EcoStruxure™
Innovation At Every Level

Easy series

EasyPact™ CVS

Catalog 2023

Molded-case circuit breakers and switch-disconnectors from 16 to 630A

se.com

Life Is On | Schneider Electric

Green Premium™

An industry leading portfolio of offers delivering sustainable value

More than 75% of our product sales offer superior transparency on the material content, regulatory information and environmental impact of our products:

- RoHS compliance
- REACh substance information
- Industry leading # of PEP's*
- Circularity instructions

Discover what we mean by green
Check your products!

The Green Premium program stands for our commitment to deliver customer valued sustainable performance. It has been upgraded with recognized environmental claims and extended to cover all offers including Products, Services and Solutions.

CO_2 and P&L impact through… Resource Performance

Green Premium brings improved resource efficiency throughout an asset's lifecycle. This includes efficient use of energy and natural resources, along with the minimization of CO_2 emissions.

Cost of ownership optimization through… Circular Performance

We're helping our customers optimize the total cost of ownership of their assets. To do this, we provide IoT-enabled solutions, as well as upgrade, repair, retrofit, and remanufacture services.

Peace of mind through… Well-being Performance

Green Premium products are RoHS and REACh compliant. We're going beyond regulatory compliance with step-by-step substitution of certain materials and substances from our products.

Improved sales through… Differentiation

Green Premium delivers strong value propositions through third-party labels and services. By collaborating with third-party organizations we can support our customers in meeting their sustainability goals such as green building certifications.

*PEP: Product Environmental Profile (i.e. Environmental Product Declaration)

EasyPact CVS is...Safe

Isolation

- EasyPact CVS circuit breakers are suitable for Isolation as defined in IEC standards 60947-2. The aim of isolation is to separate a circuit or apparatus from the remainder of a system which is energized in order that personnel may carry out work on the isolated part in perfect safety.
- MCCB locking with external padlocks enables a user to isolate and undertake maintenance with utmost safety.

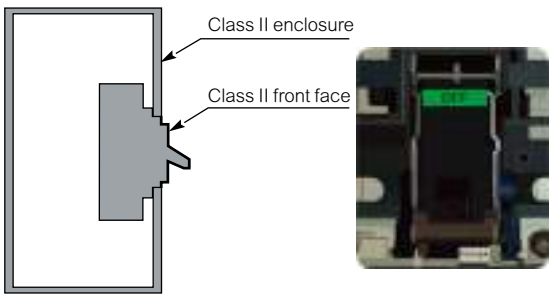
Isolation

Locking in OFF position

- Key locks enable to lock the breaker in OFF position ensuring safety and better control on installation.
- It also helps in interlocking multiple circuit breakers in an installation.

Class II front Face

- All EasyPact CVS MCCBs are class II Front face devices, they may be installed through the door of class II switchboards without downgrading the switchboard insulation. Installation requires no special operation, even when the Circuit Breaker is equipped with a rotary handle.



Class II panel with circuit breaker having a class II front face

Easy choice for Quality and Value

EasyPact CVS is...Reliable

IEC 60947-2

Conforms to IEC 60947-2 for circuit breaker

- Tested at renown international laboratories like KEMA
- Complete range* with Ics = 100% Icu

High electrical & Mechanical endurance

- 30000 mechanical operations for 100A
- 12000 electrical operations for 100A

Reliable accessories

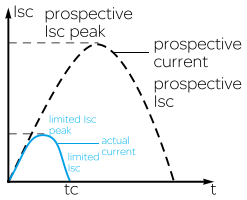
- Continuous rated shunt coils
- Multifunctional Aux./Alarm contact
- Unique electrical fault trip indication (SDE)

EasyPact CVS offer protection for human as well as Electrical installation

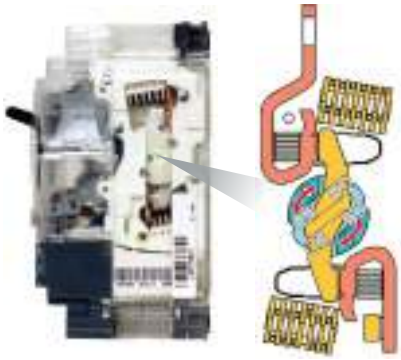
- Earth leakage protection through Vigi Module to protect human against leakage current

Fault current limitation technology

- EasyPact CVS Double break mechanism ensures high fault current limitation
  - @ Reduces thermal stresses on the electrical distribution network
  - @ Increases the life of cables and installation



Current limitation technology



EasyPact CVS Double break Roto mechanism

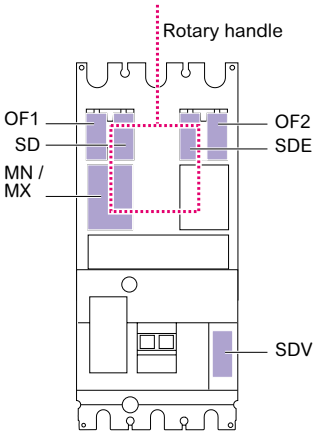
* except CVS100BS

EasyPact CVS is...Simple

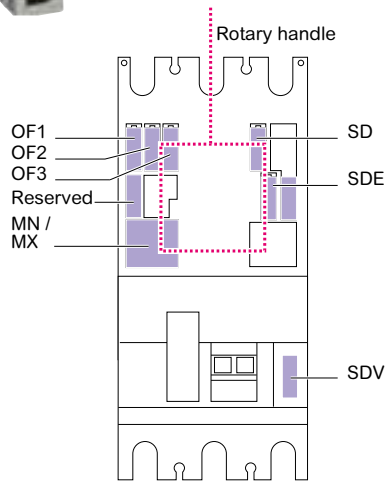
Only two frame sizes* up to 630A

Frame - I 100 - 250A
Frame – II 400 - 630A

- Common and snap-fit accessories up to 630A
- Single OF contact for ON/OFF, Trip indication
- Single Shunt coil for remote tripping
- Single Under Voltage coil
- EasyPact CVS share same footprint of Compact Family MCCBs.
  - mounting dimensions
  - easy retrofitting
  - system upgradeability



100 – 250A



400 – 630A

* except CVS100BS

EasyPact CVS stands for customer value

EasyPact CVS 100 to 630 A

Panel builders

- Only two frame sizes up to 630A
- Common accessories for complete range (ON/OFF/Trip Auxiliaries/Shunt/UV etc.)
- Line load reversibility for entire range
- Suitable for class II switchboards

End Users

- Isolation as a standard feature enhances safety
- Excellent current limiting capability reduces stresses on cables, busbars and loads
- Continuous rated accessories increase system reliability
- Modular earth leakage protection ensure human/installation protection

OEMs

- High endurance and maintenance-free operation assure continuous performance of machines
- Unique common accessories help standardisation of components

Contractors

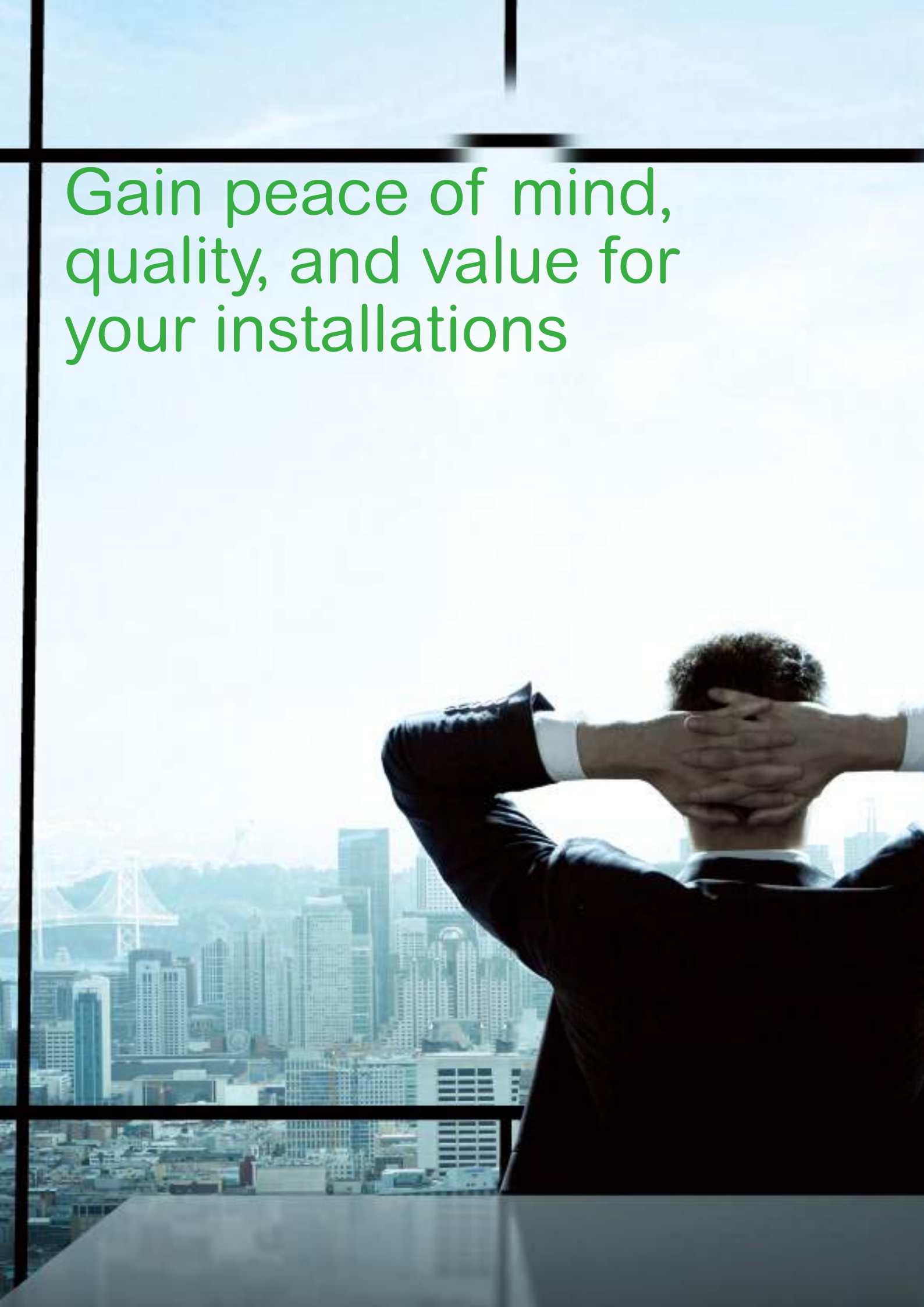
- Sufficient pole pitch helps to terminate Copper and Aluminum busbars or cables
- Easy availability of the product due to a small number of frame size
- Designed to perform in demanding applications

- Do you strain to find circuit breakers that are simple as well as flexible and safe?

- Has it been difficult to find high quality circuit breakers at the right price point?

- Do you need the reach, support and accessibility of a global leader, with the value of a local supplier?

Gain peace of mind, quality, and value for your installations



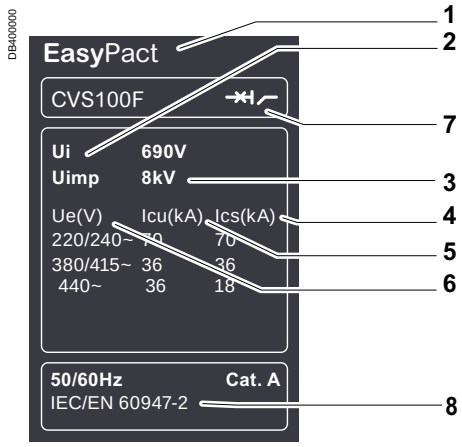
General contents

EasyPact™ CVS

Functions and characteristics

Functions and characteristics

Introduction
General characteristics



Standardised characteristics indicated on the rating plate:
1. Type of device: frame size and breaking capacity class
2. Ui: rated insulation voltage.
3. Uimp: rated impulse withstand voltage.
4. Ics: service breaking capacity.
5. Icu: ultimate breaking capacity for various values of the rated operational voltage Ue
6. Ue: operational voltage.
7. Suitable for Isolation symbol.
8. Reference standard.

Note: when the circuit breaker is equipped with an extended rotary handle, the door must be opened to access the rating plate.

Compliance with standards
EasyPact CVS circuit breakers and auxiliaries comply with the following international recommendations:
- IEC 60947-1: general rules
- IEC 60947-2: circuit breakers
- IEC 60947-3: switch-disconnectors

Pollution degree
EasyPact CVS circuit breakers are certified for operation in pollution-degree III environments as defined by IEC standards 60947-1 and 60664-1 (industrial environments).

Climatic withstand
EasyPact CVS circuit breakers have successfully passed the tests defined by the following standards for extreme atmospheric conditions:
- IEC 60068-2-1: dry cold (-55°C)
- IEC 60068-2-2: dry heat (+85°C)
- IEC 60068-2-30: damp heat (95 % relative humidity at 55°C)
- IEC 60068-2-52 severity level 2: salt mist.

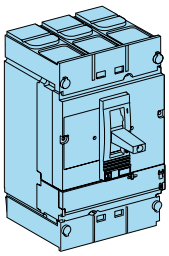
Environment
EasyPact CVS respects the European environment directive EC/2002/95 concerning the restriction of hazardous substances (RoHS).

