakers with a very good performance/dimensions ratio, so can you imagine how much more space there is for the cabling and how easily you can carry it out, and, still further, the reduction in the switchgear dimensions? But you'll also find true allies for your job in the terminals and accessories, with new, complete and standardised ranges.

Today with Tmax you're even freer to choose: T1, T2, T3 up to 225 A, and T4 and T5 up to 600 A.

Being free has never been so easy.



## BE FREE TO RIDE THE MOST ADVANCED

**T**he Tmax circuit-breakers have been designed using the experience which, for several years, has made ABB recognised worldwide as a leader in constructing low voltage circuit-breakers.

It wasn't easy to find the solutions which make it possible for the new Tmax T4 and T5 to achieve such high performances in such limited dimensions. A high breaking capacity and high limitation of the specific let-through energy express the high technological level reached by these two new circuit breakers.

Thanks to latest generation electronics, T4 and T5 are born fitted with the new electronic trip units with more functions, the integrated communication capabilities, the local indication of trip and other features that make these devices unique in the market.

Today more than yesterday, each installation, no matter what its type, has all the protections.

Being free also means this.

TMAX. BE FREE.

TECHNOLOGY.



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## BE FREE TO CHOOSE OPTIMAL SIZING.

**M**ore performances in less space. More applications, up to 600 A, with just two sizes. Easier selection of the circuit breaker and the accessories. Optimal sizing of the installation and better protection of the cables, busbar ducts and supports. Less space needed in the metal structures. Less oversizing, that means lower costs. Less time for coordination of the installations. Less part numbers to keep in stock.

All the solutions needed can be selected with Tmax T4 and T5, even that of feeling freer to choose.

TMAX. BE FREE.



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## BE FREE TO DRIBBLE ALL INSTALLATION

**H**aving circuit breakers available with smaller dimensions than all the others on the market, undoubtedly offers great advantages. More space for the wiring, simpler installation, more compact and standardized switchgear compartments. Surely it isn't necessary to explain how much time you save?

The new Tmax T4 and T5 then continue the road taken by the first three sizes of the family - T1, T2 and T3: they, too, offer complete ranges of terminals for all installation requirements, and a complete range of standardized and field installable accessories.

Can you imagine circuit breakers with reduced dimensions with wide and optimized terminal slots?

Can you imagine the freedom of selecting the trip units even with work under way?

Have you an idea of the reduction in stock provided by having standardized accessories?

Being free also means having much more time for yourself.

**TMAX. BE FREE.**

**DIFFICULTIES.**





## HIGH BREAKING CAPACITIES.

The new Tmax T4 and T5 can be used in any application, even the most special ones, thanks to their really exceptional performances. Interrupting rating up to 150 kA at 480 V, high breaking capacities at 600 V (85 kA), too, for the **standard** range, make T4 and T5 the ideal circuit breakers for all requirements.

## JUST TWO SIZES.

ABB proposes two sizes: Tmax T4 up to 250 A and Tmax T5 up to 600 A. They both have a really high rated current/volume ratio, are made of top quality materials using innovative construction techniques which guarantee the same performances for all their versions: fixed, plug-in and draw out.



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# TMAX T4 AND T5. ONLY THE MOST ADVANCED TECHNOLOGY CAN ACHIEVE SUCH HIGH PERFORMANCES.

## LATEST GENERATION ELECTRONICS.

The technology is of the latest generation: the electronic PR221DS (LSI/I version) and PR222DS/P (LSI or LSIG version) trip units for distribution and PR221DS-I for Motor Control Protection. The dialogue unit incorporated in the PR222DS/PD trip unit is also absolutely new, and the dialogue function is added to its high protection performances. Furthermore, the basic versions of the trip units have been enriched with more functions. And then what about the accessories for the electronic trip units? The front display for showing the currents is one of the novelties proposed along with the auxiliary contacts in electronic version, which communicate directly with the electronic trip unit.



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## 600 V APPLICATIONS.

Tmax T4 and T5 have been studied for 600 V applications with a very high interrupting ratings: up to 85 kA @ 600 V AC starting from a rated current of 15 A.

Tmax T4 and T5, certified for use at this voltage, perfectly suit US and Canadian installation's habits and standards.



