Circuit breakers 100 A

EasyPact

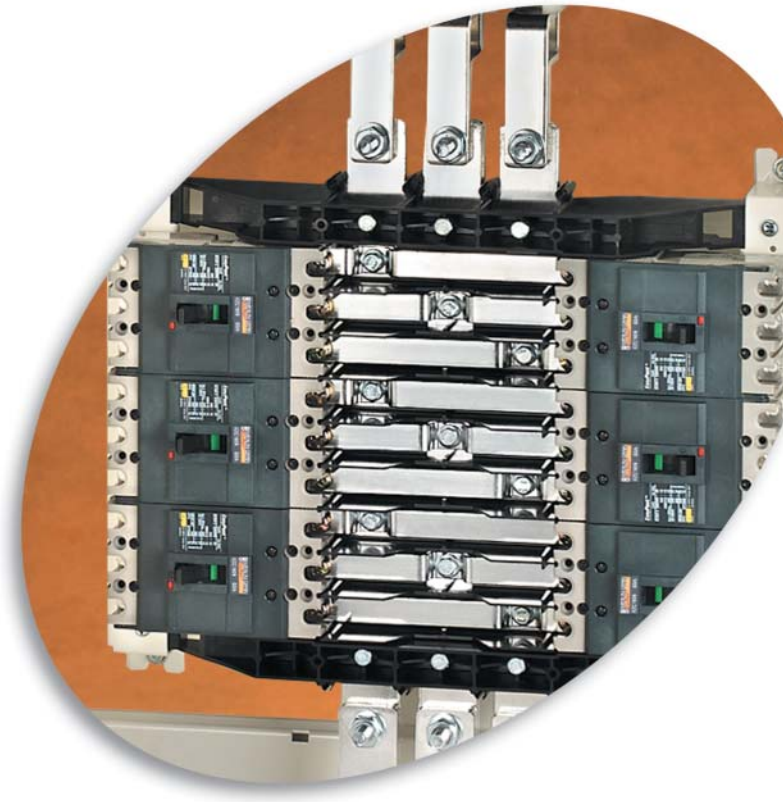
Catalogue

2004

a brand of Schneider Electric

Merlin Gerin

EasyPact™ General Contents



EZL40P

EasyPact™ System

A World-Class Solution

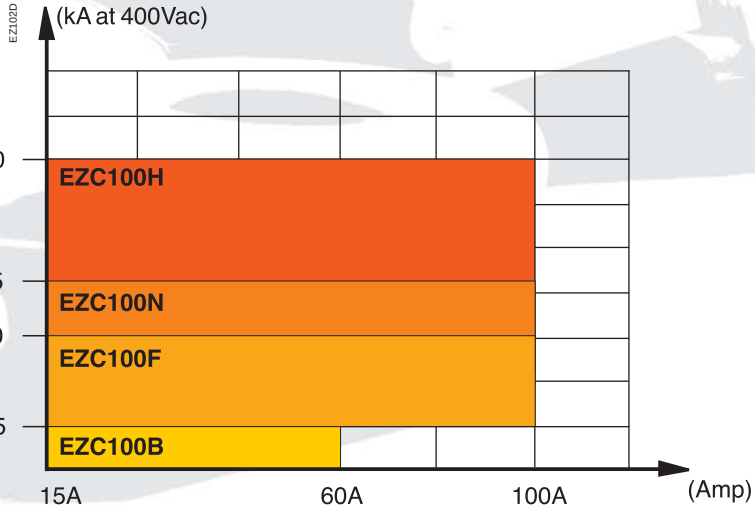
EasyPact™ System takes you to new heights of the Low Voltage World with its unique Busbar design and single-sized Circuit Breaker.

EasyPact™ Circuit Breaker is the world's smallest in its range with only one frame size for all ratings and breaking capacities to suit all types of applications.

EasyPact™ System adopts an Easy codification for its entire range of Circuit Breakers.

EZC	100	N	3	015
EasyPact™ Circuit Breaker	Frame Size 100 : 100 A frame	Breaking capacity B : 7,5 kA F : 10 kA N : 15 kA H : 30 kA	Number of poles 1 : 1-pole 2 : 2-pole 3 : 3-pole	Amp. Ratings 015 : 15 A 020 : 20 A 025 : 25 A 030 : 30 A 040 : 40 A 050 : 50 A 060 : 60 A 075 : 75 A 080 : 80 A 100 : 100 A

EZC	100	N	3	015
EasyPact™ Circuit Breaker	100 : 100 A frame	N : 15 kA	3 : 3-pole	015 : 15 A



Available in 250A, 400A and 630A, EasyPact™ Busbar gives you the most compact solution for your panelboard.

Designed and certified to meet all requirements specified in IEC60439-1, EasyPact™ Busbar gives you the guarantee of a World-Class Solution!

With EasyPact™ Busbar, it is very Easy to install EasyPact™ Circuit Breaker in just a few seconds!

Busbar codification makes it Easy to order

EZB
EasyPact™ Busbar

250
Max Current Rating

250 : 250 A busbar
400 : 400 A busbar
630 : 630 A busbar

W04
Number of Ways

W04 : 4 ways 3-pole MCCB
W06 : 6 ways 3-pole MCCB
W08 : 8 ways 3-pole MCCB
W10 : 10 ways 3-pole MCCB
W12 : 12 ways 3-pole MCCB

Example:

EZB
EasyPact™ Busbar

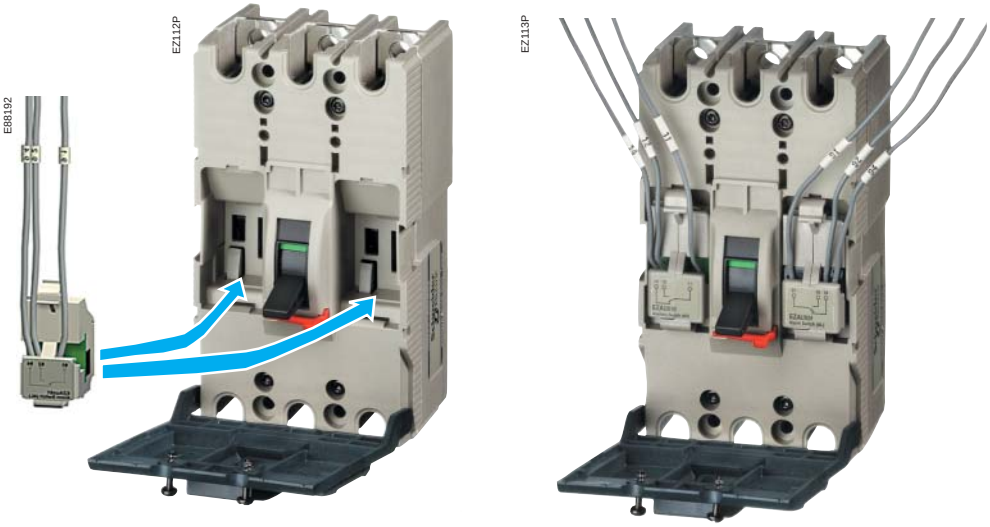
250
250 : 250 A busbar

W04
W04 : 4 ways 3-pole

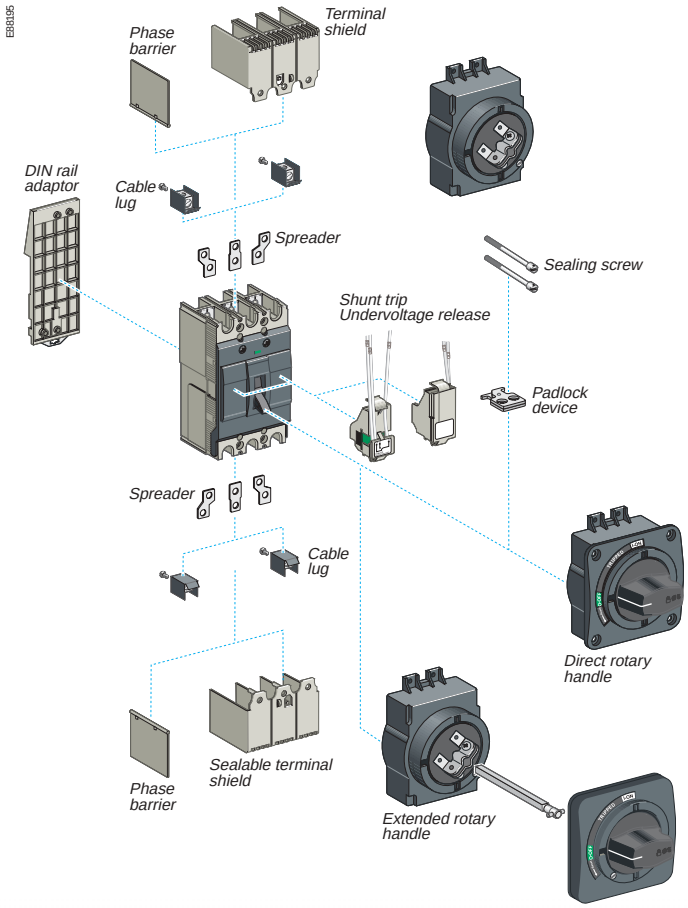
EasyPact™ System

A World-Class Solution

Electrical auxiliaries can be installed in either location (left or right) regardless of the function (AX - AL - SHT - UVR).

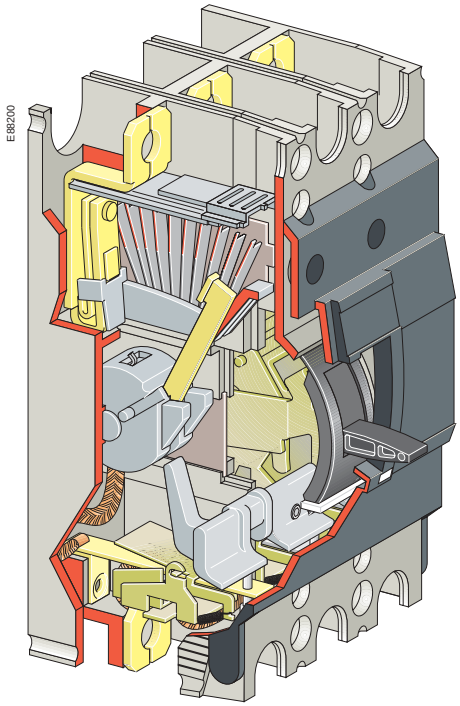


EasyPact™ Circuit Breaker comes with a full range of accessories to fulfill different application requirements and make it Easy for the end-user.

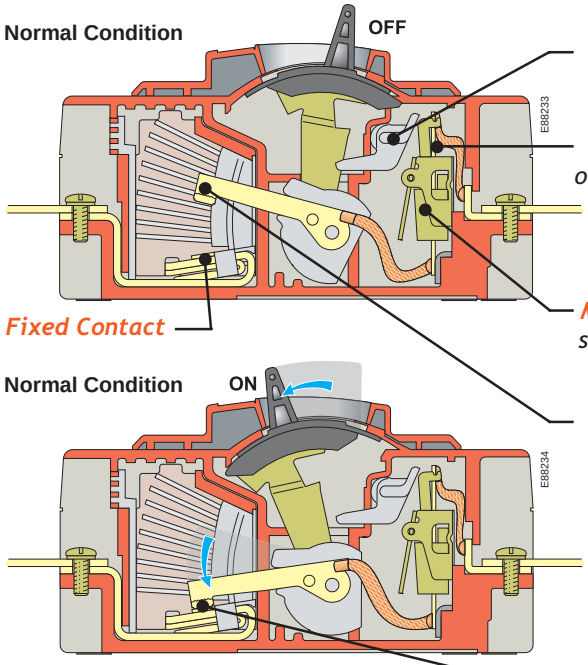


EasyPact™ Circuit Breaker

A World-Class Technology



EasyPact™ circuit breaker is the most powerful in its range, thanks to its unique design.

