Coordination tables

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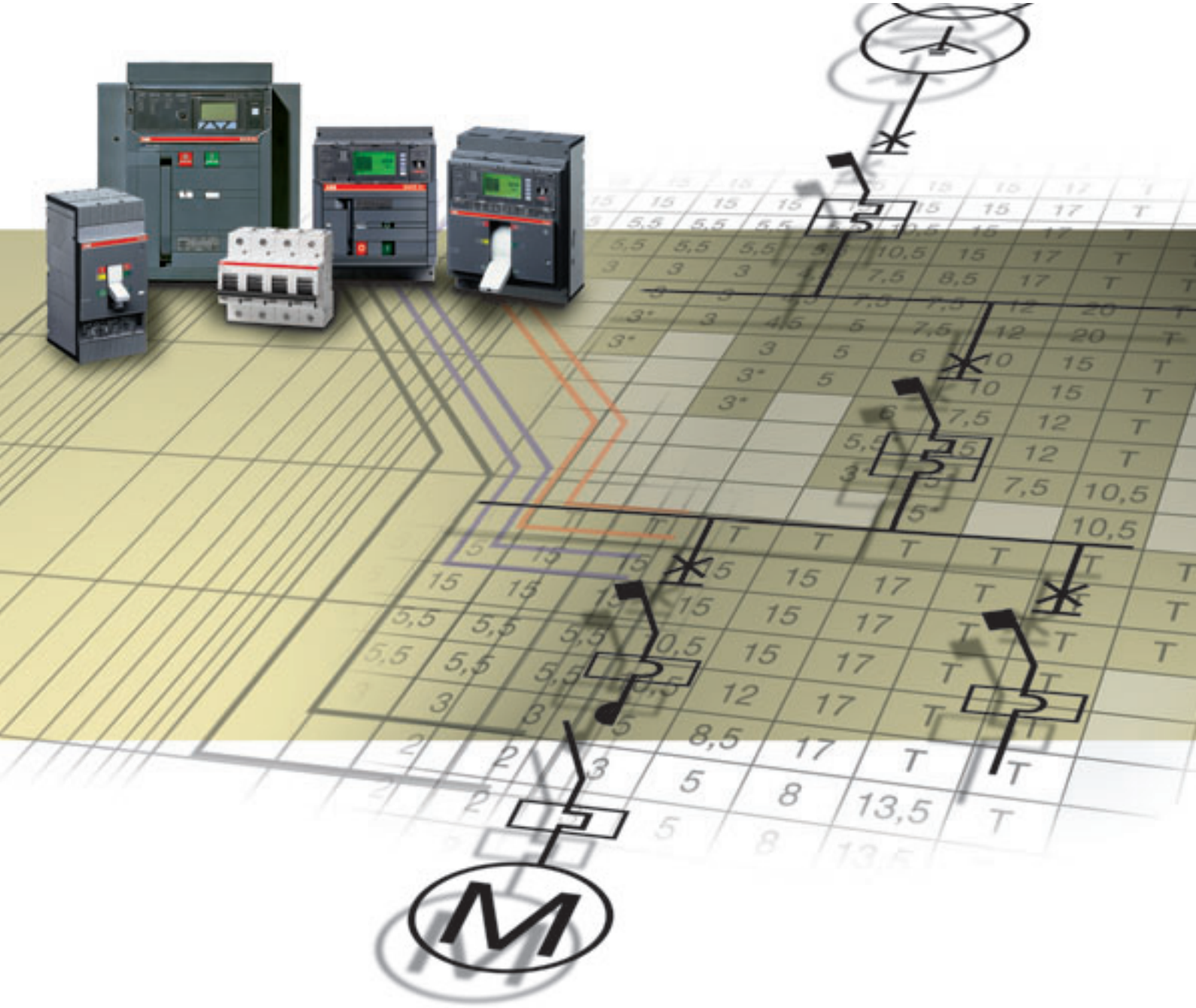

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Discrimination and back-up

This collection of selectivity and back-up tables for ABB circuit-breakers has been studied to help select the appropriate circuit-breaker, fulfilling the specific selectivity and back-up requirements according to the different types of installation.

The tables are divided on the basis of the type of intervention (back-up or selective protection), and are grouped according to types of circuit-breakers (air, moulded-case, and miniature), covering all the possible combinations of ABB circuit-breakers.

The technical data, updated to the latest series of miniature, moulded-case and air circuit breakers on the market, make this publication a comprehensive and simple tool: once again, ABB SACE makes its consolidated experience in the Low Voltage sector available to professionals.

Choosing the type of coordination for protection of a low voltage installation

Problems and requirements for coordinating protection devices

Selection of the system for protecting an electric installation is of paramount importance both to ensure correct economic and functional operation of the whole installation and to reduce any problems caused by anomalous operating conditions and actual faults to a minimum.

This analysis deals with coordination between the different devices dedicated to protection of zones and specific components in order to:

– guarantee safety for people and the installation at all times;

– identify and rapidly exclude only the zone affected by a given problem, instead of taking indiscriminate action thereby reducing the energy available in areas unaffected by the fault;

– reduce the effects of a fault on other sound parts of the installation (voltage drops, loss of stability in rotating machines);

– reduce the stress on components and damage in the zone involved;

– ensure service continuity with good quality power supply voltage;

– guarantee adequate backup in the event of any malfunction of the protection device responsible for opening the circuit;

– provide maintenance personnel and the management system with the information needed to restore the service as rapidly as possible and with minimal disturbance to the rest of the network;

– achieve a valid compromise between reliability, simplicity and cost effectiveness.

To be more precise, a valid protection system must be able to:

– understand what and where an event has occurred, discriminating between situations that are anomalous but tolerable and genuine faults within a given zone of influence, avoiding unwarranted trips which lead to unjustified stoppage of a sound part of the installation;

– act as rapidly as possible to limit damage (destruction, accelerated ageing, etc.), safeguarding continuity and stability of the power supply.

The solutions stem from a compromise between the following two opposing needs - precise identification of the fault and rapid intervention - and are defined according to which requirement takes priority.

For instance, when it is more important to avoid unnecessary tripping, it is generally preferable to have an indirect protection system based on interlocks and data transmission between different devices which measure the electrical values locally, whereas for prompt response and limitation of the destructive effect of short-circuits, a direct-acting system with releases integrated in the devices is needed. Generally speaking, in low voltage systems for primary and secondary distribution, the latter solution is preferable.

Coordination tables

Discrimination and back-up

Restricting the field to an analysis of the problem of how to harmonize the action of the protection devices in the event of overcurrents (overloads and short-circuits) - a problem covering 90% of the coordination requirements of protection devices in radial low voltage installations - it is important to remember that:

– **overcurrent trip selectivity** means “coordination of the operating characteristics of two or more overcurrent protection devices so that, on occurrence of overcurrents within established limits, the device supposed to operate within these limits intervenes, whereas the others do not”[1];

– **total discrimination** means “overcurrent selectivity so that when there are two overcurrent protection devices in series, the protection device on the load side provides protection without tripping the other protection device”[2];

– **partial discrimination** means “overcurrent selectivity so that when there are two overcurrent protection devices in series, the protection device on the load side provides protection up to a given overcurrent limit without tripping the other device”[3]. This overcurrent threshold is called the “selectivity limit current I_s”[4];

– **back-up protection** means “coordination for protection against overcurrents of two protection devices in series, where the protection device generally (but not necessarily) situated on the supply side provides overcurrent protection with or without the aid of the other protection device and avoids excessive stress on the latter”[5]. The current value above which protection is ensured is called the “switching current I_B”[6].

Types of coordination

Influence of the electrical parameters of the installation (rated current and short-circuit current)

If the analysis is restricted to the behavior of the protection devices with tripping based on overcurrent releases, the strategy used to coordinate the protection devices mainly depends on the rated current (In) and short-circuit current (Ik) values in the part of installation concerned.

Generally speaking, the following types of coordination can be classified:

– current type selectivity;

– time type selectivity;

– zone selectivity;

– energy selectivity;

– back-up.

Now let us examine these various solutions in detail.

[1] IEC 60947-1 Standard, def. 2.5.23

[2] IEC 60947-2 Standard, def. 2.17.2

[3] IEC 60947-2 Standard, def. 2.17.3

[4] IEC 60947-2 Standard, def. 2.17.4

[5] IEC 60947-1 Standard, def. 2.5.24

[6] IEC 60947-1 Standard, def. 2.5.25 and IEC 60947-1 Standard, def. 2.17.6

Current type selectivity

This type of discrimination is based on the observation that the closer the fault is to the power supply of the installation, the higher the short-circuit current will be. We can therefore pinpoint the zone where the fault has occurred can therefore be discriminated simply by setting the protection devices to a limit value so that this does not generate unwarranted trips due to faults in the zone of influence of the protection device immediately to the load side (where the fault current must be lower than the current threshold set on the protection device on the supply side).

Total discrimination can normally only be obtained in specific cases where the fault current is not very high or where a component with high impedance is placed between the two protection devices (e.g. a transformer, a very long cable, or a cable with reduced cross-section, etc.) giving rise to a great difference between the short-circuit current values.

This type of coordination is therefore mainly used in end distribution (with low rated current and short-circuit current values and high impedance of the connection cables).

The device time-current trip curves are generally used for the study.

This solution is intrinsically rapid (instantaneous), easy to implement and inexpensive.

On the other hand:

– the selectivity limit current is normally low, so discrimination is often only partial;
– the threshold setting of the overcurrent protection devices rapidly exceeds the values consistent with safety requirements, becoming incompatible with the need to reduce damage caused by short-circuits;
– it becomes impossible to provide redundant protection devices which can guarantee elimination of the fault in the event of any of the protection devices failing to function.

Time type selectivity

This type of discrimination is an evolution of the previous one. Using this type of coordination, in order to define the trip threshold, the current value measured is associated with the duration of the phenomenon: a given current value will trip the protection devices after an established time delay, which is such as to allow any protection devices situated closer to the fault to trip, excluding the zone where the fault occurred.

The setting strategy is therefore to progressively increase the current thresholds and the trip time delays the closer one is to the power supply source (the setting level correlates directly with the hierarchical level). The steps between the time delays set on protection devices in series must take into account the sum of the times for detecting and eliminating the fault and the overshoot time of the supply side device (the time interval during which the protection device can trip even if the phenomenon has already ended). As in the case of current type selectivity, the study is carried out by comparing the time-current protection device trip curves.

This type of coordination is generally:

– easy to study and implement, and inexpensive with regard to the protection system;
– it allows even high limit discrimination levels to be obtained, depending on the short time withstand current of the supply side device;
– it allows redundant protection functions and can send valid information to the control system;

but:

– the trip times and energy levels let through by the protection devices, especially those close to the sources, are high, with obvious problems regarding safety and damage to the components (often oversized) even in zones unaffected by the fault;
– it only allows use of current-limiting circuit-breakers at levels hierarchically lower down the chain. The other circuit-breakers must be capable of withstanding the thermal and electro-dynamic stresses related to the passage of the fault current for the intentional time delay. Selective circuit-breakers, often of the open type, must be used for the various levels (category B circuit-breakers according to the IEC 60947-2 Standard) to guarantee a sufficiently high short-time withstand current;
– the duration of the disturbance induced by the short-circuit current on the power supply voltages in the zones unaffected by the fault can pose problems with electromechanical (voltage below the electromagnetic release value) and electronic devices;
– the number of discrimination levels is limited by the maximum time which can be withstood by the electrical system without loss of stability.

Zone (or logical) selectivity

This type of coordination is a further evolution of time coordination and can be direct or indirect. Generally speaking, it is implemented by means of a dialogue between current measuring devices which, when they detect that the setting threshold has been exceeded, enable correct identification and power supply disconnection of just the zone affected by the fault.

It can be implemented in two ways:

– the measuring devices send information to the supervision system about the fact that the set current threshold has been exceeded and the latter decides which protection device to trip;
– when there are current values over the set threshold, each protection device sends a blocking signal via a direct connection or a bus to the protection device higher in the hierarchy (i.e. on the supply side in relation to the direction of the power flow) and, before it trips, makes sure that a similar blocking signal has not arrived from the protection device on the load side. This way, only the protection device immediately to the supply side of the fault is tripped.

The first mode has trip times of around 0.5-5 s and is mainly used in the case of not particularly high short-circuit currents with a power flow direction not unequivocally defined (e.g. for lighting systems in long road and rail tunnels).

The second mode has distinctly shorter trip times: compared with time type coordination, there is no longer any need to increase the intentional time delay progressively as you move closer to the power supply source. The delay can be reduced to a waiting time sufficient to rule out any presence of a block signal from the protection device on the load side (time taken by the device to detect the anomalous situation and successfully complete transmission of the signal).

Compared with time type coordination, zone selectivity implemented in this way:

– reduces the trip times and increases the safety level. The trip times can be around a hundred milliseconds;
– reduces both the damage caused by the fault and the disturbance to the power supply network;
– reduces the thermal and dynamic stresses on the circuit-breakers;
– allows a very high number of discrimination levels;

but it is more burdensome both in terms of costs and in the complexity of the installation.

This solution is therefore mainly used in systems with high rated current and short-circuit current values, with inescapable needs both in terms of safety and service continuity: in particular, examples of logical discrimination are often found in primary distribution switchgear, immediately to the load side of transformers and generators.

Another interesting application is the combined use of zone and time type selectivity, in which the stretches of the coordination chain managed logically have protection device trip times for short-circuits which decrease progressively moving up towards the power supply sources.

Zs zone selectivity

By means of the Zs zone selectivity with circuit-breakers equipped with PR332- PR333-PR122-PR123 trip units, it is possible obtain selectivity considerably reducing the trip times. This means:

– reducing the thermal stresses in all the plant components

– lower trip curve to help the selectivity towards medium voltage circuit-breakers

The Zs zone selectivity can be applied to the protection functions S, D and G and it can be enable in the case where:

– the curve with fixed time is selected;

– the auxiliary power supply is present.

The selectivity limit value obtained is the same as the value of the Icw of the supply side circuit-breaker (with I_3 set to OFF).

For further information, please see the technical catalogue.

EFDP zone selectivity

By means of the new PR223EF electronic trip unit, it is possible to realize zone selectivity between moulded-case circuit-breakers T4L, T5L and T6L, obtaining total selectivity between these circuit-breakers.

The zone selectivity with the PR223EF trip unit is implemented on the S, G and EF functions.

The trip unit can extinguish the fault present in extremely rapid times of around 10-15 ms.

To activate the EFDP zone selectivity it is sufficient to connect the circuit-breakers to a simple screened-twisted-pair cable.

The section 2 of this publication includes the selectivity tables of circuit-breakers equipped with PR223EF trip units. For further information, please see the technical catalogue.

Energy-based selectivity

Energy-based coordination is a particular type of selectivity which exploits the current limiting characteristics of moulded-case circuit-breakers. It is important to remember that a current-limiting circuit-breaker is “a circuit-breaker with a trip time short enough to prevent the short-circuit current reaching the peak value it would otherwise reach”[7].

In practice, all the ABB SACE moulded-case circuit-breakers in the Tmax ranges have more or less accentuated current-limiting features, obtained by:

– reaching a valid compromise between the capacity of the trip unit to withstand current values lower than the instantaneous trip thresholds and the repulsion of the main contacts at short-circuit currents;

[7] IEC 60947-2 Standard, def. 2.3

– triggering rapid displacement of the arc inside the arcing chambers (magnetic blast) suitably designed to generate a high arcing voltage;
– placing several arcing chambers in series, with contacts optimized to carry out different functions (main opening under short-circuit, backup opening with the principal function of isolation and opposition to the recovery voltage, etc.).

Under short-circuit conditions, these circuit-breakers are extremely rapid (with trip times of a few milliseconds) and open in the event of a strong asymmetric component. It is therefore not possible to use the time-current trip curves (load side circuit-breaker) and no trip limit curves (supply side circuit-breaker), obtained with symmetrical sine wave forms, to study the coordination. The phenomena are mainly dynamic (and therefore proportional to the square of the instantaneous current value) and can be described using the specific let-through energy and no trip limit energy curves of the supply side circuit-breaker.

What generally happens is that the energy associated with the load side circuit-breaker trip is lower than the energy value needed to complete the opening of the supply side circuit-breaker. To ensure a good level of reliability, avoiding any oversizing or transient contact repulsion phenomena in the circuit-breaker on the supply side, this calculation should be integrated with additional information, such as the current limiting curves (peak I_p value - prospective value of the symmetrical component of the short-circuit current) and the setting for contact repulsion.

This type of selectivity is certainly more difficult to consider than the previous ones because it depends largely on the interaction between the two devices placed in series (wave forms, etc.) and requires access to data often unavailable to the end user.

Manufacturers provide tables, slide rules and calculation programs in which the limit selectivity current values I_s under short-circuit conditions between different combinations of circuit-breakers are given. These values are defined by theoretically integrating the results of a large number of tests performed in compliance with the requirements of appendix A of the IEC 60947-2 Standard.

The advantages of using this type of coordination include:

– breaking is fast, with trip times which become shorter as the short-circuit current increases. This consequently reduces the damage caused by the fault (thermal and dynamic stresses), the disturbance to the power supply system, the sizing costs, etc.;
– the discrimination level is no longer limited by the value of the short-time current Icw withstood by the devices;
– a large number of hierarchically different levels can be coordinated;
– different current-limiting devices (fuses, circuit-breakers, etc.) can be coordinated, even when located in intermediate positions along the chain.

This type of coordination is used above all for secondary and final distribution, with rated currents below 1600 A.

Back-up protection

With backup protection, discrimination is sacrificed in favour of the need to help the load side devices which have to interrupt short-circuit currents beyond their breaking capacity. In this case, over and above the switching current I_B, simultaneous opening of both the protection devices placed in series or, alternatively, of just the supply side circuit-breaker (a somewhat rare case, typical of a configuration consisting of a supply side circuit-breaker and a load side isolator).

Manufacturers provide tables derived from tests based on the previously-mentioned appendix A of the IEC 60947-2 Standard.

These combinations can be calculated according to the instructions given in section A.6.2 of the above standard, comparing:

– the value of the Joule integral of the device protected at its breaking capacity with that of the supply side device at the prospective current of the association (maximum short-circuit current for which backup protection is provided);
– the effects induced in the load side device (e.g. by the arcing energy, maximum peak current and limited current) at the peak current value during operation of the protection device against a supply side short-circuit.

Conclusions

Technically a large number of solutions can be realised regarding coordination of the protection devices in an installation.

Selecting which type of coordination to use in the various zones of the installation is strictly linked to installation and design parameters and stems from a series of compromises so that the objectives required in terms of reliability and availability are achieved keeping the costs and limiting the risks within acceptable limits.

The designer's task is to choose a solution, for the various installation zones, from among those available which offers the best balance between technical and financial requirements according to:

– functional and safety requirements (acceptable risk levels) and reliability (availability of the installation);
– the reference value of the electrical values;
– the costs (protection devices, control systems, interconnection components, etc.);
– the effects, the admissible duration and the cost of electrical disservices;
– any future evolution of the system.

For each of the proposed solutions, there is a combination of ABB products which can meet these requirements.

Electromechanical starter

The starter is designed to:

– start motors;

– ensure continuous functioning of motors;

– disconnect motors from the supply line;

– guarantee protection of motors against working overloads.

The starter is typically made up of a switching device (contactor) and an overload protection device (thermal release).

The two devices must be coordinated with equipment capable of providing protection against short-circuit (typically a circuit breaker with magnetic release only), which is not necessarily part of the starter.

The characteristics of the starter must comply with the international Standard IEC 60947-4-1, which defines the above as follows:

Contactor: a mechanical switching device having only one position of rest, operated otherwise than by hand, capable of making, carrying and breaking currents under normal circuit conditions including operating overload conditions.

Thermal release: thermal overload relay or release which operates in the case of overload and also in case of loss of phase.

Circuit-breaker: defined by IEC 60947-2 as a mechanical switching device, capable of making, carrying and breaking currents under normal circuit conditions and also making, carrying for a specified time and breaking currents under specified abnormal circuit conditions.

The main types of motor which can be operated and which determine the characteristics of the starter are defined by the following utilization categories:

Table 1: Utilization categories and typical applications

Current type	Utilization categories	Typical applications
Alternating current AC	AC-2	Slip-ring motors: starting, switching off
	AC-3	Squirrel-cage motors: starting, switching off during running[1]
	AC-4	Squirrel-cage motors: starting, plugging, inching

[1] AC-3 categories may be used for occasionally inching or plugging for limited time periods such as machine set-up; during such limited time periods the number of such operations should not exceed five per minutes or more than ten in a 10 minutes period.

The choice of the starting method and also, if necessary, of the type of motor to be used depends on the typical resistant torque of the load and on the short-circuit power of the motor supplying network.

With alternating current, the most commonly used motor types are as follows:

– asynchronous three-phase squirrel-cage motors (AC-3): the most widespread type due to the fact that they are of simple construction, economical and sturdy; they develop high torque with short acceleration times, but require elevated starting currents;

– slip-ring motors (AC-2): characterized by less demanding starting conditions, and have quite a high starting torque, even with a supply network of low power.

Coordination tables

General notes on motor protection and switching

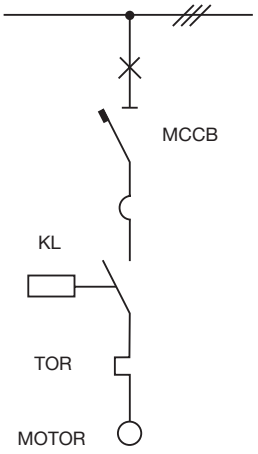
Starting methods

The most common starting methods for asynchronous squirrel-cage motors are detailed below.

Direct starting (DOL)

With direct starting, the DOL (Direct On Line) starter, with the closing of line contactor KL, the line voltage is applied to the motor terminals in a single operation. Hence a squirrel-cage motor develops a high starting torque with a relatively reduced acceleration time.

This method is generally used with small and medium power motors which reach full working speed in a short time.



These advantages are, however, accompanied by a series of drawbacks, including, for example:

– high current consumption and associated voltage drop which may cause damages to the other parts of the system connected to the network;
– violent acceleration which has negative effects on mechanical transmission components (belts, chains and mechanical joints), reducing working life.

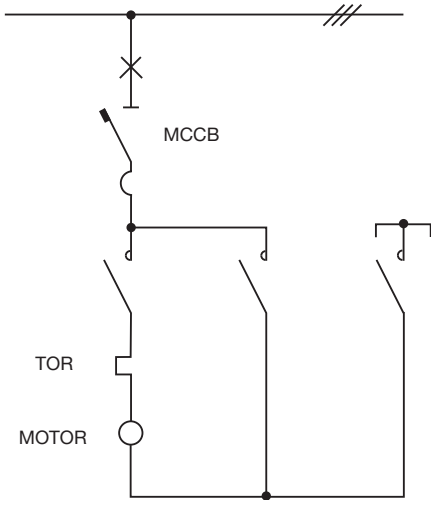
Other types of starting for squirrel-cage motors are accomplished by reducing the supply voltage of the motor: this leads to a reduction in the starting current and of the motor torque, and an increase in the acceleration time.

Star-Delta starter (Y-Δ)

The most common reduced voltage starter is the Star-Delta starter (Y-Δ), in which:

– on starting, the stator windings are star-connected, thus achieving the reduction of peak inrush current;
– once the normal speed of the motor is nearly reached, the switchover to delta is carried out.

After the switchover, the current and the torque follow the progress of the curves associated with normal service connections (delta).



As can be easily checked, starting the motor with star-connection gives a voltage reduction of $\sqrt{3}$, and the current absorbed from the line is reduced by 1/3 compared with that absorbed with delta-connection.

The start-up torque, proportional to the square of the voltage, is reduced by 3 times, compared with the torque that the same motor would supply when delta-connected.

This method is generally applied to motors with power from 15 to 355 kW, but intended to start with a low initial resistant torque.