All EasyPact CVS production sites have set up an ISO 14001 certified environmental management system.

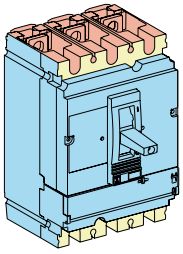
Ambient temperature
- EasyPact CVS circuit breakers can be used between -25°C and +70°C. For temperatures higher than 40°C (65°C for circuit breakers used to protect motor feeders), devices must be derated (see page B-2).
- Circuit breakers should be put into service under normal ambient, operating-temperature conditions. Exceptionally, the circuit breaker can be put into service when the ambient temperature is between -35°C and -25°C.
- The permissible storage-temperature range for EasyPact CVS circuit breakers in the original packing is -50°C and +85°C.

Electromagnetic compatibility
EasyPact CVS circuit breakers with ETS 2.2/2.3 electronic trip unit have successfully passed the tests defined by the following standards for EMC:
- IEC/EN 60947-2, Annex F: Immunity tests for circuit breakers with electronic protection

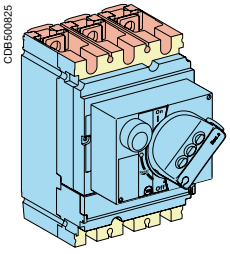
Introduction
General characteristics



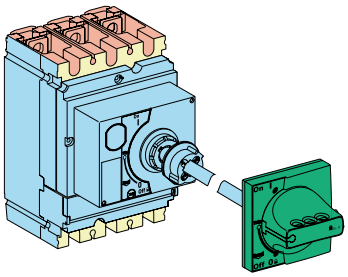
EasyPact CVS100/160/250/400/630
with terminal shields



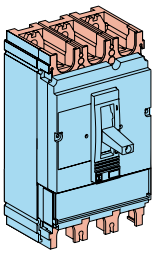
EasyPact CVS100/160/250



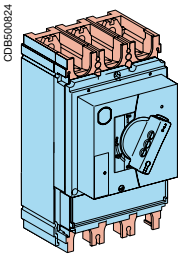
EasyPact CVS100/160/250
with direct rotary handle



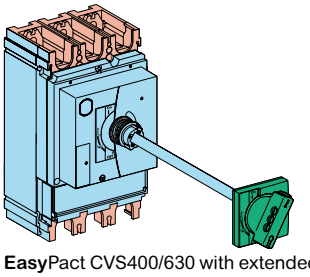
EasyPact CVS100/160/250 with extended rotary handle



EasyPact CVS400 / 630



EasyPact CVS400 / 630 with
direct rotary handle



EasyPact CVS400/630 with extended rotary handle

Suitable for isolation with positive contact indication

All EasyPact CVS 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 OFF position unless the contacts are effectively open.
- Padlocks cannot 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
- Over voltage withstand capacity between upstream and downstream connections.

The tripped position does not ensure isolation with positive contact indication. Only the OFF position guarantees isolation.

Installation in class II switchboards

All EasyPact CVS circuit breakers are class II front face devices. They can be installed through the door of class II switchboards (as per IEC standards 61140 and 60664-1) without downgrading switchboard insulation. Installation requires no special operations, even when the circuit breaker is equipped with a rotary handle.

Degree of protection

The following indications are in accordance with standards IEC 60529 (IP degree of protection) and IEC 62262 (IK protection against external mechanical impacts).

Bare circuit breaker with Escutcheon:

- with toggle: IP40, IK07 front face
- with extended rotary handle: IP 54, IK08

Circuit breaker installed in a switchboard:

- with toggle: IP40, IK07 front face
- with extended rotary handle: IP 54, IK08

Protection degree

Protection degree of the product, according to IEC60259, depends on its configuration:

Colours	Definition
	IP54: front extended rotary handle
	IP40: front cover, side, back, terminal shield, direct rotary handle
	IP20: power connection cover
	maybe IP20 or less depending on the kind of power connections and cable size used

IP54
IP40
IP20
< IP20

Introduction
Characteristics and performance

PB106447

EasyPact CVS100/160/250

PB106448

EasyPact CVS400/630

Common characteristics				
Rated voltages				
Insulation voltage (V)	**Ui**			690
Impulse withstand voltage (kV)	**Uimp**			8
Operational voltage (V)	**Ue**	AC 50/60 Hz		440
Suitability for isolation		IEC/EN 60947-2		yes
Utilisation category				A
Pollution degree		IEC 60664-1		3

Circuit breakers				
Performance				
Electrical characteristics as per IEC 60947-2				
Rated current (A)	**In**	40 °C		
Number of poles				
Breaking capacity levels				
Breaking capacity (kA rms)				
	Icu	AC 50/60 Hz	220/240 V 380/415 V 440 V	
Service breaking capacity (kA rms)				
	Ics	AC 50/60 Hz	220/240 V 380/415 V 440 V	
Durability (C-O cycles)		Mechanical		
		Electrical	415V	In/2 In

Protection			
Short-circuit protection	Magnetic only		
Overload/short-circuit protection	Thermal magnetic		
	Electronic		
		with neutral protection (Off-0.5-1)	
Earth-leakage protection	By Vigi module		
Installation/connections			
Dimensions and weights			
Dimensions (mm) W x H x D	Fixed, front connections	3P 4P	
Weight (kg)	Fixed, front connections	3P	
		4P	
Connections			
Connection terminals	Pitch	Without/ With spreaders	
Large Cu or Al cables	Cross-section	mm²	

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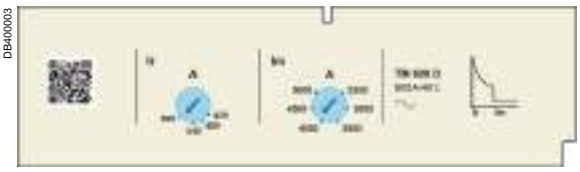
Introduction
Characteristics and performance

CVS100	CVS160	CVS250	CVS400	CVS630
100	**160**	**250**	**400**	**630**
3, 4	3, 4	3, 4	3, 4	3, 4
B F N	**B F N**	**B F N**	**F N H**	**F N H**
40 70 90	40 70 90	40 70 90	40 70 100	40 70 100
25 36 50	25 36 50	25 36 50	36 50 70	36 50 70
20 36 50	20 36 50	20 36 50	30 42 65	30 42 65
40 70 90	40 70 90	40 70 90	40 70 100	40 70 100
25 36 50	25 36 50	25 36 50	36 50 70	36 50 70
15 18 38	15 18 38	15 18 38	23 32 49	23 32 49
30000	25000	20000	15000	15000
30000	25000	20000	12000	8000
12000	12000	10000	6000	4000
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
105 x 161 x 86 140 x 161 x 86	105 x 161 x 86 140 x 161 x 86	105 x 161 x 86 140 x 161 x 86	140 x 255 x 110 185 x 255 x 110	140 x 255 x 110 185 x 255 x 110
1.8	1.8	2.0	4.7	5.2
2.2	2.3	2.6	6.3	7.1
35/45 mm	35/45 mm	35/45 mm	45/52.5 mm 45/70 mm	45/52.5 mm 45/70 mm
300	300	300	4 x 240	4 x 240

Protection of distribution systems
TM-D thermal-magnetic trip units

TM-D thermal-magnetic trip units can be used on **Easy**Pact CVS100-630 circuit breakers with performance levels B/F/N/H.

TM-D thermal-magnetic trip units



Protection

TM-D trip units are used mainly in electrical distribution applications for protection of cables supplied by transformers.

Thermal protection (Ir)
Thermal protection operates according to:
- **Ir** that can be adjusted in amps from 0.7 to 1 times the rating of the trip unit (16 A to 250 A), corresponding to settings from 11 to 250 A for the range of trip units
- a non-adjustable time delay.

Magnetic protection (Im)
Short-circuit protection with a fixed or adjustable pick-up Im that initiates instantaneous tripping if exceeded.
- TM-D: fixed pick-up, Im, for 16 to 250 A ratings and adjustable from 5 to 10 x In for 400 A ratings, 4.2 to 8.3 x In for 600 A rating.

Protection versions
- 3-pole:
  - 3P 3D: 3-pole frame (3P) with detection on all 3 poles (3D)
- 4-pole:
  - 4P 3D: 4-pole frame (4P) with detection on 3 poles (3D).
  - 4P 4D: 4-pole frame (4P) with detection on all 4 poles (same threshold for phases and neutral).

Thermal-magnetic trip units		TM16D to 250D												TM320D to 600D			
Ratings (A)	**In at 40 °C** (1)	**16**	**25**	**32**	**40**	**50**	**63**	**80**	**100**	**125**	**160**	**200**	**250**	**320**	**400**	**500**	**600**
Circuit breaker	CVS100	■	■	■	■	■	■	■	■	-	-	-	-				
	CVS160	-	-	-	-	-	-	-	■	■	■	-	-				
	CVS250	-	-	-	-	-	-	-	-	-	■	■	■				
	CVS400													■	■	-	-
	CVS630													-	-	■	■
Magnetic protection																	
Pick-up (A)	**Im**	fixed												adjustable			
accuracy ±20 %	CVS100	190	300	400	500	500	500	640	800								
	CVS160/250								800	1250	1250	2000	2500				
	CVS400													1600 to 3200 (320A), 2000 to 4000 (400A)			
	CVS630													2500 to 5000			
Thermal protection																	
Pick-up (A) tripping between 1.05 and 1.30 Ir	**Ir** = In x ...	adjustable in amps from 0.7 to 1 x In															
Neutral protection																	
Unprotected neutral	4P 3D	no detection															
Fully protected neutral	4P 4D	1 x Ir															

(1) For temperatures not equal to 40°C, the thermal protection characteristics are modified. See the temperature derating table on page B-2.

Note: All the trip units have a transparent lead-sealable cover that protects access to the adjustment dials.

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Protection of distribution systems
TM-G thermal-magnetic trip units

TM-G thermal-magnetic trip units can be used on EasyPact CVS160-250 circuit breakers with performance levels B for the protection of generators or long cable length.

TM-G thermal-magnetic trip units

DB400193

Protection

TM-G, with a low pick-up for generators (lower short-circuit currents than with transformers) and distribution system with long cable lengths (fault current limited by impedance of the cable).

Thermal protection (Ir)
Thermal protection operates according to:

- **Ir** that can be adjusted in amps from 0.7 to 1 times the rating of the trip unit (80 A to 250 A), corresponding to settings from 56 to 250 A for the range of trip units
- a non-adjustable time delay.

Magnetic protection (Im)
Short-circuit protection with a fixed Im that initiates instantaneous tripping if exceeded.

- TM-G: fixed pick-up, Im, for 80 to 250 A ratings.

Protection versions

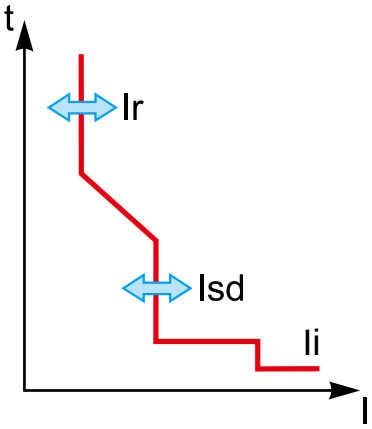
- ■ 3-pole:
- □ 3P 3D: 3-pole frame (3P) with detection on all 3 poles (3D)
- ■ 4-pole:
- □ 4P 3D: 4-pole frame (4P) with detection on 3 poles (3D).

Thermal-magnetic trip units		TM80G to 250G					
Ratings (A)	**In at 40 °C** (1)	**80**	**100**	**125**	**160**	**200**	**250**
Circuit breaker	CVS160	■	■	■	■	-	-
	CVS250	-	-	-	-	■	■
Magnetic protection							
Pick-up (A)	**Im**						
accuracy ±20 %	CVS160/250	200	320	440	500	600	750
Thermal protection							
Pick-up (A) tripping between 1.05 and 1.30 Ir	**Ir** = In x ...	adjustable in amps from 0.7 to 1 x In					
Neutral protection							
Unprotected neutral	4P 3D	no detection					

Note: All the trip units have a transparent lead-sealable cover that protects access to the adjustment dials.

Protection of distribution systems
ETS 2.2/2.3 electronic trip unit and accessories

ETS 2.2/2.3 electronic trip units can be used on **Easy**Pact CVS100-630 circuit breakers with performance levels B/F/N/H.



ETS 2.2/2.3 electronic trip unit

Circuit breakers equipped with ETS 2.2 (100-250A) / 2.3 (400/630A) trip units can be used to protect distribution systems supplied by transformers.

Protection

Settings are made using the adjustment dials with adjustment possibilities.

Overloads: Long time protection (Ir)
Inverse time protection against overloads with an adjustable current pick-up Ir set using a dial and a non-adjustable time delay tr.

Short-circuits: Short-time protection with fixed time delay (Isd)
Protection with an adjustable pick-up Isd. Tripping takes place after a very short delay used to allow discrimination with the downstream device.