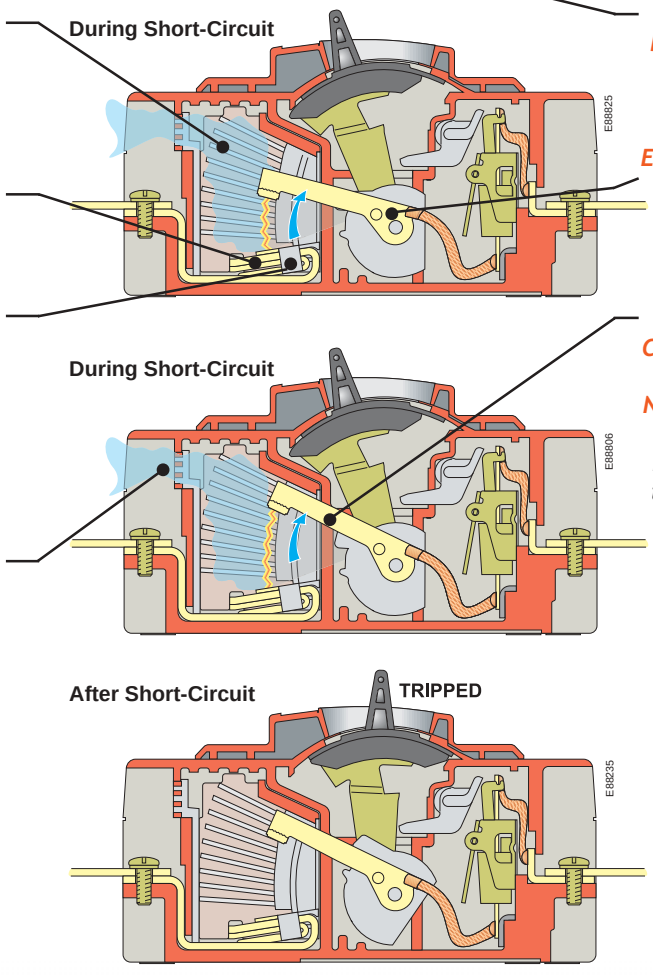


New concept of ***Isolated Arc Interruptor*** *to assure high interrupting performance (30kA) and protect the mechanism/trip unit/electrical auxiliaries during short circuit.*

U-shape Contact Holder *increasing the electromagnetic effect.*

Usage of ***High-Polymer Material*** *to generate gas pressure and achieve optimal performances.*

Very Limited and Controlled Exhaust *gas on interruptor side only to reduce safety perimeter and clearance to ground.*



EasyPact™ Circuit Breaker

Rating and Breaking Capacity

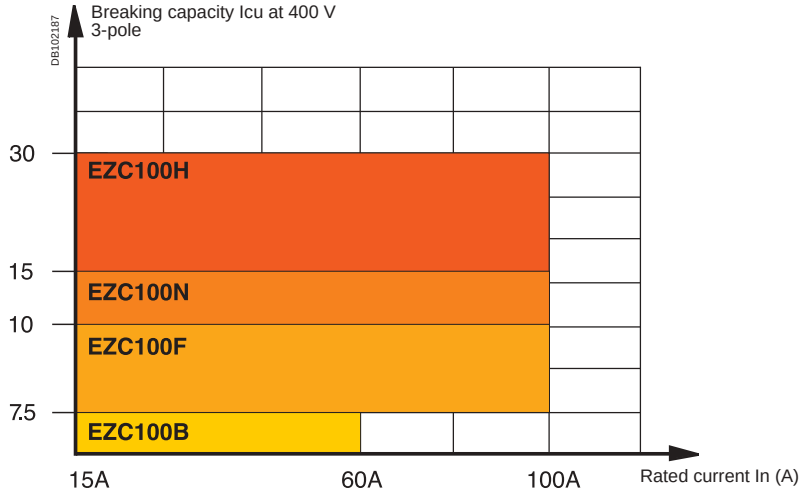
EZ101PR_56

The range

Circuit breaker	Number of poles			
	1-pole	2-pole	3-pole	Breaking capacity (1)
EZC100B			■	7.5 kA
EZC100F			■	10 kA
EZC100N	■ / 18 kA (2)		■	15 kA
EZC100H	■ / 25 kA (2)	■ / 30 kA (1)	■	30 kA

(1) *Icu at 400 V AC.*
(2) *Icu at 220/240 V AC.*

DB102187



1-pole

EZ108P

2-pole

EZ109P

3-pole

EZ101PR_36

With its **9kg reset pressure,** ***EasyPact***™ Circuit Breaker has a very robust and reliable mechanism.

EZ103P

EasyPact™ Circuit Breaker

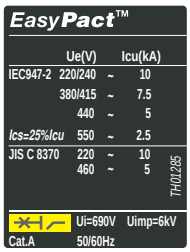
Rating and Breaking Capacity

EZ101PR_44

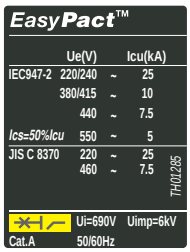
The rating plates on the front face of the circuit breakers indicate the breaking capacity at different voltages and different standards.

E88202

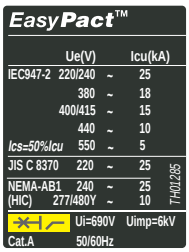
3-pole
7.5 kA (400Vac)



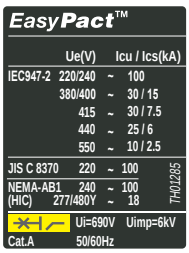
3-pole
10 kA (400Vac)



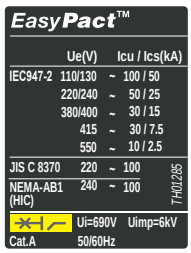
3-pole
15 kA (400Vac)



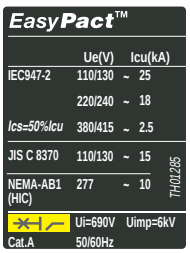
3-pole
30 kA (400Vac)



2-pole
50 kA (240Vac)



1-pole



EZ101PR_40

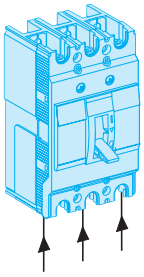
Positive contact indication

All EasyPact™ circuit breakers are suitable for isolation as defined in IEC standard 60947-2:

- the isolation position corresponds to the O (OFF) position
- the operating handle cannot indicate the O (OFF) position (“green colour” visible) unless the contacts are effectively open
- padlocks may not be installed unless the contacts are open
- installation of a rotary handle does not alter the reliability of the position-indication system

- the isolation function is certified by tests guaranteeing:
- the mechanical reliability of the position indication system
- the absence of leakage currents
- overvoltage withstand capacity between upstream and downstream connections

E88803



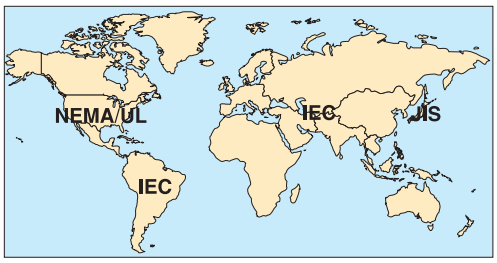
Power supply

EasyPact™ circuit breaker can be supplied from either the top or the bottom (reverse feeding) without any reduction in performance. This capability facilitates connection when installed in a switchboard.

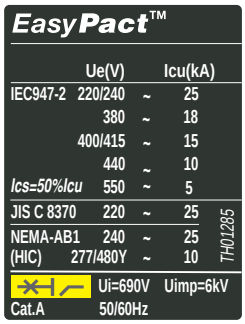
EasyPact™ Circuit Breaker

General Characteristics

E88519



E88204



Standardised characteristics indicated on the rating plate:

Ui:	*rated insulation voltage*
Uimp:	*rated impulse withstand voltage*
Icu:	*ultimate breaking capacity, for various values of the rated operational voltage Ue*
Cat:	*utilization category*
Ics:	*service breaking capacity*
	suitable for isolation

Compliance with standards

EasyPact™ circuit breakers and auxiliaries comply with the following international standards:

- IEC 60947-1 - general rules
- IEC 60947-2 - circuit breakers
- European (EN 60947-1 and EN 60947-2) and the corresponding national standards
- NEMA AB1 (High Interrupting Capacity): American standard
- JIS C 8370: Japanese standard
- Certified by an independent laboratory (ASEFA)

Pollution degree

EasyPact™ circuit breakers are certified for operation in pollution-degree III environments as defined by IEC standard 60947 (industrial environments)

Tropicalisation

EasyPact™ circuit breakers have successfully passed the tests prescribed by the following standards for extreme atmospheric conditions:

- IEC 68-2-1 - dry cold (-55 °C)
- IEC 68-2-2 - dry heat (+85 °C)
- IEC 68-2-30 - damp heat (95% relative humidity at 55 °C)
- IEC 68-2-52 - salt mist (severity level 2)

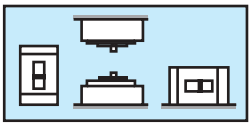
Environmental protection

EasyPact™ circuit breakers take into account important concerns for environmental protection. Most components are recyclable.

Ambient temperature

- EasyPact™ has been particularly designed to hold 100% In at 50 °C without tripping in normal condition
- EasyPact™ circuit breakers may be used between -25 °C and +70 °C
- the permissible storage-temperature range for EasyPact™ circuit breakers in the original packing is -35 °C to +85 °C

E59278

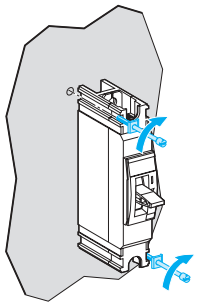


Installation positions

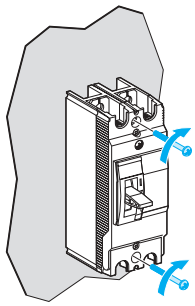
Installation

EasyPact™ circuit breakers are designed for Easy installation in the various types of switchboards. They may be mounted vertically, horizontally or flat on their back without any derating of characteristics.

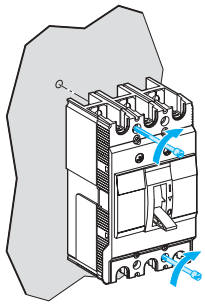
E88804



E88210

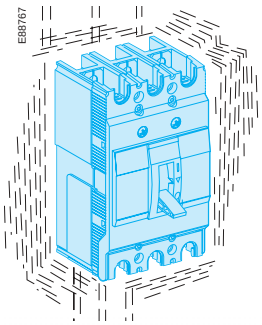


E88506



Mounting on backplate

E88767



Vibration and shock withstand test

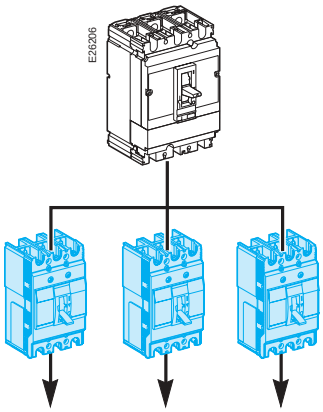
EasyPact™ circuit breakers resist mechanical vibrations and shocks. Tests are carried out in compliance with standard IEC 68-2-6 for the levels required by merchant-marine inspection organisation (Llyod's).

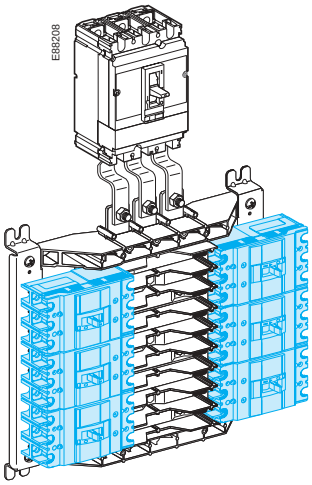
- 2 to 13.2 Hz: amplitude ±1 mm
- 13.2 to 100 Hz: acceleration 0.7 g

EasyPact™ Circuit Breaker

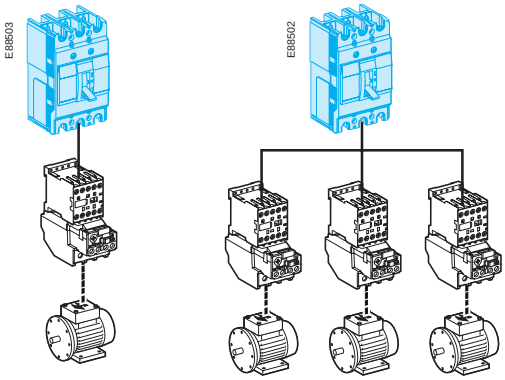
General Characteristics

Distribution application

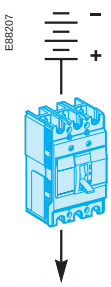




Motor protection



DC application



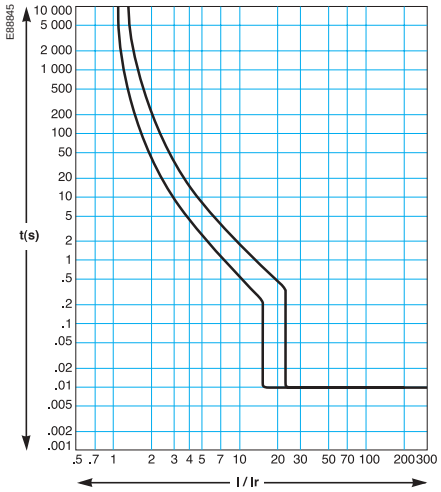
EasyPact™ Circuit Breaker			
Number of poles			
Electrical characteristics			
Rated current (A)	**In**		
Rated operational voltage (V)	**Ue**	AC 50/60 Hz	
		DC	
Rated insulation voltage (V)	**Ui**		
Rated impulse withstand voltage (kV)	**Uimp**		
Breaking capacity (kA rms) as per IEC 60947-2	**Icu**	AC	110/130 V
			220/240 V
			380 V
			400 V
			415 V
			440 V
			550 V
		DC	125 V (1P)
			250 V (2P)
	Ics	% Icu	110/130 V
			220/240 V
			380 V
			400 V
			415 V
			440 V
			550 V
Breaking capacity (kA rms) as per NEMA-AB1 (HIC)		AC	240 V
			277 V
			480 V
Breaking capacity (kA rms) as per JIS C8370		AC	110/130 V
			220 V
			460 V
Utilisation category			
Suitability for isolation			
Durability (C-O cycles)	mechanical		
	electrical		
Protection			
Protection against overcurrent (A)	Thermal		
	Magnetic		
Earth-fault protection			
Installation and connection			
Fixed/front connection	Back plate		
	DIN rail		
Fixed/rear connection			
Indication auxiliaries			
Auxiliary (AX)			
Alarm switch (AL)			
Control auxiliaries			
Shunt trip (SHT)			
Under voltage release (UVR)			
Rotary handle (fixed depth)			
Rotary handle (variable depth)			
Installation and connection accessories			
Allow crimp lug connection			
Allow bare cable connection			
Terminal shield			
Phase barriers			
Locking system			
Dimension and weight			
Dimensions (mm) L x H x D			
Weight (kg)			