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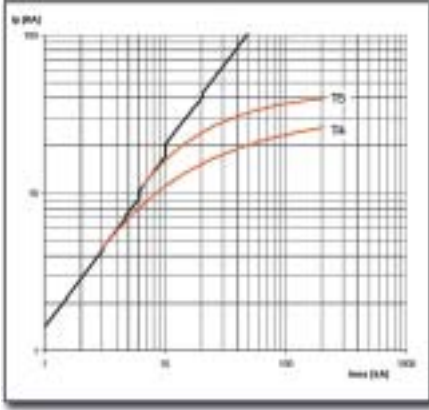
ABB TeraMax

Tmax



## HIGH LIMITATION.

With the new Tmax T4 and T5, high limitation of both the specific let-through energy and the short-circuit peak current is obtained, thereby truly making it possible to size the installation in the best possible way and obtain better cable, busbar duct and relative support protection, as well as that of all the coordinated apparatus on the load side. High values are also obtained for back-up, particularly useful for sizing the terminal parts of the installation.



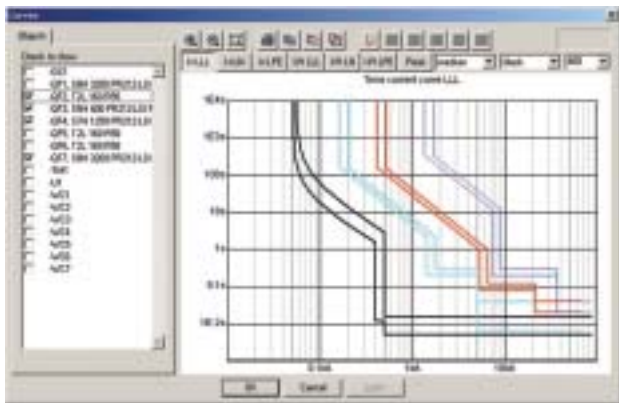
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# TMAX T4 AND T5. ABSOLUTE VERSATILITY FOR OPTIMAL SIZING.

## SELECTIVITY.

For circuit breakers with rated currents up to 600 A, it is important to reach high selectivity values and Tmax T4 and T5 guarantee these high performances.

Being free to count on high selectivity values simplifies selection of the circuit breaker during study of the installation, and facilitates optimal sizing of all the apparatus.



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## MCP: MOTOR CONTROL PROTECTION.

ABB increases the offer of circuit breakers for motor control protection with T4-MCP and T5-MCP with interrupting ratings up to 100 kA @ 480 V AC and 65 kA @ 600 V AC.

The new electronic trip unit PR221DS/P-I, with protection against the short circuit, equips both the circuit breakers. They can be combined with a thermal relay for protection against overload and phase loss or unbalance of phase and contactor for motor switching.

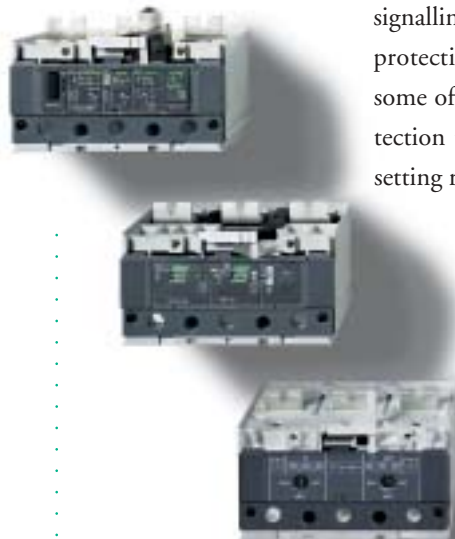


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## ALL THE TRIP UNITS.

Tmax T4 and T5 have a wide range of both thermomagnetic and electronic trip units for all applications, and even for the most special ones. The thermomagnetic trip units are suitable also for DC applications, and the new generation of electronic trip units has many new functions even in the basic version. Setting the

neutral protection to OFF, to 50% or 100%, the LED for signalling pre-alarm and alarm for the protection against overload, are just some of the novelties of the new protection trip units. The wide and fine setting range of the protection thresholds are, furthermore, a guarantee of great flexibility of use and optimal protection in any installation.



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### INCREASINGLY COMPACT DIMENSIONS.

The new Tmax T4 and T5 have the same height and depth, which facilitates positioning them in the switchgear compartments and makes it possible to build increasingly compact and standardized units.

And that's not all: the limited dimensions allow greater access to the terminals, and make all the connection and cabling operations more convenient.