Short-circuits: Non-adjustable instantaneous protection
Instantaneous short-circuit protection with a fixed pick-up.

Neutral protection
- On 3-pole circuit breakers, neutral protection is not possible.
- On four-pole circuit breakers, neutral protection may be set using a three-position switch:
  - 4P 3D: neutral unprotected
  - 4P 3D + N/2: neutral protection at half the value of the phase pick-up, i.e. 0.5 x Ir
  - 4P 4D: neutral fully protected at Ir

Note: all the trip units have a transparent lead-sealable cover that protects access to the adjustment dials.

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Protection of distribution systems

ETS 2.2/2.3 electronic trip unit and accessories

ETS 2.2/2.3											
Ratings (A)	**In at 40 °C (1)**		**40**	**100**	**160**	**250**	**400**	**630**			
Circuit breaker	CVS100		■	■	-	-	-	-			
	CVS160		-	-	■	-	-	-			
	CVS250		-	-	-	■	-	-			
	CVS400		-	-	-	-	■	-			
	CVS630		-	-	-	-	-	■			
L Long-time protection (40 A - 250 A)											
Pick-up (A)		Ir	value depending on trip unit rating (In) and setting on dial								
tripping between 1.05 and 1.20 Ir	In = 40 A	Ir =	18	18	20	23	25	28	32	36	40
	In = 100 A	Ir =	40	45	50	55	63	70	80	90	100
	In = 160 A	Ir =	63	70	80	90	100	110	125	150	160
	In = 250 A	Ir =	100	110	125	140	160	175	200	225	250
Time delay (s)	tr	keypad setting	non-adjustable								
accuracy 0 to -20 %		1.5 x Ir	400								
		6 x Ir	16								
		7.2 x Ir	11								
Thermal memory			20 minutes before and after tripping								
L Long-time protection (400 A / 630 A)											
Pick-up (A)		Ir	value depending on trip unit rating (In) and setting on dial								
tripping between 1.05 and 1.20 Ir	In = 400 A	Ir =	160	180	200	230	250	280	320	360	400
	In = 630 A	Ir =	250	280	315	370	400	440	505	565	630
Time delay (s)	tr	keypad setting	non-adjustable								
accuracy 0 to -20 %		1.5 x Ir	200								
		6 x Ir	8								
		7.2 x Ir	5.5								
Thermal memory			20 minutes before and after tripping								
S_0 Short-time protection with fixed time delay											
Pick-up (A)	Isd = Ir x ...		1.5	2	3	4	5	6	7	8	10
accuracy ±10 %											
	tsd		non-adjustable								
	Non-tripping time		20								
	Maximum break time		80								
I Instantaneous protection											
Pick-up (A)	Ii non-adjustable		600	1500	2400	3000	4800	6930			
accuracy ±15 %	Non-tripping time		10 ms								
	Maximum break time		50 ms for I>Ii								

(1) If the trip units are used in high-temperature environments, the ETS 2.2/2.3 setting must take into account the thermal limitations of the circuit breaker. See the temperature derating table.

Earth-leakage protection
Add-on protection against insulation faults using a Vigi module

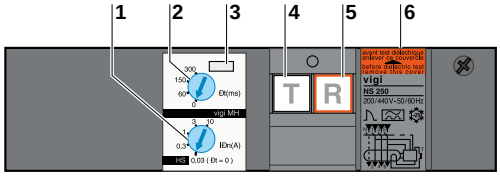
A Vigi module can be added to any three or four-pole CVS100 to 630 circuit breakers to form a Vigi CVS.

PB106449

Vigi CVS100 to 630

PB103580-36

DB112147



1. Sensitivity setting
2. Time-delay setting (for selective earth-leakage protection).
3. Lead-seal fixture for controlled access to settings.
4. Test button simulating an earth-fault for regular checks on the tripping function
5. Reset button (reset required after earth-fault tripping).
6. Rating plate

Circuit breaker with add-on Vigi module (Vigi CVS)

- For general characteristics of circuit breakers, see pages A-2 and A-3.
- Add-on Vigi modules: Earth-leakage protection is achieved by installing a Vigi module (characteristics and selection criteria on next page) directly on the circuit breaker terminals. It directly actuates the trip unit (magnetic, thermal-magnetic or ETS).

Vigi CVS100 to 630 circuit breakers with earth-leakage protection

Addition of the Vigi module does not alter circuit-breaker characteristics:

- compliance with standards
- degree of protection, class II front-face insulation
- positive contact indication
- electrical characteristics
- trip-unit characteristics
- installation and connection modes
- indication, measurement and control auxiliaries
- installation and connection accessories.

Dimensions and weights		CVS100 to 250	CVS400/630
Dimensions	3-pole	105 x 236 x 86	140 x 355 x 110
W x H x D (mm)	4-pole	140 x 236 x 86	185 x 355 x 110
Weight (kg)	3-pole	2.5	8.8
	4-pole	3.2	10.8

Vigi earth-leakage protection modules

Compliance with standards

- IEC 60947-2, annex B.
- Decree dated 14 November 1988 (for France).
- IEC 60755, class A, immunity to DC components up to 6 mA
- operation down to -25 °C as per VDE 664.

Vigi module selection

Type	CVS100 to 250	CVS400/630
Number of poles	3, 4 (1)	3, 4 (1)
Protection characteristics		
Sensitivity	adjustable	adjustable
IΔn (A)	0.03 - 0.3 - 1 - 3 - 10	0.3 - 1 - 3 - 10 - 30
Time delay	adjustable	adjustable
Intentional delay (ms)	0 - 60 (2) - 150 (2) - 300 (2)	0 - 60 - 150 - 300
Max. break time (ms)	< 40 < 150 < 300 < 800	< 40 < 150 < 300 < 800
Rated voltage V AC 50/60 Hz	200... 440	200...440

(1) Vigi 3P modules may also be used on 3P circuit breakers used for two-phase protection.
(2) If the sensitivity is set to 30 mA, there is no time delay, whatever the time-delay setting.

Operating safety

The Vigi module is a user safety device. It must be tested at regular intervals (every 6 months) via the test button.

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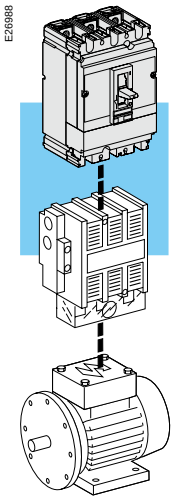
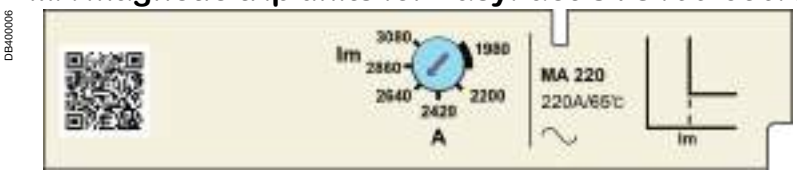
Motor protection
MA instantaneous trip units



CVS100 to 630 circuit breakers, equipped with an MA magnetic trip unit with adjustable thresholds, offer:
- short-circuit protection
- suitability for isolation.

CVS100 to 630 circuit breakers with trip unit are supplied ready-assembled.

MA magnetic trip units for EasyPact CVS100-630A



Circuit breakers with an MA trip unit are combined with a thermal relay and a contactor or a starter.

Protection

Magnetic protection (Im)
Short-circuit protection with an adjustable pick-up Im that initiates instantaneous tripping if exceeded.

- ■ **Im** = In x ... is set on an adjustment dial in multiples of the rating:
- □ 6 to 14 x In (2.5 to 100 A ratings)
- □ 9 to 14 x In (150 to 220 A ratings)
- □ 6 to 13 x In (320 to 500 A ratings)

Protection version
- ■ 3-pole (3P 3D): 3-pole frame (3P) equipped with detection on all 3 poles (3D).

Motor protection up to 250 kW

Motor protection rating (kW)			
CVS100/160/250		1.1...110	
CVS400/630			18.5...250
Breaking capacity (kA rms) 380/415V	B	25	-
	F	36	36
	N	50	50
	H		70

MA trip units									
Ratings (A)	**In at 65 °C**	**2.5**	**6.3**	**12.5**	**25**	**50**	**100**	**150**	**220**
Circuit breaker	CVS100	■	■	■	■	■	■	-	-
	CVS160	-	-	-	-	-	■	■	-
	CVS250	-	-	-	-	-	-	■	■
Short-circuit protection (magnetic)									
Pick-up (A) CVS100 CVS160/250	**Im** = In x ...	setting 6...14 x In -						setting - 9...14 x In	

MA trip units			
Ratings (A)	**In at 65 °C**	**320**	**500**
Circuit breaker	CVS400	■	-
	CVS630	-	■
Short-circuit protection (magnetic)			
Pick-up (A) CVS400/630	**Im** = In x ...	setting 6...13 x In	

Switch-disconnectors
Characteristics and performance

Installation standards require upstream protection. However, **Easy**Pact CVS100 to 630 NA switch-disconnectors are self-protected by their high-set magnetic release.

PB106451

EasyPact CVS100 to 250 NA

PB106452

EasyPact CVS400 to 630 NA

Switch-disconnectors				
Electrical characteristics as per IEC 60947-3 and EN 60947-3				
Conventional thermal current (A)	**Ith 50 °C**			
Number of poles				
Operational current (A) depending on the utilisation category	**Ie**	AC 50/60 Hz		
			220/240 V	
			380/415 V	
			440 V	
Short-circuit making capacity (kA peak)	**Icm**	min. (switch-disconnector alone)		
		max. (protection by upstream circuit breaker)		
Rated short-time withstand current (A rms)	**Icw**	for	1 s	
			3 s	
			20 s	
Durability (C-O cycles)	mechanical			
	electrical	AC		
			415 V	In
Protection				
Add-on earth-leakage protection	By Vigi module			
Additional indication and control auxiliaries				
Indication contacts				
Voltage releases	MX shunt release			
	MN undervoltage release			
Installation/connections				
Dimensions (mm)	fixed, front connections		3P	
W x H x D			4P	
Weight (kg)	fixed, front connections		3P	
			4P	

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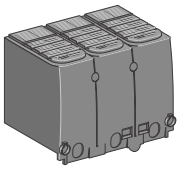
Switch-disconnectors
Characteristics and performance

	CVS100NA	CVS160NA	CVS250NA	CVS400NA	CVS630NA
	100	**160**	**250**	**400**	**630**
	3, 4	3, 4	3, 4	3, 4	3, 4
	AC22A / AC23A	**AC22A / AC23A**	**AC22A / AC23A**	**AC22A / AC23A**	**AC22A / AC23A**
	100	160	250	400	630/500
	100	160	250	400	630/500
	100	160	250	400	630/500
	2.6	3.6	4.9	7.1	8.5
	75	75	75	105	105
	1800	2500	3500	5000	6000
	1800	2500	3500	5000	6000
	690	960	1350	1930	2320
	30000	25000	20000	15000	15000
	AC22A / AC23A	**AC22A / AC23A**	**AC22A / AC23A**	**AC22A / AC23A**	**AC22A / AC23A**
	8000	8000	6500	4000	2500
	■			■	
	■			■	
	■			■	
	■			■	
	105 x 161 x 86			140 x 255 x 110	
	140 x 161 x 86			185 x 255 x 110	
	1.5 to 1.8			5.2	
	2.0 to 2.2			6.8	

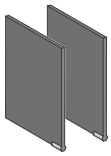
Accessories and auxiliaries
Overview

DB400001

Insulation accessories

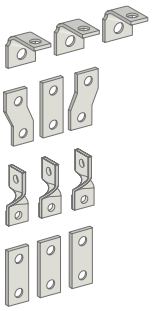


Sealable terminal shields

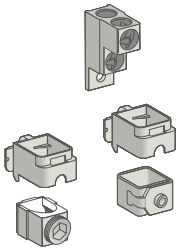


Interphase barriers

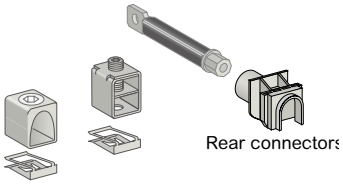
Connection



Terminal extensions

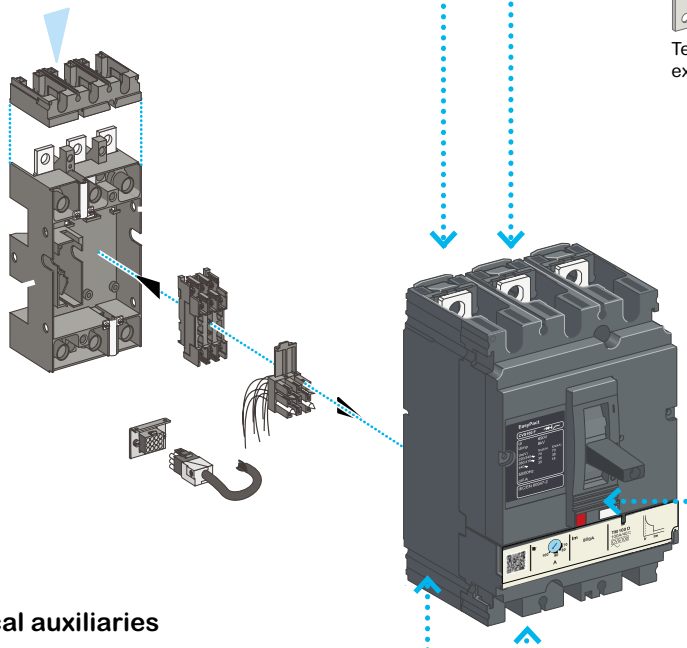


Cable connectors



Cable connectors

Rear connectors



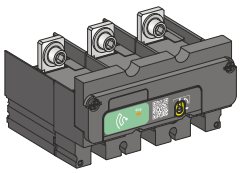
Motor Mechanism

Electrical auxiliaries

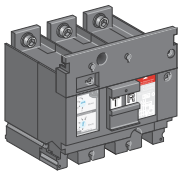
Indication contact

Voltage release

Monitoring

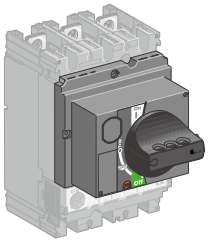


PowerTag Energy M250/M630

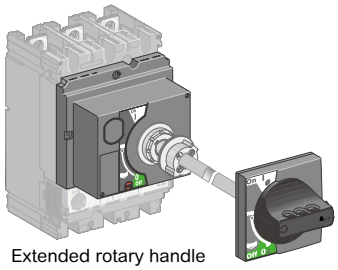


Earth leakage protection (Vigi CVS)

Control accessories



Direct rotary handle



Extended rotary handle

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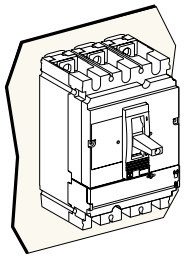
Accessories and auxiliaries
Device installation

CVS circuit breakers may be installed horizontally, vertically or flat on their back, without derating performance levels.