Starting sequence

By pressing the start button, contactors KL and KY are closed. The timer starts to measure the start time with the motor connected in star. Once the set time has elapsed, the first contact of the timer opens the KY contactor and the second contact, delayed by approximately 50-80 ms, closes the KΔ contactor.

With this new configuration, contactors KL and KΔ closed, the motor becomes deltaconnected.

The thermal release TOR, inserted in the delta circuit, can detect any 3rd harmonic currents, which may occur due to saturation of the magnetic pack and by adding to the fundamental current, overload the motor without involving the line.

With reference to the connection diagram, the equipment used for a Star/Delta starter must be able to carry the following currents:

$\frac{I_e}{\sqrt{3}}$ KL line contactor and KΔ delta contactor

$\frac{I_e}{3}$ KY star contactor

$\frac{I_e}{\sqrt{3}}$ overload protection release

where I_e is the rated current of the motor.

With reference to the previously-mentioned Standard, the starter can be classified according to the tripping time (Trip Class) and to the coordination type implemented by means of a protection device against short-circuit (Type 1 and Type 2).

Trip classes

The trip classes differentiate between the thermal releases according to their trip curve.

The trip classes are defined in the following table 2:

Table 2: Trip class

Trip Class	Trip time in seconds **(Tp)**
10 A	$2 < Tp \leq 10$
10	$4 < Tp \leq 10$
20	$6 < Tp \leq 20$
30	$9 < Tp \leq 30$

where Tp is the cold trip time of the thermal release at 7.2 times the set current value (for example: a release in class 10 at 7.2 times the set current value must not trip within 4 s, but must trip within 10 s).

It is normal procedure to associate class 10 with a normal start-up type, and class 30 with a heavy duty start-up type.

Coordination type

Type 1

It is acceptable that in the case of short-circuit the contactor and the thermal release may be damaged. The starter may still not be able to function and must be inspected; if necessary, the contactor and/or the thermal release must be replaced, and the breaker release reset.

Type 2

In the case of short-circuit, the thermal release must not be damaged, while the welding of the contactor contacts is allowed, as they can easily be separated (with a screwdriver, for example), without any significant deformation.

Switch-disconnectors

Switch-disconnectors are mechanical switching devices, capable of closing, carrying and interrupting currents under normal circuit conditions which can include specific overload switching conditions and which, in the open position, satisfy the isolation requirements specified for an isolator.

A switch-disconnector can be able to close and carry currents - for an established time - under specific abnormal circuit conditions, such as those which occur in the case of a short-circuit.

The Standard regarding switch-disconnectors is IEC 60947-3.

Each switch-disconnector must be protected by a coordinated device which safeguards it against overcurrents - normally a circuit-breaker, and which is able to limit the peak values of the short-circuit current and the specific let-through energy, to acceptable levels for the switch-disconnector.

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Back-up protection

The tables given provide the value (in kA, referring to the breaking capacity according to the IEC 60947-2 Standard) for which the back-up protection among the combination of selected circuit-breakers is verified. The tables cover the possible combinations between ABB SACE Tmax series of moulded-case circuit-breakers and those between the above-mentioned circuit-breakers and the ABB series of miniature circuit-breakers.

The values indicated in the tables refer to the voltage:

– Vn of 230/240 V AC for coordination with miniature S9 circuit-breakers

– Vn of 400/415 V AC for all the other coordinations.

Note

The following tables give the breaking capacities at 415 V AC for circuit-breakers SACE Tmax.

Tmax @ 415 V AC	
Version	I_{cu} [kA]
B	16
C	25
N	36
S	50
H	70
L (for T2)	85
L (for T6)	100
L	120
V (for T7)	150
V	200

Caption

MCB = miniature circuit-breakers (S9, S2, S800)

MCCB = moulded-case circuit-breakers (Tmax)

For moulded-case circuit-breakers:

TM = thermomagnetic release
- TMD
- TMA

M = magnetic only release
- MF
- MA

EL = electronic trip unit
- PR221DS - PR222DS

For miniature circuit-breakers:

B = trip characteristic (Im=3...5In)

C = trip characteristic (Im=5...10In)

D = trip characteristic (Im=10...20In)

K = trip characteristic (Im=8...14In)

Z = trip characteristic (Im=2...3In)

Caption of symbols

MCB

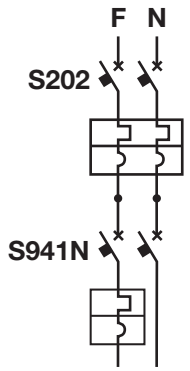
Tmax

For solutions not shown in these tables, please consult the website:
http://bol.it.abb.com
or contact ABB SACE

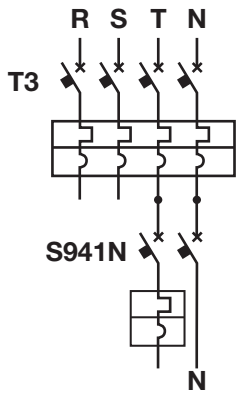
Back-up
Notes for use

The following drawings show the possible combination between circuit-breakers in order to obtain the back-up value given in the coordination tables.

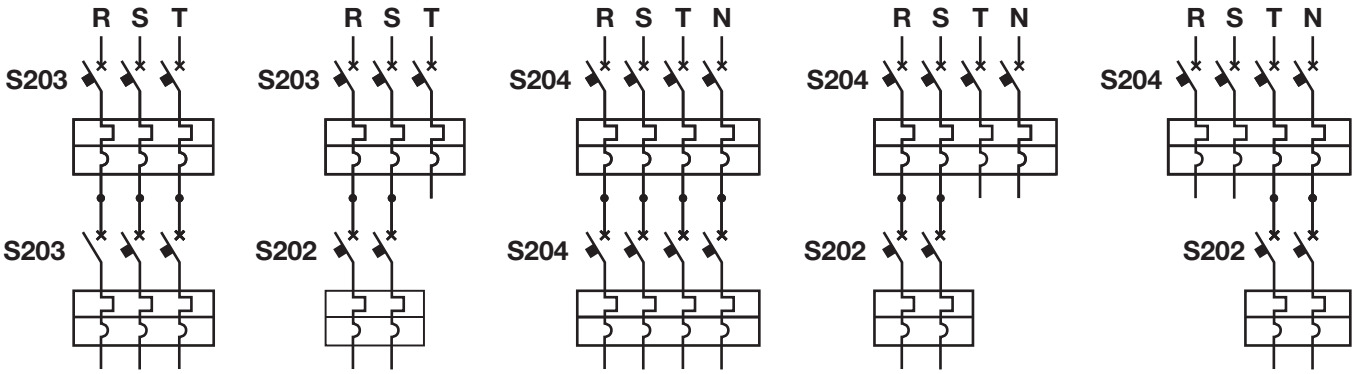
MCB - MCB @ 240 V (Two-pole circuit-breakers)



MCCB @ 415 V - MCB @ 240 V



MCB - MCB @ 415 V



Back-up

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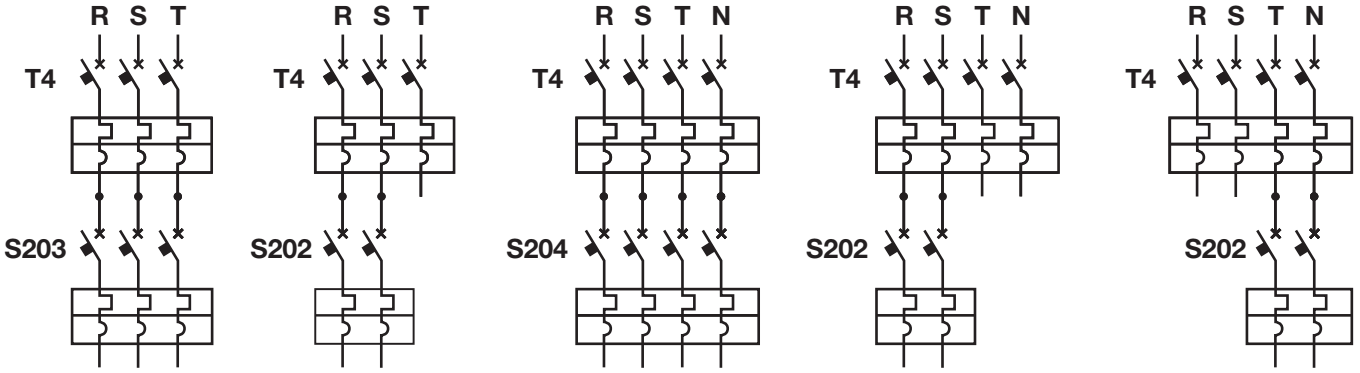
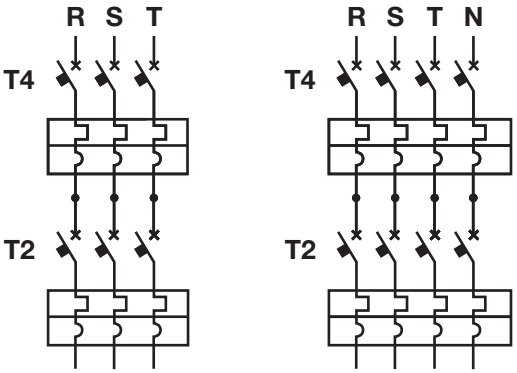
MCCB - MCB @ 415 V



MCCB - MCCB @ 415 V

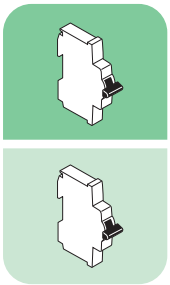


Back-up

Supply side circuit-breaker: MCB
Load side circuit-breaker: MCB

MCB - MCB @ 240 V (Two-pole circuit-breakers)

			Supply S.	S200	S200M	S200P		S290	S800S
	Char.			B-C	B-C	B-C		C	B-C-D-K
Load S.		I_{cu} [kA]		20	25	40	25	25	50
			I_n [A]	0.5..63	0.5..63	0.5..25	32..63	80..125	10..125
S931N	C	4.5	2..40	20	25	40	25	15	50
S941N	B,C	6	2..40	20	25	40	25	15	50
S951N	B,C	10	2..40	20	25	40	25	15	50
S971N	B,C	10	2..40	20	25	40	25	15	50
S200	B,C,K,Z	20	0.5..63		25	40	25		50
S200M	B,C	25	0.5..63			40			50
S200P	B,C, D,K,Z	40	0.5..25						50
		25	32..63						50
S290	C,D	25	80..125						



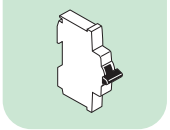
Back-up

Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCB

MCCB @ 415 V - MCB @ 240 V

			Supply S.[1]	T1	T1	T1	T2	T3	T2	T3	T2	T2
			Version	B	C	N			S		H	L
Load S.	Char.	I_n [A]	I_{cu} [kA]	16	25	36			50		70	85
S931 N	C	2..25	4.5	16	16	16	20	10	20	10	20	20
		32, 40		10	10	10	16		16		16	16
S941 N	B,C	2..25	6	16	16	16	20	10	20	10	20	20
		32, 40		10	10	10	16		16		16	16
S951 N	B,C	2..25	10	16	16	16	25	16	25	16	25	25
		32, 40					16		16		16	16
S971 N	B,C	2..25	10	16	16	16	25	16	25	16	25	25
		32, 40					16		16		16	16

[1] Supply side circuit-breaker 4P (load side circuit branched between one phase and the neutral)

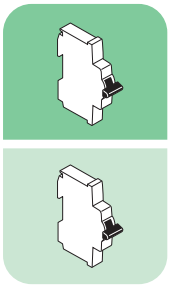


Back-up

Supply side circuit-breaker: MCB
Load side circuit-breaker: MCB

MCB - MCB @ 415 V

			Supply S.	S200	S200M	S200P		S280	S290	S800N	S800S
	Char.			B-C	B-C	B-C		B-C	C	B-C-D	B-C-D-K
Load S.		I_{cu} [kA]		10	15	25	15	6	15	36	50
			I_n [A]	0.5..63	0.5..63	0.5..25	32..63	80, 100	80..125	25..125	25..125
S200	B,C,K,Z	10	0.5..63		15	25	15		15	36	50
S200M	B,C	15	0.5..63			25				36	50
S200P	B,C, D,K,Z	25	0.5..25							36	50
		15	32..63							36	50
S280	B,C	6	80, 100								
S290	C,D	15	80..125								
S800N	B,C,D	36	10..125								
S800S	B,C,D,K	50	10..125								

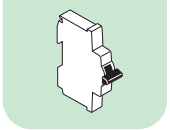


Back-up

Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCB

MCCB - MCB @ 415 V

			Supply S.	T1	T1	T1	T2	T3	T4	T2	T3	T4	T2	T4	T2	T4	T4
			Version	B	C	N				S			H		L	L	V
Load S.	Char.	I_n [A]	I_{cu} [kA]	16	25	36				50			70		85	120	200
S200	B,C,K,Z	0.5..10	10	16	25	30	36	36	36	36	40	40	40	40	40	40	40
		13..63						16			16						
S200M	B,C	0.5..10	15	16	25	30	36	36	36	50	40	40	70	40	85	40	40
		13..63						25			25		60		60		
S200P	B,C, D,K,Z	0.5..10	25			30	36	36	36	50	40	40	70	40	85	40	40
		13..25				30	36	30	36	50	30	40	60	40	60	40	40
		32..63	15	16	25	30	36	25	36	50	25	40	60	40	60	40	40
S280	B,C	80, 100	6	16	16	16	36	16	30	36	16	30	36	30	36	30	30
S290	C,D	80..125	15	16	25	30	36	30	30	50	30	30	70	30	85	30	30
S800N	B,C,D	10..125	36										70	70	85	120	200
S800S	B,C,D,K	10..125	50										70	70	85	120	200



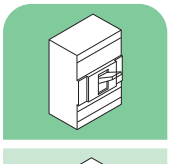
Back-up

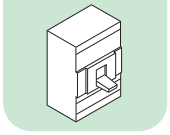
Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCCB

MCCB - MCCB @ 415 V

		Supply S.	T1	T1	T2	T3	T4	T5	T6	T2	T3	T4	T5	T6	T7	T2	T4	T5	T6	T7	T2	T4	T5	T6	T7	T4	T5
		Version	C	N						S						H					L	L		L		V	
Load S.	Char.	I_{cu} [kA]	25	36						50										65	85	120		100[1]		200	
T1	B	16	25	36	36	36	30	30	30	50	50	36	36	36		70	40	40	40		85	50	50	50		85	65
T1	C	25		36	36	36	36	36	36	50	50	40	40	50	50	70	65	65	65	50	85	85	85	70	50	130	100
T1	N	36								50	50	50	50	50	50	70	65	65	65	50	85	100	100	70	50	200	120
T2										50	50	50	50	50	50	70	65	65	65	65	85	100	100	85	85	200	120
T3											50	50	50	50	50		65	65	65	50		100	100	100	50	200	120
T4												50	50	50	50		65	65	65	50		100	100	65	65	200	120
T5													50	50	50			65	65	50			100	85	65		120
T6														50	40				65	40				70	50		
T2	S	50															70	70	70	70	85	100	100	85	85	200	130
T3																	70	70	70			100	100	100		200	150
T4																	70	70	70	70		100	100	85	85	200	150
T5																		70	70	70			100	85	85		150
T6																			70					85	85		
T2	H	70																			85	120	120	85	85	200	150
T4																						120	120	100	100	200	180
T5																							120	100	100		180
T6																								100	85		
T2	L	85																				120	120			200	180
T4		120																								200	200
T5																											200

[1] 120 kA for T7





Coordination tables
Discrimination

Index

Selective protection

The tables given provide the value (in kA, referring to the breaking capacity according to the IEC 60947-2 Standard) for which the selective protection is verified among the combination of selected circuit-breakers. The tables cover the possible combinations between ABB SACE Emax series air circuit-breakers, ABB SACE Tmax series of moulded-case circuit-breakers, and the ABB series of miniature circuit-breakers.

The values in the table represent the maximum value obtainable of discrimination between supply side circuit-breaker and load side circuit-breaker referring to the voltage:

– Vn of 230/240 V AC for the S9 circuit-breakers and Vn of 400/415 V AC for the supply side circuit-breakers in the coordination between MCB with the miniature S9 circuit-breakers.
– Vn of 400/415 V AC for all the other coordinations.

These values are obtained following particular specifications which, when not respected, could give discrimination values which are in some cases much lower than what is indicated. Some of these are generally valid and are given below, others referring exclusively to particular types of circuit-breakers will be the subject of a note under the relative table.

EFDP zone selectivity

In the following pages are also given the discrimination tables with circuit-breakers equipped with PR223EF trip units (for T4L - T5L - T6L) valid for the following combination:

– Tmax T4- T5- T6 circuit-breakers on the supply side (with trip delayed parameter set to ON and 24 V auxiliary power supply) and T1-T2 on the load side.
– Tmax T4- T5- T6 circuit-breakers both on the supply and load side (with 24 V auxiliary power supply).

General prescriptions

– Function I of the electronic releases of the supply side circuit-breakers must be excluded (I_3 in OFF);
– The magnetic trip of thermomagnetic (TM) or magnetic only (M) circuit-breakers placed on the supply side must be ≥ 10 x In and regulated to the maximum threshold;
– It is of prime importance to check that the settings made by the user for the electronic and thermomagnetic relays of circuit-breakers placed both on the load and supply side results in time-current curves properly spaced.

Note

The letter T indicates total discrimination for the selected combination; the corresponding value in kA is obtained by considering the lowest between the breaking capacities (Icu) of the circuit-breaker on the load side and the circuit-breaker on the supply side.

The following tables give the breaking capacities at 415 V AC for SACE Emax and Tmax circuit-breakers.

Tmax @ 415 V AC	
Version	I_{cu} [kA]
B	16
C	25
N	36
S	50
H	70
L (for T2)	85
L (for T6)	100
L	120
V (for T7)	150
V	200

Emax @ 415 V AC	
Version	I_{cu} [kA]
B	42
N (for E1)	50
N	65
S	75
S (for E2)	85
L	130
L (for X1)	150
V (for E3)	130
V	150

Caption

MCB = miniature circuit-breakers (S9, S2, S800)
MCCB = moulded-case circuit-breakers (Tmax)
ACB = air circuit-breakers (Emax)

For moulded-case or air circuit-breakers:
TM = thermomagnetic release
- TMD (Tmax)
- TMA (Tmax)

M = magnetic only release
- MF (Tmax)
- MA (Tmax)

EL = electronic trip unit

For miniature circuit-breakers:
B = trip characteristic (Im=3...5In)
C = trip characteristic (Im=5...10In)
D = trip characteristic (Im=10...20In)
K = trip characteristic (Im=8...14In)
Z = trip characteristic (Im=2...3In)

Caption of symbols


MCB


Tmax


Emax

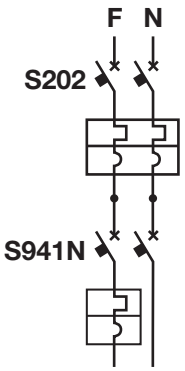
For solutions not shown in these tables, please consult the website:
http://bol.it.abb.com
or contact ABB SACE

Discrimination

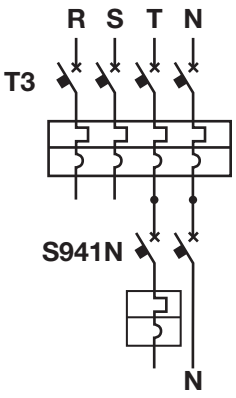
Notes for use

The following drawings show the possible combination between circuit-breakers in order to obtain the selectivity value given in the coordination tables.

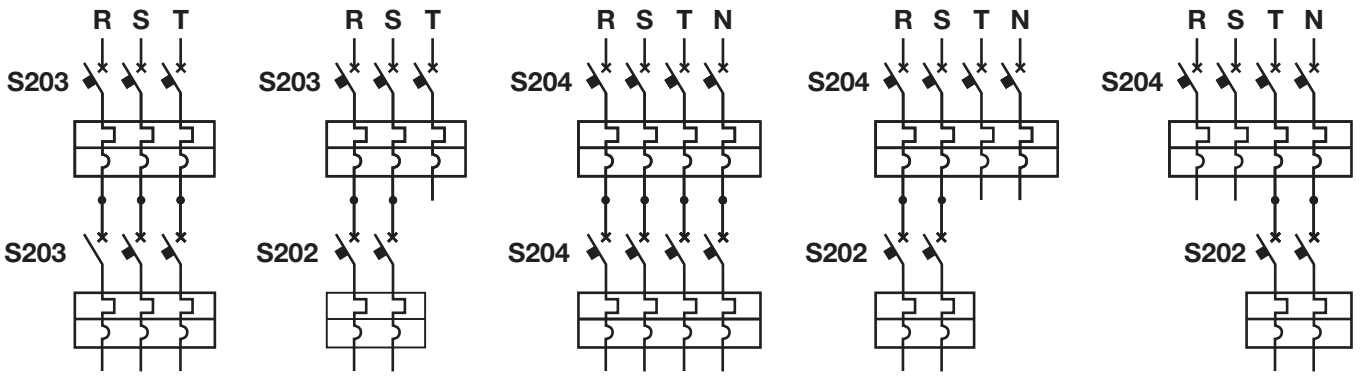
MCB - MCB @ 240 V (Two-pole circuit-breakers)