Available in all the versions - fixed, plug-in and draw out - and provided with the conversion kit from fixed to plug-in/draw out, T4 and T5 are suited to constructing any installation solution. Selection flexibility is guaranteed.



# TMAX T4 AND T5. ALL THE BENEFITS OF FLEXIBILITY AND SIMPLE INSTALLATION.

### CONVENIENTLY ACCESSIBLE CONNECTION TERMINALS.

The terminal slots of the T4 and T5 circuit breakers are ample and optimized for all types of connections: cables, busbars and cable lugs. The complete range of connection terminals always makes it possible to select those most suited to the installation to be built. Standard front (F), front extended (EF), front extended spread (ES); front for copper cables (FC Cu), for copper-aluminium cables (FC CuAl)\* and multi-cable (MC) terminals, as well as rear terminals (R), make all configurations possible. With T4 and T5 you can build exactly the switchgear you had in mind.

\* UL listed



### INTERCHANGEABLE TRIP UNITS. AT ALL TIMES.

Thanks to ABB advanced design, on the new Tmax T4 and T5 the trip units of any type - thermomagnetic or electronic - can be replaced in the field at all times and in complete safety. The advantages? Interchangeability of the trip units which therefore means terrific versatility.

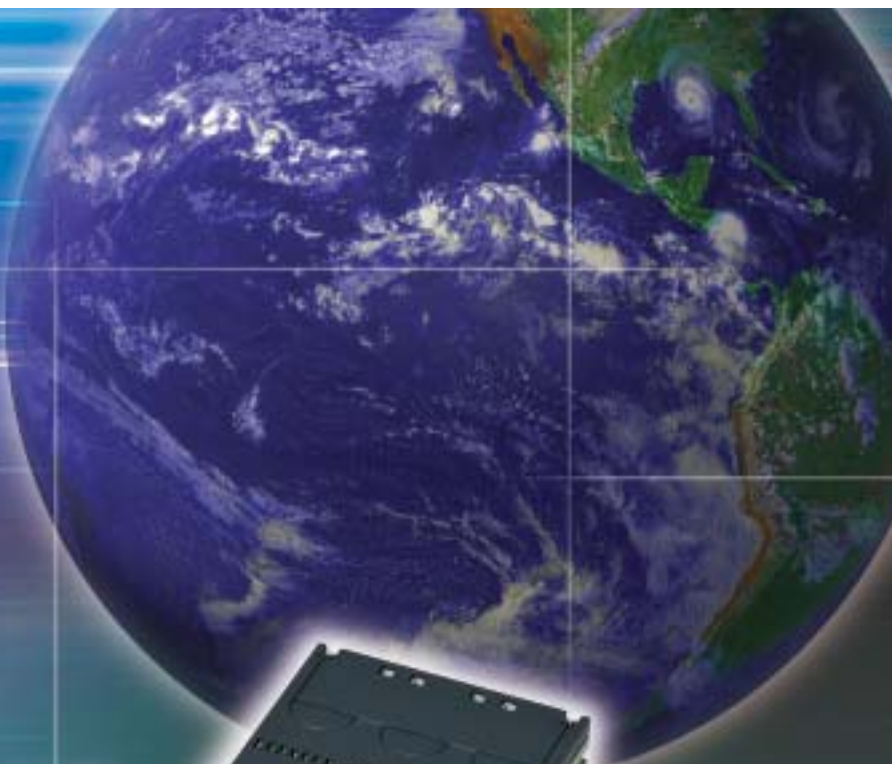


### UNIFIED ACCESSORIES.

As for Tmax T1, T2, and T3, the new Tmax T4 and T5 also have a complete, standardized and unified range of electrical and mechanical accessories, which makes selection easier, provides flexibility of use and reduces stocks. With Tmax you can select accessories with your eyes shut.



Automation



Timax

Control



## T1, T2, T3, T4 AND T5. THE TMAX PROJECT.

That's right: with the arrival of Tmax T4 and T5, designing and building an installation up to 600 A has never been so simple.

The complete Tmax family starts out life distinguished by very high construction quality, recognised over the years for all ABB products. The whole Tmax project, from T1 to T5, has basic characteristics common to all the frames, such as double insulation, the possibility of use in heavy-duty environments, and the complete set of international certifications.

There are two depths up to 600 A: 2,76 inches for T1, T2 and T3, 4,07 inches for T4 and T5. Quality means this as well.