Fixed circuit breakers

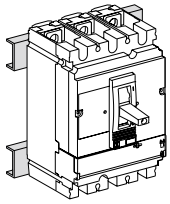
Fixed circuit breakers are designed for standard connection using bars or cables with lugs. Bare-cable connectors are available for connection to bare copper or aluminium cables.

DB400009



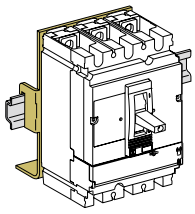
Mounting on a backplate.

DB400010



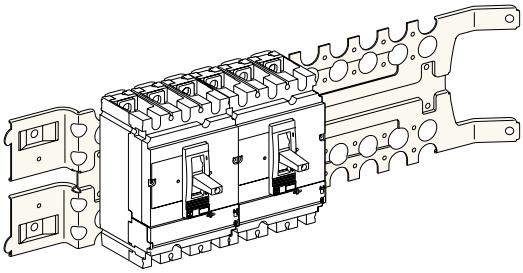
Mounting on rails.

DB400011



Mounting on DIN rail (with adaptor).

DB400012

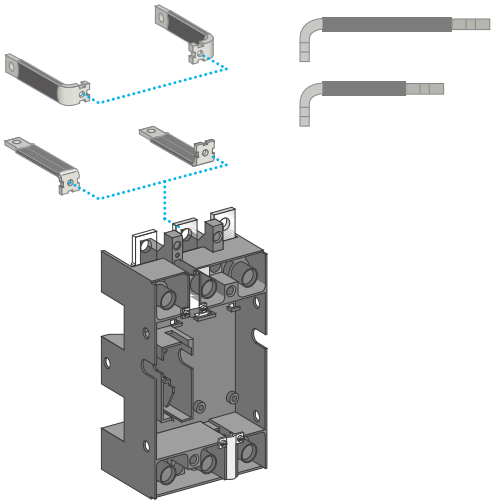


Mounting on a Prisma mounting plate.

Accessories and auxiliaries
Connection of plug-in devices

The same accessories as for fixed devices may be used

Four positions. Two lengths.



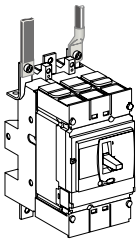
Bars or cables with lugs

The plug-in base is equipped with terminals which, depending on their orientation, serve for front and rear connection.

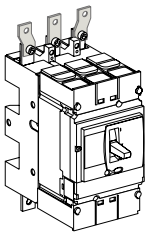
For rear connection of a base mounted on a backplate, the terminals must be replaced

by insulated, long right-angle terminal extensions.

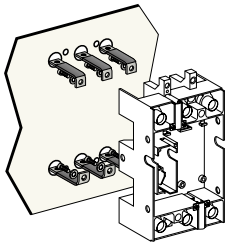
For EasyPact CVS630 devices, connection most often requires the 52.5 or 70 mm pitch spreaders.



Front connection.



Front connection with spreaders.



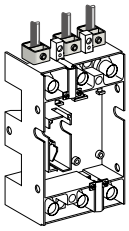
Rear connection of a base mounted on a backplate.

Connection accessories

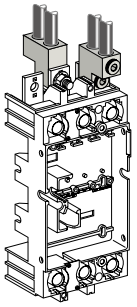
All accessories for fixed devices (bars, lugs, terminal extensions and spreaders) maybe used with the plug-in base.

Bare cables

All terminals may be equipped with bare-cable connectors. See the “Connection of fixed devices” section.



With a 100 to 250 A base.

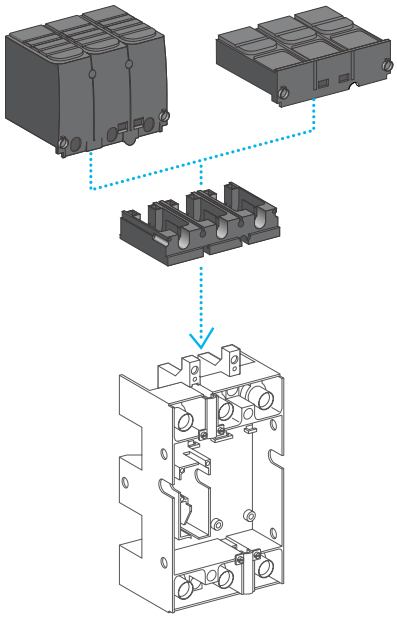


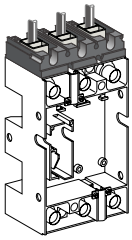
With a 400/630 A base.

Adapter for plug-in base

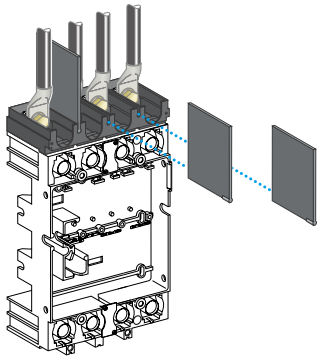
The adapter is a plastic component for the 100 to 250 base and the 400/630 base that enables use of all the connection accessories of the fixed device.

It is required for interphase barriers and the long and short terminal shields.





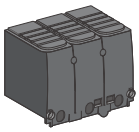
Adapter for 100 to 250 A - 3P base.
Connection with bars or cables with lugs.



Adapter for 400/630 A - 4P base.
Connection with spreaders and interphase barriers.

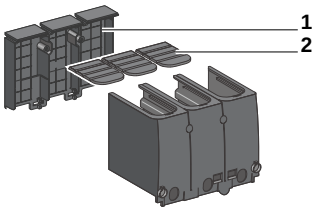
Accessories and auxiliaries
Insulation of live parts

Terminal shields are identical for fixed and plug-in versions and cover all applications up to 1000 V. They exist for the 100 to 250 A and 400/630 A ratings, in long and short versions.

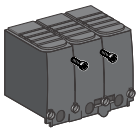


Long terminal shields.

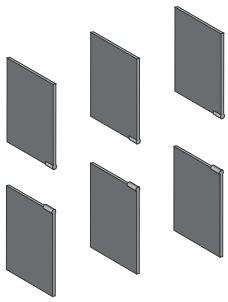
Short terminal shields.



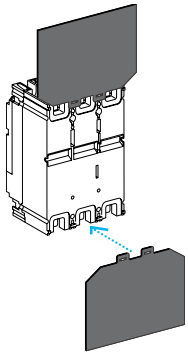
1. Partially cut removable squares
2. Grids with break marks.



1. Partially cut removable squares
2. Grids with break marks.



1. Partially cut removable squares
2. Grids with break marks.



Rear insulating screens.

Terminal shields

Insulating accessories used for protection against direct contact with power circuits. They provide IP40 degree of protection and IK07 mechanical impact protection.

Terminal-shield types

EasyPact CVS100 to 250 and CVS400/630 3P or 4P can be equipped with:

- short terminal shields
- long terminal shields.

All terminal shields have holes or knock-outs in front for voltage-presence indicators.

Short terminal shields

They are used with:

- plug-in version in all connection configurations
- fixed version with rear connection.

Long terminal shields

They are used for front connection with cables or insulated bars.

They comprise two parts assembled with captive screws, forming an IP40 cover.

- The top part is equipped with sliding grids with break marks for precise adaptation to cables or insulated bars.
- The rear part completely blocks off the connection zone. Partially cut squares can be removed to adapt to all types of connection for cables with lugs or copper bars.

Long terminal shields may be mounted upstream and downstream of:

- Fixed devices
- The base of plug-in version, thus completing the insulation provided by the mandatory short terminal shields on the device
- The one-piece spreader for CVS100 to 250
- The 52.5 mm spreaders forCVS400/630.

Terminal shields and pitch

Combination possibilities are shown below.

Circuit breaker	CVS100 to 250	CVS400/630	
Short terminal shields			
Pitch (mm)	35	45	
Long terminal shields			
Pitch (mm)	35	45	52.5

Interphase barriers

Safety accessories for maximum insulation at the power-connection points:

- they clip easily onto the circuit breaker
- single version for fixed devices and adapters on plug-in bases
- not compatible with terminal shields
- the adapter for the plug-in base is required for mounting on plug-in version.

Rear insulating screens

Safety accessories providing insulation at the rear of the device.

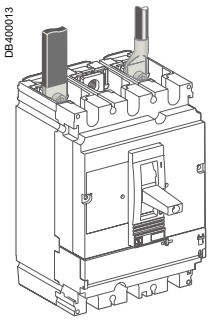
Their use is mandatory for devices with spreaders, installed on backplates, when terminal shields are not used.

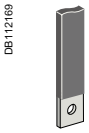
The available screen dimensions are shown below.

Circuit breaker	CVS100 to 250	CVS400/630
3P W x H x thickness (mm)	140 x 105 x 1	203 x 175 x 1.5
4P W x H x thickness (mm)	175 x 105 x 1	275 x 175 x 1.5

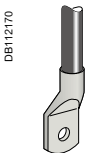
Accessories and auxiliaries
Connection of devices

Fixed circuit breakers are designed for standard front connection using bars or cables with lugs. Cable connectors are available for bare cables. Rear connection is also possible.

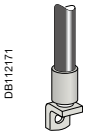




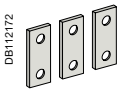
Insulated bar.



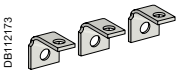
Small lug for copper cables.



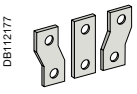
Small lug for Al cables.



Straight terminal extensions.



Right-angle terminal extensions



Spreaders.

Front connection

Bars or cables with lugs

Standard terminals

EasyPact CVS100 to 630 come with terminals comprising snap-in nuts with screws:

- EasyPact CVS100: M6 nuts and screws.
- EasyPact CVS160/250: M8 nuts and screws
- EasyPact CVS400/630: M10 nuts and screws.

These terminals may be used for:

- direct connection of insulated bars or cables with lugs
- terminal extensions.

Interphase barriers or terminal shields are recommended. They are mandatory for certain connection accessories (in which case the interphase barriers are provided).

Bars

When the switchboard configuration has not been tested, insulated bars are mandatory.

Maximum size of bars

EasyPact CVS circuit breaker		100 to 250	400/630
Without spreaders	pitch (mm)	35	45
	maximum bar size (mm)	20 x 3	32 x 8
With spreaders	pitch (mm)	45	52.5
	maximum bar size (mm)	32 x 2	40 x 6

Crimp lugs

There are two modules of lugs, for aluminium and copper cables.

Interphase barriers or long terminal shields must be used with narrow lugs. The lugs are supplied with interphase barriers.

EasyPact CVS circuit breaker		100 to 250	400/630
Copper cables	size (mm²)	150, 185	240, 300
	crimping	hexagonal barrels or punching	
Aluminium cables	size (mm²)	150, 185	240, 300
	crimping	hexagonal barrels	

Terminal extensions

Extensions with anti-rotation ribs can be attached to the standard terminals to provide numerous connection possibilities in little space:

- straight terminal extensions
- right-angle terminal extensions

Spreaders

Spreaders may be used to increase the pitch:

- CVS100 to 250: the 35 mm pitch can be increased to 45 mm
- CVS400/630: the 45 mm pitch can be increased to 52 or 70 mm.

Bars, cable lugs or cable connectors can be attached to the ends.