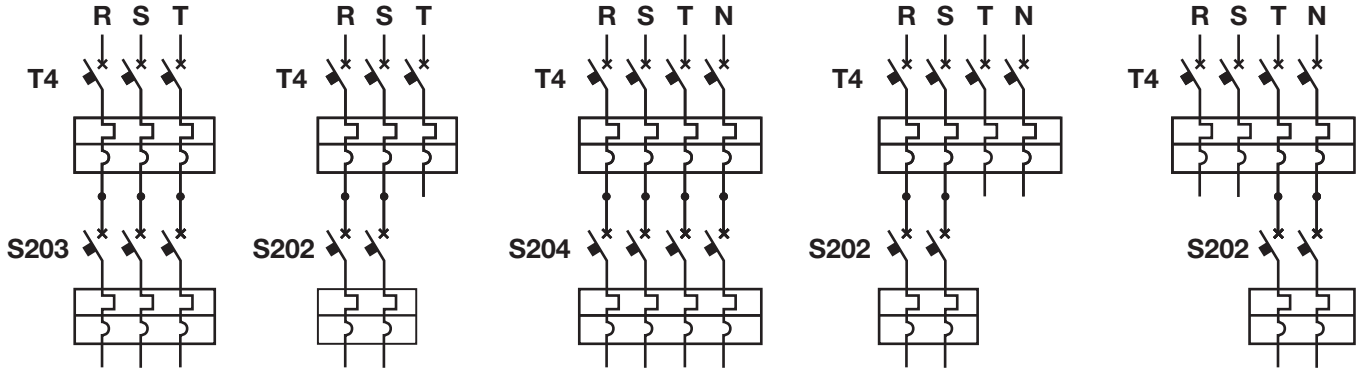
MCCB @ 415 V - MCB @ 240 V



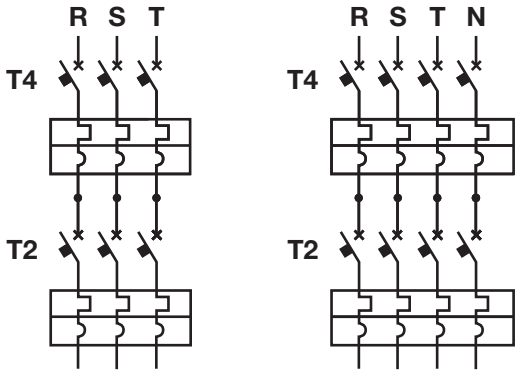
MCB - MCB @ 415 V



MCCB - MCB @ 415 V



MCCB - MCCB @ 415 V



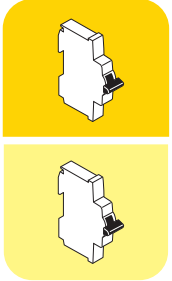
Discrimination

Supply side circuit-breaker: MCB
Load side circuit-breaker: MCB

MCB - S9 @ 230/240 V

Load S.[1]	Supply S.[2] Char.	I_{cu} [kA]	I_n [A]	S290 C 15			S290 D 15		S800 N-S B 36-50							
				80	100	125	80	100	25	32	40	50	63	80	100	125
S931N	B, C	4.5	2	T	T	T	T	T		0.43[3]	0.6	1.3	4	T	T	T
			4	T	T	T	T	T			0.45	0.8	1.5	2.5	4	T
			6	T	T	T	T	T				0.6	1.2	1.6	2.6	3.8
			10	4	T	T	T	T				0.5	1.1	1.4	2	3
			16	2.5	3.5	3.5	4	T					0.8	1.2	1.7	2.5
			20	1.5	2.5	2.5	3	T						1	1.5	2.1
			25	0.5	0.5	1.5	2	4							1.3	1.8
			32	0.5	0.5	0.5	1.5	3.5							1.1	1.7
			40	0.5	0.5	0.5	1.5	3.5								1.6
S941N	B, C	6	2	T	T	T	T	T		0.43[3]	0.6	1.3	4	T	T	T
			4	5	T	T	T	T			0.45	0.8	1.5	2.5	4	T
			6	4.5	5	T	5.5	T				0.6	1.2	1.6	2.6	3.8
			10	4	4.5	5	5	5				0.5	1.1	1.4	2	3
			16	2.5	3.5	3.5	4	4.5					0.8	1.2	1.7	2.5
			20	1.5	2.5	2.5	3	4.5						1	1.5	2.1
			25	0.5	0.5	1.5	2	4							1.3	1.8
			32	0.5	0.5	0.5	1.5	3.5							1.1	1.7
			40	0.5	0.5	0.5	1.5	3.5								1.6
S951N	B, C	10	2	6	8	9	7	8		0.43[3]	0.6	1.3	4	9	T	T
			4	5	6	7.5	6	7			0.45	0.8	1.5	2.5	4	7.3
			6	4.5	5	6	5.5	6				0.6	1.2	1.6	2.6	3.8
			10	4	4.5	5	5	5				0.5	1.1	1.4	2	3
			16	2.5	3.5	3.5	4	4.5					0.8	1.2	1.7	2.5
			20	1.5	2.5	2.5	3	4.5						1	1.5	2.1
			25	0.5	0.5	1.5	2	4							1.3	1.8
			32	0.5	0.5	0.5	1.5	3.5							1.1	1.7
			40	0.5	0.5	0.5	1.5	3.5								1.6
S971N	B, C	10	2	6	8	9	7	8		0.43[3]	0.6	1.3	4	9	T	T
			4	5	6	7.5	6	7			0.45	0.8	1.5	2.5	4	7.3
			6	4.5	5	6	5.5	6				0.6	1.2	1.6	2.6	3.8
			10	4	4.5	5	5	5				0.5	1.1	1.4	2	3
			16	2.5	3.5	3.5	4	4.5					0.8	1.2	1.7	2.5
			20	1.5	2.5	2.5	3	4.5						1	1.5	2.1
			25	0.5	0.5	1.5	2	4							1.3	1.8
			32	0.5	0.5	0.5	1.5	3.5							1.1	1.7
			40	0.5	0.5	0.5	1.5	3.5								1.6

[1] Load side circuit-breaker 1P+N (230/240 V)
[2] For networks with 230/240 V AC ⇒ two-pole circuit-breaker (phase + neutral)
for networks at 400/415 V AC ⇒ four-pole circuit-breaker (load side circuit branched between one phase and the neutral)
[3] Only for curve B



	S800 N-S								S800 N-S							
	C								D							
	36-50								36-50							
	25	32	40	50	63	80	100	125	25	32	40	50	63	80	100	125
	0.4[3]	0.55	1.2	3	T	T	T	T	1.3	4.1	T	T	T	T	T	T
		0.43	0.75	1.3	2.1	3.9	T	T	0.8	1.6	3	5.4	T	T	T	T
			0.55	1.1	1.5	2.5	3.6	5.5	0.6	1.3	2	3.2	3.9	T	T	T
			0.45	1	1.3	1.9	2.8	4.2	0.5	1.2	1.65	2.6	3.1	T	T	T
				0.75	1.1	1.6	2.3	3.6		0.9	1.4	1.8	2.6	5	T	T
					0.9	1.4	1.9	3.3			1.3	1.6	2.2	4.2	5.4	T
						1.2	1.6	2.7				1.5	1.9	3.5	4.5	T
						1	1.5	2.5					1.8	2.8	4.2	5.5
							1.4	2.1					1.7	2.7	4	5
	0.4[3]	0.55	1.2	3	T	T	T	T	1.3	4.1	T	T	T	T	T	T
		0.43	0.75	1.3	2.1	3.9	T	T	0.8	1.6	3	5.4	T	T	T	T
			0.55	1.1	1.5	2.5	3.6	5.5	0.6	1.3	2	3.2	3.9	T	T	T
			0.45	1	1.3	1.9	2.8	4.2	0.5	1.2	1.65	2.6	3.1	T	T	T
				0.75	1.1	1.6	2.3	3.6		0.9	1.4	1.8	2.6	5	T	T
					0.9	1.4	1.9	3.3			1.3	1.6	2.2	4.2	5.4	T
						1.2	1.6	2.7				1.5	1.9	3.5	4.5	T
						1	1.5	2.5					1.8	2.8	4.2	5.5
							1.4	2.1					1.7	2.7	4	5
	0.4[3]	0.55	1.2	3	6.6	T	T	T	1.3	4.1	T	T	T	T	T	T
		0.43	0.75	1.3	2.1	3.9	6.6	T	0.8	1.6	3	5.4	7.6	T	T	T
			0.55	1.1	1.5	2.5	3.6	5.5	0.6	1.3	2	3.2	3.9	8	T	T
			0.45	1	1.3	1.9	2.8	4.2	0.5	1.2	1.65	2.6	3.1	6.2	8.6	T
				0.75	1.1	1.6	2.3	3.6		0.9	1.4	1.8	2.6	5	6.3	8.8
					0.9	1.4	1.9	3.3			1.3	1.6	2.2	4.2	5.4	7.6
						1.2	1.6	2.7				1.5	1.9	3.5	4.5	6.6
						1	1.5	2.5					1.8	2.8	4.2	5.5
							1.4	2.1					1.7	2.7	4	5
	0.4[3]	0.55	1.2	3	6.6	T	T	T	1.3	4.1	T	T	T	T	T	T
		0.43	0.75	1.3	2.1	3.9	6.6	T	0.8	1.6	3	5.4	7.6	T	T	T
			0.55	1.1	1.5	2.5	3.6	5.5	0.6	1.3	2	3.2	3.9	8	T	T
			0.45	1	1.3	1.9	2.8	4.2	0.5	1.2	1.65	2.6	3.1	6.2	8.6	T
				0.75	1.1	1.6	2.3	3.6		0.9	1.4	1.8	2.6	5	6.3	8.8
					0.9	1.4	1.9	3.3			1.3	1.6	2.2	4.2	5.4	7.6
						1.2	1.6	2.7				1.5	1.9	3.5	4.5	6.6
						1	1.5	2.5					1.8	2.8	4.2	5.5
							1.4	2.1					1.7	2.7	4	5

Discrimination

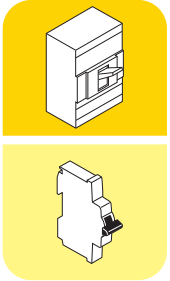
Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCB

MCCB @ 415 V 4p - S9 @ 240 V

			Supply S.	T1																		
			Version	B, C, N																		
			Release	TMD																		
			I_u [A]	160																		
Load S.	Char.	I_{cu} [kA]	I_n [A]	16	20	25	32	40	50	63	80	100	125	160[2]	160	16	20	25	32	40	50
S931N	C	4.5	≤4	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	C		6	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	C		10			3	3	3	T	T	T	T	T	T	T		3[1]	3	3	3	T
	C		16					3	T	T	T	T	T	T	T				3[1]	3	T
	C		20						3	T	T	T	T	T	T				3[1]		3
	C		25							T	T	T	T	T	T						3[1]
	C		32								T	T	T	T	T						3[1]
	C		40									T	T	T	T						
S941N	B, C	6	≤4	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	B, C		6	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	B, C		10			3	3	3	4.5	T	T	T	T	T	T		3[1]	3	3	3	4.5
	B, C		16					3	4.5	5	T	T	T	T	T				3[1]	3	4.5
	B, C		20						3	5	T	T	T	T	T				3[1]		3
	B, C		25							5	T	T	T	T	T						3[1]
	B, C		32								T	T	T	T	T						3[1]
	B, C		40									T	T	T	T						
S951N	B, C	10	≤4	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	B, C		6	6	6	6	6	6	6	T	T	T	T	T	T	T	T	T	T	T	T
	B, C		10			3	3	3	4.5	7.5	8.5	T	T	T	T		3[1]	3	3	3	4.5
	B, C		16					3	4.5	5	7.5	T	T	T	T				3[1]	3	4.5
	B, C		20						3	5	6	T	T	T	T				3[1]		3
	B, C		25							5	6	T	T	T	T						3[1]
	B, C		32								6	7.5	T	T	T						3[1]
	B, C		40									7.5	T	T	T						
S971N	B, C	10	≤4	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	B, C		6	6	6	6	6	6	6	12	T	T	T	T	T	T	T	T	T	T	T
	B, C		10			3	3	3	4.5	7.5	8.5	T	T	T	T		3[1]	3	3	3	4.5
	B, C		16					3	4.5	5	7.5	T	T	T	T				3[1]	3	4.5
	B, C		20						3	5	6	T	T	T	T				3[1]		3
	B, C		25							5	6	T	T	T	T						3[1]
	B, C		32								6	T	T	T	T						3[1]
	B, C		40									T	T	T	T						

Supply side circuit-breaker 4P (load side circuit branched between one phase and the neutral)
Load side circuit-breaker 1P+N (230/240 V)

[1] Value valid for magnetic only supply side circuit-breaker
[2] Neutral at 50%



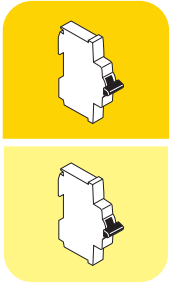
T2													T3										
N, S, H, L													N, S										
TMD, MA								EL					TMD, MA										
160													250										
63	80	100	125[2]	125	160[2]	160	10	25	63	100	160	63	80	100	125[2]	125	160[2]	160	200[2]	200	250[2]	250
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T	T	T			T	T	T		T	T	T	T	T	T	T	T	T	T	T
	T[1]	T		T	T	T				T	T		T[1]	T		T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
5	T	T	T	T	T	T			T	T	T	5	T	T	T	T	T	T	T	T	T	T	T
5	T	T	T	T	T	T			T	T	T	5	T	T	T	T	T	T	T	T	T	T	T
5	T	T	T	T	T	T			T	T	T	5	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T	T	T			T	T	T		T	T	T	T	T	T	T	T	T	T	T
	T	T		T	T	T				T	T		T	T		T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
7.5	8.5	T	T	T	T	T		T	T	T	T	7.5	8.5	T	T	T	T	T	T	T	T	T	T
5	7.5	T	7.5	T	T	T			T	T	T	5	7.5	T	7.5	T	T	T	T	T	T	T	T
5	6	T	6	T	T	T			T	T	T	5	6	T	6	T	T	T	T	T	T	T	T
5	6	T	6	T	T	T			T	T	T	5	6	T	6	T	T	T	T	T	T	T	T
	6	7.5	6	T	T	T			T	T	T		6	7.5	6	T	T	T	T	T	T	T	T
	6[1]	7.5		T	T	T				T	T		6[1]	7.5		T	T	T	T	T	T	T	T
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T	T	T	T	T	T	T		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
7.5	8.5	T	T	T	T	T		T	T	T	T	7.5	8.5	T	T	T	T	T	T	T	T	T	T
5	7.5	T	7.5	T	T	T			T	T	T	5	7.5	T	7.5	T	T	T	T	T	T	T	T
5	6	T	6	T	T	T			T	T	T	5	6	T	6	T	T	T	T	T	T	T	T
5	6	T	6	T	T	T			T	T	T	5	6	T	6	T	T	T	T	T	T	T	T
	6	7.5	6	T	T	T			T	T	T		6	7.5	6	T	T	T	T	T	T	T	T
	6[1]	7.5		T	T	T				T	T		6[1]	7.5		T	T	T	T	T	T	T	T

Discrimination

Supply side circuit-breaker: MCB
Load side circuit-breaker: MCB

MCB - S2.. B @ 415 V

						Supply S.	S290		S800N-S							
	Char.						D		B							
		I_{cu} [kA]					15		36-50							
		10	15	25	I_n [A]		80	100	25	32	40	50	63	80	100	125
Load S.	B	-	-	-	≤2											
		-	-	-	3											
		-	-	-	4											
		S200	S200M	S200P	6		10.5	T			0.4	0.5	0.7	1	1.5	2.6
		S200	S200M	S200P	8		10.5	T				0.4	0.6	0.7	1	1.4
		S200	S200M	S200P	10		5	8				0.4	0.6	0.7	1	1.4
		S200	S200M	S200P	13		4.5	7					0.5	0.7	0.9	1.3
		S200	S200M	S200P	16		4.5	7						0.7	0.9	1.3
		S200	S200M	S200P	20		3.5	5							0.9	1.3
		S200	S200M	S200P	25		3.5	5							0.9	1.3
		S200	S200M-S200P	-	32			4.5							0.8	1.1
		S200	S200M-S200P	-	40										0.8	1.1
		S200	S200M-S200P	-	50											1
		S200	S200M-S200P	-	63											0.9



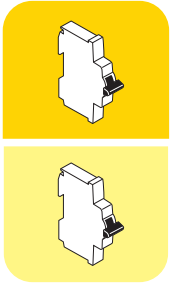
	S800N-S								S800N-S							
	C								D							
	36-50								36-50							
	25	32	40	50	63	80	100	125	25	32	40	50	63	80	100	125
			0.4	0.5	0.7	1	1.5	2.6	0.5	1	1.2	2	2.8	9.9	21.3	T
				0.4	0.6	0.7	1	1.4	0.4	0.6	0.8	1.1	1.4	2.8	3.9	7.4
				0.4	0.6	0.7	1	1.4	0.4	0.6	0.8	1.1	1.4	2.8	3.9	7.4
					0.5	0.7	0.9	1.3	0.4	0.6	0.8	1.1	1.4	2.5	3.3	5.6
						0.7	0.9	1.3		0.6	0.8	1.1	1.4	2.5	3.3	5.6
							0.9	1.3			0.8	1.1	1.3	2.3	3	4.7
							0.9	1.3			0.8	1.1	1.3	2.3	3	4.7
							0.8	1.1				0.9	1.1	1.9	2.4	3.7
							0.8	1.1					1.1	1.9	2.4	3.7
								1						1.5	1.9	2.3
								0.9							1.7	2.3

Discrimination

Supply side circuit-breaker: MCB
Load side circuit-breaker: MCB

MCB - S2.. C @ 415 V

					Supply S.	S290		S800N-S							
	Char.					D		B							
		I_{cu} [kA]				15		36-50							
		10	15	25	I_n [A]	80	100	25	32	40	50	63	80	100	125
Load S.	C	S200	S200M	S200P	≤2	T	T		0.7	1.3	T	T	T	T	T
		S200	S200M	S200P	3	T	T			0.6	0.7	1.1	2.6	8.8	T
		S200	S200M	S200P	4	T	T			0.6	0.7	1	1.7	3.1	7
		S200	S200M	S200P	6	10.5	T			0.4	0.5	0.7	1	1.5	2.6
		S200	S200M	S200P	8	10.5	T				0.4	0.6	0.7	1	1.4
		S200	S200M	S200P	10	5	8				0.4	0.6	0.7	1	1.4
		S200	S200M	S200P	13	4.5	7					0.5	0.7	0.9	1.3
		S200	S200M	S200P	16	4.5	7						0.7	0.9	1.3
		S200	S200M	S200P	20	3.5	5							0.9	1.3
		S200	S200M	S200P	25	3.5	5							0.9	1.3
		S200	S200M-S200P	-	32		4.5							0.8	1.1
		S200	S200M-S200P	-	40									0.8	1.1
		S200	S200M-S200P	-	50										1
		S200	S200M-S200P	-	63										0.9



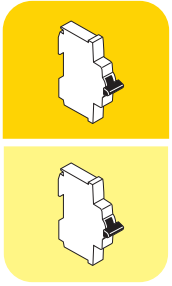
	S800N-S								S800N-S							
	C								D							
	36-50								36-50							
	25	32	40	50	63	80	100	125	25	32	40	50	63	80	100	125
		0.7	1.3	T	T	T	T	T	T	T	T	T	T	T	T	T
			0.6	0.7	1.1	2.6	8.8	T	0.7	2.2	4.4	T	T	T	T	T
			0.6	0.7	1	1.7	3.1	7	0.7	1.3	2.2	4.4	7.7	T	T	T
			0.4	0.5	0.7	1	1.5	2.6	0.5	1	1.2	2	2.8	9.9	22	T
				0.4	0.6	0.7	1	1.4	0.4	0.6	0.8	1.1	1.4	2.8	3.9	7.4
				0.4	0.6	0.7	1	1.4	0.4	0.6	0.8	1.1	1.4	2.8	3.9	7.4
					0.5	0.7	0.9	1.3	0.4	0.6	0.8	1.1	1.4	2.5	3.3	5.6
						0.7	0.9	1.3		0.6	0.8	1.1	1.4	2.5	3.3	5.6
							0.9	1.3			0.8	1.1	1.3	2.3	3	4.7
							0.9	1.3			0.8	1.1	1.3	2.3	3	4.7
							0.8	1.1				0.9	1.1	1.9	2.4	3.7
							0.8	1.1					1.1	1.9	2.4	3.7
								1						1.5	1.9	2.3
								0.9							1.7	2.3

Discrimination

Supply side circuit-breaker: MCB
Load side circuit-breaker: MCB

MCB - S2.. D @ 415 V

					Supply S.	S290		S800N-S								
	Char.					D		B								
		I_{cu} [kA]				15		36-50								
		10	15	25	I_n [A]	80	100	25	32	40	50	63	80	100	125	
Load S.	D	S200	-	S200P	≤2	T	T		0.5	0.7	2.1	T	T	T	T	
		S200	-	S200P	3	T	T			0.5	0.7	1.2	2.5	8.6	T	
		S200	-	S200P	4	T	T			0.4	0.7	1	1.7	3	7.7	
		S200	-	S200P	6	10.5	T				0.6	0.8	1.2	2	3.6	
		S200	-	S200P	8	10.5	T					0.7	0.9	1.3	2	
		S200	-	S200P	10	5	8						0.9	1.3	2	
		S200	-	S200P	13	3	5							1	1.5	
		S200	-	S200P	16	3	5								1.5	
		S200	-	S200P	20	3	5									
		S200	-	S200P	25		4									
		S200	S200P	-	32											
		S200	S200P	-	40											
		S200	S200P	-	50											
		S200	S200P	-	63											



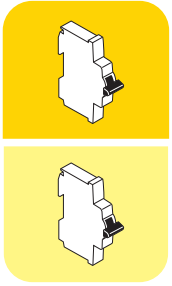
	S800N-S								S800N-S							
	C								D							
	36-50								36-50							
	25	32	40	50	63	80	100	125	25	32	40	50	63	80	100	125
		0.5	0.7	2.1	T	T	T	T	2.3	T	T	T	T	T	T	T
			0.5	0.7	1.2	2.5	8.6	T	0.7	1.3	4.4	T	T	T	T	T
			0.4	0.7	1	1.7	3	7.7	0.7	1	2.2	4.4	7.7	T	T	T
				0.6	0.8	1.2	2	3.6	0.6	0.8	1.5	2.5	3.6	12.1	24.2	T
					0.7	0.9	1.3	2	0.5	0.7	1.1	1.5	2	4	5.5	9.9
						0.9	1.3	2	0.5	0.7	1.1	1.5	2	4	5.5	9.9
							1	1.5		0.6	0.9	1.2	1.5	2.6	3.4	5.2
								1.5			0.9	1.2	1.5	2.6	3.4	5.2
												0.9	1.1	1.8	2.2	3.2
													1.1	1.8	2.2	3.2
														1.7	2	2.9
															1.9	2.6
																2.2

Discrimination

Supply side circuit-breaker: MCB
Load side circuit-breaker: MCB

MCB - S2.. K @ 415 V

						Supply S.	S290		S800N-S								
	Char.						D		B								
		I_{cu} [kA]					15		36-50								
		10	15	25	I_n [A]		80	100	25	32	40	50	63	80	100	125	
Load S.	K	S200	-	S200P	≤2		T	T		0.5	0.7	2.1	T	T	T	T	
		S200	-	S200P	3		T	T			0.5	0.7	1.2	2.5	8.6	T	
		S200	-	S200P	4		T	T			0.4	0.7	1	1.7	3	7.7	
		S200	-	S200P	6		10.5	T				0.6	0.8	1.2	2	3.6	
		S200	-	S200P	8		10.5	T					0.7	0.9	1.3	2	
		S200	-	S200P	10		5	8						0.9	1.3	2	
		-	-	S200P	13		3	5							1	1.5	
		S200	-	S200P	16		3	5								1.5	
		S200	-	S200P	20		3	5									
		S200	-	S200P	25			4									
		S200	S200P	-	32												
		S200	S200P	-	40												
		S200	S200P	-	50												
		S200	S200P	-	63												



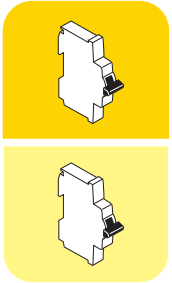
	S800N-S								S800N-S							
	C								D							
	36-50								36-50							
	25	32	40	50	63	80	100	125	25	32	40	50	63	80	100	125
		0.5	0.7	2.1	T	T	T	T	2.3	T	T	T	T	T	T	T
			0.5	0.7	1.2	2.5	8.6	T	0.7	1.3	4.4	T	T	T	T	T
			0.4	0.7	1	1.7	3	7.7	0.7	1	2.2	4.4	7.7	T	T	T
				0.6	0.8	1.2	2	3.6	0.6	0.8	1.5	2.5	3.6	12.1	24.2	T
					0.7	0.9	1.3	2	0.5	0.7	1.1	1.5	2	4	5.5	9.9
						0.9	1.3	2	0.5	0.7	1.1	1.5	2	4	5.5	9.9
							1	1.5		0.6	0.9	1.2	1.5	2.6	3.4	5.2
								1.5			0.9	1.2	1.5	2.6	3.4	5.2
												0.9	1.1	1.8	2.2	3.2
													1.1	1.8	2.2	3.2
														1.7	2	2.9
															1.9	2.6
																2.2

Discrimination

Supply side circuit-breaker: MCB
Load side circuit-breaker: MCB

MCB - S2.. Z @ 415 V

					Supply S.	S290		S800N-S								
	Char.					D		B								
		I_{cu} [kA]				15		36-50								
		10	15	25	I_n [A]	80	100	25	32	40	50	63	80	100	125	
Load S.	Z	S200	-	S200P	≤2	T	T		0.7	1.3	T	T	T	T	T	
		S200	-	S200P	3	T	T			0.6	0.7	1.1	2.6	8.8	T	
		S200	-	S200P	4	T	T			0.6	0.7	1	1.7	3.1	7	
		S200	-	S200P	6	10.5	T			0.4	0.5	0.7	1	1.5	2.6	
		S200	-	S200P	8	10.5	T				0.4	0.6	0.7	1	1.4	
		S200	-	S200P	10	5	8				0.4	0.6	0.7	1	1.4	
		-	-	S200P	13	4.5	7						0.7	0.9	1.3	
		S200	-	S200P	16	4.5	7						0.7	0.9	1.3	
		S200	-	S200P	20	3.5	5							0.9	1.3	
		S200	-	S200P	25	3.5	5							0.9	1.3	
		S200	S200P	-	32	3	4.5							0.8	1.1	
		S200	S200P	-	40	3	4.5							0.8	1.1	
		S200	S200P	-	50		3								1	
		S200	S200P	-	63										0.9	