(1) *125 V per pole or 250 V for 2 poles in series.*

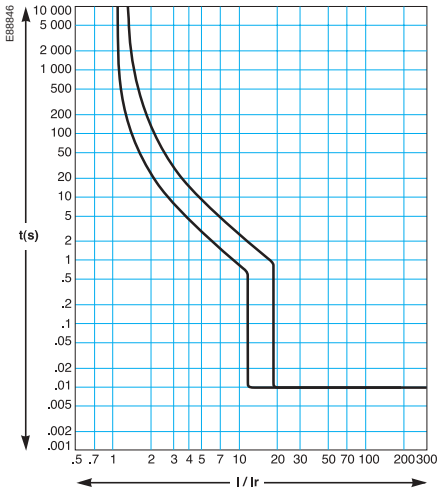
EZC100B	EZC100F	EZC100N		EZC100H		
3	3	1	3	1	2	3
15, 20, 25, 30	15, 20, 25, 30, 40, 50	15, 20, 25, 30, 40, 50	15, 20, 25, 30, 40, 50	15, 20, 25, 30, 40, 50	15, 20, 25, 30, 40, 50	15, 20, 25, 30, 40, 50
40, 50, 60	60, 75, 80, 100	60, 75, 80, 100	60, 75, 80, 100	60, 75, 80, 100	60, 75, 80, 100	60, 75, 80, 100
550	550	415	550	415	550	550
250 (1)	250 (1)	125	250 (1)	125	250 (1)	250 (1)
690	690	690	690	690	690	690
6	6	6	6	6	6	6
-	-	25	-	50	100	-
10	25	**18**	25	**25**	50	100
7.5	10	2.5	18	5	30	30
7.5	**10**	2.5	**15**	5	**30**	**30**
7.5	**10**	2.5	**15**	5	**30**	**30**
5	7.5	-	10	-	20	20
2.5	5	-	5	-	10	10
-	5	5	5	10	10	10
-	5	-	5	-	10	10
25%	50%	50%	50%	50%	50%	50%
25%	50%	50%	50%	50%	50%	50%
25%	50%	50%	50%	50%	50%	50%
25%	50%	50%	50%	50%	50%	50%
25%	50%	50%	50%	50%	25%	25%
25%	50%	-	50%	-	25%	25%
25%	50%	-	50%	-	25%	25%
-	-	-	25	-	100	100
-	-	10	-	18	-	-
-	-	-	10	-	-	18
-	-	15	-	30	-	-
10	25	-	25	-	100	100
5	7.5	-	10	-	25	25
A	A	A	A	A	A	A
■	■	■	■	■	■	■
8,500	8,500	8,500	8,500	8,500	8,500	8,500
1,500	1,500	1,500	1,500	1,500	1,500	1,500
Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
■	■	■	■	■	■	■
Option	Option	Option	Option	Option	Option	Option
-	-	-	-	-	-	-
■	■	-	■	-	■	■
■	■	-	■	-	■	■
■	■	-	■	-	■	■
■	■	-	■	-	■	■
■	■	-	■	-	-	■
■	■	-	■	-	-	■
■	■	■	■	■	■	■
Option	Option	■	Option	■	Option	Option
■	■	-	■	-	-	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
75 x 130 x 60	75 x 130 x 60	25 x 130 x 60	75 x 130 x 60	25 x 130 x 60	50 x 130 x 60	75 x 130 x 60
0.78	0.78	0.28	0.78	0.28	0.6	0.78

TM magnetic trip units

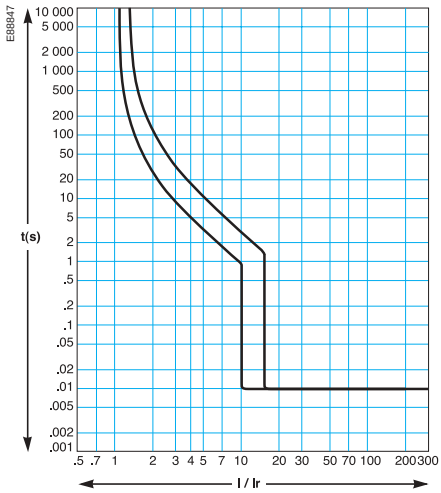
15 A



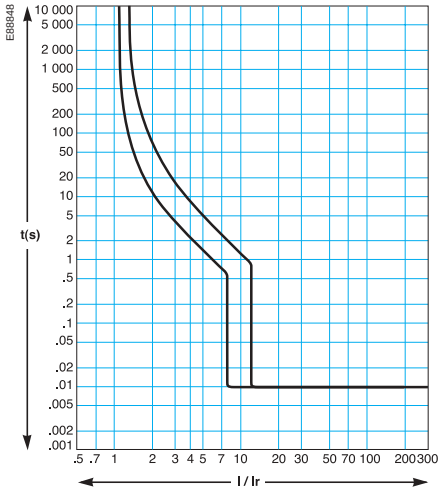
20 A



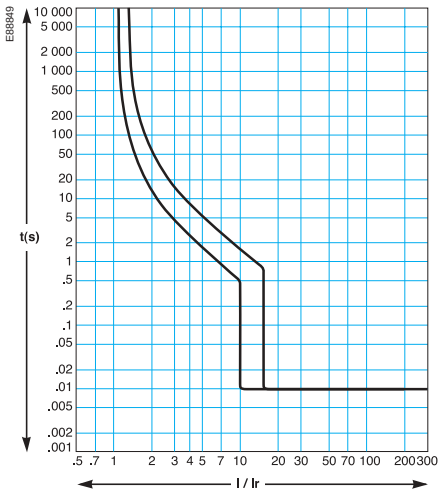
25 A



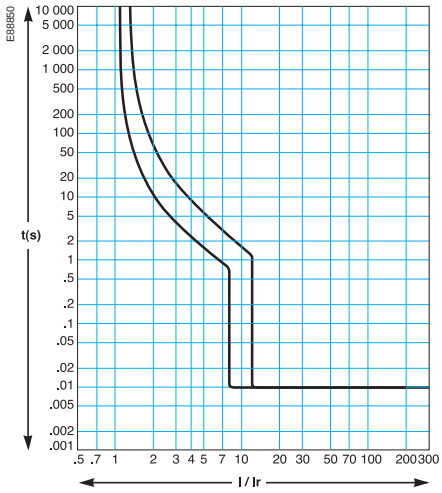
30 A



40 A

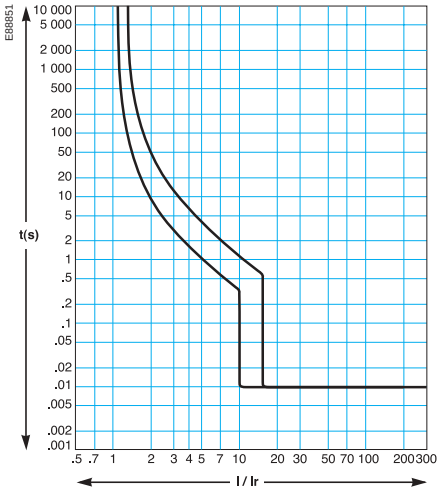


50 A

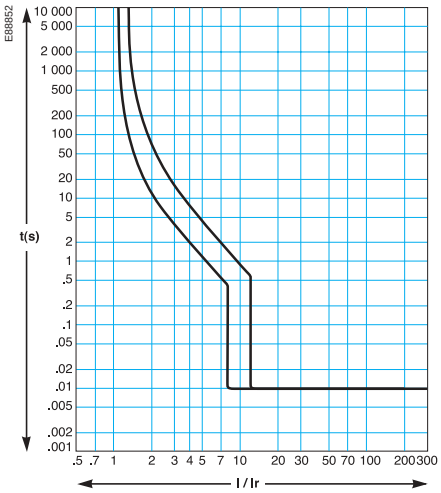


TM magnetic trip units

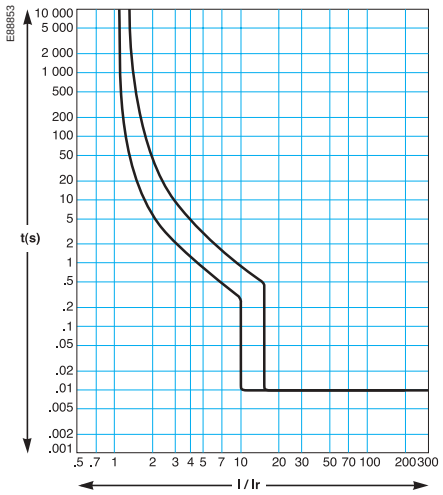
60 A



75 A



80 A



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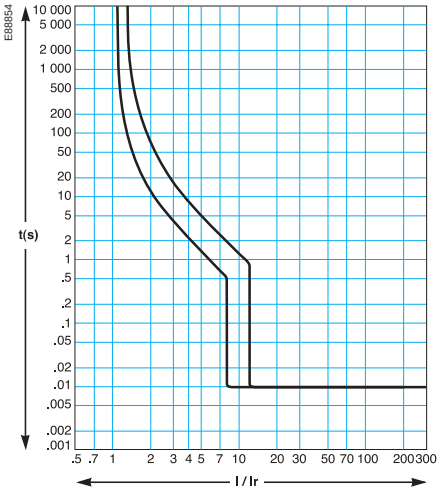
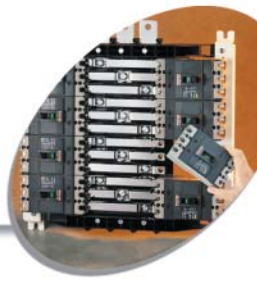




Ambient temperature

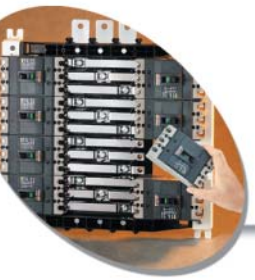
EasyPact™ devices are equipped with fixed thermal-magnetic trip units

- EasyPact™ has been particularly designed to hold 100% In at 50 °C without tripping in normal condition
- EasyPact™ Circuit Breakers may be used between -25 °C and +70 °C
- Circuit Breakers should be put into service under normal ambient operating temperature conditions. Exceptionally, the circuit breaker may be put into service when the ambient temperature is between -35 °C and -25 °C
- The permissible storage-temperature range for EasyPact™ Circuit Breakers in the original packing is -35 °C to +85 °C

To determine tripping times using time/current curves, use Ir values corresponding to the thermal setting on the device, corrected as indicated in the tables below.

2-pole and 3-pole EasyPact™

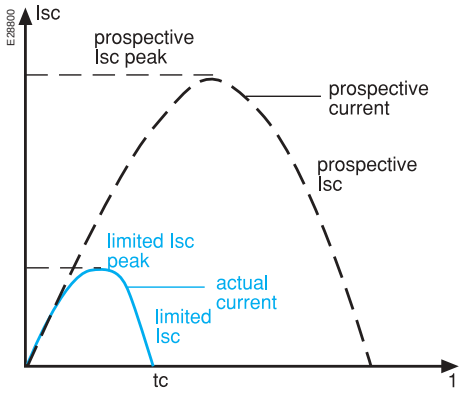
Breaker Amperage	25 °C	40 °C	45 °C	50 °C	55 °C	60 °C	65 °C	70 °C
15	17.0	15.7	15.3	15.0	14.7	14.6	14.2	13.8
20	21.8	20.4	20.2	20.0	19.7	19.2	18.9	18.5
25	26.9	25.7	25.3	25.0	24.7	24.5	24.3	24.0
30	34.5	31.4	30.7	30.0	29.4	29.1	28.5	28.0
40	42.8	40.9	40.4	40.0	39.5	38.0	37.6	37.1
50	54.2	52.1	51.0	50.0	49.3	48.1	47.3	46.6
60	64.4	61.8	60.9	60.0	59.0	57.5	56.6	55.7
75	78.6	76.8	75.9	75.0	73.5	70.4	69.8	69.1
80	84.4	82.2	81.1	80.0	78.6	77.3	76.7	76.1
100	108.8	102.6	101.3	100.0	99.2	94.2	93.5	92.7



EasyPact™ Installation Guide

Current-Limiting Curves

The limiting capacity of a circuit breaker is its aptitude to limit short-circuit currents.



The exceptional limiting capacity of the EasyPact™ range greatly reduces the forces created by fault currents in devices.
The result is a major increase in breaking performance.