Pitch (mm) depending on the type of spreader

EasyPact CVS circuit breaker	CVS100 to 250	CVS400/630
Without spreaders	35	45
With spreaders	45	52.5 or 70

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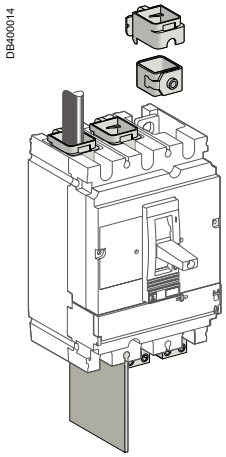
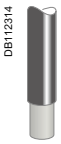
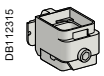
Accessories and auxiliaries
Connection of devices



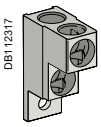


Bare cable.

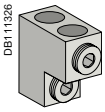


1-cable connector for CVS100 to 250

CVS400/630.



2-cable connector for CVS100 to 250



CVS400/630.

Bare cables
Bare-cable connectors may be used for both copper and aluminium cables.

1-cable connectors for EasyPact CVS100 to 250
The connectors snap directly on to the device terminals or are secured by clips to right-angle and straight terminal extensions as well as spreaders.

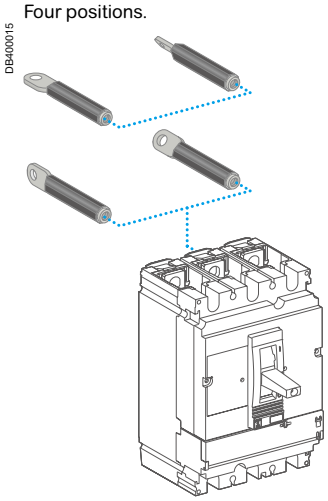
1-cable connectors for EasyPact CVS400 to 630
The connectors are screwed directly to the device terminals.

2-cable connectors for EasyPact CVS100 to 250 and 400/630
The connectors are screwed to device terminals or right-angle terminal extensions.

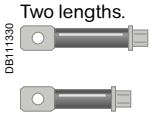
Maximum size of cables depending on the type of connector

EasyPact CVS circuit breaker		100/160	250	400	630
Steel connectors	1.5 to 95 mm²	■			
Aluminium connectors	25 to 95 mm²	■	■		
	120 to 185 mm²	■	■		
	2 cables 50 to 120 mm²	■	■		
	2 cables 35 to 240 mm²			■	■
	35 to 300 mm²			■	■

Four positions.



Two lengths.



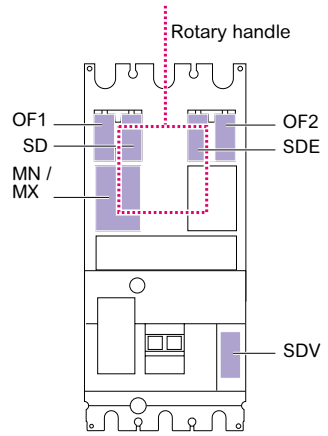
Rear connection
Device mounting on a backplate with suitable holes enables rear connection.

Bars or cables with lugs
Rear connections for bars or cables with lugs are available in two lengths. Bars may be positioned flat, on edge or at 45° angles depending on how the rear connections are positioned.

The rear connections are simply fitted to the device connection terminals. All combinations of rear connection lengths and positions are possible on a given device.

Accessories and auxiliaries
Selection of auxiliaries

DB115583



EasyPact CVS100/160/250

Standard

All EasyPact CVS100/160/250 circuit breakers and switch-disconnectors have slots for the electrical auxiliaries listed below.

5 indication contacts

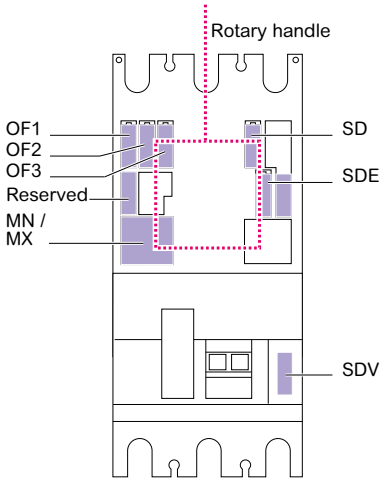
- 2 ON/OFF (OF1 and OF2)
- 1 trip indication (SD)
- 1 fault-trip indication (SDE)
- 1 earth-fault indication (SDV), when the device is equipped with a Vigi module.

1 remote-tripping release

- either 1 MN undervoltage release
- or 1 MX shunt release.

All these auxiliaries can be installed with a rotary handle.

DB115590



EasyPact CVS400/630

Standard

All EasyPact CVS400/630 circuit breakers and switch-disconnectors have slots for the electrical auxiliaries listed below.

6 indication contacts

- 3 ON/OFF (OF3)
- 1 trip indication (SD)
- 1 fault-trip indication (SDE)
- 1 earth-fault indication (SDV), when the device is equipped with a Vigi module.

1 remote-tripping release

- either 1 MN undervoltage release
- or 1 MX shunt release.

All these auxiliaries can be installed with a rotary handle.
The illustration shown (TMD, MA, NA and ETS standard) indicates auxiliary possibilities depending on the type of trip unit.

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Accessories and auxiliaries
Indication contacts

One contact model provides circuit-breaker status indications (OF - SD - SDE - SDV).

Indication contacts.

These common-point changeover contacts provide remote circuit-breaker status information.

They can be used for indications, electrical locking, relaying, etc.

They comply with the IEC 60947-5 international recommendation.

Functions

Breaker-status indications, during normal operation or after a fault
A single type of contact provides all the different indication functions:

- ■ OF (ON/OFF) indicates the position of the circuit breaker contacts
- ■ SD (trip indication) indicates that the circuit breaker has tripped due to:
  - □ an overload
  - □ a short-circuit
  - □ an earth fault (Vigi)
  - □ operation of a voltage release
  - □ operation of the “push to trip” button
  - □ disconnection when the device is ON.

The SD contact returns to de-energised state when the circuit breaker is reset.

- ■ SDE (fault-trip indication) indicates that the circuit breaker has tripped due to:
  - □ an overload
  - □ a short-circuit
  - □ an earth fault (Vigi)
- ■ SDV indicates that the circuit breaker has tripped due to an earth fault. It returns de-energised state when the Vigi module is reset.

Installation

- ■ OF, SD, SDE and SDV functions: a single type of contact provides all these different indication functions, depending on where it is inserted in the device. The contacts clip into slots behind the front cover of the circuit breaker (or the Vigi module for the SDV function).

The SDE function on a CVS100 - 630 A equipped with a magnetic, thermal-magnetic or ETS 2 trip unit requires the SDE adaptor.

Electrical characteristics of auxiliary contacts

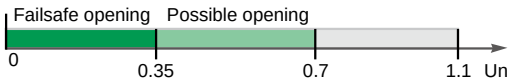
Contacts			Standard				Low level			
Types of contacts			**All**				**OF, SD, SDE, SDV**			
Rated thermal current (A)			6				5			
Minimum load			100 mA at 24 V DC				1 mA at 4 V DC			
Utilisation cat. (IEC 60947-5-1)			AC12	AC15	DC12	DC14	AC12	AC15	DC12	DC14
Operational current (A)	24 V	AC/DC	6	6	6	1	5	3	5	1
	48 V	AC/DC	6	6	2.5	0.2	5	3	2.5	0.2
	110 V	AC/DC	6	5	0.6	0.05	5	2.5	0.6	0.05
	220/240 V	AC	6	4	-	-	5	2	-	-
	250 V	DC	-	-	0.3	0.03	5	-	0.3	0.03
	380/440 V	AC	6	2	-	-	5	1.5	-	-

Accessories and auxiliaries
Remote tripping

DB125550

MX or MN voltage release.

DB115605



Opening conditions of the MN release.

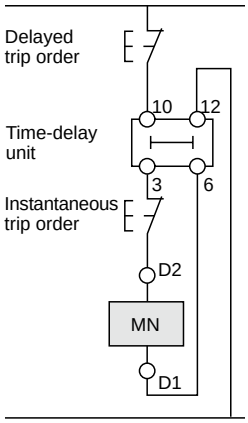
DB115606

Closing conditions of the MN release.

PB103752-32

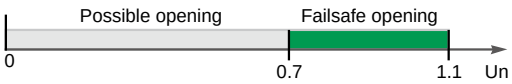
MN release with a time-delay unit.

DB115607



Wiring diagram for emergency-off function with MN + time-delay unit.

DB115608



Opening conditions of the MX release.

MN undervoltage release

- This release trips the circuit breaker when the control voltage drops below a tripping threshold
- The tripping threshold is between 0.35 and 0.7 times the rated voltage
- Circuit breaker closing is possible only if the voltage exceeds 0.85 times the rated voltage.

Characteristics

Power supply	V AC	50/60 Hz: 24 - 48 - 100/130 - 200/240
		50 Hz: 380/415 60 Hz: 208/277
	V DC	12 - 24 - 30 - 48 - 60 - 125 -250
Operating threshold	Opening	0.35 to 0.7 Un
	Closing	0.85 Un
Operating range		0.85 to 1.1 Un
Consumption (VA or W)		Pick-up: 10 - Hold: 5
Response time (ms)		50

Time-delay unit for an MN release

A time delay unit for the MN release eliminates the risk of nuisance tripping due to a transient voltage dip lasting ⩽ 200 ms. For shorter micro-outages, a system of capacitors provides temporary supply to the MN at U > 0.7 to ensure no tripping.

The correspondence between MN releases and time-delay units is shown below.

Power supply	Corresponding MN release
Unit with fixed delay 200 ms	
48 V AC	48 V DC
220 / 240 V AC	250 V DC
Unit with adjustable delay (0.5s, 0.9s, 1.5s, 3s)	
48 - 60 V AC/DC	48 V DC
100 - 130 V AC/DC	125 V DC
220 - 250 V AC/DC	250 V DC

MX shunt release

The MX release opens the circuit breaker via an impulse-type (⩾ 20 ms) or maintained order.

Opening conditions

When the MX release is supplied, it automatically opens the circuit breaker. Opening is ensured for a voltage U ⩾ 0.7 x Un.

Characteristics

Power supply	V AC	50/60 Hz: 24 - 48 - 100/130 - 200/240
		50 Hz: 380/415 60 Hz: 208/277
	V DC	12 - 24 - 30 - 48 - 60 - 125 -250
Operating range		0.7 to 1.1 Un
Consumption (VA or W)		Pick-up: 10
Response time (ms)		50

Circuit breaker control by MN or MX

When the circuit breaker has been tripped by an MN or MX release, it must be reset before it can be reclosed.

MN or MX tripping takes priority over manual closing.

In the presence of a standing trip order, closing of the contacts, even temporary, is not possible.

Connection using wires up to 1.5mm^2 to integrated terminal blocks.

Note: circuit breaker opening using an MN or MX release must be reserved for safety functions. This type of tripping increases wear on the opening mechanism. Repeated use reduces the mechanical endurance of the circuit breaker by 50 %.

Accessories and auxiliaries
Rotary handles

There are two types of rotary handle:
- direct rotary handle
- extended rotary handle.

PB106453

EasyPact CVS with a rotary handle.

PB106454

EasyPact CVS with an extended rotary handle installed at the back of a switchboard, with the keylock option and key.

PB106455

PB106456

Direct rotary handle

Standard handle

Degree of protection IP40, IK07.

The direct rotary handle maintains:
- visibility of and access to trip-unit settings
- suitability for isolation
- indication of the three positions O (OFF), I (ON) and tripped
- access to the "push to trip" button.

Device locking

The rotary handle facilitates circuit-breaker locking.
- Padlocking:
  - standard situation, in the OFF position, using 1 to 3 padlocks, shackle diameter 5 to 8 mm, not supplied

Extended rotary handle

Degree of protection IP54, IK08.

The extended rotary handle makes it possible to operate circuit breakers installed at the back of switchboards, from the switchboard front.

It maintains:
- visibility of and access to trip-unit settings
- suitability for isolation
- indication of the three positions O (OFF), I (ON) and tripped.

Device and door padlocking

Padlocking locks the circuit-breaker handle and disables door opening:
- standard situation, in the OFF position, using 1 to 3 padlocks, shackle diameter 5 to 8 mm, not supplied

Parts of the extended rotary handle
- A unit that replaces the front cover of the circuit breaker (secured by screws).
- An assembly (handle and front plate) on the door that is always secured in the same position, whether the circuit breaker is installed vertically or horizontally.
- An extension shaft that must be adjusted to the distance. The min/max distance between the back of circuit breaker and door is:
  - 185…600 mm for EasyPact CVS100 to 250
  - 209…600 mm for EasyPact CVS 400/630.

Manual source-changeover systems

Additional accessory interlocks two devices with rotary handle to create a source-changeover system. Closing of one device is possible only if the second is open.

This function is compatible with direct or extended rotary handles.

Up to three padlocks can be used to lock in the OFF or ON position.

Accessories and auxiliaries
Motor Mechanism

EasyPact CVS Motor Mechanism can be used on CVS100-630 circuit breakers / switch disconnectors to achieve remote closing and opening.