	S800N-S								S800N-S							
	C								D							
	36-50								36-50							
	25	32	40	50	63	80	100	125	25	32	40	50	63	80	100	125
		0.7	1.3	T	T	T	T	T	T	T	T	T	T	T	T	T
			0.6	0.7	1.1	2.6	8.8	T	0.7	2.2	4.4	T	T	T	T	T
			0.6	0.7	1	1.7	3.1	7	0.7	1.3	2.2	4.4	7.7	T	T	T
			0.4	0.5	0.7	1	1.5	2.6	0.5	1	1.2	2	2.8	9.9	22	T
				0.4	0.6	0.7	1	1.4	0.4	0.6	0.8	1.1	1.4	2.8	3.9	7.4
				0.4	0.6	0.7	1	1.4	0.4	0.6	0.8	1.1	1.4	2.8	3.9	7.4
						0.7	0.9	1.3		0.6	0.8	1.1	1.4	2.5	3.3	5.6
						0.7	0.9	1.3		0.6	0.8	1.1	1.4	2.5	3.3	5.6
							0.9	1.3			0.8	1.1	1.3	2.3	3	4.7
							0.9	1.3			0.8	1.1	1.3	2.3	3	4.7
							0.8	1.1				0.9	1.1	1.9	2.4	3.7
							0.8	1.1					1.1	1.9	2.4	3.7
								1						1.5	1.9	2.3
								0.9							1.7	2.3

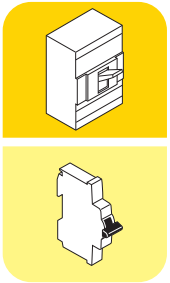
Discrimination

Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCB

MCCB - S800 @ 415 V

			Supply S.	T1						T1 - T3				T1	T3		
			Version	B, C, N, S, H, L, V													
			Release	TM													
Load S.	Char.	I_{cu} [kA]	I_n [A]	16	20	25	32	40	50	63	80	100	125	160	160	200	250
S800N	B C D	36	10			4.5	4.5	4.5	4.5	8	10	20[1]	25[1]	T	T	T	T
			13				4.5	4.5	4.5	7.5	10	15	25[1]	T	T	T	T
			16					4.5	4.5	7.5	10	15	25[1]	T	T	T	T
			20						4.5	7.5	10	15	25[1]	T	T	T	T
			25							6	10	15	20[1]	T	T	T	T
			32								7.5	10	20[1]	T	T	T	T
			40									10	20[1]	T	T	T	T
			50										15	T	T	T	T
			63											T	T	T	T
			80											T		T	T
			100											T			T
			125														T
S800S	B C D K	50	10			4.5	4.5	4.5	4.5	8	10	20[1]	25[1]	36[1]	36[1]	36[1]	T
			13				4.5	4.5	4.5	7.5	10	15	25[1]	36[1]	36[1]	36[1]	T
			16					4.5	4.5	7.5	10	15	25[1]	36[1]	36[1]	36[1]	T
			20						4.5	7.5	10	15	25[1]	36[1]	36[1]	36[1]	T
			25							6	10	15	20[1]	36[1]	36[1]	36[1]	T
			32								7.5	10	20[1]	36[1]	36[1]	36[1]	T
			40									10	20[1]	36[1]	36[1]	36[1]	T
			50										15	36[1]	36[1]	36[1]	T
			63											36[1]	36[1]	36[1]	T
			80											36[1]		36[1]	T
			100											36[1]			T
			125														T

[1] Select the lowest value between what is indicated and the breaking capacity of the supply side circuit-breaker



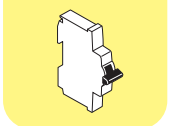
Discrimination

Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCB

MCCB-S800 @ 415 V

			Supply S.	T4									T4 - T5
			Version	N, S, H, L, V									
			Release	TM									EL
Load S.	Char.	I_{cu} [kA]	I_n [A]	20	25	32	50	80	100	125	160	200÷250	100÷630
S800N/S	B	36-50	10	6.5	6.5[1]	6.5	6.5	11	T	T	T	T	T
			13	6.5	5[1]	6.5	6.5	11	T	T	T	T	T
			16		5[1]	6.5	6.5	11	T	T	T	T	T
			20		4[1]	6.5	6.5	11	T	T	T	T	T
			25				6.5	11	T	T	T	T	T
			32				6.5	8	T	T	T	T	T
			40				5[1]	6.5	T	T	T	T	T
			50					5[1]	7.5	T	T	T	T
			63						5[1]	7	T	T	T
			80								T	T	T[2]
			100									T	T[2]
			125										T[2 3]
	C	36-50	10	6.5	6.5[1]	6.5	6.5	11	T	T	T	T	T
			13	6.5	5[1]	6.5	6.5	11	T	T	T	T	T
			16		5[1]	6.5	6.5	11	T	T	T	T	T
			20		4[1]	6.5	6.5	11	T	T	T	T	T
			25		4[1]		6.5	11	T	T	T	T	T
			32				6.5	8	T	T	T	T	T
			40				5[1]	6.5	T	T	T	T	T
			50				4[1]	5[1]	7.5	T	T	T	T
			63					4[1]	6.5[1]	7	T	T	T
			80					4[1]	5[1]	6.5[1]	6.5	T	T[2]
			100						4[1]	5[1]	5[1]	6.5	T[2]
			125							4[1]	4[1]	5[1]	T[2 3]
	D	36-50	10	6.5	6.5[1]	6.5	6.5	11	T	T	T	T	T
			13		5[1]		6.5	11	T	T	T	T	T
			16				6.5	11	T	T	T	T	T
			20				6.5[1]	11	T	T	T	T	T
			25				6.5[1]	11	T	T	T	T	T
			32					8[1]	T	T	T	T	T
			40					6.5[1]	T	T	T	T	T
			50						7.5[1]	T	T	T	T
			63							7[1]	T	T	T
			80								5[1]	T	T[2]
			100									5[1]	T[2]
			125										T[2 3]
	K	36-50	10		6.5[1]	6.5	6.5	11	T	T	T	T	T
			13		5[1]	5	6.5	11	T	T	T	T	T
			16		5[1]		6.5	11	T	T	T	T	T
			20		4[1]		6.5	11	T	T	T	T	T
			25				6.5[1]	11[1]	T	T	T	T	T
			32				5[1]	8[1]	T[1]	T	T	T	T
			40					6.5[1]	T[1]	T[1]	T	T	T
			50					5[1]	7.5[1]	T[1]	T[1]	T	T
			63					4[1]	6.5[1]	7[1]	T[1]	T[1]	T
			80						5[1]	6.5[1]	7[1]	T[1]	T[2]
			100							5[1]	6.5[1]	7[1]	T[2]
			125								5[1]	6.5[1]	T[2 3]

[1] Value valid only for magnetic only supply side circuit-breaker (with In = 50 A, please consider MA52 circuit-breakers)
[2] For T4 In = 100 A, value valid only for magnetic only supply side circuit-breaker
[3] For T4 In = 160 A, value valid only for magnetic only supply side circuit-breaker



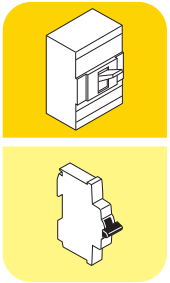
Discrimination

Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCB

MCCB - S2.. B @ 415 V

					Supply S.	T2	T1 - T2						T1 - T2 - T3				
					Version	B, C, N, S, H, L											
	Char.	I_{cu} [kA]			Release	TM											
		10	15	25	I_n [A]	12.5	16	20	25	32	40	50	63	80	100	125	160
Load S.	B	-	-	-	≤2												
		-	-	-	3												
		-	-	-	4												
		S200	S200M	S200P	6	5.5[1]	5.5	5.5	5.5	5.5	5.5	5.5	10.5	T	T	T	T
		S200	S200M	S200P	8			5.5	5.5	5.5	5.5	5.5	10.5	T	T	T	T
		S200	S200M	S200P	10			3[1]	3	3	3	4.5	7.5	8.5	17	T	T
		S200	S200M	S200P	13			3[1]		3	3	4.5	7.5	7.5	12	20	T
		S200	S200M	S200P	16					3[1]	3	4.5	5	7.5	12	20	T
		S200	S200M	S200P	20					3[1]		3	5	6	10	15	T
		S200	S200M	S200P	25							3[1]	5	6	10	15	T
		S200	S200M-S200P	-	32							3[1]		6	7.5	12	T
		S200	S200M-S200P	-	40									5.5[1]	7.5	12	T
		S200	S200M-S200P	-	50									3[1]	5[2]	7.5	10.5
		S200	S200M-S200P	-	63										5[2]	6[3]	10.5
		-	-	-	80												
		-	-	-	100												
		-	-	-	125												

[1] Value valid only for T2 magnetic only supply side circuit-breaker
[2] Value valid only for T2-T3 magnetic only supply side circuit-breaker
[3] Value valid only for T3 magnetic only supply side circuit-breaker
[4] Value valid only for T4 magnetic only supply side circuit-breaker



	T3		T4										T5	T2					T4		T5
	B, C, N, S, H, L, V																				
	TM													EL							
	200	250	20	25	32	50	80	100	125	160	200	250	320÷500	10	25	63	100	160	100, 160	250, 320	320÷630
	T	T	7.5	7.5[4]	7.5	7.5	T	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T	7.5	7.5[4]	7.5	7.5	T	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T	5	5[4]	5	6.5	9	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T		5[4]	5	6.5	8	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T		3[4]	5	6.5	8	T	T	T	T	T	T			T	T	T	T	T	T
	T	T				5	7.5	T	T	T	T	T	T			T	T	T	T	T	T
	T	T				5	7.5	T	T	T	T	T	T			T	T	T	T	T	T
	T	T				5[4]	7.5	T	T	T	T	T	T			T	T	T	T	T	T
	T	T					6.5	T	T	T	T	T	T				T	T	T	T	T
	T	T					5[4]	T	T	T	T	T	T				10.5	10.5	T	T	T
	T	T						T[4]	T[4]	T	T	T	T					10.5	T	T	T

2

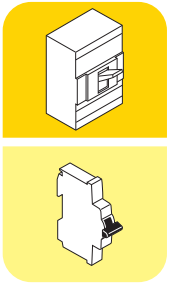
Discrimination

Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCB

MCCB - S2.. C @ 415 V

					Supply S.	T2	T1 - T2					T1 - T2 - T3				
					Version	B, C, N, S, H, L										
	Char.	I_{cu} [kA]			Release	TM										
		10	15	25	I_n [A]	12.5	16	20	25	32	40	50	63	80	100	125	160
Load S.	C	S200	S200M	S200P	≤2	T	T	T	T	T	T	T	T	T	T	T	T
		S200	S200M	S200P	3	T	T	T	T	T	T	T	T	T	T	T	T
		S200	S200M	S200P	4	T	T	T	T	T	T	T	T	T	T	T	T
		S200	S200M	S200P	6	5.5[1]	5.5	5.5	5.5	5.5	5.5	5.5	10.5	T	T	T	T
		S200	S200M	S200P	8			5.5	5.5	5.5	5.5	5.5	10.5	T	T	T	T
		S200	S200M	S200P	10			3[1]	3	3	3	4.5	7.5	8.5	17	T	T
		S200	S200M	S200P	13			3[1]		3	3	4.5	7.5	7.5	12	20	T
		S200	S200M	S200P	16					3[1]	3	4.5	5	7.5	12	20	T
		S200	S200M	S200P	20					3[1]		3	5	6	10	15	T
		S200	S200M	S200P	25							3[1]	5	6	10	15	T
		S200	S200M-S200P	-	32							3[1]		6	7.5	12	T
		S200	S200M-S200P	-	40									5.5[1]	7.5	12	T
		S200	S200M-S200P	-	50									3[1]	5[2]	7.5	10.5
		S200	S200M-S200P	-	63										5[2]	6[3]	10.5
		-	S290	-	80												4[3]
		-	S290	-	100												4[3]
		-	S290	-	125												

[1] Value valid only for T2 magnetic only supply side circuit-breaker
[2] Value valid only for T2-T3 magnetic only supply side circuit-breaker
[3] Value valid only for T3 magnetic only supply side circuit-breaker
[4] Value valid only for T4 magnetic only supply side circuit-breaker
[5] Value valid only for T4 In 160 magnetic only supply side circuit-breaker



	T3		T4										T5	T2					T4		T5
	B, C, N, S, H, L, V																				
	TM													EL							
	200	250	20	25	32	50	80	100	125	160	200	250	320÷500	10	25	63	100	160	100, 160	250, 320	320÷630
	T	T	T	T[4]	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T[4]	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T[4]	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	7.5	7.5[4]	7.5	7.5	T	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T	7.5	7.5[4]	7.5	7.5	T	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T	5	5[4]	5	6.5	9	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T		5[4]	5	6.5	8	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T		3[4]	5	6.5	8	T	T	T	T	T	T			T	T	T	T	T	T
	T	T				5	7.5	T	T	T	T	T	T			T	T	T	T	T	T
	T	T				5	7.5	T	T	T	T	T	T			T	T	T	T	T	T
	T	T				5[4]	7.5	T	T	T	T	T	T			T	T	T	T	T	T
	T	T					6.5	T	T	T	T	T	T				T	T	T	T	T
	T	T					5[4]	T	T	T	T	T	T				10.5	10.5	T	T	T
	T	T						T[4]	T[4]	T	T	T	T					10.5	T	T	T
	10	15								5	11	T	T					4	T[5]	T	T
	7.5[3]	15								5[4]	8	T	T					4	12[4]	T	T
	7.5[3]										8[4]	12	T					4		T	T

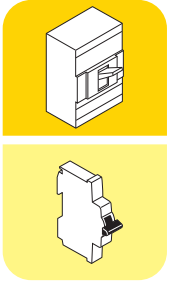
Discrimination

Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCB

MCCB - S2.. D @ 415 V

					Supply S.	T2	T1 - T2						T1 - T2 - T3				
					Version	B, C, N, S, H, L											
	Char.	I_{cu} [kA]			Release	TM											
		10	15	25	I_n [A]	12.5	16	20	25	32	40	50	63	80	100	125	160
Load S.	D	S200	-	S200P	≤2	T	T	T	T	T	T	T	T	T	T	T	T
		S200	-	S200P	3	T	T	T	T	T	T	T	T	T	T	T	T
		S200	-	S200P	4	T	T	T	T	T	T	T	T	T	T	T	T
		S200	-	S200P	6	5.5[1]	5.5	5.5	5.5	5.5	5.5	5.5	10.5	T	T	T	T
		S200	-	S200P	8			5.5	5.5	5.5	5.5	5.5	10.5	12	T	T	T
		S200	-	S200P	10			3[1]	3	3	3	3	5	8.5	17	T	T
		S200	-	S200P	13					2[1]	2	2	3	5	8	13.5	T
		S200	-	S200P	16					2[1]	2	2	3	5	8	13.5	T
		S200	-	S200P	20					2[1]		2	3	4.5	6.5	11	T
		S200	-	S200P	25							2[1]	2.5	4	6	9.5	T
		S200	S200P	-	32									4	6	9.5	T
		S200	S200P	-	40									3[1]	5	8	T
		S200	S200P	-	50									2[1]	3[2]	5	9.5
		S200	S200P	-	63										3[2]	5[3]	9.5
		-	S290	-	80												4[3]
		-	S290	-	100												4[3]
		-	-	-	125												

[1] Value valid only for T2 magnetic only supply side circuit-breaker
[2] Value valid only for T2-T3 magnetic only supply side circuit-breaker
[3] Value valid only for T3 magnetic only supply side circuit-breaker
[4] Value valid only for T4 magnetic only supply side circuit-breaker
[5] Value valid only for T4 In 160 magnetic only supply side circuit-breaker



	T3		T4										T5	T2					T4		T5
	B, C, N, S, H, L, V																				
	TM													EL							
	200	250	20	25	32	50	80	100	125	160	200	250	320÷500	10	25	63	100	160	100, 160	250, 320	320÷630
	T	T	T	T[4]	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T[4]	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T[4]	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	7.5	7.5[4]	7.5	7.5	T	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T	7.5	7.5[4]	7.5	7.5	T	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T	5	5[4]	5	5	9	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T		5[4]		4	5.5	T	T	T	T	T	T			T	T	T	T	T	T
	T	T				4	5.5	T	T	T	T	T	T			T	T	T	T	T	T
	T	T				4[4]	5	T	T	T	T	T	T			T	T	T	T	T	T
	T	T				4[4]	4.5	T	T	T	T	T	T			T	T	T	T	T	T
	T	T					4.5[4]	T	T	T	T	T	T			T	T	T	T	T	T
	T	T					4.5[4]	T	T	T	T	T	T				T	T	T	T	T
	T	T						T[4]	T	T	T	T	T				9.5	9.5	T	T	T
	T	T							T[4]	T[4]	T	T	T					9.5	T	T	T
	10	15								5	11	T	T					4	T[5]	T	T
	7.5[3]	15									8	T	T					4	12[5]	T	T

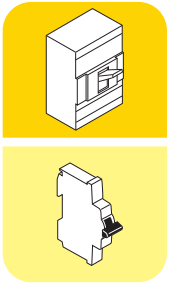
Discrimination

Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCB

MCCB - S2.. K @ 415 V

					Supply S.	T2	T1 - T2						T1 - T2 - T3				
					Version	B, C, N, S, H, L											
	Char.	I_{cu} [kA]			Release	TM											
		10	15	25	I_n [A]	12.5	16	20	25	32	40	50	63	80	100	125	160
Load S.	K	S200	-	S200P	≤2	T	T	T	T	T	T	T	T	T	T	T	T
		S200	-	S200P	3	T	T	T	T	T	T	T	T	T	T	T	T
		S200	-	S200P	4	T	T	T	T	T	T	T	T	T	T	T	T
		S200	-	S200P	6	5.5[1]	5.5	5.5	5.5	5.5	5.5	5.5	10.5	T	T	T	T
		S200	-	S200P	8			5.5	5.5	5.5	5.5	5.5	10.5	12	T	T	T
		S200	-	S200P	10			3[1]	3	3	3	3	6	8.5	17	T	T
		-	-	S200P	13					2[1]	3	3	5	7.5	10	13.5	T
		S200	-	S200P	16					2[1]	3	3	4.5	7.5	10	13.5	T
		S200	-	S200P	20					2[1]		3	3.5	5.5	6.5	11	T
		S200	-	S200P	25							2[1]	3.5	5.5	6	9.5	T
		S200	S200P	-	32									4.5	6	9.5	T
		S200	S200P	-	40									3[1]	5	8	T
		S200	S200P	-	50									2[1]	3[2]	6	9.5
		S200	S200P	-	63										3[2]	5.5[3]	9.5
		-	S290	-	80												4[3]
		-	S290	-	100												4[3]
		-	-	-	125												

[1] Value valid only for T2 magnetic only supply side circuit-breaker
[2] Value valid only for T2-T3 magnetic only supply side circuit-breaker
[3] Value valid only for T3 magnetic only supply side circuit-breaker
[4] Value valid only for T4 magnetic only supply side circuit-breaker
[5] Value valid only for T4 In 160 magnetic only supply side circuit-breaker



	T3		T4										T5	T2					T4		T5
	B, C, N, S, H, L, V																				
	TM													EL							
	200	250	20	25	32	50	80	100	125	160	200	250	320÷500	10	25	63	100	160	100, 160	250, 320	320÷630
	T	T	T	T[4]	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T[4]	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T[4]	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	7.5	7.5[4]	7.5	7.5	T	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T	7.5	7.5[4]	7.5	7.5	T	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T		5[4]	5	5	9	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T		5[4]	5	5	8	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T		5[4]		5	8	T	T	T	T	T	T			T	T	T	T	T	T
	T	T				5	6	T	T	T	T	T	T			T	T	T	T	T	T
	T	T				5[4]	6[4]	T	T	T	T	T	T			T	T	T	T	T	T
	T	T				5[4]	6[4]	T[4]	T	T	T	T	T			T	T	T	T	T	T
	T	T					5.5[4]	T[4]	T[4]	T	T	T	T				T	T	T	T	T
	T	T					5[4]	T[4]	T[4]	T[4]	T	T	T				9.5	9.5	T	T	T
	T	T						T[4]	T[4]	T[4]	T[4]	T	T					9.5	T	T	T
	10	15								5	11	T	T					4	T[5]	T	T
	7.5[3]	15								5[4]	8	T	T					4	12[5]	T	T

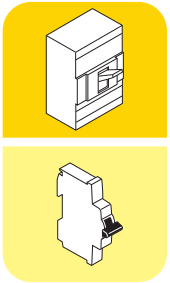
Discrimination

Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCB

MCCB - S2.. Z @ 415 V

					Supply S.	T2	T1 - T2						T1 - T2 - T3				
					Version	B, C, N, S, H, L											
	Char.	I_{cu} [kA]			Release	TM											
		10	15	25	I_n [A]	12.5	16	20	25	32	40	50	63	80	100	125	160
Load S.	Z	S200	-	S200P	≤2	T	T	T	T	T	T	T	T	T	T	T	T
		S200	-	S200P	3	T	T	T	T	T	T	T	T	T	T	T	T
		S200	-	S200P	4	T	T	T	T	T	T	T	T	T	T	T	T
		S200	-	S200P	6	5.5[1]	5.5	5.5	5.5	5.5	5.5	5.5	10.5	T	T	T	T
		S200	-	S200P	8			5.5	5.5	5.5	5.5	5.5	10.5	T	T	T	T
		S200	-	S200P	10			3[1]	3	3	3	4.5	8	8.5	17	T	T
		-	-	S200P	13			3[1]		3	3	4.5	7.5	7.5	12	20	T
		S200	-	S200P	16					3[1]	3	4.5	5	7.5	12	20	T
		S200	-	S200P	20					3[1]		3	5	6	10	15	T
		S200	-	S200P	25							3[1]	5	6	10	15	T
		S200	S200P	-	32							3[1]		6	7.5	12	T
		S200	S200P	-	40									5.5[1]	7.5	12	T
		S200	S200P	-	50									4[1]	5[2]	7.5	10.5
		S200	S200P	-	63										5[2]	6[3]	10.5
		-	-	-	80												
		-	-	-	100												
		-	-	-	125												

[1] Value valid only for T2 magnetic only supply side circuit-breaker
[2] Value valid only for T2-T3 magnetic only supply side circuit-breaker
[3] Value valid only for T3 magnetic only supply side circuit-breaker
[4] Value valid only for T4 magnetic only supply side circuit-breaker



	T3		T4										T5	T2					T4		T5
	B, C, N, S, H, L, V																				
	TM													EL							
	200	250	20	25	32	50	80	100	125	160	200	250	320÷500	10	25	63	100	160	100, 160	250, 320	320÷630
	T	T	T	T[4]	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T[4]	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T[4]	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	7.5	7.5[4]	7.5	7.5	T	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T	7.5	7.5[4]	7.5	7.5	T	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T	5	5[4]	5	6.5	9	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T		5[4]	5	6.5	8	T	T	T	T	T	T		T	T	T	T	T	T	T
	T	T		5[4]	4.5	6.5	8	T	T	T	T	T	T			T	T	T	T	T	T
	T	T				5	6.5	T	T	T	T	T	T			T	T	T	T	T	T
	T	T				5	6.5	T	T	T	T	T	T			T	T	T	T	T	T
	T	T				5[4]	6.5	T	T	T	T	T	T			T	T	T	T	T	T
	T	T					5	T	T	T	T	T	T				T	T	T	T	T
	T	T					3.5[4]	T	T	T	T	T	T				10.5	10.5	T	T	T
	T	T						T[4]	T	T	T	T	T					10.5	T	T	T