The Ics value, defined by IEC standard 60947-2, is guaranteed by tests comprising the following operations:
- ■ break three times consecutively a fault current equal from 25% to 100% of Icu
- ■ check that the device continues to function normally:
- ☐ it conducts the rated current without abnormal temperature rises
- ☐ protection functions perform within the limits specified by the standard
- ☐ suitability for isolation is not impaired

Longer service life of electrical installations

Current-limiting circuit breakers greatly reduce the negative effects of short-circuits on installations.

Thermal effects
Less temperature rise in conductors, therefore longer service life for cables.

Mechanical effects
Reduced electrodynamic forces, therefore less risk of electrical contacts or bus bars being deformed or broken.

Electromagnetic effects
Less disturbances for measuring devices located near electrical circuits.

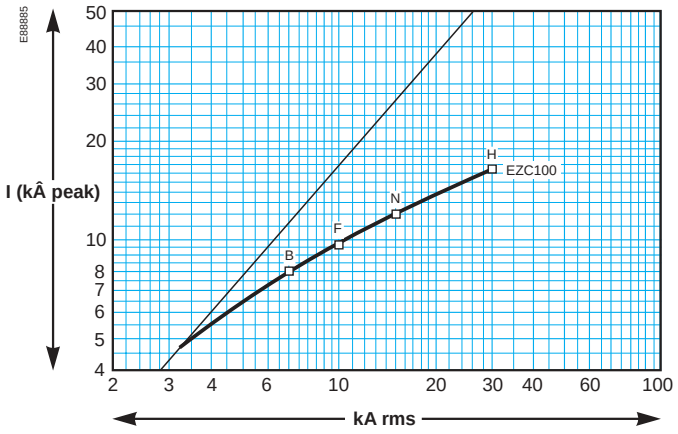
Economy by means of cascading

Cascading is a technique directly derived from current limiting. Circuit breakers with breaking capacities less than the prospective short-circuit current may be installed downstream of a limiting circuit breaker. The breaking capacity is reinforced by the limiting capacity of the upstream device.
It follows that substantial savings can be made on downstream equipment and enclosures.

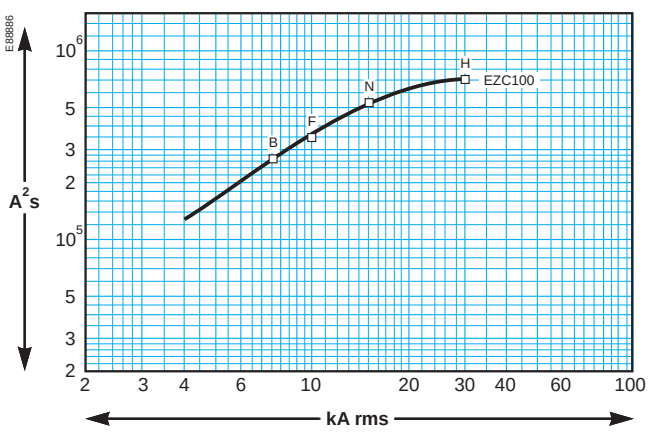
Current-limiting curves

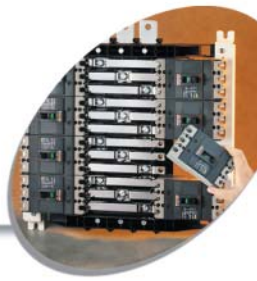
The current-limiting capacity of a circuit breaker is expressed by two curves which are a function of the prospective short-circuit current (the current which would flow if no protection devices were installed):
- ■ the actual peak current (limited current),
- ■ thermal stress (A^2s), i.e. the energy dissipated by the short-circuit in a conductor with a resistance of 1 Ω

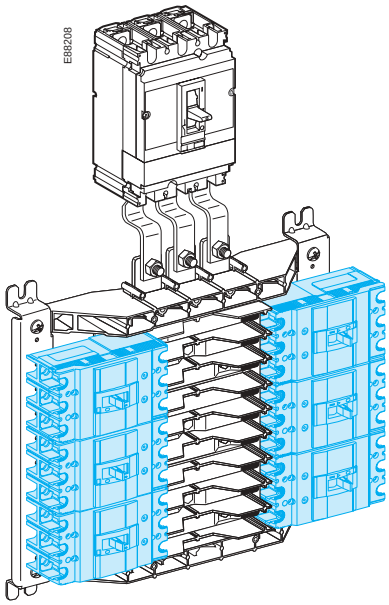
Current Limiting Curves ***380/415 Vac***



Thermal-Stress Curves ***380/415 Vac***







What is cascading?

Cascading is the use of the current limiting capacity of circuit breakers at a given point to permit installation of lower-rated and therefore lower-cost circuit breakers downstream.

The upstream Compact circuit breakers acts as a barrier against short-circuit currents. In this way, downstream circuit breakers with lower breaking capacities than the prospective short-circuit (at their point of installation) operate under their normal breaking conditions.

Since the current is limited throughout the circuit controlled by the limiting circuit breaker, cascading applies to all switchgear downstream. It is not restricted to two consecutive devices.

General use of cascading

With cascading, the devices can be installed in different switchboards. Thus, in general, cascading refers to any combination of circuit breakers where a circuit breaker with a breaking capacity less than the prospective Isc at its point of installation can be used. Of course, the breaking capacity of the upstream circuit breaker must be greater than or equal to the prospective short-circuit current at its point of installation.

The combination of two circuit breakers in cascading configuration is covered by the following standards:

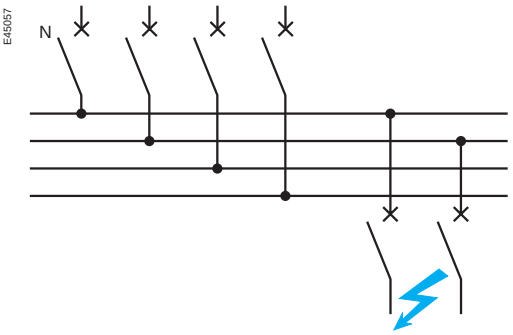
- IEC 60947-2 (construction)
- NF C 15-100, § 434.3.1 (installation)

Coordination between circuit breakers

The use of a protective device possessing a breaking capacity less than the prospective short-circuit current at its installation point is permitted as long as another device is installed upstream with at least the necessary breaking capacity.

In this case, the characteristics of the two devices must be coordinated in such a way that the energy let through by the upstream device is not more than that which can be withstood by the downstream device and the cables protected by these devices without damage.

Cascading can only be checked by laboratory tests and the possible combinations can be specified only by the circuit breaker manufacturer.



220/240 V network downstream from a 380/415 V network

For 1P + N or 2P circuit breakers connected between the phase and neutral on a 380/415 V network, with a TT or TNS neutral system, consult the 220/240 V cascading table to determine cascading possibilities between upstream and downstream circuit breakers.

Economy by means of cascading

Thanks to cascading, circuit breakers with breaking capacities less than the prospective short-circuit current may be installed downstream from a current limiting circuit breaker.

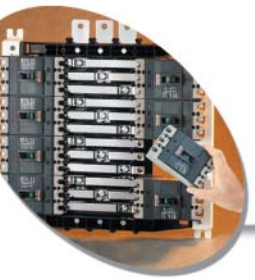
It follows that substantial savings can be made on downstream switchgear and enclosures.

Cascading tables

Merlin Gerin cascading tables are:

- drawn up on the basis of calculations (comparison between the energy limited by the upstream device and the maximum permissible thermal stress for the downstream device)
- verified experimentally in accordance with IEC standard 60947-2

For distribution systems with 220/240 V, 380/415 V and 440 V between phases, the tables of the following pages indicate cascading possibilities between upstream Compact/EasyPact™ and downstream Multi 9 and EasyPact™ circuit breakers.



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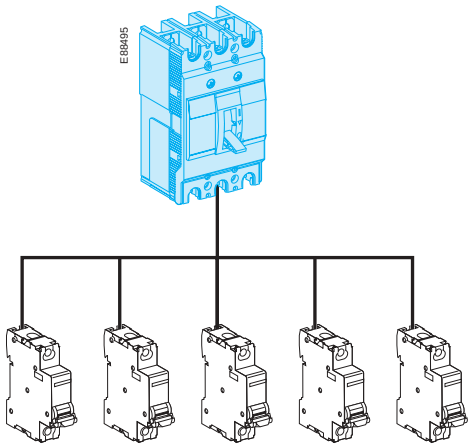
Cascading Tables



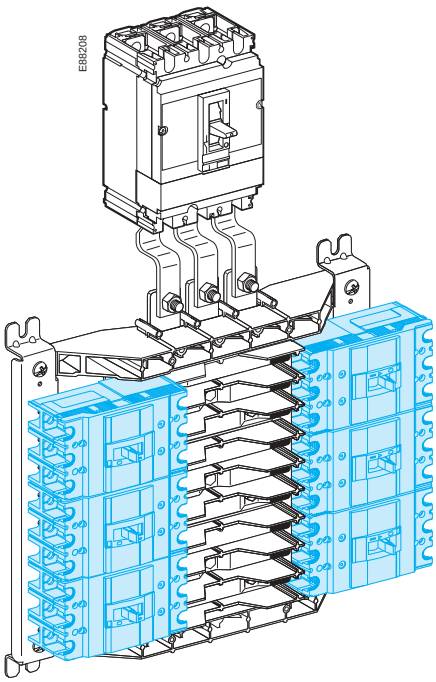
Network 220/240 V

Upstream Breaking capacity kA rms		EZC100F 25	EZC100N 25	EZC100H 100
Downstream	(1)	Enhanced breaking capacity (kA rms)		
NC45	6	10	10	15
NC45N	10	15	15	25
NC45H	15	25	25	50
C60a	10	25	25	50
C60N	20	25	25	65
C60H	30			65
QO-E	10	25	25	50

Upstream Breaking capacity kA rms		NS100/160/250N NS400/630N 85	NS100/160/250H NS400/630H 100	NS100/160/250L NS400/630L 150
Downstream	(1)	Enhanced breaking capacity (kA rms)		
EZC100B	10	20	20	20
EZC100F	25	50	50	50
EZC100N	25	50	50	100
EZC100H	100			150

Network 380/415 V

Upstream Breaking capacity kA rms		EZC100F 10	EZC100N 15	EZC100H 30
Downstream	(1)	Enhanced breaking capacity (kA rms)		
NC45	5	6	8	30
NC45N	8	10	10	30
NC45H	10		15	30
C60a	6	10	15	30
C60N	10		15	30
C60H	15			30
QO-E	5	10	15	30
GV2M	15			30



Upstream Breaking capacity kA rms		NS100N 25	NS160/250H 36	NS100/160H NS250H 70	NS100/160L NS250L 150
Downstream	(1)	Enhanced breaking capacity (kA rms)			
EZC100B	7.5	10	10	15	20
EZC100F	10	15	15	30	50
EZC100N	15	25	36	50	100
EZC100H	30	-	36	70	100

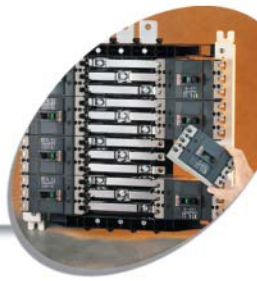
Upstream Breaking capacity kA rms		NS400/630N 45	NS400/630H 70	NS400/630L 150
Downstream	(1)	Enhanced breaking capacity (kA rms)		
EZC100B	7.5			
EZC100F	10			
EZC100N	15	20	30	30
EZC100H	30	45	50	50

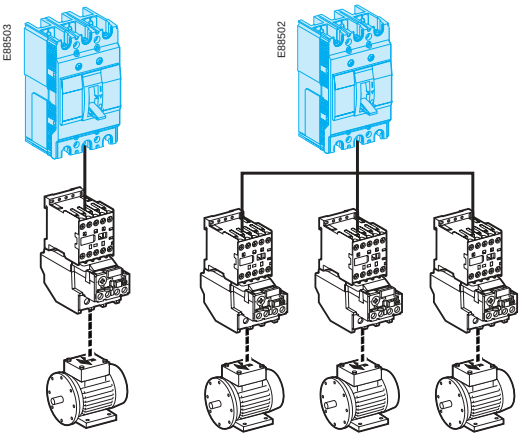
Network 440 V

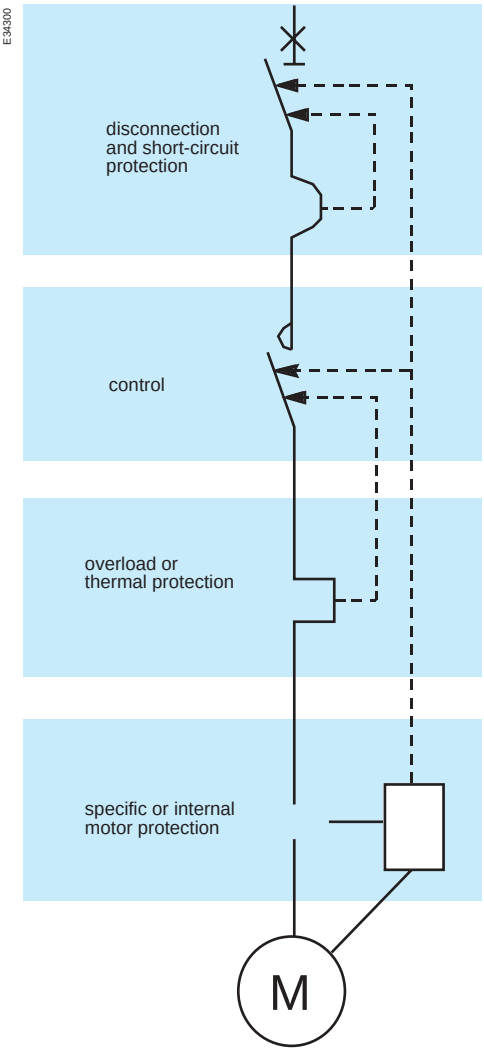
Upstream Breaking capacity kA rms		NS100N 25	NS160/250N 35	NS100/160H NS250H 65	NS100/160L NS250L 130
Downstream	(1)	Enhanced breaking capacity (kA rms)			
EZC100B	5	10	10	15	20
EZC100F	7.5	15	15	30	50
EZC100N	10	25	35	50	100
EZC100H	25	-	35	65	130

Upstream Breaking capacity kA rms		NS400/630N 42	NS400/630H 65	NS400/630L 130
Downstream	(1)	Enhanced breaking capacity (kA rms)		
EZC100B	5			
EZC100F	7.5			
EZC100N	10	20	30	30
EZC100H	25	42	65	65

(1) *Normal breaking capacity (kA rms)*







A circuit supplying a motor may include one, two, three or four switchgear or controlgear devices fulfilling one or more functions.