When equipped with a motor mechanism module, EasyPact CVS circuit breakers feature very high mechanical endurance as well as easy and reliable operation:

- Remote control via electric signal
- Direct local control on the front panel of the circuit breaker through the manual operating mechanism

1. **Push-to-trip button**
2. **Position indicator (ON/OFF/TRIP)**
3. **Slide cover for Manual/Auto mode selection switch**
4. **Handle for Manual mode operation**
5. **Handle insertion point**

Operation

The type of operation is selected using the slide cover for manual/auto mode.

Automatic
When the switch is in the “auto” position, circuit-breaker ON and OFF is controlled by two impulse-type or maintained signals.

Manual
When the switch is in the “manual” position, circuit-breaker ON and OFF is controlled by the handle.

Installation and Connections

All installation (fixed, plug-in) and connection possibilities are maintained. Motor-mechanism module connections are made behind its front cover to integrated terminals, for cables up to 2.5mm².

Characteristics				
EasyPact CVS Motor Mechanism			MT100 to 250	MT400/630
Response time (ms)		opening	350	500
		closing	700	1000
Operating frequency		cycles/minute max.	3	2
Control voltage (V)		DC	110-230	
		AC 50/60Hz	110-230, 400	
Electrical endurance			25000	20000
Consumption	DC(W)	opening	150	300
		closing		
	VC(VA)	opening		
		closing		

Notes: CVS Motor Mechanism is not applicable to IT earthing system.

Accessories and auxiliaries

Additional measurement module:

PowerLogic™ PowerTag Energy Monoconnect 250 A & 630 A

PowerLogic PowerTag M250 3P

> PowerTag Energy Web

> PowerTag Energy Catalog

PowerTag Energy M250/M630 is a class 1 energy meter, as per IEC 61557-12, that incorporates features required to perform accurate real-time measurements (U, V, I, P, PF) and get energy values up to 250 A or 630 A, depending on the model.

Used together with a gateway or a Panel Server to collect and process the data, the PowerTag Energy M250/M630 provides circuit monitoring and diagnosis down to load level.

The PowerTag Energy M250/M630 is designed for CVS up to 630A for 3P and 3P+N electrical networks.

Thanks to its integrated design, the PowerTag Energy M250/M630 does not require any specific wiring and is compatible with the same connection accessories as the device it is mounted on.

Functions

PowerTag Energy M250/M630 measures the following values in accordance with the IEC 61557-12 standard

PMD-II/DD/K70/1:

- Energy (4 quadrants):
  - Active energy (kWh): total and partial, delivered and received.
  - Active energy per phase (kWh): total.
  - Reactive energy (kVARh): partial, delivered and received.
- Real-time measurement values:
  - Voltages (V): phase-to-phase (U12, U23, U31) and phase-to-neutral (V1N, V2N, V3N).
  - Currents (A): per phase (I1, I2, I3).
  - Power:
    - Active power (W): total and per phase.
    - Reactive power (VAR): total.
    - Apparent power (VA): total.
  - Frequency (Hz).
  - Power factor.
- Voltage loss alarms:
  - PowerTag Energy sends a “voltage loss” alarm and the current-per-phase value before being de-energized.
  - At “voltage loss”, PowerTag Energy adds an overload alarm if the current is higher than the rated current of the associated protective device.

Note: Functions listed above depends on Concentrator/Gateway.

Accessories and auxiliaries

Additional measurement module:

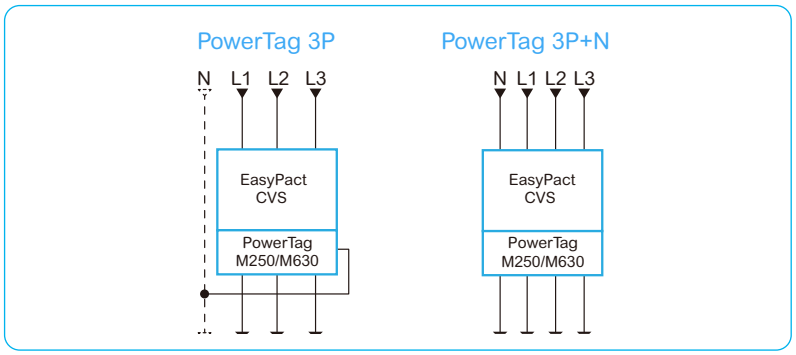
PowerLogic™ PowerTag Energy Monoconnect 250 A & 630 A

Installation

The module is self-powered and is installed for fixed devices directly on the bottom side of the circuit breaker. For plug-in devices, it has to be installed on the base itself, top or bottom.

PowerTag Energy M250/M630 3P has to be used with 3P devices, and an external neutral voltage tap is provided in case of the installation has a neutral to provide phase-to-neutral voltages, active energy per phase and power per phase.

PowerTag Energy M250/M630 3P+N has to be used with 4P devices.



Important notice : A derating coefficient may apply for the circuit-breaker on which the PowerTag is mounted on. Refer to the temperature derating table.

In case of retrofit, following points have to been checked:
- Clearance to be able to add PowerTag Energy module and to respect bending radius of cables.
- Condition of power connectors: to be replaced if damaged.
- Tightening torques depending on the connector used.

Accessories and auxiliaries
Additional measurement module:
PowerLogic™ PowerTag Energy Monoconnect 250 A & 630 A

Technical specifications

Main characteristics				
Rated voltage	Un	Phase-to-neutral		230 V AC ± 20 %
		Phase-to-phase		400 V AC ± 20 %
Frequency				50/60 Hz
Maximum current	Imax			250 A / 630 A
Maximum operating current				1.2 x Imax
Saturation current				2 x Imax
Maximum consumption				3.7 VA
Starting current	Ist			160 mA / 400 mA
Basic current	Ib			40 A / 100 A
Additional characteristic				
Operating temperature				-25 °C to +70 °C
Storage temperature				-40 °C to +85 °C
Overvoltage category		As per IEC 61010-1		Cat. IV
Measuring category		As per IEC 61010-2-030		Cat. III
Pollution degree				3
Altitude				Up to 2000 m without derating (1)
Degree of protection device				IP20
				IK07
Radio-frequency communication				
ISM band 2.4 GHz				2.4 GHz to 2.4835 GHz
Channels		As per IEEE 802.15.4		11 to 26
Isotropic Radiated Power		Equivalent (EIRP)		0 dBm
Maximum transmission time				< 5 ms
Channel occupancy		For 1 device		messages sent every 5 seconds

Characteristics of measuring functions				
Function	Symbol	Performance category as per IEC 61557-12 (PMD-II/DD/K70/1)		Measuring range (250 A / 630 A)
		Class	Measuring range (250 A / 630 A)	
Total active power (Active power per phase)	P	1	4 to 250 A / 10 to 630 A	88 W (29 W) to 416 kW / 222 W (74 W) to 1048 kW
Total reactive power	Q_A	2		88 VAR to 416 kVAR / 221 VAR to 1048 kVAR
Total apparent power	S_A	2		88 VA to 416 kVA / 221 VA to 1048 kVA
Active energy: per phase, total, partial	E_a	1		0 to 281.10⁹ kWh
Partial reactive energy	E_{rA}	2		0 to 281.10⁹ kVARh
Frequency	f	1	45 to 55 Hz	45 to 65 Hz
Phase current	I	1	8 to 250 A / 20 to 630 A	160 mA to 500 A / 400 mA to 1260 A
Voltages (Line to Line)	U	0.5	Un ± 20 %	320 to 480 VAC
Power factor	PF_A	1	From 0.5 inductive to 0.8 capacitive	-1 to 1

(1) Above 2000 m, please consult us.

Accessories and auxiliaries

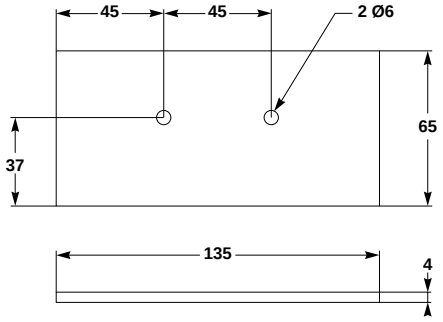
Additional measurement module:

PowerLogic™ PowerTag Energy Monoconnect 250 A & 630 A

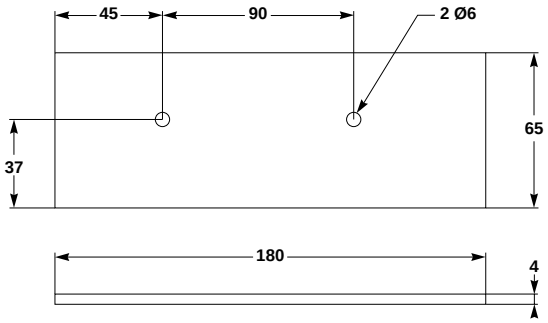
			PowerTag Energy 250 A		PowerTag Energy 630 A	
						
Products (AC network)		**Mounting position**	**M250 3P**	**M250 3P+N**	**M630 3P**	**M630 3P+N**
EasyPact						
Circuit breakers						
CVS 100/250 Plug-in (mounted on the base)	3P	Top/Bottom	☑	-	-	-
	4P	Top/Bottom	-	☑	-	-
CVS 400/630 Plug-in (mounted on the base)	3P	Top/Bottom	-	-	☑ (2)	-
	4P	Top/Bottom	-	-	-	☑ (1) (2)
CVS 100/250 Fixed	3P	Bottom	☑	-	-	-
	4P	Bottom	-	☑	-	-
CVS 400/630 Fixed	3P	Bottom	-	-	☑	-
	4P	Bottom	-	-	-	☑

(1) neutral on the right when mounted on top side
(2) when plate mounted, need to add an intercalary wedging plate under the PowerTag module with following dimensions:

3P



3P + N



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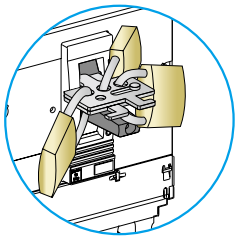
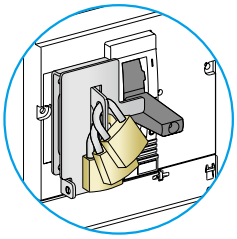
Accessories and auxiliaries
Locks and sealing accessories

DB400025

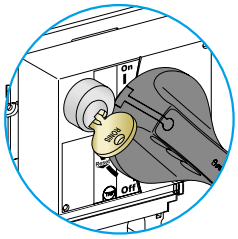


DB400026



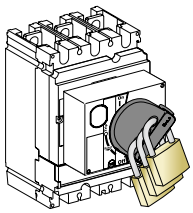
Toggle locking using padlocks and an accessory:
Removable device — Fixed device attached to the case.

DB400027

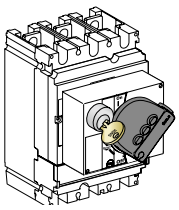


Rotary-handle locking using a keylock.

DB400028

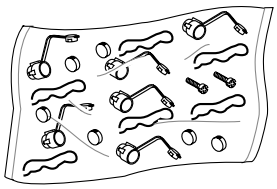


DB400029



Rotary-handle locking using a padlock or a keylock.

DB115033



Sealing accessories.

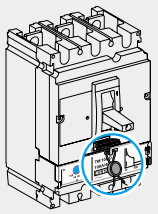
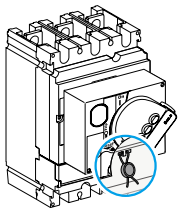
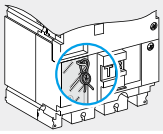
Locks

Locking in the OFF position guarantees isolation as per IEC 60947-2. Padlocking systems can receive up to three padlocks with shackle diameters ranging from 5 to 8 mm (padlocks not supplied). Certain locking systems require an additional accessory.

Control device	Function	Means	Required accessories
Toggle	Lock in OFF position	Padlock	Removable device
	Lock in OFF or ON position	Padlock	Fixed device
Direct rotary handle — Standard	Lock in ■ OFF position ■ OFF or ON position (1)	Padlock	-
		Keylock	Locking device + keylock
Extended rotary handle	Lock in ■ OFF position ■ OFF or ON position (1) with door opening prevented (2)	Padlock	-
	Lock in OFF position	Padlock	UL508 control accessory
	■ OFF or ON position (1) inside the switchboard	Keylock	Locking device + keylock

(1) Following a simple modification of the mechanism.
(2) Unless door locking has been voluntarily disabled.

Sealing accessories

Toggle control	DB400017 
Rotary handle	DB400018 
Access to Vigi-module settings	DB400019 
Types of seals	**Protection cover for settings**
Protected operations	■ modification of settings.

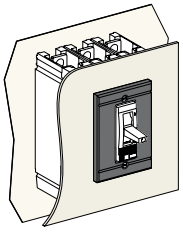
Escutcheons are an optional feature mounted on the switchboard door. They increase the degree of protection to IP40, IK07. Protection collars maintain the degree of protection, whatever the position of the device (connected, disconnected).