2

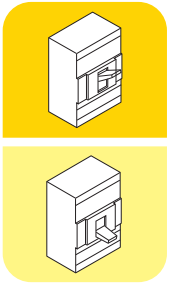
Discrimination

Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCCB

MCCB - T1 @ 415 V

			Supply S.	T1	T2					T3			T4								
	Version			B C N	N, S, H, L					N, S			N, S, H, L, V								
		Release		TM	TM,M	EL				TM, M			TM, M								
			I_u [A]	160	160					250			250								
Load S.			I_n [A]	160	160	25	63	100	160	160	200	250	20	25	32	50	80	100	125	160	200	250
T1	B C N	TM	160	16	3	3		3	3	3	3	4	5				10^2	10^4	10	10	10	10	10
				20	3	3		3	3	3	3	4	5				10^2	10^4	10	10	10	10	10
				25	3	3		3	3	3	3	4	5				10^2	10^4	10	10	10	10	10
				32	3	3			3	3	3	4	5					10^1	10	10	10	10	10
				40	3	3			3	3	3	4	5					10^1	10	10	10	10	10
				50	3	3			3	3	3	4	5						10^1	10	10	10	10
				63	3	3				3	3	4	5							10^1	10	10	10
				80						3		4	5								10	10	10
				100									5								10^1	10	10
				125																		10^1	10
				160																			

[1] Value valid only for magnetic only supply side circuit-breaker
[2] Value valid only for PR232/P, PR331/P and PR332/P trip units
[3] Available only with Iu ≤ 1250A
[4] Value valid only for T1 with I_3 = 500 A



	T4				T5						T6					T7			
	N, S, H, L, V				N, S, H, L, V						N, S, H, L					S, H, L, V[3]			
	EL				TM			EL			TM, M		EL			EL			
	250			320	400		630	400		630	630	800	630	800	1000	800	1000	1250	1600
	100	160	250	320	320	400	500	320	400	630	630	800	630	800	1000	800[2]	1000[2]	1250	1600
	10	10	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	10	10	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	10	10	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	10	10	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	10	10	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	10	10	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	10	10	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
		10	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
		10	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
			10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
			10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T

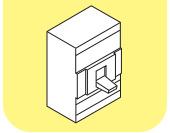
Discrimination

Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCCB

MCCB - T2 @ 415 V

Supply S.				T1	T2						T3			T4									
Version				B C N	N, S, H, L						N, S			N, S, H, L, V									
Release				TM	TM,M	EL					TM, M			TM, M									
		I_u [A]		160	160						250			250									
Load S.			I_n [A]	160	160	25	63	100	160		160	200	250	20	25	32	50	80	100	125	160	200	250
T2	N S H L	TM	160	1.6-2.5	T	T	T	T	T	T	T	T	T	T	T[1]	T	T	T	T	T	T	T	T
				3.2	T	T	T	T	T	T	T	T	T	T	T[1]	T	T	T	T	T	T	T	T
				4-5	T	T	T	T	T	T	T	T	T	T	T[1]	T	T	T	T	T	T	T	T
				6.3	10	10	10	10	10	10	10	15	40	T	T[1]	T	T	T	T	T	T	T	T
				8	10	10	10	10	10	10	10	15	40		T[1]	T	T	T	T	T	T	T	T
				10	10	10	10	10	10	10	10	15	40		T[1]	T	T	T	T	T	T	T	T
				12,5	3	3		3	3	3	3	4	5			T	T	T	T	T	T	T	T
				16	3	3		3	3	3	3	4	5					70	70	70	70	70	70
				20	3	3		3	3	3	3	4	5					55[1]	55	55	55	55	55
				25	3	3		3	3	3	3	4	5					40[1]	40	40	40	40	40
				32	3	3			3	3	3	4	5					40[1]	40	40	40	40	40
				40	3	3			3	3	3	4	5					30[1]	30[1]	30	30	30	30
				50	3	3			3	3	3	4	5					30[1]	30[1]	30	30	30	30
				63	3	3				3	3	4	5					30[1]	30[1]	30[1]	30	30	30
				80						3	3[1]	4	5						25[1]	25[1]	25[1]	25	25
				100								4	5							25[1]	25[1]	25[1]	25
				125																	25[1]	25[1]	
				160																		25[1]	
		EL	160	10								3	4				25	25	25	25	25	25	25
				25								3	4					25	25	25	25	25	25
				63								3	4								25	25	25
				100								3	4										25
				160								3	4										

[1] Value valid only for magnetic only supply side circuit-breaker
[2] Value valid only for PR232/P, PR331/P and PR332/P trip units
[3] Available only with Iu ≤ 1250A



	T4				T5						T6					T7			
	N, S, H, L, V				N, S, H, L, V						N, S, H, L					S, H, L, V[3]			
	EL				TM			EL			TM, M		EL			EL			
	250			320	400		630	400		630	630	800	630	800	1000	800	1000	1250	1600
	100	160	250	320	320	400	500	320	400	630	630	800	630	800	1000	800[2]	1000[2]	1250	1600
	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	70	70	70	70	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	55	55	55	55	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	40	40	40	40	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	40	40	40	40	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	30	30	30	30	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	30	30	30	30	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	30	30	30	30	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
		25	25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
		25	25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
			25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
			25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	25	25	25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	25	25	25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	25	25	25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
		25	25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
			25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T

Discrimination

Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCCB

MCCB - T3 @ 415 V

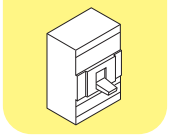
		Supply S.	T1	T2					T3			T4									
	Version		B C N	N, S, H, L					N, S			N, S, H, L, V									
	Release		TM	TM,M	EL				TM, M			TM, M									
		I_u [A]	160	160					250			250									
Load S.		I_n [A]	160	160	25	63	100	160	160	200	250	20	25	32	50	80	100	125	160	200	250
T3	N S	TM	250	63						3	4	5							7[1]	7	7	7
				80						3[1]	4	5								7[1]	7	7
				100							4[1]	5								7[1]	7[1]	7
				125																	7[1]	
				160																		
				200																		
				250																		

[1] Value valid only for magnetic only supply side circuit-breaker
[2] Value valid only for PR232/P, PR331/P and PR332/P trip units
[3] Available only with Iu ≤ 1250A

MCCB - T4 @ 415 V

		Supply S.	T5						T6					T7			
	Version		N, S, H, L, V						N, S, H, L					S, H, L, V[1]			
	Release		TM			EL			TM, M		EL			EL			
		I_u [A]	400		630	400		630	630	800	630	800	1000	800	1000	1250	1600
Load S.		I_n [A]	320	400	500	320	400	630	630	800	630	800	1000	800[2]	1000[2]	1250	1600
T4	N S H L V	TM	250	20	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
				25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
				32	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
				50	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
				80	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
				100		50	50	50	50	50	T	T	T	T	T	T	T	T	T
				125			50	50	50	50	T	T	T	T	T	T	T	T	T
				160				50	50	50	T	T	T	T	T	T	T	T	T
				200				50	50	50	T	T	T	T	T	T	T	T	T
				250					50	50	T	T	T	T	T	T	T	T	T
		EL	250	100	50	50	50	50	50	50	T	T	T	T	T	T	T	T	T
				160	50	50	50	50	50	50	T	T	T	T	T	T	T	T	T
				250			50		50	50	T	T	T	T	T	T	T	T	T
			320	320						50	T	T	T	T	T	T	T	T	T

[1] Available only with Iu ≤ 1250A
[2] Value valid only for PR232/P, PR331/P and PR332/P trip units



	T4				T5						T6					T7			
	N, S, H, L, V				N, S, H, L, V						N, S, H, L					S, H, L, V[3]			
	EL				TM			EL			TM, M		EL			EL			
	250			320	400		630	400		630	630	800	630	800	1000	800	1000	1250	1600
	100	160	250	320	320	400	500	320	400	630	630	800	630	800	1000	800[2]	1000[2]	1250	1600
	7	7	7	7	25	25	25	25	25	25	T	T	T	T	T	T	T	T	T
		7	7	7	25	25	25	25	25	25	T	T	T	T	T	T	T	T	T
		7	7	7	25	25	25	25	25	25	40	T	40	T	T	T	T	T	T
			7	7	20	20	20	20	20	20	36	T	36	T	T	T	T	T	T
			7	7			20	20	20	20	36	T	36	T	T	T	T	T	T
				7				20	20	20	30	T	30	T	T	T	T	T	T
								20	20	20	30	40	30	40	40	T	T	T	T

Discrimination

Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCCB

MCCB - T5 @ 415 V

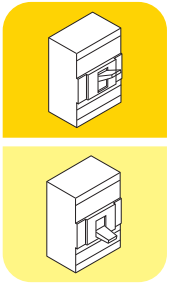
			Supply S.	T6					T7			
	Version			N, S, H, L					S, H, L, V[1]			
	Release			TM, M		EL			EL			
		I_u [A]		630	800	630	800	1000	800	1000	1250	1600
Load S.			I_n [A]	630	800	630	800	1000	800[2]	1000[2]	1250	1600
T5	N S H L V	TM	400	320	30	30	30	30	30	T	T	T	T
				400		30		30	30	T	T	T	T
			630	500				30	30	T	T	T	T
		EL	400	320	30	30	30	30	30	T	T	T	T
				400	30	30	30	30	30	T	T	T	T
			630	630					30	T	T	T	T

[1] Available only with Iu ≤ 1250A
[2] Value valid only for PR232/P, PR331/P and PR332/P trip units

MCCB - T6 @ 415 V

			Supply S.	T7			
	Version			S, H, L, V[1]			
	Release			EL			
		I_u [A]		800	1000	1250	1600
Load S.			I_n [A]	800[2]	1000[2]	1250	1600
T6	N S H L V	TM	630	630			40	40
			800	800			40	40
		EL	630	630	40	40	40	40
			800	800	40	40	40	40
			1000	1000			40	40

[1] Available only with Iu ≤ 1250A, maximum selectivity value: 15kA
[2] Value valid only for PR232/P, PR331/P and PR332/P trip units



Discrimination

Supply side circuit-breaker: ACB
Load side circuit-breaker: MCCB

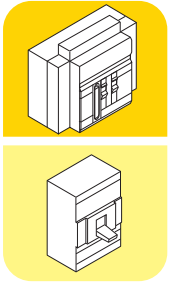
ACB - MCCB @ 415 V

			Supply S.	X1			E1		E2				E3					E4			E6	
	Version			B	N	L	B	N	B	N	S	L[1]	N	S	H	V	L[1]	S	H	V	H	V
		Release		EL			EL		EL				EL					EL				
Load S.			I_u [A]	800 1000 1250 1600	800 1000 1250 1600	800 1000 1250	800 1000 1250 1600	800 1000 1250 1600	1600 2000	1000 1250 1600 2000	800 1000 1250 1600 2000	1250 1600	2500 3200	1000 1250 1600 2000 2500 3200	800 1000 1250 1600 2000 2500 3200	800 1000 1250 1600 2000 2500 3200	2000 2500	4000	3200 4000	3200 4000	4000 5000 6300	3200 4000 5000 6300
T1	B	TM	160	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	C			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	N			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T2	N	TM EL	160	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	H			T	T	T	T	T	T	55	65	T	T	T	T	T	T	T	T	T	T	T
	L			T	T	T	T	T	T	55	65	T	T	T	75	T	T	T	T	T	T	T
T3	N	TM	250	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
T4	N	TM EL	250 320	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	H			T	T	T	T	T	T	55	65	T	T	T	T	T	T	T	T	T	T	T
	L			T	T	T	T	T	T	55	65	100	T	T	75	85	100	T	T	100	T	100
	V			T	T	T	T	T	T	55	65	100	T	T	75	85	100	T	T	100	T	100
T5	N	TM EL	400 630	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	H			T	T	T	T	T	T	55	65	T	T	T	T	T	T	T	T	T	T	T
	L			T	T	T	T	T	T	55	65	100	T	T	75	85	100	T	T	100	T	100
	V			T	T	T	T	T	T	55	65	100	T	T	75	85	100	T	T	100	T	100
T6	N	TM EL	630 800 1000	T	T	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	S			T	T	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	H			T	T	15	T	T	T	55	65	T	T	T	T	T	T	T	T	T	T	T
	L			T	T	15	T	T	T	55	65	T	T	T	75	85	T	T	T	T	T	T
T7	S	EL	800 1000 1250 1600	T	42	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	H			T	42	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	L			T	42	15	T	T	T	55	T	T	T	T	T	T	T	T	T	T	T	T
	V[2]			T	42	15	T	T	T	55	65	T	T	T	75	85	T	T	T	T	T	T	T

Table valid for Emax circuit-breakers only with PR121/P, PR122/P and PR123/P trip units

[1] Emax L circuit-breakers only with PR122/P and PR123/P trip units

[2] Available only with Iu ≤ 1250A



Discrimination

Supply side circuit-breaker: MCCB
Load side circuit-breaker: MCCB

MCCB - Tmax T1, T2 @ 400/415 V

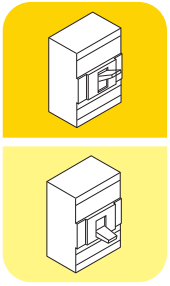
				Supply S.	T4			T5			T6	
	Version				L							
		Release			PR223EF[1]						PR223EF	
			I_u [A]		250		320	400		630	800	
Load S.				I_n [A]	160	250	320	320	400	630	630	800
T1	B, C, N	TM	160	16-100	T	T	T	T	T	T	T	T
				125		T	T	T	T	T	T	T
				160		T	T	T	T	T	T	T
T2	N,S,H,L	TM, EL	160	10-100	75[2]	75[2]	75[2]	T	T	T	T	T
				125		75[2]	75[2]	T	T	T	T	T
				160		75[2]	75[2]	T	T	T	T	T

[1] Relays in auxiliary power supply and trip delayed parameter set to ON
[2] Select the lowest value between what is indicated and the breaking capacity of the supply side circuit-breaker

MCCB - Tmax T4, T5, T6 @ 400/415 V

				Supply S.	T4			T5			T6	
	Version				L							
		Release			PR223EF							
			I_u [A]		250		320	400		630	800	
Load S.				I_n [A]	160	250	320	320	400	630	630	800
T4	L	PR223EF	250	160	T	T	T	T	T	T	T	T
				250		T	T	T	T	T	T	T
			320	320			T	T	T	T	T	T
T5	L	PR223EF	400	320				T	T	T	T	T
				400					T	T	T	T
			630	630						T	T	T
T6	L	PR223EF	630	630							T	T
			800	800								T

Table valid for relays with auxiliary power supply connected through a shielded twisted-pair wire as shown in the installing instructions 1SDH000538R0002



Coordination tables
Motor protection

Index

Motor protection

Notes for use

ABB SACE proposes a vast range of coordination solutions for the power supply of any motor for which protection against short-circuit and overload are of fundamental importance.

Standard used

– IEC 60947 - 4 - 1

Rated power of the motor

– The tables are based on the current consumed by electric, three-phase squirrel cage ABB induction motors with four poles.
– The rated power of the motor is expressed in kiloWatt

Protection device

As protection device, the following tables use the moulded-case circuit-breakers (**MCCB**) with the following types of releases:

– MF fixed magnetic only release (for Tmax T2 circuit-breakers)
– MA magnetic only release adjustable (for Tmax T2 and T3 circuit-breakers)
– PR221/I electronic release (for Tmax T4, T5 and T6 circuit-breakers)
– PR222MP electronic release (for Tmax T4, T5 and T6 circuit-breakers).

The solutions proposed refer to an ambient temperature of 40 °C and to fixed version apparatus. For higher temperatures, please contact ABB SACE.

Type of starting

– By **normal** starting, a starting time up to 2 s is intended in accordance with the trip time of the thermal relays in class 10 A (see table 2).
– By **heavy** duty, a starting time up to 9 s is intended in accordance with the trip time of the thermal relays in class 30 (see table 2).
– Two factors must be considered for **normal star-delta** starting: the speed the motor has reached at the end of the starting period is 85% higher than the rated one; the transition time between the star delta connection is 80 ms shorter.

Short-circuit current

– The valid selection for a certain value also covers lower levels of short-circuit. For example, by selecting 80 kA, protection which is also valid for lower values is obtained (70, 60..kA, at the same voltage). This means a starter with higher performances at the required breaking capacity. For more economical solutions, verifying some specific solutions for lower short-circuit levels is recommended.

Note

To determine a type of coordination univocally, and therefore the apparatus needed to carry it out, the following must be known:

– motor power in kW and the type;
– rated installation voltage;
– rated current of the motor;
– short-circuit current at the point of installation;
– type of starting: DOL or Y/Δ - Normal or Heavy - Type 1 o Type 2.

Example for using the tables

You want to realize Y/Δ Normal Type 2 starting of a three-phase asynchronous squirrelcage motor with the following data:

rated voltage	U_r = 400 V
short-circuit current	I_k = 50 kA
rated motor power	P_e = 200 kW

The following information is read from the table (star-delta 400 V 50 kA), in correspondence with the relative line:

I_e (rated current):	349 A
protection device against short-circuit:	T5S630 PR221-I In 630 circuit-breaker
magnetic trip threshold:	I_3 = 4410 A
line contactor:	A210
delta contactor:	A210
star contactor:	A185
thermal relay:	E320DU320 adjustable 100-320 A (to adjusted to $\frac{I_e}{\sqrt{3}}$ = 202 A).

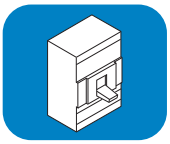
Caption of symbols

Tmax

For solutions not shown in these tables, please consult the website:
http://bol.it.abb.com
or contact ABB SACE

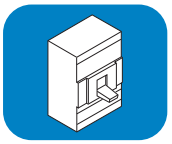
DOL @ 400/415 V - 36 kA - Type 2 - Normal starting

Motor		MCCB		Contactor	Thermal release			Group
Rated power Pe [kW]	Rated current Ie [A]	Type	Setting of the magnetic release [A]	Type	Type	Current setting min [A]	Current setting max [A]	I max [A]
0.37	1.1	**T2N160 MF1.6**	21	**A9**	**TA25DU1.4**	1	1.4	1.4
0.55	1.5	**T2N160 MF1.6**	21	**A9**	**TA25DU1.8**	1.3	1.8	1.6
0.75	1.9	**T2N160 MF 2**	26	**A9**	**TA25DU2.4**	1.7	2.4	2
1.1	2.8	**T2N160 MF 3.2**	42	**A9**	**TA25DU4**	2.8	4	3.2
1.5	3.5	**T2N160 MF 4**	52	**A16**	**TA25DU5**	3.5	5	4
2.2	5	**T2N160 MF 5**	65	**A26**	**TA25DU6.5**	4.5	6.5	5
3	6.6	**T2N160 MF 8.5**	110	**A26**	**TA25DU8.5**	6	8.5	8.5
4	8.6	**T2N160 MF 11**	145	**A30**	**TA25DU11**	7.5	11	11
5.5	11.5	**T2N160 MF 12.5**	163	**A30**	**TA25DU14**	10	14	12.5
7.5	15.2	**T2N160 MA 20**	210	**A30**	**TA25DU19**	13	19	19
11	22	**T2N160 MA 32**	288	**A30**	**TA42DU25**	18	25	25
15	28.5	**T2N160 MA 52**	392	**A50**	**TA75DU42**	29	42	42
18.5	36	**T2N160 MA 52**	469	**A50**	**TA75DU52**	36	52	50
22	42	**T2N160 MA 52**	547	**A50**	**TA75DU52**	36	52	50
30	56	**T2N160 MA 80**	840	**A63**	**TA75DU80**	60	80	65
37	68	**T2N160 MA 80**	960	**A75**	**TA75DU80**	60	80	75
45	83	**T2N160 MA 100**	1200	**A95**	**TA110DU110**	80	110	96
55	98	**T3N250 MA 160**	1440	**A110**	**TA110DU110**	80	110	110
75	135	**T3N250 MA 200**	1800	**A145**	**TA200DU175**	130	175	145
90	158	**T3N250 MA 200**	2400	**A185**	**TA200DU200**	150	200	185
110	193	**T4N320 PR221-I In320**	2720	**A210**	**E320DU320**	100	320	210
132	232	**T5N400 PR221-I In400**	3200	**A260**	**E320DU320**	100	320	260
160	282	**T5N400 PR221-I In400**	4000	**A300**	**E320DU320**	100	320	300
200	349	**T5N630 PR221-I In630**	5040	**AF400**	**E500DU500**	150	500	400
250	430	**T6N630 PR221-I In630**	6300	**AF460**	**E500DU500**	150	500	430
290	520	**T6N800 PR221-I In800**	7200	**AF580**	**E800DU800**	250	800	580
315	545	**T6N800 PR221-I In800**	8000	**AF580**	**E800DU800**	250	800	580
355	610	**T6N800 PR221-I In800**	8000	**AF750**	**E800DU800**	250	800	750



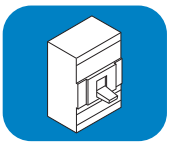
DOL @ 400/415 V - 50 kA -Type 2 - Normal starting

Motor		MCCB		Contactor	Thermal release			Group
Rated power	Rated current	Type	Setting of the magnetic release	Type	Type	Current setting		I max
						min	max	
Pe	Ie							
[kW]	[A]		[A]			[A]	[A]	[A]
0.37	1.1	**T2S160 MF 1.6**	21	**A9**	**TA25DU1.4**	1	1.4	1.4
0.55	1.5	**T2S160 MF 1.6**	21	**A9**	**TA25DU1.8**	1.3	1.8	1.6
0.75	1.9	**T2S160 MF 2**	26	**A9**	**TA25DU2.4**	1.7	2.4	2
1.1	2.8	**T2S160 MF 3.2**	42	**A9**	**TA25DU4**	2.8	4	3.2
1.5	3.5	**T2S160 MF 4**	52	**A16**	**TA25DU5**	3.5	5	4
2.2	5	**T2S160 MF 5**	65	**A26**	**TA25DU6.5**	4.5	6.5	5
3	6.6	**T2S160 MF 8.5**	110	**A26**	**TA25DU8.5**	6	8.5	8.5
4	8.6	**T2S160 MF 11**	145	**A30**	**TA25DU11**	7.5	11	11
5.5	11.5	**T2S160 MF 12.5**	163	**A30**	**TA25DU14**	10	14	12.5
7.5	15.2	**T2S160 MA 20**	210	**A30**	**TA25DU19**	13	19	19
11	22	**T2S160 MA 32**	288	**A30**	**TA42DU25**	18	25	25
15	28.5	**T2S160 MA 52**	392	**A50**	**TA75DU42**	29	42	42
18.5	36	**T2S160 MA 52**	469	**A50**	**TA75DU52**	36	52	50
22	42	**T2S160 MA 52**	547	**A50**	**TA75DU52**	36	52	50
30	56	**T2S160 MA 80**	840	**A63**	**TA75DU80**	60	80	65
37	68	**T2S160 MA 80**	960	**A75**	**TA75DU80**	60	80	75
45	83	**T2S160 MA 100**	1200	**A95**	**TA110DU110**	80	110	96
55	98	**T3S250 MA 160**	1440	**A110**	**TA110DU110**	80	110	110
75	135	**T3S250 MA 200**	1800	**A145**	**TA200DU175**	130	175	145
90	158	**T3S250 MA 200**	2400	**A185**	**TA200DU200**	150	200	185
110	193	**T4S320 PR221-I In320**	2720	**A210**	**E320DU320**	100	320	210
132	232	**T5S400 PR221-I In400**	3200	**A260**	**E320DU320**	100	320	260
160	282	**T5S400 PR221-I In400**	4000	**A300**	**E320DU320**	100	320	300
200	349	**T5S630 PR221-I In630**	5040	**AF400**	**E500DU500**	150	500	400
250	430	**T6S630 PR221-I In630**	6300	**AF460**	**E500DU500**	150	500	430
290	520	**T6S800 PR221-I In800**	7200	**AF580**	**E800DU800**	250	800	580
315	545	**T6S800 PR221-I In800**	8000	**AF580**	**E800DU800**	250	800	580
355	610	**T6S800 PR221-I In800**	8000	**AF750**	**E800DU800**	250	800	750