The Tmax T4 and T5 circuit breakers have obtained the prestigious "INTEL Design 2003 – Augusto Morello award" in the Product Technologies and Production processes section.

## INDUSTRIAL<sup>IT</sup>. BORN TO INTEGRATE.

Industrial<sup>IT</sup> is the solution developed by ABB to integrate the company activities at all levels, collecting together the automation and control systems, installation running and the production processes, design, marketing and sales, as well as the financial and administrative activities, under a single management system (AIP: Aspect Integrator Platform).

The products and technologies are certified according to the Industrial<sup>IT</sup> standard and grouped into about thirty functional categories.

As well as interaction between certified products, each certified product ensures easy traceability of all the information useful for its operation - technical characteristics, instructions for installation, use and maintenance, environmental certificates and declarations, updated to the latest version ... a great advantage for the user.

The whole range of Tmax molded case circuit breakers, together with Isomax and the Emax range of power circuit breakers, is Industrial<sup>IT</sup> enabled and is part of the suite of Protect<sup>IT</sup> products – apparatus for protection of installations and people.

# TMAX MOLDED CASE CIRCUIT BREAKERS. AN INCREASINGLY WIDE CHOICE.

Today you have a family of circuit breakers available for the various different fields of application. The power distribution range for protection of installations in direct and alternating current; the motor control protection range (MCP) for protecting asynchronous motors by means of circuit breakers with currents up to 600 A. And finally, the molded case switches (MCS) derived from the corresponding circuit breakers.

That's really great freedom of choice, isn't it?

Tmax, Isomax and Emax operate in an integrated way with the ABB products which can be configured in a system: this tendency has always been behind ABB's design process. Mass customisation, i.e. producing customised products in series according to the requirements of each customer, is already possible, as the Industrial<sup>IT</sup> certification demonstrates.

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



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# Accessories

	T1	T2	T3	T4	T5
	100 A	100 A	225 A	250 A	400 - 600 <sup>(4)</sup> A
Number of poles	3/4	3/4	3/4	3/4	3/4
Rated operational voltage U <sub>e</sub> (AC)	[V] 480	480	480	600	600
Level of performances	N	S H	N S	N S H L V	N S H L V
I <sub>cu</sub> (AC) 50-60Hz 480V	[kA] 22	35 65	25 35	25 36 65 100 150	25 36 65 100 150

## Service releases

Shunt trip (SOR) <sup>(1)</sup>					
Undervoltage release (UVR) <sup>(1)</sup>					
Undervoltage release in delayed version (UVD)					

## Electrical signals

1 on changeover open/closed + 1 bell alarm - AUX <sup>(1)</sup>					
3 on changeover open/closed + 1 bell alarm - AUX <sup>(1)</sup>					
2 on changeover open/closed - AUX <sup>(1)</sup>					
1 bell alarm (with PR222DS/PD - AUX-SA <sup>(1)</sup> )					
1 signalling state of the motor operator - AUX-MO					
2 early auxiliary contacts for undervoltage release - AUE					
3 auxiliary position contacts for signalling circuit breaker racked in/out - AUP					

## Electrical operators

Solenoid operator with front assembly - MOS <sup>(1)</sup>					
Solenoid operator with side by side assembly - MOS					
Stored energy operating mechanism - MOE <sup>(1)</sup>					
Stored energy operating mechanism for PR222DS/PD <sup>(2)</sup> - MOE-E					
Automatic transfer switch - ATS010					

## Operating mechanisms and locks

Direct rotary handle operating mechanism - RHE <sup>(1)</sup>					
Transmitted rotary handle operating mechanism - RHD <sup>(1)</sup>					
Lever lock with padlocks - PLL <sup>(1)</sup>					
Key lock on the circuit breaker - KLC					
Key lock for rotary handle and front operating mechanism - RHL/KLF-D/KLF-S					
Key lock for stored energy operating mechanism - MOL					
Front for locks - FLD					
Key locks for fixed part of draw out KLF-D FP/KLF-S FP					
Padlock for fixed part of draw out PLL FP					
Compartment door lock					
Front interlock - MIF <sup>(1)</sup>					
Rear interlock - MIR <sup>(1)</sup>					

## Electronic residual current releases<sup>(2)</sup>

<b>Dedicated:</b>					
RC221 "L" shape					
RC222 "L" shape					
RC222 underneath					
For switchgear compartment: RCQ					