IP40 escutcheons for fixed devices

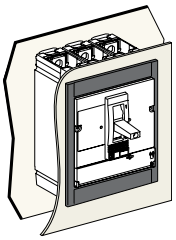
There are three types of an escutcheon with a gasket which are screwed to the door cut-out:

- three escutcheons for all control types (toggle, handle or motor mechanism)
- a wide model for Vigi modules that can be combined with the above.

DB400041

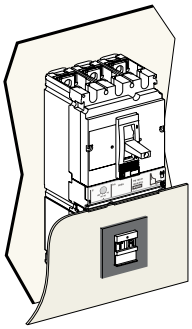


DB400031



Escutcheon for toggle without and with access to the trip unit.

DB400032



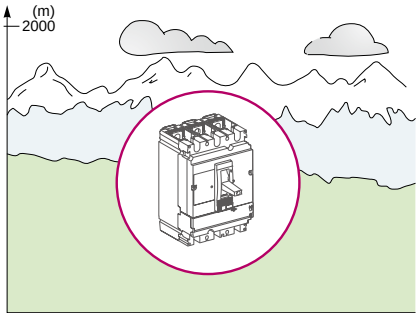
Escutcheon for Vigi module.

Installation recommendations

Installation recommendations

Operating conditions and temperature derating

When thermal-magnetic trip units are used at ambient temperatures other than 40 °C, the Ir pick-up is modified.



Electronic trip units are not affected by variations in temperature. If the trip units are used in high-temperature environments, the ETS setting must nevertheless take into account the temperature limits of the circuit breaker.

Altitude derating

Altitude does not significantly affect the characteristics of EasyPact CVS circuit breakers up to 2000 m. Above this altitude, it is necessary to take into account the decrease in the dielectric strength and cooling capacity of air.

Altitude (m)	2000	3000	4000	5000
Impulse withstand voltage Uimp (kV)	8	7	6	5.2
Current ratio	1,00	0,96	0,93	0,90
Ui	690	600	520	450
Ue	440	400	400	380

Vibrations

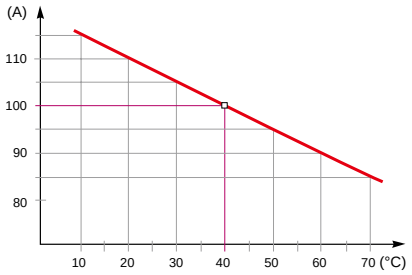
CVS devices resist electromagnetic or mechanical vibrations.
Tests are carried out in compliance with standard IEC 60068-2-6 for the levels required by merchant-marine inspection organisations (Veritas, Lloyds, etc.):
- 2 to 13.2 Hz: amplitude ±1 mm
- 13.2 to 100 Hz: constant acceleration 0.7 g.

Excessive vibration may cause tripping, breaks in connections or damage to mechanical parts.

Degree of protection

CVS circuit breakers have been tested for degree of protection (IP) and mechanical impact protection (IK). See page A-3.

DB115053



Temperature derating curve for CVS100.

The overload protection is calibrated at 40 °C in the lab. This means that when the ambient temperature is less than or greater than 40 °C, the Ir protection pick-up is slightly modified.
To obtain the tripping time for a given temperature:
- see the tripping curves for 40 °C (see pages D-2 and D-3)
- determine tripping times corresponding to the Ir value (thermal setting on the device), corrected for the ambient temperature as indicated in the tables below.

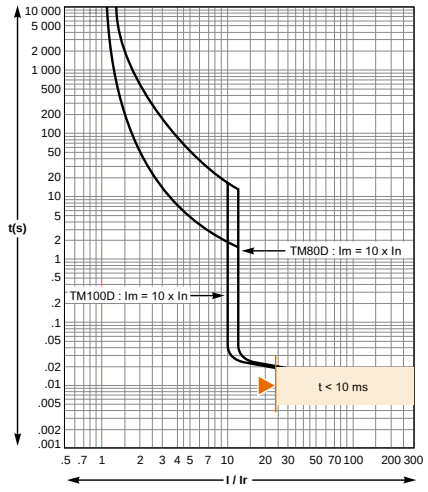
Settings of CVS100 to 630 equipped with TM-D or TM-G* trip units as a function of the temperature

The table indicates the real Ir (A) value for a given rating and temperature.

Rat. (A)	Temperature (°C) 10	15	20	25	30	35	40	45	50	55	60	65	70
16	18.4	18	18	18	17	16.6	16	15.6	15.2	14.8	14.5	14	13.8
25	28.8	28	27.5	27	26.3	25.6	25	24.5	24	23.5	23	22	21
32	36.8	36	35.2	34.4	33.6	32.8	32	31.3	30.5	30	29.5	29	28.5
40	46	45	44	43	42	41	40	39	38	37	36	35	33.5
50	57.5	56	55	54	53	51	50	49	47	46	44	43	41
63	73	72	70	68	67	65	63	61	59	57	55	53	50
80	92	90	88	86	84	82	80	78	75.5	73	70.7	68	65
100	114	112	110	107	105	102.5	100	97	95	92.0	89	86	83
125	144	141	138	134	131	128	125	122	119	116	113	109	106
160	184	180	176	172	168	164	160	156	152	148	144	140	136
200	230	225	220	215	210	205	200	195	190	185	180	175	170
250	288	281	277	269	263	256	250	244	238	231	225	219	213
320	365	358	350.5	343	335.6	328	320	312	303.6	295	286	277	267.7
400	456.6	447.7	438.6	429	419.7	410	400	390	379.3	368.5	357.3	345.8	334
500	558.6	549	539.7	530	520.3	510.2	500	489.6	479	468	457	445.4	433.6
600	672	660.5	649	637	625	612.6	600	587	574	560.6	547	532.7	518

* For TM-G, the rating is from 80A to 250A.

DB400102



Reflex tripping.

Thermal-protection curve with minimum and maximum values.

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Operating conditions and temperature derating

CVS 100-630 (equipped with ETS 2.2/2.3 electronic trip unit)

The table below indicates the maximum long-time (LT) protection setting Ir (A) depending on the ambient temperature.

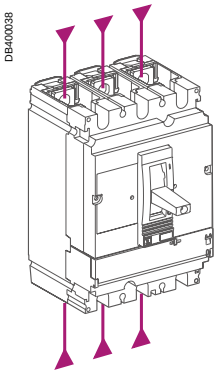
Type of device	Rating (A)	Temperature (°C) 40	45	50	55	60	65	70
CVS100/160 + ETS 2.2								
Fixed, plug-in	100	no derating						
	160	no derating						
CVS250 + ETS 2.2								
Fixed	250	250	250	250	245	237	230	225
Plug-in	250	250	245	237	230	225	220	215
CVS400 + ETS 2.3								
Fixed	400	400	400	400	390	380	370	360
Plug-in	400	400	390	380	370	360	350	340
CVS630 + ETS 2.3								
Fixed	630	630	615	600	585	570	550	535
Plug-in	630	570	550	535	520	505	490	475

Additional derating coefficient for an add-on module

For fixed or plug-in circuit breakers equipped with an add-on module, the coefficients in the table below must be applied.

Type of device	Circuit breaker	Trip unit	Plug-in	Vigi add-on module	PowerTag Energy
Fixed	CVS100	TMD100 ETS 2.2	1	1	1
	CVS160	TMD160 ETS 2.2	1	1	1
	CVS250	TMD250 ETS 2.2	1	1	1
	CVS400	TMD320 TMD400 ETS 2.3	0.96 0.92 1	0.98 0.94 0.97	1
	CVS630	TMD500 TMD600 ETS 2.3	0.88 0.82 0.9	0.9 0.89 0.9	0.9 0.9 1
Plug-in	CVS100	TMD100 ETS 2.2	-	1	1
	CVS160	TMD160 ETS 2.2	-	1	0.84
	CVS250	TMD250 ETS 2.2	-	0.84 0.86	0.84
	CVS400	TMD320 TMD400 ETS 2.3	-	0.88 0.88 0.97	0.87 0.87 1
	CVS630	TMD500 TMD600 ETS 2.3	-	0.73 0.73 0.9	0.75 0.75 1

Installation in switchboards
Power supply and weights



Power supply from the top or bottom

CVS circuit breakers can be supplied from either the top or the bottom, even when equipped with a Vigi earth-leakage protection module, without any reduction in performance. This capability facilitates connection when installed in a switchboard.
All connection and insulation accessories can be used on circuit breakers supplied either from the top or bottom.

Weight

The table below presents the weights (in kg) of the circuit breakers and the main accessories.

Type of device		Circuit breakers			Vigi module	PowerTag Energy	Motor Mechanism
		CVS with TM-D	CVS with TM-G	CVS with ETS			
CVS100	3P 3D	1.64	-	2.04	0.87	0.25	0.99
	4P 4D	2.01	-	2.81	1.13	0.30	
	4P 3D	2.01	-	2.81	1.13	0.30	
CVS160	3P 3D	1.60	1.60	2	0.87	0.25	
	4P 4D	2.08	-	2.88	1.13	0.30	
	4P 3D	2.08	2.08	2.88	1.13	0.30	
CVS250	3P 3D	1.79	1.79	2.19	0.87	0.25	
	4P 4D	2.39	-	3.19	1.13	0.30	
	4P 3D	2.39	2.39	3.19	1.13	0.30	
CVS400	3P 3D	4.37	-	4.71	2.8	0.8	2.7
	4P 4D	5.83	-	6.32	3	1	
	4P 3D	5.83	-	6.32	3	1	
CVS630	3P 3D	4.80	-	5.24	2.8	0.8	
	4P 4D	6.40	-	7.14	3	1	
	4P 3D	6.40	-	7.14	3	1	

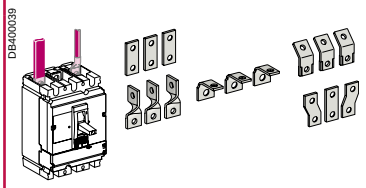
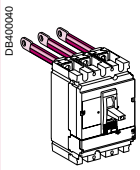
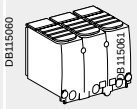
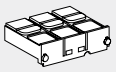
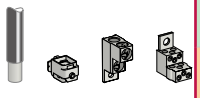
Installation in switchboards
Safety clearances and minimum distances

General rules
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
- segregate the busbars using insulating screens.

For CVS100 to 630 devices, terminal shields and interphase barriers are recommended and may be mandatory depending on the operating voltage of the device and type of installation (fixed, withdrawable, etc.).

Power connections
The table below indicates the rules to be respected for CVS100 to 630 devices to ensure the insulation of live parts for fixed devices.

CVS100 to 630: rules to be respected to ensure the insulation of live parts

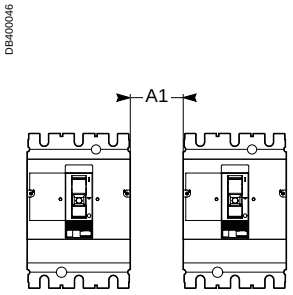
Type of connection		Fixed, front connection			Fixed, rear connection
					
Possible, recommended or mandatory accessories: With:		No insulating accessory	Interphase barriers 	Long terminal shields (1) 	Short terminal shields 
operating voltage	type of conductor				
≤ 440 V	Insulated bars 	Possible	Possible	Possible	Recommended
	Extension terminals Cables + crimp lugs 	No	Mandatory (supplied)	Possible (instead of ph. barriers)	Recommended
	Bare cables + connectors 	Possible for CVS100 to 250	Possible for CVS100 to 250	Possible for CVS100 to 250	Recommended
		No	Mandatory (supplied)	Possible (instead of ph. barriers)	

(1) Long terminal shields provide a degree of protection of IP40 (ingress) and IK07 (mechanical impact).

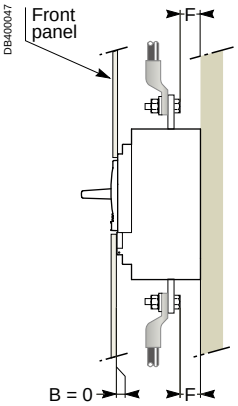
Installation in switchboards
Installation example

Safety clearance

Minimum distance between two adjacent circuit breakers



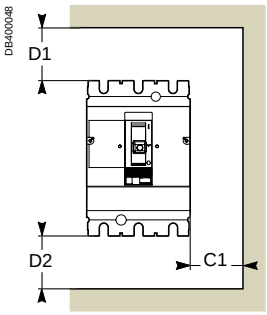
Minimum distance between circuit breaker and front or rear panels



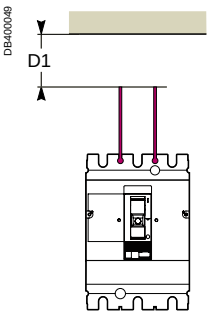
Bare or painted sheet metal

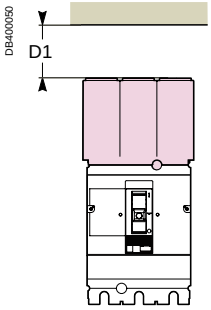
Note: if F < 8 mm: an insulating screen or long terminal shield is mandatory.

Minimum distance between circuit breaker and top, bottom or side panels



Devices without accessories.





Devices with interphase barriers or long terminal shields.