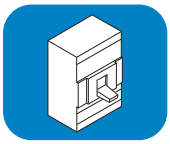
DOL @ 400/415 V - 70 kA - Type 2 - Normal starting

Motor		MCCB		Contactor	Thermal release			Group
Rated power Pe [kW]	Rated current Ie [A]	Type	Setting of the magnetic release [A]	Type	Type	Current setting min [A]	Current setting max [A]	I max [A]
0.37	1.1	**T2H160 MF 1.6**	21	**A9**	**TA25DU1.4**	1	1.4	1.4
0.55	1.5	**T2H160 MF 1.6**	21	**A9**	**TA25DU1.8**	1.3	1.8	1.6
0.75	1.9	**T2H160 MF 2**	26	**A9**	**TA25DU2.4**	1.7	2.4	2
1.1	2.8	**T2H160 MF 3.2**	42	**A16**	**TA25DU4**	2.8	4	3.2
1.5	3.5	**T2H160 MF 4**	52	**A26**	**TA25DU5**	3.5	5	4
2.2	5	**T2H160 MF 5**	65	**A26**	**TA25DU6.5**	4.5	6.5	5
3	6.6	**T2H160 MF 8.5**	110	**A26**	**TA25DU8.5**	6	8.5	8.5
4	8.6	**T2H160 MF 11**	145	**A30**	**TA25DU11**	7.5	11	11
5.5	11.5	**T2H160 MF 12.5**	163	**A50**	**TA25DU14**	10	14	12.5
7.5	15.2	**T2H160 MA 20**	210	**A50**	**TA25DU19**	13	19	19
11	22	**T2H160 MA 32**	288	**A50**	**TA42DU25**	18	25	25
15	28.5	**T2H160 MA 52**	392	**A50**	**TA75DU42**	29	42	42
18.5	36	**T2H160 MA 52**	469	**A50**	**TA75DU52**	36	52	50
22	42	**T2H160 MA 52**	547	**A50**	**TA75DU52**	36	52	50
30	56	**T2H160 MA 80**	840	**A63**	**TA75DU80**	60	80	65
37	68	**T2H160 MA 80**	960	**A75**	**TA75DU80**	60	80	75
45	83	**T2H160 MA 100**	1200	**A95**	**TA110DU110**	80	110	96
55	98	**T4H250 PR221-I In160**	1360	**A110**	**TA110DU110**	80	110	110
75	135	**T4H250 PR221-I In250**	1875	**A145**	**E200DU200**	60	200	145
90	158	**T4H250 PR221-I In250**	2500	**A185**	**E200DU200**	60	200	185
110	193	**T4H320 PR221-I In320**	2720	**A210**	**E320DU320**	100	320	210
132	232	**T5H400 PR221-I In400**	3200	**A260**	**E320DU320**	100	320	260
160	282	**T5H400 PR221-I In400**	4000	**A300**	**E320DU320**	100	320	300
200	349	**T5H630 PR221-I In630**	5040	**AF400**	**E500DU500**	150	500	400
250	430	**T6H630 PR221-I In630**	6300	**AF460**	**E500DU500**	150	500	430
290	520	**T6H800 PR221-I In800**	7200	**AF 580**	**E 800DU800**	250	800	580
315	545	**T6H800 PR221-I In800**	8000	**AF 580**	**E 800DU800**	250	800	580
355	610	**T6H800 PR221-I In800**	8000	**AF 750**	**E 800DU800**	250	800	650



DOL @ 400/415 V - 80 kA - Type 2 - Normal starting

Motor		MCCB		Contactor	Thermal release			Group
Rated power	Rated current	Type	Setting of the magnetic release	Type	Type	Current setting		I max
						min	max	
Pe	Ie							
[kW]	[A]		[A]			[A]	[A]	[A]
0.37	1.1	**T2L160 MF 1.6**	21	**A9**	**TA25DU1.4**	1	1.4	1.4
0.55	1.5	**T2L160 MF 1.6**	21	**A9**	**TA25DU1.8**	1.3	1.8	1.6
0.75	1.9	**T2L160 MF 2**	26	**A9**	**TA25DU2.4**	1.7	2.4	2
1.1	2.8	**T2L160 MF 3.2**	42	**A16**	**TA25DU4**	2.8	4	3.2
1.5	3.5	**T2L160 MF 4**	52	**A26**	**TA25DU5**	3.5	5	4
2.2	5	**T2L160 MF 5**	65	**A26**	**TA25DU6.5**	4.5	6.5	5
3	6.6	**T2L160 MF 8.5**	110	**A26**	**TA25DU8.5**	6	8.5	8.5
4	8.6	**T2L160 MF 11**	145	**A30**	**TA25DU11**	7.5	11	11
5.5	11.5	**T2L160 MF 12.5**	163	**A50**	**TA25DU14**	10	14	12.5
7.5	15.2	**T2L160 MA 20**	210	**A50**	**TA25DU19**	13	19	19
11	22	**T2L160 MA 32**	288	**A50**	**TA42DU25**	18	25	25
15	28.5	**T2L160 MA 52**	392	**A50**	**TA75DU42**	29	42	42
18.5	36	**T2L160 MA 52**	469	**A50**	**TA75DU52**	36	52	50
22	42	**T2L160 MA 52**	547	**A50**	**TA75DU52**	36	52	50
30	56	**T2L160 MA 80**	840	**A63**	**TA75DU80**	60	80	65
37	68	**T2L160 MA 80**	960	**A75**	**TA75DU80**	60	80	75
45	83	**T2L160 MA 100**	1200	**A95**	**TA110DU110**	80	110	96
55	98	**T4L250 PR221-I In160**	1360	**A110**	**TA110DU110**	80	110	110
75	135	**T4L250 PR221-I In250**	1875	**A145**	**E200DU200**	60	200	145
90	158	**T4L250 PR221-I In250**	2500	**A185**	**E200DU200**	60	200	185
110	193	**T4L320 PR221-I In320**	2720	**A210**	**E320DU320**	100	320	210
132	232	**T5L400 PR221-I In400**	3200	**A260**	**E320DU320**	100	320	260
160	282	**T5L400 PR221-I In400**	4000	**A300**	**E320DU320**	100	320	300
200	349	**T5L630 PR221-I In630**	5040	**AF400**	**E500DU500**	150	500	400
250	430	**T6L630 PR221-I In630**	6300	**AF460**	**E500DU500**	150	500	430
290	520	**T6L800 PR221-I In800**	7200	**AF580**	**E800DU800**	250	800	580
315	545	**T6L800 PR221-I In800**	8000	**AF580**	**E800DU800**	250	800	580
355	610	**T6L800 PR221-I In800**	8000	**AF750**	**E800DU800**	250	800	750



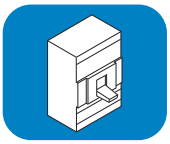
Motor protection

DOL Type 2 - Normal starting

DOL @ 440 V - 50 kA - Type 2 - Normal starting

Motor		MCCB		Contactor	Thermal release			Group
Rated power Pe [kW]	Corrente nominale Ie [A]	Type	Setting of the magnetic release [A]	Type	Type	Current setting min [A]	Current setting max [A]	I max [A]
0.37	1	**T2H160 MF 1**	13	**A9**	**TA25DU1.4**	1	1.4	1
0.55	1.4	**T2H160 MF 1.6**	21	**A9**	**TA25DU1.8**	1.3	1.8	1.6
0.75	1.7	**T2H160 MF 2**	26	**A9**	**TA25DU2.4**	1.7	2.4	2
1.1	2.2	**T2H160 MF 2.5**	33	**A9**	**TA25DU3.1**	2.2	3.1	2.5
1.5	3	**T2H160 MF 3.2**	42	**A16**	**TA25DU4**	2.8	4	3.2
2.2	4.4	**T2H160 MF 5**	65	**A26**	**TA25DU5**	3.5	5	5
3	5.7	**T2H160 MF 6.5**	84	**A26**	**TA25DU6.5**	4.5	6.5	6.5
4	7.8	**T2H160 MF 8.5**	110	**A30**	**TA25DU11**	7.5	11	8.5
5.5	10.5	**T2H160 MF 11**	145	**A30**	**TA25DU14**	10	14	11
7.5	13.5	**T2H160 MA 20**	180	**A30**	**TA25DU19**	13	19	19
11	19	**T2H160 MA 32**	240	**A30**	**TA42DU25**	18	25	25
15	26	**T2H160 MA 32**	336	**A50**	**TA75DU32**	22	32	32
18.5	32	**T2H160 MA 52**	469	**A50**	**TA75DU42**	29	42	42
22	38	**T2H160 MA 52**	547	**A50**	**TA75DU52**	36	52	45
30	52	**T2H160 MA 80**	720	**A63**	**TA75DU63**	45	63	63
37	63	**T2H160 MA 80**	840	**A75**	**TA75DU80**	60	80	70
45	75	**T2H160 MA 100**	1050	**A95**	**TA110DU90**	65	90	90
55	90	**T4H250 PR221-I In160**	1200	**A110**	**TA110DU110**	80	110	100
75	120	**T4H250 PR221-I In250**	1750	**A145**	**E200DU200**	60	200	145
90	147	**T4H250 PR221-I In250**	2000	**A185**	**E200DU200**	60	200	185
110	177	**T4H250 PR221-I In250**	2500	**A210**	**E320DU320**	100	320	210
132	212	**T5H400 PR221-I In320**	3200	**A260**	**E320DU320**	100	320	220
160	260	**T5H400 PR221-I In400**	3600	**A300**	**E320DU320**	100	320	280
200	320	**T5H630 PR221-I In630**	4410	**AF400**	**E500DU500**	150	500	400
250	410	**T6H630 PR221-I In630**	5355	**AF460**	**E500DU500**	150	500	430
290	448	**T6H630 PR221-I In630**	6300	**AF580**	**E500DU500**[1]	150	500	500
315	500	**T6H800 PR221-I In800**	7200	**AF580**	**E800DU800**	250	800	580
355	549	**T6H800 PR221-I In800**	8000	**AF580**	**E800DU800**	250	800	580

[1] Connection Kit not available. To use the connection kit. replace with relay E800DU800



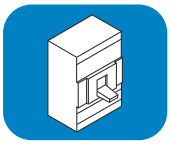
Motor protection

DOL Type 2 - Normal starting

DOL @ 440 V - 65 kA - Type 2 - Normal starting

Motor		MCCB		Contactor	Thermal release			Group
Rated power	Corrente nominale	Type	Setting of the magnetic release	Type	Type	Current setting		I max
						min	max	
Pe	Ie							
[kW]	[A]		[A]			[A]	[A]	[A]
0.37	1	**T2L160 MF 1**	13	**A9**	**TA25DU1.4**	1	1.4	1
0.55	1.4	**T2L160 MF 1.6**	21	**A9**	**TA25DU1.8**	1.3	1.8	1.6
0.75	1.7	**T2L160 MF 2**	26	**A9**	**TA25DU2.4**	1.7	2.4	2
1.1	2.2	**T2L160 MF 2.5**	33	**A9**	**TA25DU3.1**	2.2	3.1	2.5
1.5	3	**T2L160 MF 3.2**	42	**A16**	**TA25DU4**	2.8	4	3.2
2.2	4.4	**T2L160 MF 5**	65	**A26**	**TA25DU5**	3.5	5	5
3	5.7	**T2L160 MF 6.5**	84	**A26**	**TA25DU6.5**	4.5	6.5	6.5
4	7.8	**T2L160 MF 8.5**	110	**A30**	**TA25DU11**	7.5	11	8.5
5.5	10.5	**T2L160 MF 11**	145	**A30**	**TA25DU14**	10	14	11
7.5	13.5	**T2L160 MA 20**	180	**A30**	**TA25DU19**	13	19	19
11	19	**T2L160 MA 32**	240	**A30**	**TA42DU25**	18	25	25
15	26	**T2L160 MA 32**	336	**A50**	**TA75DU32**	22	32	32
18.5	32	**T2L160 MA 52**	469	**A50**	**TA75DU42**	29	42	42
22	38	**T2L160 MA 52**	547	**A50**	**TA75DU52**	36	52	45
30	52	**T2L160 MA 80**	720	**A63**	**TA75DU63**	45	63	63
37	63	**T2L160 MA 80**	840	**A75**	**TA75DU80**	60	80	70
45	75	**T2L160 MA 100**	1050	**A95**	**TA110DU90**	65	90	90
55	90	**T4H250 PR221-I In160**	1200	**A110**	**TA110DU110**	80	110	100
75	120	**T4H250 PR221-I In250**	1750	**A145**	**E200DU200**	60	200	145
90	147	**T4H250 PR221-I In250**	2000	**A185**	**E200DU200**	60	200	185
110	177	**T4H250 PR221-I In250**	2500	**A210**	**E320DU320**	100	320	210
132	212	**T5H400 PR221-I In320**	3200	**A260**	**E320DU320**	100	320	220
160	260	**T5H400 PR221-I In400**	3600	**A300**	**E320DU320**	100	320	280
200	320	**T5H630 PR221-I In630**	4410	**AF400**	**E500DU500**	150	500	400
250	410	**T6L630 PR221-I In630**	5355	**AF460**	**E500DU500**	150	500	430
290	448	**T6L630 PR221-I In630**	6300	**AF580**	**E500DU500**[1]	150	500	500
315	500	**T6L800 PR221-I In800**	7200	**AF580**	**E800DU800**	250	800	580
355	549	**T6L800 PR221-I In800**	8000	**AF580**	**E800DU800**	250	800	580

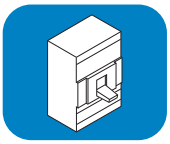
[1] Connection Kit not available. To use the connection kit, replace with relay E800DU800



DOL @ 500 V - 50 kA - Type 2 - Normal starting

Motor		MCCB		Contactor	Thermal release			Group
Rated power Pe [kW]	Rated current Ie [A]	Type	Setting of the magnetic release [A]	Type	Type	Current setting min [A]	Current setting max [A]	I max [A]
0.37	0.88	**T2L160 MF 1**	13	**A9**	**TA25DU1.0**	0.63	1	1
0.55	1.2	**T2L160 MF 1.6**	21	**A9**	**TA25DU1.4**	1	1.4	1.4
0.75	1.5	**T2L160 MF 1.6**	21	**A9**	**TA25DU1.8**	1.3	1.8	1.6
1.1	2.2	**T2L160 MF 2.5**	33	**A9**	**TA25DU3.1**	2.2	3.1	2.5
1.5	2.8	**T2L160 MF 3.2**	42	**A16**	**TA25DU4**	2.8	4	3.2
2.2	4	**T2L160 MF 4**	52	**A26**	**TA25DU5**	3.5	5	4
3	5.2	**T2L160 MF 6.5**	84	**A26**	**TA25DU6.5**	4.5	6.5	6.5
4	6.9	**T2L160 MF 8.5**	110	**A30**	**TA25DU8.5**	6	8.5	8.5
5.5	9.1	**T2L160 MF 11**	145	**A30**	**TA25DU11**	7.5	11	11
7.5	12.2	**T2L160 MF 12.5**	163	**A30**	**TA25DU14**	10	14	12.5
11	17.5	**T2L160 MA 20**	240	**A30**	**TA25DU19**	13	19	19
15	23	**T2L160 MA 32**	336	**A50**	**TA75DU25**	18	25	25
18.5	29	**T2L160 MA 52**	392	**A50**	**TA75DU32**	22	32	32
22	34	**T2L160 MA 52**	469	**A50**	**TA75DU42**	29	42	42
30	45	**T2L160 MA 52**	624	**A63**	**TA75DU52**	36	52	52
37	56	**T2L160 MA 80**	840	**A75**	**TA75DU63**	45	63	63
45	67	**T2L160 MA 80**	960	**A95**	**TA80DU80**	60	80	80
55	82	**T2L160 MA 100**	1200	**A110**	**TA110DU90**	65	90	90
75	110	**T4H250 PR221-I In160**	1440	**A145**	**E200DU200**	60	200	145
90	132	**T4H250 PR221-I In250**	1875	**A145**	**E200DU200**	60	200	145
110	158	**T4H250 PR221-I In250**	2250	**A185**	**E200DU200**	60	200	170
132	192	**T4H320 PR221-I In320**	2720	**A210**	**E320DU320**	100	320	210
160	230	**T5H400 PR221-I In400**	3600	**A260**	**E320DU320**	100	320	240
200	279	**T5H400 PR221-I In400**	4000	**A300**	**E320DU320**	100	320	280
250	335	**T5H630 PR221-I In630**	4725	**AF400**	**E 500DU500**	150	500	400
290	394	**T6H630 PR221-I In630**	5040	**AF460**	**E 500DU500**	150	500	430
315	440	**T6H630 PR221-I In630**	6300	**AF580**	**E 500DU500**[1]	150	500	500
355	483	**T6H630 PR221-I In630**	6300	**AF580**	**E 800DU800**	250	800	500

[1] Connection Kit not available. To use the connection kit, replace with relay E800DU800



Motor protection

DOL Type 2 - Normal starting

DOL @ 690 V - 50 kA - Type 2 - Normal starting

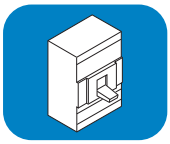
Motor		MCCB		Contactor	TC		Thermal release			Group
Rated power Pe [kW]	Rated current Ie [A]	Type	Setting of the magnetic release [A]	Type	KORC	Spire primarie su TA	Type	Current setting min [A]	Current setting max [A]	I max [A]
0.37	0.6	**T2L160 MF1**	13	**A9**			**TA25DU0.63**	0.4	0.63	0.63
0.55	0.9	**T2L160 MF1**	13	**A9**			**TA25DU1**	0.63	1	1
0.75	1.1	**T2L160 MF1.6**	21	**A9**			**TA25DU1.4**	1	1.4	1.4
1.1	1.6	**T2L160 MF1.6**	21	**A9**			**TA25DU1.8**	1.3	1.8	1.6
1.5	2	**T2L160 MF2.5**	33	**A9**			**TA25DU2.4**	1.7	2.4	2.4
2.2	2.9	**T2L160 MF3.2**	42	**A9**			**TA25DU3.1**[1]	2.2	3.1	3.1
3	3.8	**T2L160 MF4**	52	**A9**			**TA25DU4**[1]	2.8	4	4
4	5	**T2L160 MF5**	65	**A9**			**TA25DU5**[1]	3.5	5	5
5.5	6.5	**T2L160 MF6.5**	84	**A9**			**TA25DU6.5**[1]	4.5	6.5	6.5
		T4L250 PR221-I In 100	150	**A95**	**4L185R/4**	13[2]	**TA25DU2.4**	6	8.5	8.5
7.5	8.8	**T4L250 PR221-I In 100**	150	**A95**	**4L185R/4**	10[2]	**TA25DU2.4**	7.9	11.1	11.1
11	13	**T4L250 PR221-I In 100**	200	**A95**	**4L185R/4**	7[2]	**TA25DU2.4**	11.2	15.9	15.9
15	18	**T4L250 PR221-I In 100**	250	**A95**	**4L185R/4**	7[2]	**TA25DU3.1**	15.2	20.5	20.5
18.5	21	**T4L250 PR221-I In 100**	300	**A95**	**4L185R/4**	6	**TA25DU3.1**	17.7	23.9	23.9
22	25	**T4L250 PR221-I In 100**	350	**A95**	**4L185R/4**	6	**TA25DU4**	21.6	30.8	30.8
30	33	**T4L250 PR221-I In 100**	450	**A145**	**4L185R/4**	6	**TA25DU5**	27	38.5	38.5
37	41	**T4L250 PR221-I In 100**	550	**A145**	**4L185R/4**	4	**TA25DU4**	32.4	46.3	46.3
45	49	**T4L250 PR221-I In 100**	700	**A145**	**4L185R/4**	4	**TA25DU5**	40.5	57.8	57.8
55	60	**T4L250 PR221-I In 100**	800	**A145**	**4L185R/4**	3	**TA25DU5**	54	77.1	77.1
75	80	**T4L250 PR221-I In 160**	1120	**A145**			**E200DU200**	65	200	120
90	95	**T4L250 PR221-I In 160**	1280	**A145**			**E200DU200**	65	200	120
110	115	**T4L250 PR221-I In 250**	1625	**A145**			**E200DU200**	65	200	120
132	139	**T4L250 PR221-I In 250**	2000	**A185**			**E200DU200**	65	200	170
160	167	**T4L250 PR221-I In 250**	2250	**A185**			**E200DU200**	65	200	170
200	202	**T5L400 PR221-I In 320**	2720	**A210**			**E320DU320**	105	320	210
250	242	**T5L400 PR221-I In 400**	3400	**A300**			**E320DU320**	105	320	280
290	301	**T5L630 PR221-I In 630**	4410	**AF400**			**E500DU500**	150	500	350
315	313	**T5L630 PR221-I In 630**	4410	**AF400**			**E500DU500**	150	500	350
355	370	**T5L630 PR221-I In 630**	5355	**AF580**			**E500DU500**[3]	150	500	430

For further information about the KORC, please see the “Brochure KORC 1 GB 00-04” catalogue.