When a number of devices are used, they must be coordinated to ensure optimum operation of the motor.

Protection of a motor circuit involves a number of parameters that depend on:
- the application (type of machine driven, operating safety, starting frequency, etc.)
- the level of service continuity imposed by the load or the application
- the applicable standards to ensure protection of life and property

The necessary electrical functions are of very different natures:
- short circuit protection
- overload protection dedicated for motor
- control (generally with high endurance levels)
- isolation

Protection functions

Disconnection functions:
Isolate a motor circuit prior to maintenance operations.

Short-circuit protection:
Protect the starter and the cables against major overcurrents (> 10 In).

Control:
Start and stop the motor and, if applicable:
- gradual acceleration
- speed control

Overload protection:
Protect the starter and the cables against minor overcurrents (< 10 In).

Additional specific protection:
- limitative fault protection (while the motor is running)
- preventive fault protection (monitoring of motor insulation with motor off)

Overloads (I < 10 In)
An overload may be caused by:
- an electrical problem, for instance on the mains (loss of a phase, voltage outside tolerances, etc.)
- a mechanical problem, for instance excessive torque due to abnormally high demands by the process or motor damage (bearing vibrations, etc.)

A further consequence of these two origins is excessively long starting.

Impedant short-circuit (10 < I < 50 In)
Deterioration of motor-winding insulation is the primary cause.

Short-circuit (I > 50 In)
This type of fault is relatively rare. A possible cause may be a connection error during maintenance.

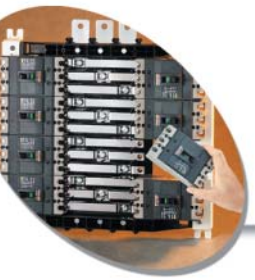
Overload protection
Thermal relays provide protection against this type of fault. They may be:
- integrated in the short-circuit protective device
- separate

Short-circuit protection
This type of protection is provided by a circuit breaker.

Protection against insulation faults
This type of protection may be provided by:
- a residual current device (RCD)
- an insulation monitoring device (IMD)

Motor protection - circuit breaker selection

Motors 220/230 V P (kW)	I (A)	380 V P (kW)	I (A)	415 V P (kW)	I (A)	440 V P (kW)	I (A)	Circuit breaker EZC100 Rating (A)
		0.37	1.2	**0.37**	1.1	**0.37**	1	20
		0.55	1.6	**0.55**	1.5	**0.55**	1.4	20
0.37	1.8	**0.75**	2	**0.75**	1.8	**0.75**	1.7	20
						1.1	2.4	20
0.55	2.8	**1.1**	2.8	**1.1**	2.5			20
		1.5	3.7	**1.5**	3.5	**1.5**	3.1	20
1,1	4.4	**2.2**	5	**2.2**	4.8	**2.2**	4.5	20
1.5	6.1	**3**	6.6	**3**	6.5	**3**	5.8	20
2.2	8.7	**4**	8.5	**4**	8.2	**4**	7.9	20
3	11.5	**5.5**	11.5	**5.5**	11	**5.5**	10.4	20
4	14.5	**7.5**	15.5	**7.5**	14	**7.5**	13.7	20
				9	17	**9**	16.9	25
5.5	20	**11**	22	**11**	21	**11**	20.1	30
7.5	28	**15**	30	**15**	28	**15**	26.5	40
11	39	**18.5**	37	**22**	40	**22**	39	50
		22	44	**25**	47			60
15	52					**30**	51.5	75/80
18.5	64	**30**	59	**30**	55	**37**	64	75/80
				37	66			80
22	75	**37**	72	**45**	80	**45**	76	100



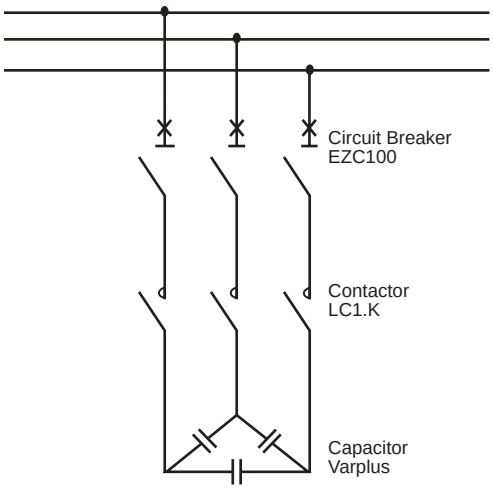
EasyPact™ Installation Guide

Capacitor Protection

Thanks to its small size and short-circuit capacity, EasyPact™ Circuit Breaker is the most compact solution for any capacitor protection (eg: for each step of capacitor bank from 7.5 kVAR to 50 kVAR).

EZ101PR_56

EZ151D



EZ152P

EasyPact™ Circuit Breaker is suitable for Capacitor Protection following the rules below:

■ **Inc = Nominal Current from the capacitor**

$$Inc = \frac{Qc}{U\sqrt{3}}$$

Inc = Nominal Current Capacitor (Amp)
Qc = Reactive power (kVAR)
U = Nominal Voltage (Volt)

■ **Inb = Nominal Current for the Circuit Breaker protection (EZC100)**

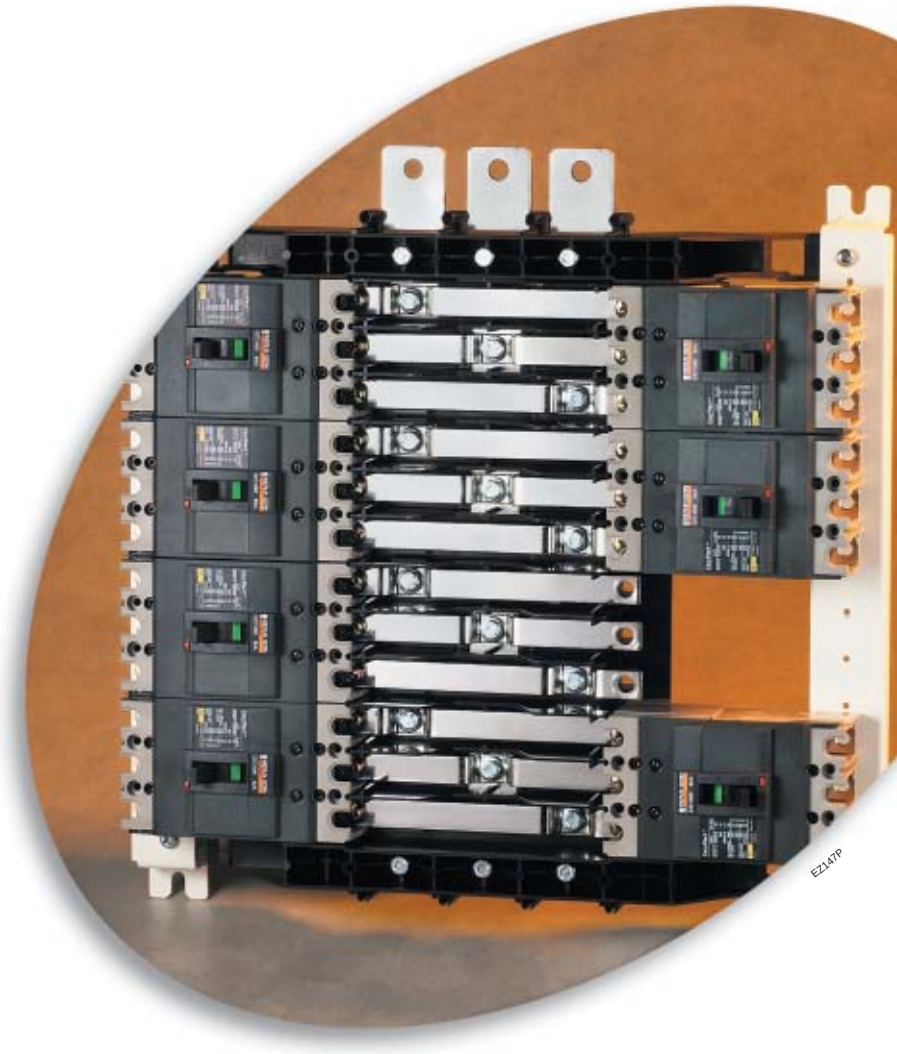
☐ Inb = 1.36 x Inc for standard equipment
☐ Inb = 1.5 x Inc for overrated type equipment
☐ Inb = 1.19 x Inc for detuned type equipment: 3.8 tuning
☐ Inb = 1.31 x Inc for detuned type equipment: 4.3 tuning
☐ Inb = 1.12 x Inc for detuned type equipment: 2.7 tuning
☐ the short-circuit (magnetic) protection-setting thresholds must enable passage of the energizing transients: 10 x Inc for standard, overrated and detuned type equipment

■ Short Circuit level is given by the installation

Example:

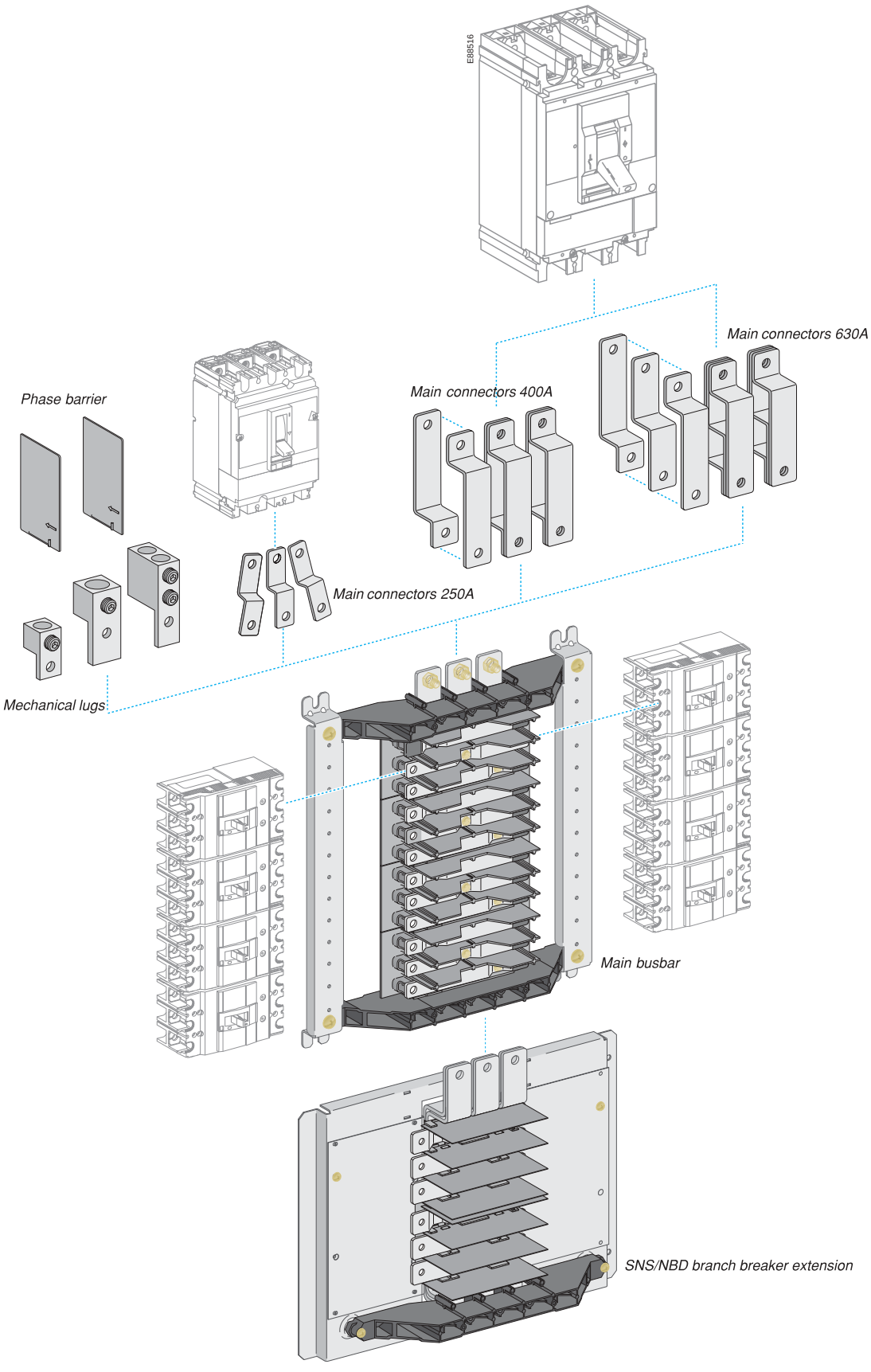
Table at 400 Vac – 3 Phase 50Hz for standard equipment.