## Trip units

Thermomagnetic TMF					
Thermomagnetic TMD/TMA					
Magnetic only MA					
Electronic PR221DS/P					
Electronic PR221DS/P - PR222DS/P - PR222DS/PD					
Interchangeability of trip units					

## Connection terminals

Terminals for fixed or plug in version <sup>(3)</sup>	FCCuAl	FCCuAl, EF, F, FCCu, ES, R		
Terminals for fixed version <sup>(3)</sup>			FCCuAl, F, EF, ES, FCCu, MC, R	FCCuAl, F, EF, ES, FCCu, R
Terminals for plug in and draw out version <sup>(3)</sup>			EF, ES, FCCu, FCCuAl, HR, VR	EF, ES, FCCu, FCCuAl, HR, VR
High and low terminal covers				

<sup>(1)</sup> UL File: E116596

TERMINAL CAPTION

FC CuAl = Front for CuAl cables

<sup>(2)</sup> IEC only

F = Front

R = Rear orientated

<sup>(3)</sup> FCCuAl: UL listed

EF = Front extended

HR = Rear in horizontal flat bar

<sup>(4)</sup> Please ask ABB

ES = Front extended spread

VR = Rear in vertical flat bar

for 600A availability

FC Cu = Front for copper cables

MC = Multicable

# Circuit breakers for power distribution

## Electrical characteristics

			Tmax T1 1P	Tmax T1		
<b>UL 489 CSA C22.2</b>						
Continuous current rating		[A]	100	100		
Number of poles		[Nr]	1	3,4		
Rated voltage	<b>AC (50-60Hz)</b>	[V]	277	480		
	<b>DC</b>	[V]		500		
Interrupting ratings			<b>B</b>	<b>N</b>		
	<b>AC</b> 240 V	[kA]		50**		
	277 V	[kA]	18*			
	480 V	[kA]		22**		
	600 V	[kA]				
	<b>DC</b> 250 V - 2 poles in series	[kA]		25		
500 V - 3 poles in series	[kA]		25			
500 V - 2 poles in series	[kA]					
600 V - 3 poles in series	[kA]					
Trip units	TMF		■	■		
	TMD/TMA					
	ELT					
	MA					
Versions	MCCB		■	■		
	MCS			■		
	MCP					
<b>IEC 60947-2</b>						
Rated uninterrupted current, Iu		[A]	160	160		
Number of poles		[Nr]	1	3,4		
Rated service voltage, Ue	<b>AC (50-60Hz)</b>	[V]	240	690		
	<b>DC</b>	[V]	125	500		
Rated ultimate short circuit breaking capacity, Icu			<b>B</b>	<b>C</b>	<b>N</b>	
	<b>AC (50-60 Hz)</b> 220/230 V	[kA]	25	25	40	50
	380/415 V	[kA]		16	25	36
	440 V	[kA]		10	15	22
	500 V	[kA]		8	10	15
	690 V	[kA]		3	4	6
	<b>DC</b> 250V - 2 poles in series	[kA]		16	25	36
	250V - 3 poles in series	[kA]		20	30	40
	500V - 2 poles in series	[kA]				
	500V - 3 poles in series	[kA]		16	25	36
750V - 3 poles in series	[kA]					
Trip units	TMF		■			
	TMD/TMA				■	
	ELT					
	MF					
MA						
<b>UL 489 CSA C22.2 and IEC 60947-2</b>						
Dimensions	H	[in/mm]	5.12/130	5.12/130		
	W 1p or 3p	[in/mm]	1/25.4	3/76		
	W 4p	[in/mm]		4/102		
	D	[in/mm]	2.76/70	2.76/70		
Mechanical life		[No. operations]	25000	25000		
		[No. Hourly operations]	240	240		
Electrical life @ 415 V AC		[No. operations]	8000	8000		
		[No. Hourly operations]	120	120		

\* In15A = 10kA @ 277 V AC

\*\* In15A = 35 kA @ 240 V AC, 14 kA @ 480 V AC

\*\*\* Please ask ABB for 600A availability

TMF = Thermomagnetic trip unit with fixed thermal and magnetic threshold

TMD = Thermomagnetic trip unit with adjustable thermal threshold and fixed magnetic threshold

TMA = Thermomagnetic trip unit with adjustable thermal and magnetic threshold

MF = Magnetic fixed trip unit

MA = Magnetic adjustable trip unit

ELT = Electronic trip unit





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