[1] Type 1 coordination

[2] Cable cross section = 4 mm²

[3] Connection Kit not available. To use the connection kit, replace with relay E800DU800



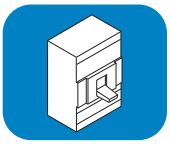
Motor protection

DOL Type 2 - Heavy duty

DOL @ 400/415 V - 36 kA - Type 2 - Heavy duty

Motor		MCCB		Contactor	Thermal release				Group
Rated power Pe [kW]	Rated current Ie [A]	Type	Setting of the magnetic release [A]	Type	Type[2]	No. of turns of the CT primary coil	Current setting min [A]	Current setting max [A]	I max [A]
0.37	1.1	**T2N160 MF1.6**	21	**A9**	**TA25DU1.4**[1]		1	1.4	1.4
0.55	1.5	**T2N160 MF1.6**	21	**A9**	**TA25DU1.8**[1]		1.3	1.8	1.6
0.75	1.9	**T2N160 MF 2**	26	**A9**	**TA25DU2.4**[1]		1.7	2.4	2
1.1	2.8	**T2N160 MF 3.2**	42	**A9**	**TA25DU4**[1]		2.8	4	3.2
1.5	3.5	**T2N160 MF 4**	52	**A16**	**TA25DU5**[1]		3.5	5	4
2.2	5	**T2N160 MF 5**	65	**A26**	**TA25DU6.5**[1]		4.5	6.5	5
3	6.6	**T2N160 MF 8.5**	110	**A26**	**TA25DU8.5**[1]		6	8.5	8.5
4	8.6	**T2N160 MF 11**	145	**A30**	**TA25DU11**[1]		7.5	11	11
5.5	11.5	**T2N160 MF 12.5**	163	**A30**	**TA450SU60**	**4**	10	15	12.5
7.5	15.2	**T2N160 MA 20**	210	**A30**	**TA450SU60**	**3**	13	20	20
11	22	**T2N160 MA 32**	288	**A30**	**TA450SU60**	**2**	20	30	32
15	28.5	**T2N160 MA 52**	392	**A50**	**TA450SU80**	**2**	23	40	40
18.5	36	**T2N160 MA 52**	469	**A50**	**TA450SU80**	**2**	23	40	40
22	42	**T2N160 MA 52**	547	**A50**	**TA450SU60**		40	60	50
30	56	**T2N160 MA 80**	840	**A63**	**TA450SU80**		55	80	65
37	68	**T2N160 MA 80**	960	**A95**	**TA450SU80**		55	80	80
45	83	**T2N160 MA 100**	1200	**A110**	**TA450SU105**		70	105	100
55	98	**T3N250 MA 160**	1440	**A145**	**TA450SU140**		95	140	140
75	135	**T3N250 MA 200**	1800	**A185**	**TA450SU185**		130	185	185
90	158	**T3N250 MA 200**	2400	**A210**	**TA450SU185**		130	185	185
110	193	**T4N320 PR221-I In320**	2720	**A260**	**E320DU320**		100	320	220
132	232	**T5N400 PR221-I In400**	3200	**A300**	**E320DU320**		100	320	300
160	282	**T5N400 PR221-I In400**	4000	**AF400**	**E500DU500**		150	500	400
200	349	**T5N630 PR221-I In630**	5040	**AF460**	**E500DU500**		150	500	430
250	430	**T6N630 PR221-I In630**	6300	**AF580**	**E500DU500**[3]		150	500	430
290	520	**T6N800 PR221-I In800**	7200	**AF750**	**E800DU800**		250	800	750
315	545	**T6N800 PR221-I In800**	8000	**AF750**	**E800DU800**		250	800	750
355	610	**T6N800 PR221-I In800**	8000	**AF750**	**E800DU800**		250	800	750

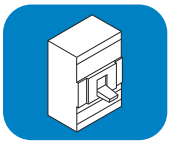
[1] Provide a by-pass contactor of the same size during motor start-up
[2] Set trip class 30 on the Type E relays
[3] Connection Kit not available. To use the connection kit, replace with relay E800DU800



DOL @ 400/415 V - 50 kA - Type 2 - Heavy duty

Motor		MCCB		Contactor	Thermal release				Group
Rated power	Rated current	Type	Setting of the magnetic release	Type	Type[2]	No. of turns of the CT primary coil	Current setting		I max
							min	max	
Pe	Ie								
[kW]	[A]		[A]				[A]	[A]	[A]
0.37	1.1	**T2S160 MF 1.6**	21	**A9**	**TA25DU1.4**[1]		1	1.4	1.4
0.55	1.5	**T2S160 MF 1.6**	21	**A9**	**TA25DU1.8**[1]		1.3	1.8	1.6
0.75	1.9	**T2S160 MF 2**	26	**A9**	**TA25DU2.4**[1]		1.7	2.4	2
1.1	2.8	**T2S160 MF 3.2**	42	**A9**	**TA25DU4**[1]		2.8	4	3.2
1.5	3.5	**T2S160 MF 4**	52	**A16**	**TA25DU5**[1]		3.5	5	4
2.2	5	**T2S160 MF 5**	65	**A26**	**TA25DU6.5**[1]		4.5	6.5	5
3	6.6	**T2S160 MF 8.5**	110	**A26**	**TA25DU8.5**[1]		6	8.5	8.5
4	8.6	**T2S160 MF 11**	145	**A30**	**TA25DU11**[1]		7.5	11	11
5.5	11.5	**T2S160 MF 12.5**	163	**A30**	**TA450SU60**	**4**	10	15	12.5
7.5	15.2	**T2S160 MA 20**	210	**A30**	**TA450SU60**	**3**	13	20	20
11	22	**T2S160 MA 32**	288	**A30**	**TA450SU60**	**2**	20	30	32
15	28.5	**T2S160 MA 52**	392	**A50**	**TA450SU80**	**2**	23	40	40
18.5	36	**T2S160 MA 52**	469	**A50**	**TA450SU80**	**2**	23	40	40
22	42	**T2S160 MA 52**	547	**A50**	**TA450SU60**		40	60	50
30	56	**T2S160 MA 80**	840	**A63**	**TA450SU80**		55	80	65
37	68	**T2S160 MA 80**	960	**A95**	**TA450SU80**		55	80	80
45	83	**T2S160 MA 100**	1200	**A110**	**TA450SU105**		70	105	100
55	98	**T3S250 MA 160**	1440	**A145**	**TA450SU140**		95	140	140
75	135	**T3S250 MA 200**	1800	**A185**	**TA450SU185**		130	185	185
90	158	**T3S250 MA 200**	2400	**A210**	**TA450SU185**		130	185	185
110	193	**T4S320 PR221-I In320**	2720	**A260**	**E320DU320**		100	320	220
132	232	**T5S400 PR221-I In400**	3200	**A300**	**E320DU320**		100	320	300
160	282	**T5S400 PR221-I In400**	4000	**AF400**	**E500DU500**		150	500	400
200	349	**T5S630 PR221-I In630**	5040	**AF460**	**E500DU500**		150	500	430
250	430	**T6S630 PR221-I In630**	6300	**AF580**	**E500DU500**[3]		150	500	430
290	520	**T6S800 PR221-I In800**	7200	**AF750**	**E800DU800**		250	800	750
315	545	**T6S800 PR221-I In800**	8000	**AF750**	**E800DU800**		250	800	750
355	610	**T6S800 PR221-I In800**	8000	**AF750**	**E800DU800**		250	800	750

[1] Provide a by-pass contactor of the same size during motor start-up
[2] Set trip class 30 on the Type E relays
[3] Connection Kit not available. To use the connection kit, replace with relay E800DU800



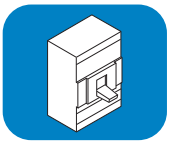
Motor protection

DOL Type 2 - Heavy duty

DOL @ 440 V - 50 kA - Type 2 - Heavy duty

Motor		MCCB		Contactor	Thermal release				Group
Rated power	Rated current	Type	Setting of the magnetic release	Type	Type[2]	No. of turns of the CT primary coil	Current setting		I max
							min	max	
Pe	Ie								
[kW]	[A]		[A]				[A]	[A]	[A]
0.37	1	**T2H160 MF 1**	13	**A9**	**TA25DU1.4**[1]		1	1.4	1
0.55	1.4	**T2H160 MF 1.6**	21	**A9**	**TA25DU1.8**[1]		1.3	1.8	1.6
0.75	1.7	**T2H160 MF 2**	26	**A9**	**TA25DU2.4**[1]		1.7	2.4	2
1.1	2.2	**T2H160 MF 2.5**	33	**A9**	**TA25DU3.1**[1]		2.2	3.1	2.5
1.5	3	**T2H160 MF 3.2**	42	**A16**	**TA25DU4**[1]		2.8	4	3.2
2.2	4.4	**T2H160 MF 5**	65	**A26**	**TA25DU5**[1]		3.5	5	5
3	5.7	**T2H160 MF 6.5**	84	**A26**	**TA25DU6.5**[1]		4.5	6.5	6.5
4	7.8	**T2H160 MF 8.5**	110	**A30**	**TA25DU11**[1]		7.5	11	8.5
5.5	10.5	**T2H160 MF 11**	145	**A30**	**TA25DU14**[1]		10	14	11
7.5	13.5	**T2H160 MA 20**	180	**A30**	**TA450SU60**	**4**	10	15	15
11	19	**T2H160 MA 32**	240	**A30**	**TA450SU80**	**3**	18	27	27
15	26	**T2H160 MA 32**	336	**A50**	**TA450SU60**	**2**	20	30	32
18.5	32	**T2H160 MA 52**	469	**A50**	**TA450SU80**	**2**	28	40	40
22	38	**T2H160 MA 52**	547	**A50**	**TA450SU80**	**2**	28	40	40
30	52	**T2H160 MA 80**	720	**A63**	**TA450SU60**		40	60	60
37	63	**T2H160 MA 80**	840	**A95**	**TA450SU80**		55	80	80
45	75	**T2H160 MA 100**	1050	**A110**	**TA450SU105**		70	105	100
55	90	**T4H250 PR221-I In160**	1200	**A145**	**E200DU200**		60	200	145
75	120	**T4H250 PR221-I In250**	1750	**A185**	**E200DU200**		60	200	185
90	147	**T4H250 PR221-I In250**	2000	**A210**	**E320DU320**		100	320	210
110	177	**T4H250 PR221-I In250**	2500	**A260**	**E320DU320**		100	320	220
132	212	**T5H400 PR221-I In320**	3200	**A300**	**E320DU320**		100	320	220
160	260	**T5H400 PR221-I In400**	3600	**AF400**	**E500DU500**		150	500	400
200	320	**T5H630 PR221-I In630**	4410	**AF460**	**E500DU500**		150	500	430
250	410	**T6H630 PR221-I In630**	5355	**AF580**	**E500DU500**[3]		150	500	430
290	448	**T6H630 PR221-I In630**	6300	**AF750**	**E500DU500**[3]		150	500	500
315	500	**T6H800 PR221-I In800**	7200	**AF750**	**E800DU800**		250	800	750
355	549	**T6H800 PR221-I In800**	8000	**AF750**	**E800DU800**		250	800	750

[1] Provide a by-pass contactor of the same size during motor start-up
[2] Set trip class 30 on the Type E relays
[3] Connection Kit not available. To use the connection kit, replace with relay E800DU800



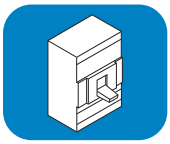
Motor protection

DOL Type 2 - Heavy duty

DOL @ 440 V - 65 kA - Type 2 - Heavy duty

Motor		MCCB		Contactor	Thermal release				Group
Rated power Pe [kW]	Rated current Ie [A]	Type	Setting of the magnetic release [A]	Type	Type[2]	No. of turns of the CT primary coil	Current setting min [A]	Current setting max [A]	I max [A]
0.37	1	**T2L160 MF 1**	13	**A9**	**TA25DU1.4**[1]		1	1.4	1
0.55	1.4	**T2L160 MF 1.6**	21	**A9**	**TA25DU1.8**[1]		1.3	1.8	1.6
0.75	1.7	**T2L160 MF 2**	26	**A9**	**TA25DU2.4**[1]		1.7	2.4	2
1.1	2.2	**T2L160 MF 2.5**	33	**A9**	**TA25DU3.1**[1]		2.2	3.1	2.5
1.5	3	**T2L160 MF 3.2**	42	**A16**	**TA25DU4**[1]		2.8	4	3.2
2.2	4.4	**T2L160 MF 5**	65	**A26**	**TA25DU5**[1]		3.5	5	5
3	5.7	**T2L160 MF 6.5**	84	**A26**	**TA25DU6.5**[1]		4.5	6.5	6.5
4	7.8	**T2L160 MF 8.5**	110	**A30**	**TA25DU11**[1]		7.5	11	8.5
5.5	10.5	**T2L160 MF 11**	145	**A30**	**TA25DU14**[1]		10	14	11
7.5	13.5	**T2L160 MA 20**	180	**A30**	**TA450SU60**	**4**	10	15	15
11	19	**T2L160 MA 32**	240	**A30**	**TA450SU80**	**3**	18	27	27
15	26	**T2L160 MA 32**	336	**A50**	**TA450SU60**	**2**	20	30	32
18.5	32	**T2L160 MA 52**	469	**A50**	**TA450SU80**	**2**	28	40	40
22	38	**T2L160 MA 52**	547	**A50**	**TA450SU80**	**2**	28	40	40
30	52	**T2L160 MA 80**	720	**A63**	**TA450SU60**		40	60	60
37	63	**T2L160 MA 80**	840	**A95**	**TA450SU80**		55	80	80
45	75	**T2L160 MA 100**	1050	**A110**	**TA450SU105**		70	105	100
55	90	**T4H250 PR221-I In160**	1200	**A145**	**E200DU200**		60	200	145
75	120	**T4H250 PR221-I In250**	1750	**A185**	**E200DU200**		60	200	185
90	147	**T4H250 PR221-I In250**	2000	**A210**	**E320DU320**		100	320	210
110	177	**T4H250 PR221-I In250**	2500	**A260**	**E320DU320**		100	320	220
132	212	**T5H400 PR221-I In320**	3200	**A300**	**E320DU320**		100	320	220
160	260	**T5H400 PR221-I In400**	3600	**AF400**	**E500DU500**		150	500	400
200	320	**T5H630 PR221-I In630**	4410	**AF460**	**E500DU500**		150	500	430
250	410	**T6L630 PR221-I In630**	5355	**AF580**	**E500DU500**[3]		150	500	430
290	448	**T6L630 PR221-I In630**	6300	**AF750**	**E500DU500**[3]		150	500	500
315	500	**T6L800 PR221-I In800**	7200	**AF750**	**E800DU800**		250	800	750
355	549	**T6L800 PR221-I In800**	8000	**AF750**	**E800DU800**		250	800	750

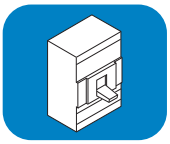
[1] Provide a by-pass contactor of the same size during motor start-up
[2] Set trip class 30 on the Type E relays
[3] Connection Kit not available. To use the connection kit, replace with relay E800DU800



DOL @ 500 V - 50 kA - Type 2 - Heavy duty

Motor		MCCB		Contactor	Thermal release				Group
Rated power	Rated current	Type	Setting of the magnetic release	Type	Type[2]	No. of turns of the CT primary coil	Current setting		I max
							min	max	
Pe	Ie								
[kW]	[A]		[A]				[A]	[A]	[A]
0.37	0.88	**T2L160 MF 1**	13	**A9**	**TA25DU1.0**[1]		0.63	1	1
0.55	1.2	**T2L160 MF 1.6**	21	**A9**	**TA25DU1.4**[1]		1	1.4	1.4
0.75	1.5	**T2L160 MF 1.6**	21	**A9**	**TA25DU1.8**[1]		1.3	1.8	1.6
1.1	2.2	**T2L160 MF 2.5**	33	**A9**	**TA25DU3.1**[1]		2.2	3.1	2.5
1.5	2.8	**T2L160 MF 3.2**	42	**A16**	**TA25DU4**[1]		2.8	4	3.2
2.2	4	**T2L160 MF 4**	52	**A26**	**TA25DU5**[1]		3.5	5	4
3	5.2	**T2L160 MF 6.5**	84	**A26**	**TA25DU6.5**[1]		4.5	6.5	6.5
4	6.9	**T2L160 MF 8.5**	110	**A30**	**TA25DU8.5**[1]		6	8.5	8.5
5.5	9.1	**T2L160 MF 11**	145	**A30**	**TA25DU11**[1]		7.5	11	11
7.5	12.2	**T2L160 MF 12.5**	163	**A30**	**TA450SU60**	**4**	10	15	12.5
11	17.5	**T2L160 MA 20**	240	**A30**	**TA450SU60**	**3**	13	20	20
15	23	**T2L160 MA 32**	336	**A50**	**TA450SU60**	**2**	20	30	30
18.5	29	**T2L160 MA 52**	392	**A50**	**TA450SU80**	**2**	27.5	40	40
22	34	**T2L160 MA 52**	469	**A50**	**TA450SU80**	**2**	27.5	40	40
30	45	**T2L160 MA 52**	624	**A63**	**TA450SU60**		40	60	52
37	56	**T2L160 MA 80**	840	**A75**	**TA450SU60**		40	60	60
45	67	**T2L160 MA 80**	960	**A95**	**TA450SU80**		55	80	80
55	82	**T2L160 MA 100**	1200	**A145**	**TA450SU105**		70	105	100
75	110	**T4H250 PR221-I In160**	1440	**A145**	**E200DU200**		60	200	145
90	132	**T4H250 PR221-I In250**	1875	**A185**	**E200DU200**		60	200	170
110	158	**T4H250 PR221-I In250**	2125	**A210**	**E320DU320**		100	320	210
132	192	**T4H320 PR221-I In320**	2720	**A260**	**E320DU320**		100	320	220
160	230	**T5H400 PR221-I In400**	3200	**A300**	**E320DU320**		100	320	280
200	279	**T5H400 PR221-I In400**	3600	**AF400**	**E500DU500**		150	500	400
250	335	**T5H630 PR221-I In630**	4725	**AF460**	**E500DU500**		150	500	430
290	394	**T6H630 PR221-I In630**	5040	**AF580**	**E500DU500**[3]		150	500	430
315	440	**T6H630 PR221-I In630**	6300	**AF750**	**E500DU500**[3]		150	500	500
355	483	**T6H630 PR221-I In630**	6300	**AF750**	**E500DU500**[3]		150	500	500

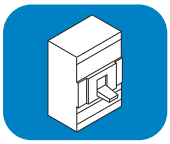
[1] Provide a by-pass contactor of the same size during motor start-up
[2] Set trip class 30 on the Type E relays
[3] Connection Kit not available. To use the connection kit, replace with relay E800DU800



DOL @ 690 V - 50 kA - Type 2 - Heavy duty

Motor		MCCB		Contactor	Thermal release				Group
Rated power Pe [kW]	Rated current Ie [A]	Type	Setting of the magnetic release [A]	Type	Type[2]	No. of turns of the CT primary coil	Current setting min [A]	Current setting max [A]	I max [A]
0.37	0.6	**T2L160 MF1**	13	**A9**	**TA25DU0.63[4]**		0.4	0.63	0.63
0.55	0.9	**T2L160 MF1**	13	**A9**	**TA25DU1[4]**		0.63	1	1
0.75	1.1	**T2L160 MF1.6**	21	**A9**	**TA25DU1.4[4]**		1	1.4	1.4
1.1	1.6	**T2L160 MF1.6**	21	**A9**	**TA25DU1.8[4]**		1.3	1.8	1.6
1.5	2	**T2L160 MF2.5**	33	**A9**	**TA25DU2.4[4]**		1.7	2.4	2.4
2.2	2.9	**T2L160 MF3.2**	42	**A9**	**TA25DU3.1[1-4]**		2.2	3.1	3.1
3	3.8	**T2L160 MF4**	52	**A9**	**TA25DU4[1-4]**		2.8	4	4
4	5	**T2L160 MF5**	65	**A9**	**TA25DU5[1-4]**		3.5	5	5
5.5	6.5	**T2L160 MF6.5**	84	**A9**	**TA25DU6.5[1-4]**		4.5	6.5	6.5
		T4L250 PR221-I In 100	150	**A95**	**TA450SU60**	**7[2]**	5.7	8.6	8.5
7.5	8.8	**T4L250 PR221-I In 100**	150	**A95**	**TA450SU60**	**5[2]**	8	12	12
11	13	**T4L250 PR221-I In 100**	200	**A95**	**TA450SU60**	**4[2]**	10	15	15
15	18	**T4L250 PR221-I In 100**	250	**A95**	**TA450SU60**	**3[2]**	13	20	20
18.5	21	**T4L250 PR221-I In 100**	300	**A95**	**TA450SU80**	**3**	18	27	27
22	25	**T4L250 PR221-I In 100**	350	**A95**	**TA450SU60**	**2**	20	30	30
30	33	**T4L250 PR221-I In 100**	450	**A145**	**TA450SU80**	**2**	27.5	40	40
37	41	**T4L250 PR221-I In 100**	550	**A145**	**TA450SU60**		40	60	60
45	49	**T4L250 PR221-I In 100**	700	**A145**	**TA450SU60**		40	60	60
55	60	**T4L250 PR221-I In 100**	800	**A145**	**TA450SU80**		55	80	80
75	80	**T4L250 PR221-I In 160**	1120	**A145**	**TA450SU105**		70	105	105
90	95	**T4L250 PR221-I In 160**	1280	**A145**	**TA450SU105**		70	105	105
110	115	**T4L250 PR221-I In 250**	1625	**A185**	**TA450SU140**		95	140	140
132	139	**T4L250 PR221-I In 250**	2000	**A210**	**E320DU320**		105	320	210
160	167	**T4L250 PR221-I In 250**	2250	**A210**	**E320DU320**		105	320	210
200	202	**T5L400 PR221-I In 320**	2720	**A260**	**E320DU320**		105	320	220
250	242	**T5L400 PR221-I In 400**	3400	**AF400**	**E500DU500**		150	500	350
290	301	**T5L630 PR221-I In 630**	4410	**AF400**	**E500DU500**		150	500	350
315	313	**T5L630 PR221-I In 630**	4410	**AF460**	**E500DU500**		150	500	400
355	370	**T5L630 PR221-I In 630**	5355	**AF580**	**E500DU500[3]**		150	500	430

[1] Type 1 coordination
[2] Cable cross section = 4 mm²
[3] Connection Kit not available. To use the connection kit, replace with relay E800DU800
[4] Provide a by-pass contactor of the same size during motor start-up

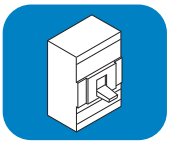


Star-delta - Type 2 @ 400/415 V - 36 kA - 50/60 Hz

Motor		MCCB		Contactor			Thermal release	
Pe [kW]	Ie [A]	type	Im [A]	line type	delta type	star type	type	[A]
18.5	36	T2N160 MA52	469	A50	A50	A26	TA75DU25	18-25
22	42	T2N160 MA52	547	A50	A50	A26	TA75DU32	22-32
30	56	T2N160 MA80	720	A63	A63	A30	TA75DU42	29-42
37	68	T2N160 MA80	840	A75	A75	A30	TA75DU52	36-52
45	83	T2N160 MA100	1050	A75	A75	A30	TA75DU63	45-63
55	98	T2N160 MA100	1200	A75	A75	A40	TA75DU63	45-63
75	135	T3N250 MA160	1700	A95	A95	A75	TA110DU90	66-90
90	158	T3N250 MA200	2000	A110	A110	A95	TA110DU110	80-110
110	193	T3N250 MA200	2400	A145	A145	A95	TA200DU135	100-135
132	232	T4N320 PR221-I In320	2880	A145	A145	A110	E200DU200	60-200
160	282	T5N400 PR221-I In400	3600	A185	A185	A145	E200DU200	60-200
200	349	T5N630 PR221-I In630	4410	A210	A210	A185	E320DU320	100-320
250	430	T5N630 PR221-I In630	5670	A260	A260	A210	E320DU320	100-320
290	520	T6N630 PR221-I In630	6300	AF400	AF400	A260	E500DU500	150-500
315	545	T6N800 PR221-I In800	7200	AF400	AF400	A260	E500DU500	150-500
355	610	T6N800 PR221-I In800	8000	AF400	AF400	A260	E500DU500	150-500

Star-delta - Type 2 @ 400/415 V - 50 kA - 50/60 Hz

Motor		MCCB		Contactor			Thermal release	
Pe [kW]	Ie [A]	type	Im [A]	line type	delta type	star type	type	[A]
18.5	36	T2S160 MA52	469	A50	A50	A26	TA75DU25	18-25
22	42	T2S160 MA52	547	A50	A50	A26	TA75DU32	22-32
30	56	T2S160 MA80	720	A63	A63	A30	TA75DU42	29-42
37	68	T2S160 MA80	840	A75	A75	A30	TA75DU52	36-52
45	83	T2S160 MA100	1050	A75	A75	A30	TA75DU63	45-63
55	98	T2S160 MA100	1200	A75	A75	A40	TA75DU63	45-63
75	135	T3S250 MA160	1700	A95	A95	A75	TA110DU90	66-90
90	158	T3S250 MA200	2000	A110	A110	A95	TA110DU110	80-110
110	193	T3S250 MA200	2400	A145	A145	A95	TA200DU135	100-135
132	232	T4S320 PR221-I In320	2880	A145	A145	A110	E200DU200	60-200
160	282	T5S400 PR221-I In400	3600	A185	A185	A145	E200DU200	60-200
200	349	T5S630 PR221-I In630	4410	A210	A210	A185	E320DU320	100-320
250	430	T5S630 PR221-I In630	5670	A260	A260	A210	E320DU320	100-320
290	520	T6S630 PR221-I In630	6300	AF400	AF400	A260	E500DU500	150-500
315	545	T6S800 PR221-I In800	7200	AF400	AF400	A260	E500DU500	150-500
355	610	T6S800 PR221-I In800	8000	AF400	AF400	A260	E500DU500	150-500