Reactive Power (kVAR)	Inc (Amp)	Inb (Amps)	Breaking capacity to Circuit Breaker 15kA	30kA
7.5	11	15	EZC100N3015	EZC100H3015
10	14	20	EZC100N3020	EZC100H3020
15	22	30	EZC100N3030	EZC100H3030
20	29	40	EZC100N3040	EZC100H3040
30	43	60	EZC100N3060	EZC100H3060
40	58	80	EZC100N3080	EZC100H3080
50	72	100	EZC100N3100	EZC100H3100



EasyPact™ Busbar

Introduction



The EasyPact™ Busbar - engineered and certified together with the EasyPact™ MCCB to provide superior performance, flexibility and value. Simply the best solution for your distribution panel needs:

- available for 250 A, 400 A or 630 A main incoming current
- available for 4, 6, 8, 10 or 12 Ways (3-pole) EasyPact™ 100 A (max.) outgoing MCCB's
- 400 A and 630 A systems can accept an additional 2 or 4 Compact NS/NB160/ 250 A outgoing MCCB's
- designed and tested to meet IEC 60439-1 requirements
- completely assembled in ISO certified facility for Easy installation into locally made enclosures

Premium Materials make a premium busbar system:

- solid copper busbars and connectors for cool, care-free operation
- electro-tin plating on all busbars and connectors for corrosion resistance in all environments
- fiberglass reinforced nylon bus supports for strength and dimensional stability
- molded thermoplastic phase barriers to maintain alignment and ensure electrical isolation between phases
- a nameplate with Schneider Electric on the bottom line - stands for quality and reliability

EasyPact™ Busbar

General Characteristics

Enclosed 10 ways Busbar 250A with 250 A main incomer

The EasyPact™ Busbar System is designed and certified to meet all international requirements specified in IEC 60439-1 relating to construction of Low Voltage switchgear and controlgear assemblies, including:

- verification of temperature - rise limits
- verification of dielectric properties
- verification of short-circuit withstand strength
- verification of clearances and creepage distances

In addition, the system has been type-tested in ASTA labs to confirm the short-circuit and short-time withstand ratings.

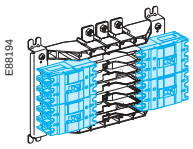
EasyPact™ Busbar System		EZB250					EZB400					EZB630				
Number of outgoing MCCB's EasyPact™ 100 A (max.)		4 Ways	6 Ways	8 Ways	10 Ways	12 Ways	4 Ways	6 Ways	8 Ways	10 Ways	12 Ways	4 Ways	6 Ways	8 Ways	10 Ways	12 Ways
	1-pole	12	18	24	30	36	12	18	24	30	36	12	18	24	30	36
	2-pole	6	8	12	14	18	6	8	12	14	18	6	8	12	14	18
	3-pole	**4**	**6**	**8**	**10**	**12**	**4**	**6**	**8**	**10**	**12**	**4**	**6**	**8**	**10**	**12**
	NS/NB branch breaker	No extension					Yes (2 or 4 Ways)					Yes (2 or 4 Ways)				
Electrical characteristics																
Rated incoming current (A)		**250**					**400**					**630**				
Rated operational voltage (V)	AC 50/60 Hz	550					550					550				
Rated insulation voltage (V)		690					690					690				
Breaking capacity		Refer to cascading tables page 42														
Rated short-time withstand current (kA rms)	1 sec.	30					40					40				
Dimensions																
Dimensions (mm) L x W x D	4 Ways	268.5 x 416 x 82.5					290 x 416 x 107					290 x 416 x 107				
	6 Ways	343.5 x 416 x 82.5					365 x 416 x 107					365 x 416 x 107				
	8 Ways	418.5 x 416 x 82.5					440 x 416 x 107					440 x 416 x 107				
	10 Ways	493.5 x 416 x 82.5					515 x 416 x 107					515 x 416 x 107				
	12 Ways	568.5 x 416 x 82.5					590 x 416 x 107					590 x 416 x 107				

EasyPact™ Busbar EZB250W08

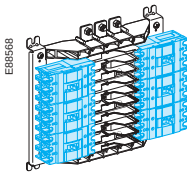
Main busbar

The core of the EasyPact™ Busbar System includes the main busbars and outgoing connectors for EasyPact™ MCCB's.

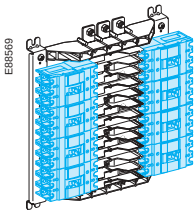
Designation	Cat. number		
Type	EZB250	EZB400	EZB630
Main busbar current rating	250 A	400 A	630 A
# Branch Ways (3-pole EasyPact™ MCCB's)			
4 Ways	EZB250W04	EZB400W04	EZB630W04
6 Ways	EZB250W06	EZB400W06	EZB630W06
8 Ways	EZB250W08	EZB400W08	EZB630W08
10 Ways	EZB250W10	EZB400W10	EZB630W10
12 Ways	EZB250W12	EZB400W12	EZB630W12



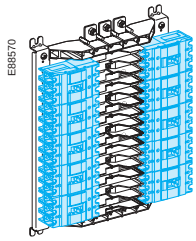
4 Ways with 3-pole



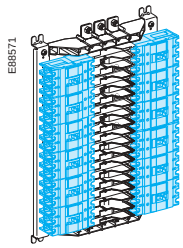
6 Ways with 3-pole



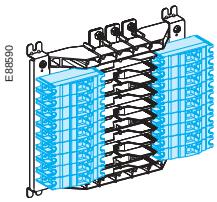
8 Ways with 3-pole



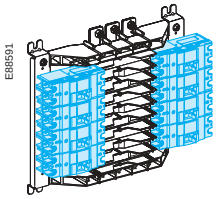
10 Ways with 3-pole



12 Ways with 3-pole



6 Ways with 1-pole



6 Ways with 2-pole

NS/NB branch breaker extension 2 Ways

Compact NS/NB branch extension

For applications calling for larger than 100 A outgoing MCCB's, EasyPact™ Busbar rated 400 A and 630 A can accept the 2 Way or 4 Way Compact NS/NB branch extension for up to four additional 250 A max. outgoing circuits.
Compact NS/NB branch extensions simply connect directly to the terminals provided on the EZB400 and EZB630 EasyPact™ Busbar.

Designation	Cat. number
NS/NB branch breaker extension	
2 Ways	EZBNS2
4 Ways	EZBNS4

EasyPact™ Busbar

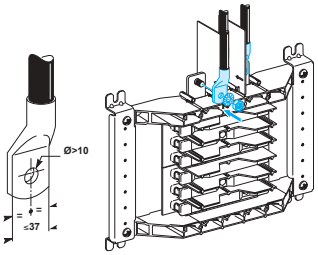
Accessories

E88301

Main incoming connections

Incoming cables with crimped lugs can connect directly to the terminals provided.

EZ137D



EZ117P

Main connectors

For installing a main disconnect device (Compact NS/NB MCCB or INS switch) ahead of EasyPact™ Busbar, use the tin-plated copper connector kits below.

Designation Main busbar current rating	Cat. number 250 A	400 A	630 A
Main disconnect device for Compact NS/NB or INS switch	EZB250MCNS	EZB400MCNS	EZB630MCNS

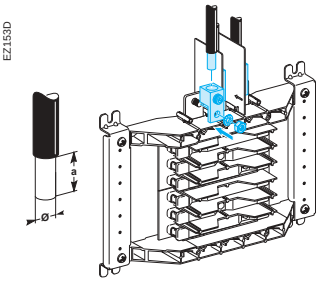
E88309

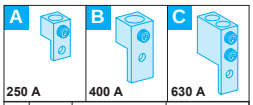
Mechanical lugs

For incoming cables without crimped lugs, use the mechanical lug kits below. Each kit contains three aluminium lugs suitable for copper or aluminium cables.

Designation Main busbar current rating	Cat. number 250 A	400 A	630 A
Incoming cable size	16-150 mm²	35-300mm²	25-240 mm² 2 cables per phase
Lug kit	EZB250MLUG	EZB400MLUG	EZB630MLUG

EZ153D





	a	Ø	
A	26	16-150mm¥	31Nm
B	35	35-300mm¥	56Nm
C	30	25-240mm¥	56Nm
	60	25-240mm¥	56Nm

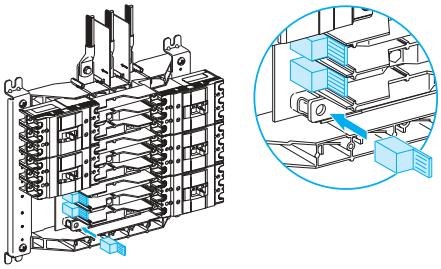
E88310

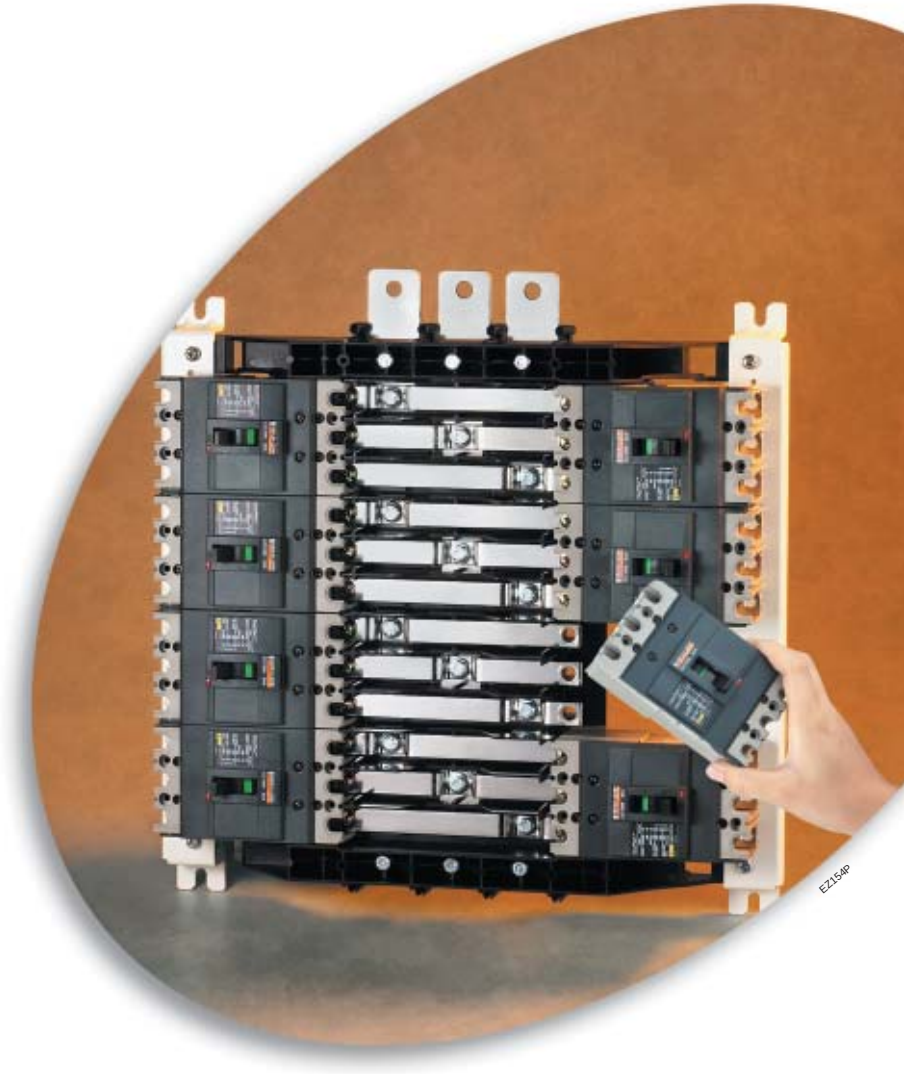
Connector caps

Connector caps are available to isolate the ends of connectors in positions where branch breakers are not installed.
Mounting screws are provided for an insulating barrier (locally provided) to cover the branch connectors when IP2X finger safety is specified.