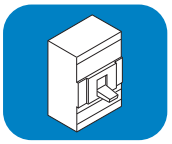


Star-delta - Type 2 @ 440 V - 50 kA - 50/60 Hz

Motor		MCCB		Contactor			Thermal release	
Pe [kW]	Ie [A]	type	Im [A]	line type	delta type	star type	type	[A]
18.5	32	T2H160 MA52	392	A50	A50	A16	TA75DU25	18-25
22	38	T2H160 MA52	469	A50	A50	A26	TA75DU25	18-25
30	52	T2H160 MA80	720	A63	A63	A26	TA75DU42	29-42
37	63	T2H160 MA80	840	A75	A75	A30	TA75DU42	29-42
45	75	T2H160 MA80	960	A75	A75	A30	TA75DU52	36-52
55	90	T2H160 MA100	1150	A75	A75	A40	TA75DU63	45-63
75	120	T4H250 PR221-I In250	1625	A95	A95	A75	TA80DU80	60-80
90	147	T4H250 PR221-I In250	1875	A95	A95	A75	TA110DU110	80-110
110	177	T4H250 PR221-I In250	2250	A145	A145	A95	E200DU200	60-200
132	212	T4H320 PR221-I In320	2720	A145	A145	A110	E200DU200	60-200
160	260	T5H400 PR221-I In400	3200	A185	A185	A145	E200DU200	60-200
200	320	T5H630 PR221-I In630	4095	A210	A210	A185	E320DU320	100-320
250	410	T5H630 PR221-I In630	5040	A260	A260	A210	E320DU320	100-320
290	448	T6H630 PR221-I In630	5670	AF400	AF400	A260	E500DU500	150-500
315	500	T6H630 PR221-I In630	6300	AF400	AF400	A260	E500DU500	150-500
355	549	T6H800 PR221-I In800	7200	AF400	AF400	A260	E500DU500	150-500

Star-delta - Type 2 @ 440 V - 65 kA - 50/60 Hz

Motor		MCCB		Contactor			Thermal release	
Pe [kW]	Ie [A]	type	Im [A]	line type	delta type	star type	type	[A]
18.5	32	T2L160 MA52	392	A50	A50	A16	TA75DU25	18-25
22	38	T2L160 MA52	469	A50	A50	A26	TA75DU25	18-25
30	52	T2L160 MA80	720	A63	A63	A26	TA75DU42	29-42
37	63	T2L160 MA80	840	A75	A75	A30	TA75DU42	29-42
45	75	T2L160 MA80	960	A75	A75	A30	TA75DU52	36-52
55	90	T2L160 MA100	1150	A75	A75	A40	TA75DU63	45-63
75	120	T4H250 PR221-I In250	1625	A95	A95	A75	TA80DU80	60-80
90	147	T4H250 PR221-I In250	1875	A95	A95	A75	TA110DU110	80-110
110	177	T4H250 PR221-I In250	2250	A145	A145	A95	E200DU200	60-200
132	212	T4H320 PR221-I In320	2720	A145	A145	A110	E200DU200	60-200
160	260	T5H400 PR221-I In400	3200	A185	A185	A145	E200DU200	60-200
200	320	T5H630 PR221-I In630	4095	A210	A210	A185	E320DU320	100-320
250	410	T5H630 PR221-I In630	5040	A260	A260	A210	E320DU320	100-320
290	448	T6H630 PR221-I In630	5670	AF400	AF400	A260	E500DU500	150-500
315	500	T6H630 PR221-I In630	6300	AF400	AF400	A260	E500DU500	150-500
355	549	T6H800 PR221-I In800	7200	AF400	AF400	A260	E500DU500	150-500



Motor protection

Star-delta - Type 2

Star-delta - Type 2 @ 500 V - 50 kA - 50/60 Hz

Motor		MCCB		Contactor			Thermal release	
Pe [kW]	Ie [A]	type	Im [A]	line type	delta type	star type	type	[A]
22	34	T2L160 MA52	430	A50	A50	A16	TA75DU25	18-25
30	45	T2L160 MA52	547	A63	A63	A26	TA75DU32	22-32
37	56	T2L160 MA80	720	A75	A75	A30	TA75DU42	29-42
45	67	T2L160 MA80	840	A75	A75	A30	TA75DU52	36-52
55	82	T2L160 MA100	1050	A75	A75	A30	TA75DU52	36-52
75	110	T4H250 PR221-I In250	1375	A95	A95	A50	TA80DU80	60-80
90	132	T4H250 PR221-I In250	1750	A95	A95	A75	TA110DU90	65-90
110	158	T4H250 PR221-I In250	2000	A110	A110	A95	TA110DU110	80-110
132	192	T4H320 PR221-I In320	2560	A145	A145	A95	E200DU200	60-200
160	230	T4H320 PR221-I In320	2880	A145	A145	A110	E200DU200	60-200
200	279	T5H400 PR221-I In400	3400	A210	A210	A145	E320DU320	100-320
250	335	T5H630 PR221-I In630	4410	A210	A210	A185	E320DU320	100-320
290	394	T5H630 PR221-I In630	5040	A260	A260	A210	E320DU320	100-320
315	440	T6L630 PR221-I In630	5760	AF400	AF400	A210	E500DU500	150-500
355	483	T6L630 PR221-I In630	6300	AF400	AF400	A260	E500DU500	150-500

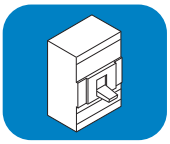
Star-delta - Type 2 @ 690 V - 50 kA - 50/60 Hz

Motor		MCCB		Contactor			TC		Thermal release	
Pe [kW]	Ie [A]	type	Im [A]	line type	delta type	star type	KORC	Spire	type	[A]
5.5	6.5[1]	T4L250 PR221-I In100	150	A95	A95	A26	4L185R/4[2]	13	TA25DU2.4[2]	6-8.5
7.5	8.8[1]	T4L250 PR221-I In100	150	A95	A95	A26	4L185R/4[2]	10	TA25DU2.4[2]	7.9-11.1
11	13[1]	T4L250 PR221-I In100	200	A95	A95	A26	4L185R/4[2]	7	TA25DU2.4[2]	11.2-15.9
15	18[1]	T4L250 PR221-I In100	250	A95	A95	A26	4L185R/4[2]	7	TA25DU3.1[2]	15.2-20.5
18.5	21	T4L250 PR221-I In100	300	A95	A95	A30	4L185R/4[2]	6	TA25DU3.1[2]	17.7-23.9
22	25	T4L250 PR221-I In100	350	A95	A95	A30	4L185R/4[2]	6	TA25DU4[2]	21.6-30.8
30	33	T4L250 PR221-I In100	450	A145	A145	A30	4L185R/4[2]	6	TA25DU5[2]	27-38.5
37	41	T4L250 PR221-I In100	550	A145	A145	A30			TA75DU52[2]	36-52
45	49	T4L250 PR221-I In100	650	A145	A145	A30			TA75DU52[2]	36-52
55	60	T4L250 PR221-I In100	800	A145	A145	A40			TA75DU52[2]	36-52
75	80	T4L250 PR221-I In160	1120	A145	A145	A50			TA75DU52	36-52
90	95	T4L250 PR221-I In160	1280	A145	A145	A75			TA75DU63	45-63
110	115	T4L250 PR221-I In160	1600	A145	A145	A75			TA75DU80	60-80
132	139	T4L250 PR221-I In250	1875	A145	A145	A95			TA200DU110	80-110
160	167	T4L250 PR221-I In250	2125	A145	A145	A110			TA200DU110	80-110
200	202	T4L320 PR221-I In320	2720	A185	A185	A110			TA200DU135	100-135
250	242	T5L400 PR221-I In400	3200	AF400	AF400	A145			E500DU500	150-500
290	301	T5L400 PR221-I In400	4000	AF400	AF400	A145			E500DU500	150-500
315	313	T5L630 PR221-I In630	4410	AF400	AF400	A185			E500DU500	150-500
355	370	T5L630 PR221-I In630	5040	AF400	AF400	A210			E500DU500	150-500
400	420	T5L630 PR221-I In630	5670	AF460	AF460	A210			E500DU500	150-500
450	470	T5L630 PR221-I In630	6300	AF460	AF460	A260			E500DU500	150-500

For further information about the KORC, please see the “Brochure KORC 1 GB 00-04” catalogue.

[1] Cable cross section = 4 mm^2

[2] Connect the overload/relay upstream the line-delta mode.



Motor protection

DOL Type 2 - Start-up with MP release

DOL @ 400/415 V - 36 kA - Type 2 - Start-up with MP release

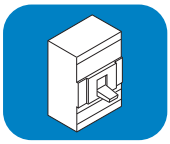
Motor		MCCB			Contactor	Group
Pe [kW]	Ie [A]	type	I_1 [1] [A]	I_3 [A]	type	I max [A]
30	56	T4N250 PR222MP In100	40-100	600	A95	95
37	68	T4N250 PR222MP In100	40-100	700	A95	95
45	83	T4N250 PR222MP In100	40-100	800	A95	95
55	98	T4N250 PR222MP In160	64-160	960	A145	145
75	135	T4N250 PR222MP In160	64-160	1280	A145	145
90	158	T4N250 PR222MP In200	80-200	1600	A185	185
110	193	T5N400 PR222MP In320	128-320	1920	A210	210
132	232	T5N400 PR222MP In320	128-320	2240	A260	260
160	282	T5N400 PR222MP In320	128-320	2560	AF400[2]	320
200	349	T5N400 PR222MP In400	160-400	3200	AF400	400
250	430	T6N800 PR222MP In630	252-630	5040	AF460	460
290	520	T6N800 PR222MP In630	252-630	5670	AF580	580
315	545	T6N800 PR222MP In630	252-630	5670	AF580	580
355	610	T6N800 PR222MP In630	252-630	5670	AF750	630

[1] For heavy-duty start set the electronic release tripping class to class 30
[2] In case of normal start use AF300

DOL @ 400/415 V - 50 kA - Type 2 - Start-up with MP release

Motor		MCCB			Contactor	Group
Pe [kW]	Ie [A]	type	I_1 [1] [A]	I_3 [A]	type	I max [A]
30	56	T4S250 PR222MP In100	40-100	600	A95	95
37	68	T4S250 PR222MP In100	40-100	700	A95	95
45	83	T4S250 PR222MP In100	40-100	800	A95	95
55	98	T4S250 PR222MP In160	64-160	960	A145	145
75	135	T4S250 PR222MP In160	64-160	1280	A145	145
90	158	T4S250 PR222MP In200	80-200	1600	A185	185
110	193	T5S400 PR222MP In320	128-320	1920	A210	210
132	232	T5S400 PR222MP In320	128-320	2240	A260	260
160	282	T5S400 PR222MP In320	128-320	2560	AF400[2]	320
200	349	T5S400 PR222MP In400	160-400	3200	AF400	400
250	430	T6S800 PR222MP In630	252-630	5040	AF460	460
290	520	T6S800 PR222MP In630	252-630	5670	AF580	580
315	545	T6S800 PR222MP In630	252-630	5670	AF580	580
355	610	T6S800 PR222MP In630	252-630	5670	AF750	630

[1] For heavy-duty start set the electronic release tripping class to class 30
[2] In case of normal start use AF300



DOL @ 440 V - 50 kA - Type 2 - Start-up with MP release

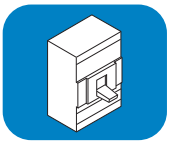
Motor		MCCB			Contactor	Group
Pe [kW]	Ie [A]	type	I_1 [1] [A]	I_3 [A]	type	I max [A]
30	52	T4H250 PR222MP In100	40-100	600	A95	93
37	63	T4H250 PR222MP In100	40-100	700	A95	93
45	75	T4H250 PR222MP In100	40-100	800	A95	93
55	90	T4H250 PR222MP In160	64-160	960	A145	145
75	120	T4H250 PR222MP In160	64-160	1120	A145	145
90	147	T4H250 PR222MP In200	80-200	1400	A185	185
110	177	T5H400 PR222MP In320	128-320	1920	A210	210
132	212	T5H400 PR222MP In320	128-320	2240	A260	240
160	260	T5H400 PR222MP In320	128-320	2560	AF400[2]	320
200	320	T5H400 PR222MP In400	160-400	3200	AF400	400
250	370	T6H800 PR222MP In630	252-630	4410	AF460	460
290	436	T6H800 PR222MP In630	252-630	5040	AF460	460
315	500	T6H800 PR222MP In630	252-630	5040	AF580	580
355	549	T6H800 PR222MP In630	252-630	5670	AF580	580

[1] For heavy-duty start set the electronic release tripping class to class 30
[2] In case of normal start use AF300

DOL @ 500 V - 50 kA - Type 2 - Start-up with MP release

Motor		MCCB			Contactor	Group
Pe [kW]	Ie [A]	type	I_1 [1] [A]	I_3 [A]	type	I max [A]
30	45	T4H250 PR222MP In100	40-100	600	A95	80
37	56	T4H250 PR222MP In100	40-100	600	A95	80
45	67	T4H250 PR222MP In100	40-100	700	A145	100
55	82	T4H250 PR222MP In100	40-100	800	A145	100
75	110	T4H250 PR222MP In160	64-160	1120	A145	145
90	132	T4H250 PR222MP In160	64-160	1280	A145	145
110	158	T4H250 PR222MP In200	80-200	1600	A185	170
132	192	T5H400 PR222MP In320	128-320	1920	A210	210
160	230	T5H400 PR222MP In320	128-320	2240	A260	260
200	279	T5H400 PR222MP In400	160-400	2800	AF400[2]	400
250	335	T5H400 PR222MP In400	160-400	3200	AF400	400
290	395	T6H800 PR222MP In630	252-630	5040	AF460	460
315	415	T6H800 PR222MP In630	252-630	5040	AF460	460
355	451	T6H800 PR222MP In630	252-630	5670	AF580	580

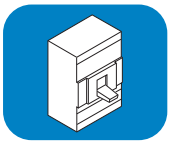
[1] For heavy-duty start set the electronic release tripping class to class 30
[2] In case of normal start use AF300



DOL @ 690 V - 50 kA - Type 2 - Start-up with MP release

Motor		MCCB			Contactor	Group
Pe [kW]	Ie [A]	type	I_1 [1] [A]	I_3 [A]	type	I max [A]
45	49	T4L250 PR222MP In100	40-100	600	A145	100
55	60	T4L250 PR222MP In100	40-100	600	A145	100
75	80	T4L250 PR222MP In100	40-100	800	A145	100
90	95	T4L250 PR222MP In160	64-160	960	A145	120
110	115	T4L250 PR222MP In160	64-160	1120	A145	120
132	139	T4L250 PR222MP In160	64-160	1440	A185	160
160	167	T4L250 PR222MP In200	80-200	1600	A185	170
200	202	T5L400 PR222MP In320	128-320	1920	A210	210
250	242	T5L400 PR222MP In320	128-320	2240	A300	280
290	301	T5L400 PR222MP In400	160-400	2800	AF400	350
315	313	T5L400 PR222MP In400	160-400	3200	AF400	350

[1] For heavy-duty start set the electronic release tripping class to class 30



Coordination tables
Switch-disconnectors

Index

Switch-disconnectors

Notes for use

The following tables give the coordination between circuit-breakers and switch-disconnectors of the following series: Tmax, OT and OTEL.

The tables give the value of the maximum short-circuit current in kA for which protection between the combination of circuit-breaker - switch-disconnector is verified, for voltages up to 415 V.

The MCCB-OT-OETL tables are also valid at a voltage of 440 V. It is important to check that the breaking capacities at 440 V (present in the technical catalogues of the circuitbreakers) are compatible with the installation data.

With regard to the switch-disconnectors of the Emax series, on the other hand, it must be checked that the short-circuit current value at the point of installation is lower than the value of the short-time withstand current (Icw) of the switch-disconnector and that the peak current value is lower than the making capacity current value (Icm).

The protection against overload of the Emax switch-disconnector must also be checked. This can be carried out by means of an Emax series circuit-breaker of the same size.

Please consult the “Emax Low Voltage air circuit-breakers” technical catalogue for the characteristics of Emax switch-disconnectors.

Switch-disconnectors

Notes for use

Note

The letter **T** indicates the switch-disconnector protection up to the breaking-capacity of the circuit-breaker.

The following tables give the breaking capacities at 415 V AC for Tmax circuit-breakers.

Tmax @ 415 V AC	
Version	I_{cu} [kA]
B	16
C	25
N	36
S	50
H	70
L (for T2)	85
L (for T6)	100
L	120
V (for T7)	150
V	200

Caption

MCS = switch-disconnectors derived from the moulded-case circuit-breakers (Tmax TD)
MCCB = moulded-case circuit-breakers (Tmax)
SD = switch-disconnectors
OT = OT series switch-disconnectors
OETL = OETL series switch-disconnectors
Ith = traditional thermal current at 40 °C in free air
Icw = short-time withstand current r.m.s. for 1 second
In = rated current of the thermomagnetic trip unit
I_1 = MCCB thermal protection threshold
I_2 = protection thresholds against delayed short-circuit
I_3 = protection thresholds against instantaneous short-circuit

For moulded-case or air circuit-breakers:

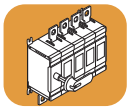
TM = thermomagnetic release
- TMD
- TMA

M = magnetic only release
- MF
- MA

EL = electronic trip unit
- PR221DS - PR222DS

Caption of symbols


Tmax


OT-OETL

For solutions not shown in these tables, please consult the website:
http://bol.it.abb.com
or contact ABB SACE

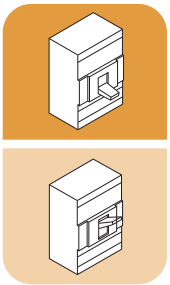
Switch-disconnectors

Supply side circuit-breaker: MCCB
Load side switch-disconnectors: MCS

MCCB - MCS @ 415 V

			Load S.	T1D	T3D	T4D	T5D		T6D		T7D		
			Icw [kA]	2	3.6	3.6	6		15		20		
Supply S.	Version	I_{cu} [kA]	I_{th} [A] / I_u [A]	160	250	320	400	630	630	800	1000	1250	1600
T1	B	16	160	16	16	16	16	16	16	16	16	16	16
	C	25		25	25	25	25	25	25	25	25	25	25
	N	36		36	36	36	36	36	36	36	36	36	36
T2	N	36	160	36	36	36	36	36	36	36	36	36	36
	S	50		50	50	50	50	50	50	50	50	50	50
	H	70		70	70	70	70	70	70	70	70	70	70
	L	85		85	85	85	85	85	85	85	85	85	85
T3	N	36	250		36	36	36	36	36	36	36	36	36
	S	50			50	50	50	50	50	50	50	50	50
T4	N	36	250 320		36[1]	36	36	36	36	36	36	36	36
	S	50			50[1]	50	50	50	50	50	50	50	50
	H	70			70[1]	70	70	70	70	70	70	70	70
	L	120			120[1]	120	120	120	120	120	120	120	120
	V	200			200[1]	200	200	200	200	200	200	200	200
T5	N	36	400 630				36[1]	36	36	36	36	36	36
	S	50					50[1]	50	50	50	50	50	50
	H	70					70[1]	70	70	70	70	70	70
	L	120					120[1]	120	120	120	120	120	120
	V	200					200[1]	200	200	200	200	200	200
T6	N	36	630 800 1000						36[1]	36[1]	36	36	36
	S	50							50[1]	50[1]	50	50	50
	H	70							70[1]	70[1]	70	70	70
	L	100							100[1]	100[1]	100	100	100
T7	S	50	800 1000 1250 1600								50	50	50
	H	70									70	70	70
	L	120									120	120	120
	V[2]	150									150[2]	150[2]	150[2]

[1] Value valid only with I_1 (MCCB) ≤ Ith (MCS).
[2] Only for T7 1000 and T7 1250



Switch-disconnectors

Supply side circuit-breaker: MCCB
Load side switch-disconnectors: OT/OETL

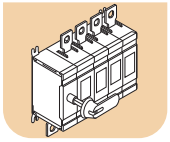
MCCB - OT/OETL @ 415 V

		Load S.	OT16	OT25	OT32	OT45	OT63	OT80	OT100	OT125	OT160	OT200-800	OETL1000-1600
		Icw [kA]	0.5	0.5	0.5	1	1.5	1.5	2.5	2.5	4	8 - 15	17 - 50
Supply S.	Release	I_{th} [A] / I_n [A]	25	32	40	63	80	100	115	125	200	200 - 400	630 - 1600
T1	TM	16	4	4	4	7	20	20	T	T	T	T	T
		20	4	4	4	7	20	20	T	T	T	T	T
		25	4	4	4	7	18	18	T	T	T	T	T
		32	4	4	4	7	18	18	T	T	T	T	T
		40	4[2]	4	4	7	18	18	T	T	T	T	T
		50		4[2]	4	6	18	18	T	T	T	T	T
		63			4[2]	6	18	18	T	T	T	T	T
		80				6[2]	16	16	T	T	T	T	T
		100					16[2]	16	T	T	T	T	T
		125						16	T	T	T	T	T
		160						16[2]	T[2]	T	T	T	T
T2	TM	16	20	20	20	50	T	T	T	T	T	T	T
		20	14	14	14	36	T	T	T	T	T	T	T
		25	12	12	12	25	70	70	T	T	T	T	T
		32	12	12	12	25	70	70	T	T	T	T	T
		40	12[2]	10	10	20	36	36	T	T	T	T	T
		50		10[2]	10	20	36	36	T	T	T	T	T
		63			10[2]	20	36	36	T	T	T	T	T
		80				7[2]	16	16	50	50	T	T	T
		100					16[2]	16	50	50	T	T	T
		125						16	50	50	T	T	T
		160						16[2]	50[2]	50	T	T	T
	EL	25	10	10	10	16	50	50	T	T	T	T	T
		63	8[1]	8[1]	8[1]	12	30	30	T	T	T	T	T
		100		8[1]	8[1]	6[1]	16[1]	16	50	50	T	T	T
		160				6[1]	16[1]	16[1]	50[1]	50	T	T	T
T3	TM	63			3.5[2]	5	8	8	25	25	T	T	T
		80				5[2]	8	8	24	24	T	T	T
		100					8[2]	8	21	21	T	T	T
		125						8[2]	20	20	40	T	T
		160							18[2]	18	36	T	T
		200								18[2]	36	T	T
		250									36	T	T
T4	TM	20	8	8	8	20	T	T	T	T	T	T	T
		32	6[2]	6	6	12	40	40	T	T	T	T	T
		50		6[2]	6	12	40	40	T	T	T	T	T
		80				8[2]	16	16	50	50	T	T	T
		100					10[2]	10	19	20	100	100	T
		160						10[2]	19	20	100	100	T
		250								20[2]	100	100	T
	EL	100-320					10[1]	10[1]	19[1]	20[1]	100[1]	100[1]	T

Select the lowest value between the Icu of the circuit-breaker and the value indicated

[1] Maximum setting of the overload threshold PR2xx = 1.28*Ith OTxx/OETLxx

[2] I_1 = 0.7 x I



Switch-disconnectors

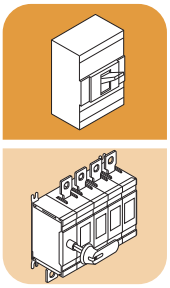
Supply side circuit-breaker: MCCB
Load side switch-disconnectors: OT/OETL

MCCB - OT/OETL @ 415 V

		Load S.	OT200	OT250	OT315	OT400	OT630	OT800	OETL1000	OETL1250	OETL1600
		Icw	8	8	15	15	20	20	50	50	50
		Icm	30	30	65	65	80	80	105	105	105
Supply S.	Release	I_{th} [A] / I_n [A]	200	250	315	400	630	800	1000	1250	1600
T5	TM	320	50	50	100	100	T	T	T	T	T
		400	50[3]	50	100	100	T	T	T	T	T
	EL	320-630	50[2]	50[2]	100[2]	100	T	T	T	T	T
T6	TM	630			25	30	70	70	T	T	T
		800				28[3]	60[3]	60	T	T	T
	EL	630-800-1000		22[2]	22[2]	28[2]	60	60	T	T	T
T7	EL	800				30[1]	40[2]	40	100	100	100
		1000				30[1]	40[2]	40	100	100	100
		1250					40[2]	40[2]	100	100	100
		1600					40[2]	40[2]	100[2]	100	100

[1] Maximum setting of the protection against short-circuit: I_2 = 10xIn t_2=0.1or I_3= 10xIn
[2] Maximum setting of the overload threshold PR2xx and PR3xx = 1.28*Ith OTxx/OETLxx
[3] I_1 = 0.7 x In

4



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

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