Designation Connector caps (set of 3)	Cat. number
EasyPact™ branch MCCB	EZB100CAP
Compact NS/NB branch MCCB	EZB250CAP

E88805





EasyPact™ Installation Guide

Safety Clearances and Minimum Distances

EasyPact™

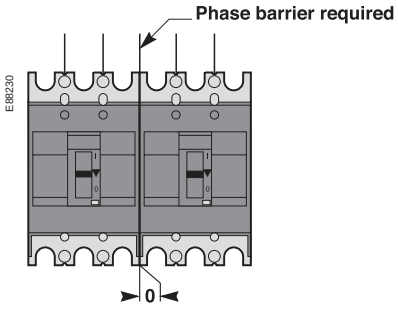
When installing a circuit breaker, minimum distances (safety clearances) must be maintained between the device and panels, bars and other protection devices installed nearby. These distances, which depend on the ultimate breaking capacity, are defined by tests carried out in accordance with standard IEC 60947-2.

If installation conformity is not checked by type tests, it is also necessary to:

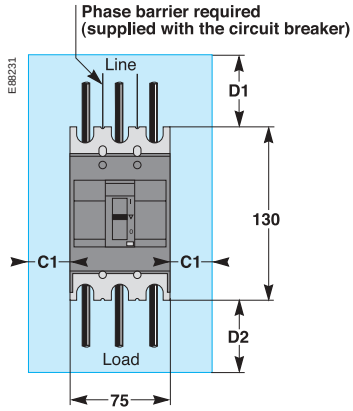
- use insulated bars for circuit-breaker connections
- block off the busbars using insulating screens.

For EasyPact™ breaker, terminal shields, inter-phase barriers or an insulation isolator are recommended and may be mandatory depending on the utilization voltage and the type of installation.

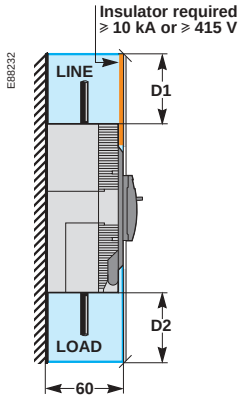
Minimal distance between two adjacent circuit breakers



Minimal distance between the circuit breaker and top, bottom or side panels

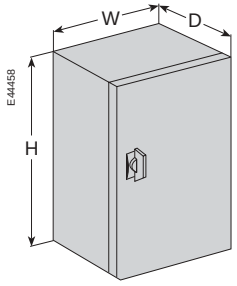


Minimal distance between the circuit breaker and front or rear panels



Dimensions (mm)	Bare or painted sheet metal; insulated bars			Bare Busbar under voltage	
EasyPact™ circuit breaker	C1	D1	D2	D1	D2
EZC100B/F/N	40	45	45	75	45
EZC100H	40	60	45	75	45

The mandatory distances when installing EasyPact™ circuit breakers are calculated from the device case, not taking into account the terminal shields or the inter-phase barriers.



Installation in an enclosure

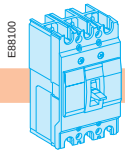
Installation in an enclosure

EasyPact™ circuit breakers can be installed in a metal enclosure together with other devices (contactors, motor-protection circuit breakers, LEDs, etc.).

Minimum enclosure dimensions

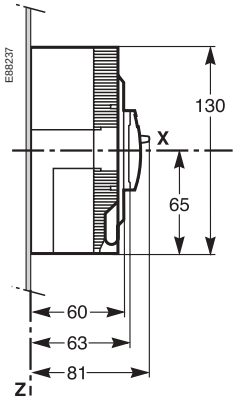
Circuit breakers	Height (mm)	Depth (mm) (*)	Width (mm)
EZC100B/F/N	200	90	155
EZC100H	215	90	155

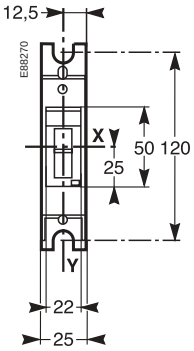
(*) *with front door*



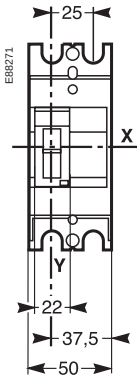
Dimensions

1-pole

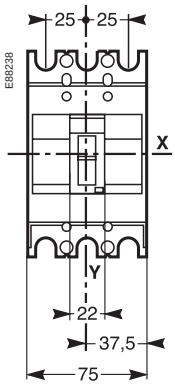


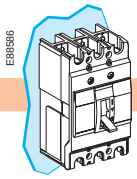


2-pole



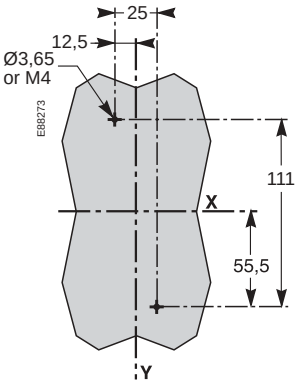
3-pole



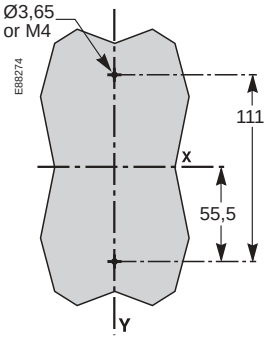


Mounting on plate

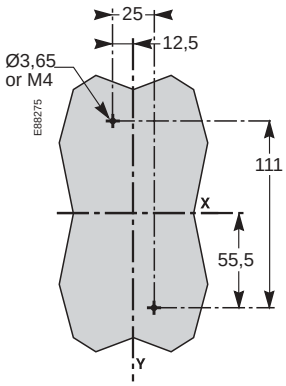
1-pole

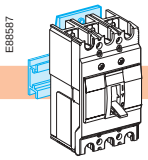


2-pole

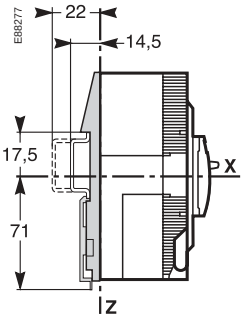


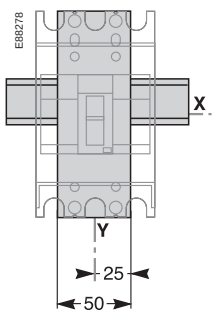
3-pole

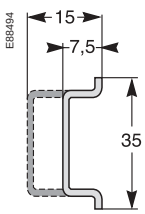


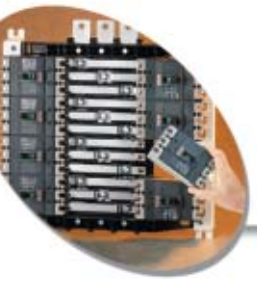


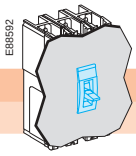
Mounting on DIN rail





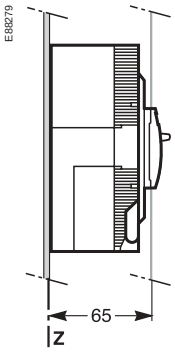




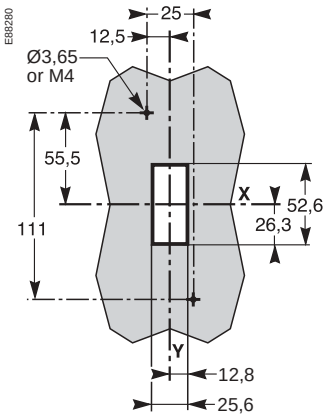


Door cut-out

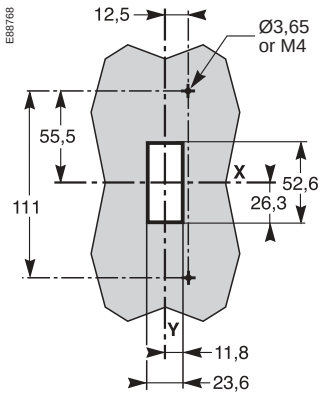
Cut-out dimension

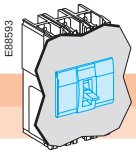


1, 3 pole



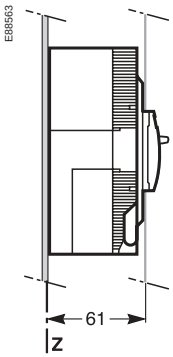
2-pole



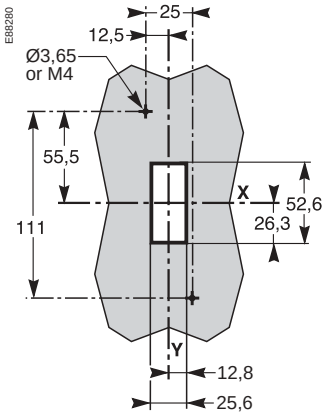


Door cut-out

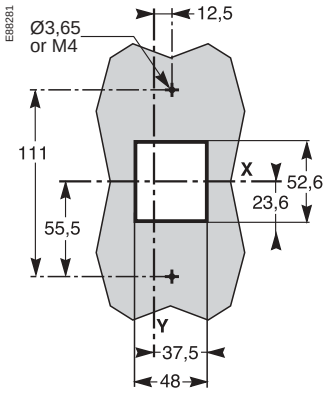
Cut-out dimensions



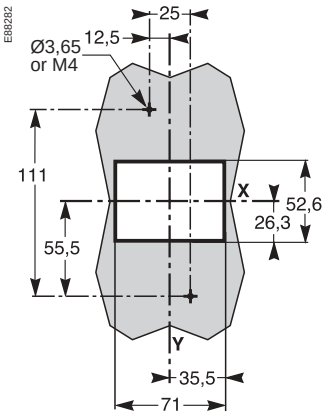
1-pole



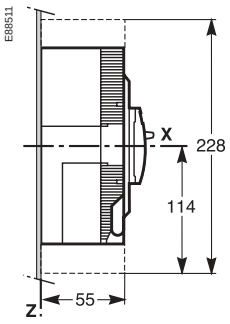
2-pole



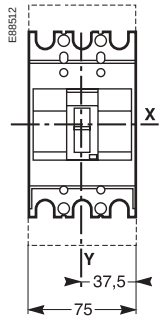
3-pole

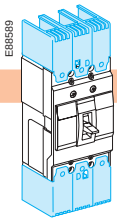


Terminal shield

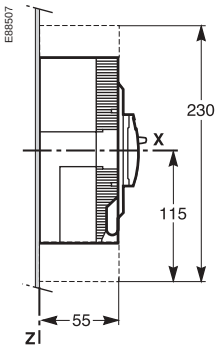


3-pole

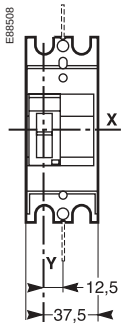




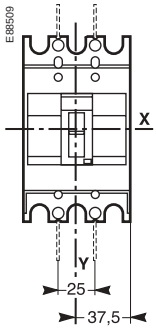
Phase barrier

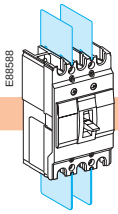


2-pole



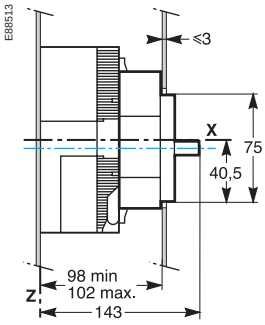
3-pole



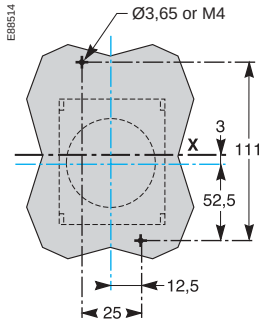


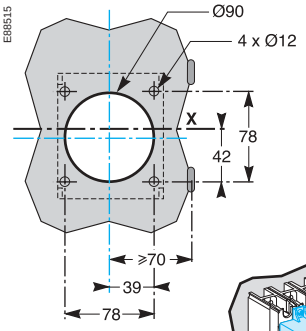
Direct rotary handle

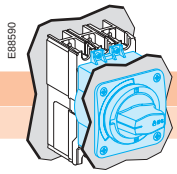
Dimensions

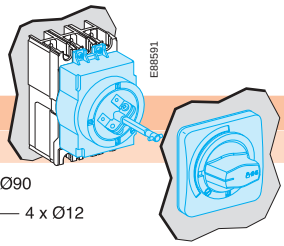


Door cut-out



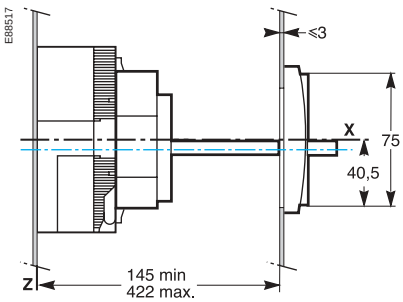




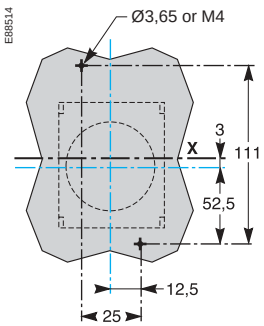


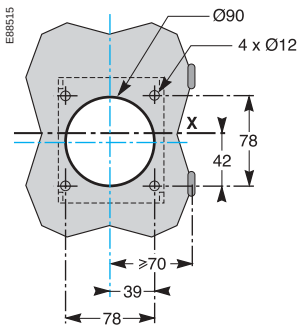
Extended rotary handle

Dimensions



Door cut-out

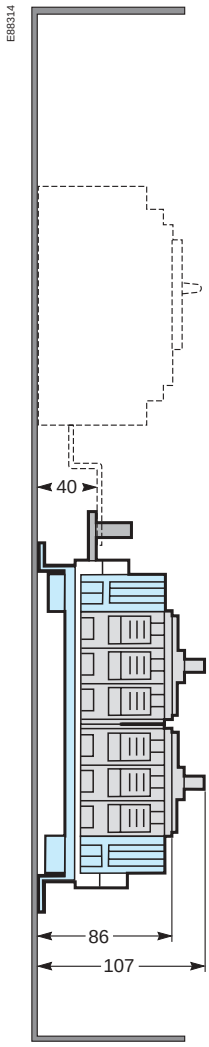


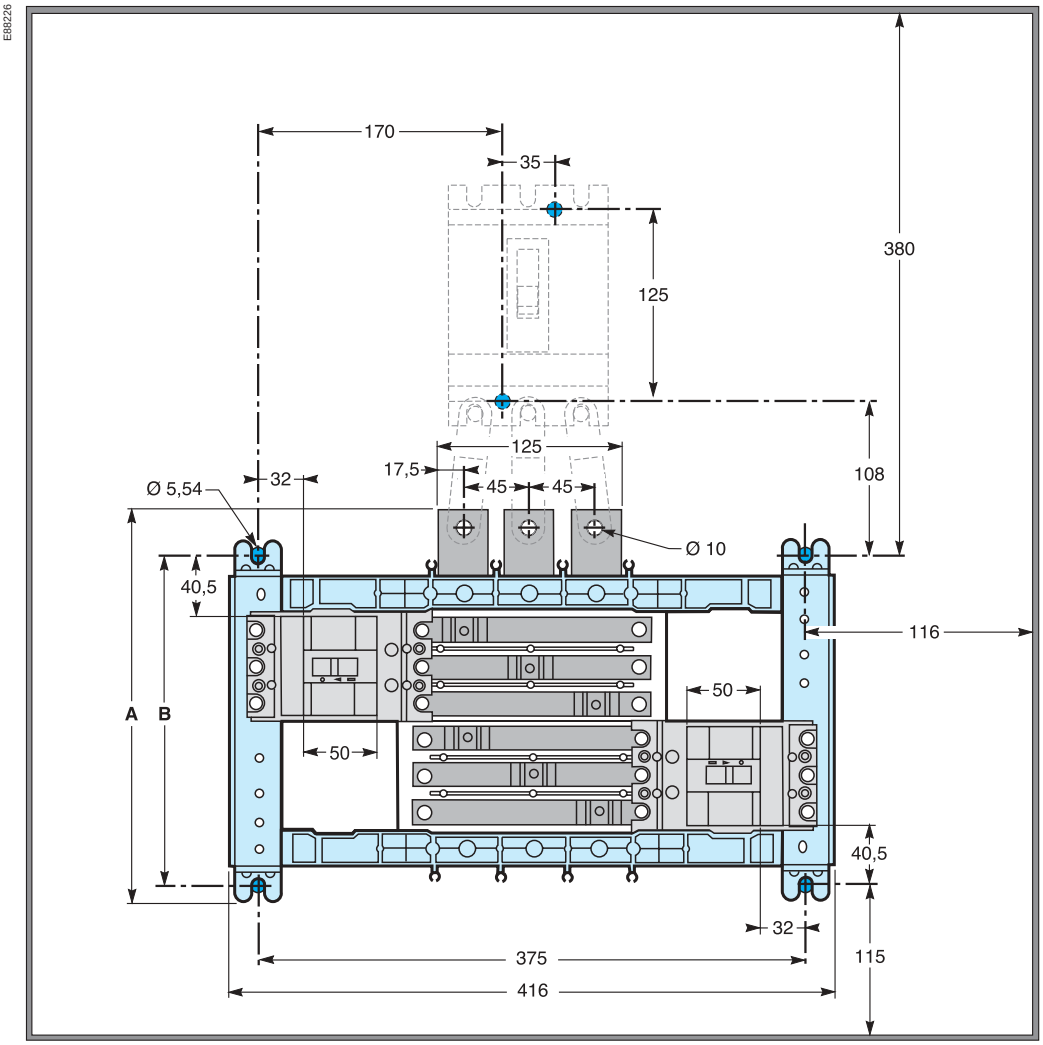


Dimensions

Layout installation EZB250

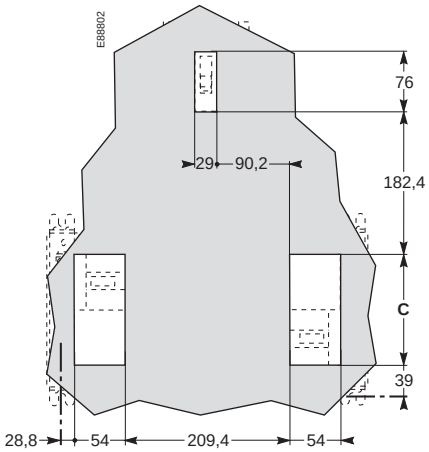
Panel layout using the EasyPact™ Busbar is simple using the guides below. In addition to the mounting locations for the busbar and main disconnect components (if required), make note of the minimum clearances required to the top, bottom and sides of the enclosure.





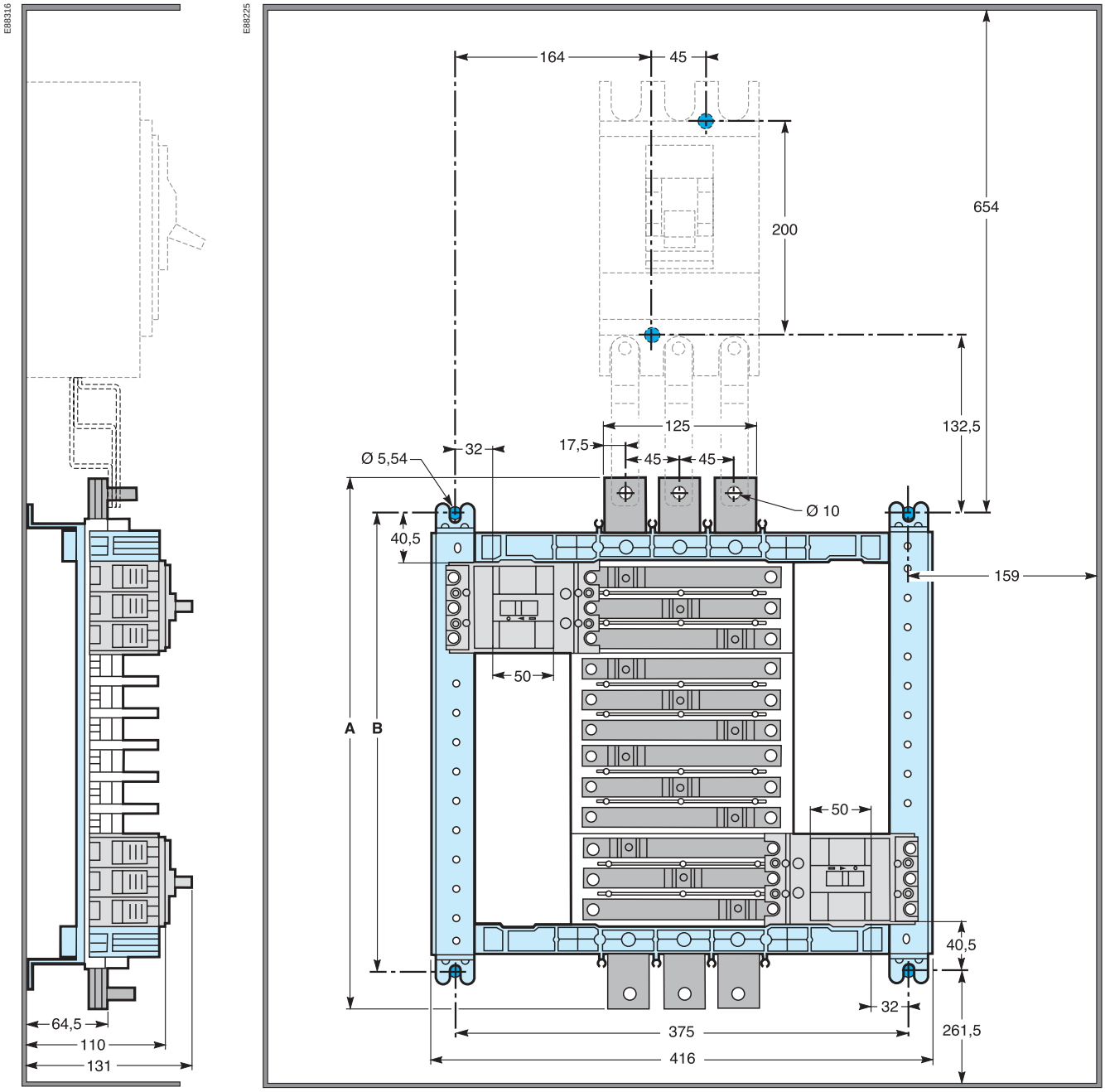
EZB250 - 250 A main busbar rating.

Trim cut-out



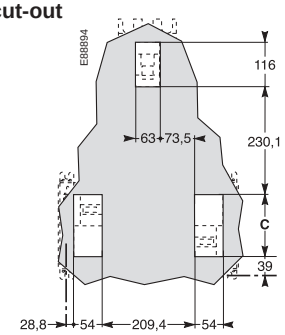
	A	B	C
4 Ways	268.5	225	147
6 Ways	343.5	300	222
8 Ways	418.5	375	297
10 Ways	493.5	450	372
12 Ways	568.5	525	447

Layout installation EZB400/630



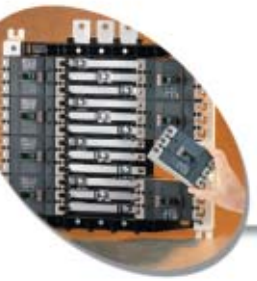
EZB400 and EZB630 - 400A and 630 A main busbar ratings.

Trim cut-out

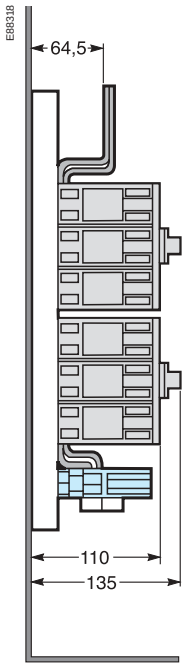


	A	B	C
4 Ways	290	225	147
6 Ways	365	300	222
8 Ways	440	375	297
10 Ways	515	450	372
12 Ways	590	525	447

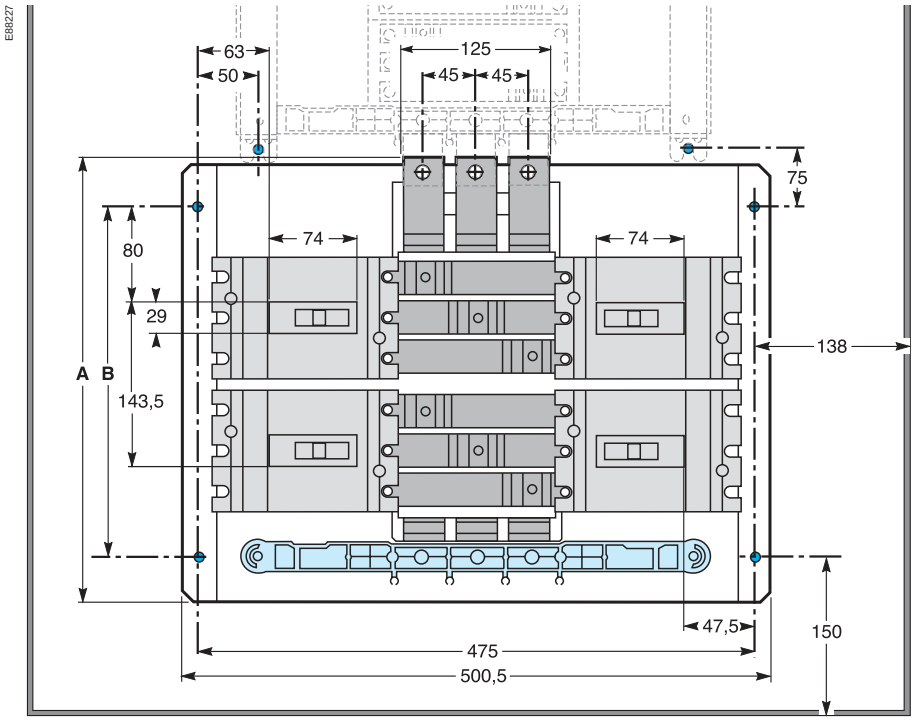
Note: *to avoid excess temperature rise on incoming MCCB terminals, panels using 630 A main breaker with these minimum enclosure dimensions require a 7000 mm² ventilation opening (after subtracting effects of screening) at each of the 4 corners of the enclosure.*



Layout installation NS/NB branch extensions



EZBNS2 and EZBNS4 Compact NS/NB branch breaker extension.



	A	B	C
EZBNS2	270	175	NA
EZBNS4	384	275	85.5

Trim cut-out