Minimum safety clearances for CVS100 to 630

Dimensions (mm) circuit breaker	Insulation, insulated bars or painted sheet metal			Bare sheet metal			
	C1	D1	D2	C1	D1	D2	A1
CVS100-250 U ≤ 440V	0	30	30	5	35	35	0
CVS400-630 U ≤ 440V	0	30	30	5	60	60	0

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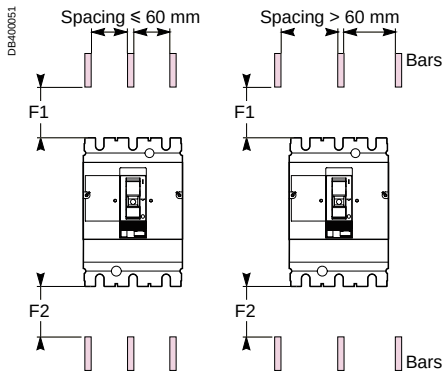
Installation in switchboards
Installation example



Live busbars.

Clearances with respect to live bare busbars

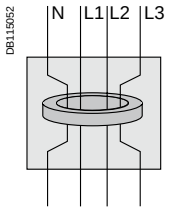
Minimum clearances for CVS100 to 630

Operating voltage	Clearances with respect to live bare busbars			
	spacing ⩽ 60 mm		spacing > 60 mm	
	F1	F2	F1	F2
U < 440 V	350	350	80	80
U = 440 V	350	350	120	120

These clearances can be reduced for special installations as long as the configuration is checked by tests.

Power loss / Resistance
EasyPact CVS equipped with thermal magnetic trip units

EasyPact CVS thermal power loss values are used to calculate total temperature rise in the switchboard in which the circuit breakers are installed.



With a Vigi module, the deviation of the N and L3 bars required to pass through the toroid results in higher power losses compared to those of the L1 and L2 bars.

The values indicated in the tables below are typical values for a device at full rated load and 50/60 Hz.

Power loss per pole (P/pole) in Watts (W)
The value indicated is the power loss at I_N, 50/60 Hz, for a three-pole or four-pole circuit breaker. Measurement and calculation of power loss are carried out in compliance with the recommendations of Annex G of standard IEC 60947-2.

Resistance per pole (R/pole) in milliohms (mΩ)
The value of the resistance per pole is provided as a general indication for a new device.
The value of the contact resistance must be determined on the basis of the measured voltage drop, in accordance with the manufacturer's test procedure (ABT instruction document no. 1 - BEE - 02.2 -A).
Note: this measurement is not sufficient to determine the quality of the contacts, i.e. the capacity of the circuit breaker to carry its rated current.

Additional power loss
Additional power loss is equal to the sum of the power dissipated by the following:
- Vigi module: note that the deviation of the N and L3 bars required to pass through the toroid results in higher power losses compared to those of the L1 and L2 bars (diagram opposite). When calculating total power loss, use L1, L2, L3 for a 3P device and N, L1, L2, L3 for a 4P device
- disconnecting contacts (plug-in and withdrawable devices)
- ammeter module
- transformer module.

Calculation of total power loss
Total power loss at full rated load and 50/60 Hz is equal to the sum of the device and additional power losses per pole multiplied by the number of poles (2, 3 or 4). If a Vigi module is installed, it is necessary to differentiate between N and L3 on one hand and L1 and L2 on the other.

EasyPact CVS100 to 630 equipped with TM-D trip units

Type of device 3/4 poles	Fixed device Rat. (A)	R/pole	P/pole
CVS100	16	11.91	3.05
	25	6.91	4.32
	32	4.43	4.54
	40	4.125	6.60
	50	3.30	8.25
	63	1.92	7.62
	80	1.86	11.90
	100	1.37	13.70
CVS160	100	0.77	7.70
	125	0.69	10.78
	160	0.55	14.08
CVS250	160	0.46	11.78
	200	0.39	15.60
	250	0.3	18.75
CVS400	320	0.24	24.00
	400	0.19	30.00
CVS630	500	0.17	40.80
	600	0.15	53.80

Power loss / Resistance
EasyPact CVS equipped with thermal magnetic trip units

EasyPact CVS100 to 630 equipped with TM-D trip units

Type of device 3/4 poles	Rat.(A)	Additional power/pole		Plug-in	PowerTag Energy module
		Vigi (N,L3)	Vigi (L1,L2)		
CVS100	16	0	0	0	0
	25	0	0	0.1	0
	32	0.06	0.03	0.15	0
	40	0.1	0.05	0.2	0
	50	0.15	0.08	0.3	0.1
	63	0.3	0.15	0.4	0.1
	80	0.4	0.2	0.6	0.1
	100	0.7	0.35	1	0.2
CVS160	100	0.7	0.35	1	0.2
	125	1.1	0.55	1.6	0.3
	160	1.8	0.9	2.6	0.5
CVS250	160	1.8	0.9	2.6	0.5
	200	2.8	1.4	4	0.8
	250	4.4	2.2	6.3	1.3
CVS400	320	2.05	1.03	6.14	2.24
	400(1)	2.86	1.43	8.57	2.24
CVS630	500(2)	4.08	2.04	12.2	5.56
	600(3)	5.7	2.85	17.1	5.56

(1) The power loss value for Vigi module is given for 378A
(2) The power loss value for Vigi module is given for 451A
(3) The power loss value for Vigi module is given for 534A

EasyPact CVS100 to 630 equipped with MA trip units

Type of device 3/4 poles	Fixed device		
	Rat. (A)	R/pole	P/pole
CVS100	2.5	148.91	0.93
	6.3	99.51	3.95
	12.5	4.54	0.71
	25	2.15	1.34
	50	1.16	2.90
	100	0.52	5.20
CVS160	150	0.38	8.55
CVS250	220	0.3	14.52
CVS400	320	0.15	15.40
CVS630	500	0.13	32.20

Type of device 3/4 poles	Rat.(A)	Additional power/pole		Plug-in	PowerTag Energy module
		Vigi (N,L3)	Vigi (L1,L2)		
CVS100	2.5	0	0	0	0
	6.3	0	0	0	0
	12.5	0	0	0	0
	25	0	0	0.1	0
	50	0.2	0.1	0.3	0.1
	100	0.7	0.35	1	0.2
CVS160	150	1.35	0.68	2.6	0.5
CVS250	220	2.9	1.45	4.89	1
CVS400	320	3.2	1.6	6.14	1.43
CVS630	500	13.99	7	15	3.5

Power loss / Resistance
EasyPact CVS equipped with electronic trip units

The values indicated in the table below are typical values for a device at full rated load and 50/60 Hz. The definitions and information are the same as that for circuit breakers equipped with thermal-magnetic trip units.

CVS100 to 630 equipped with electronic trip units

Type of device 3/4 poles	Fixed device		
	Rat. (A)	R/pole	P/pole
CVS100	40	0.658	1.29
CVS100	100	0.562	4.36
CVS160	160	0.309	9.31
CVS250	250	0.452	18.99
CVS400	400	0.15	24.00
CVS630	630	0.12	47.63

Type of device 3/4 poles	Rat. (A)	Additional power/pole		Plug-in	PowerTag Energy module
		Vigi (N,L3)	Vigi (L1,L2)		
CVS100	40	0.1	0.06	0.2	0
CVS100	100	0.7	0.35	1	0.2
CVS160	160	1.8	0.9	2.6	0.5
CVS250	250	4.4	2.2	6.3	1.3
CVS400	400	3.2	1.6	9.6	2.24
CVS630	630(4)	6.5	3.25	19.49	5.56

(4) The power loss value for Vigi module is given for 570A

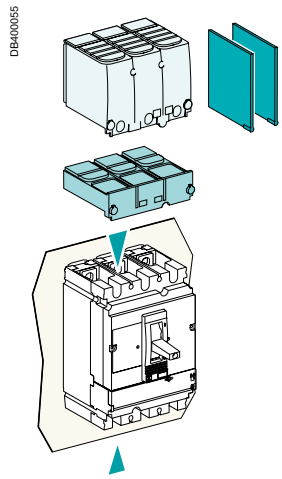
Dimensions and connection

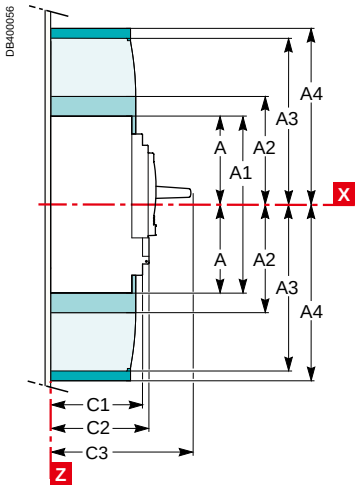
Dimensions and connection

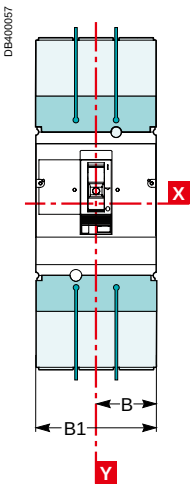
Dimensions and mounting
EasyPact CVS100 to 630

Dimensions

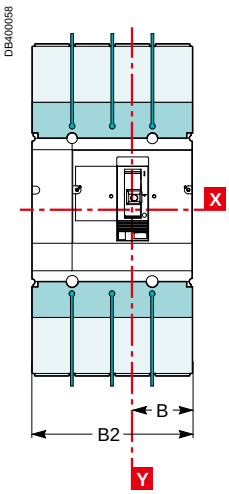
3P







4P

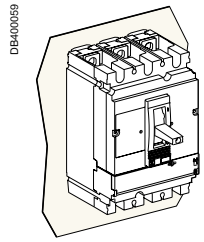


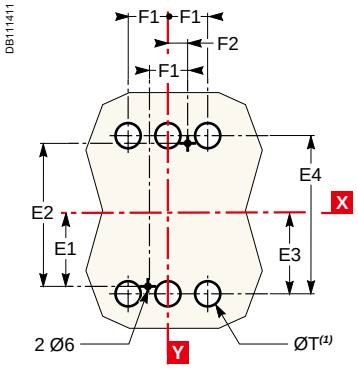
Interphase barriers.
Short terminal shields.

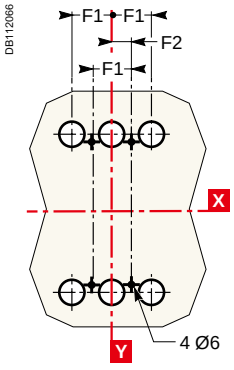
Long terminal shields (also available for CVS400/630 spreaders with 52.5 mm pitch: B1 = 157.5 mm, B2 = 210 mm).

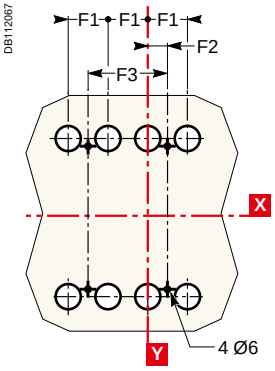
Mounting

	CVS100 to 250	CVS400/630	CVS100 to 630
On backplate	3P	3P	4P



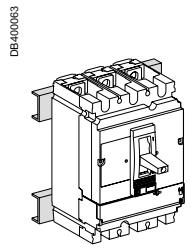


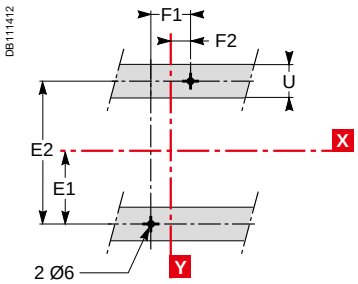


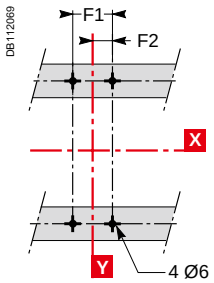


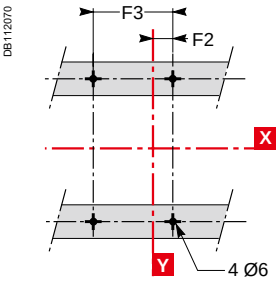
(1) The ØT holes are required for rear connection only.

On rails	3P	3P	4P

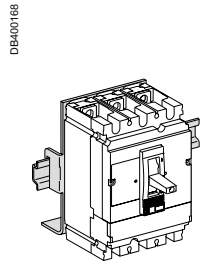


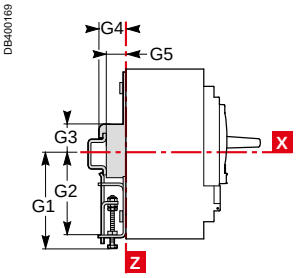






On DIN rail with adaptor plate (CVS100 to 250)





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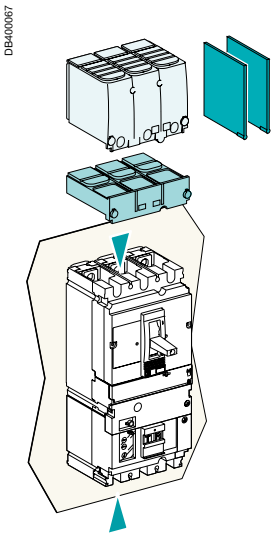
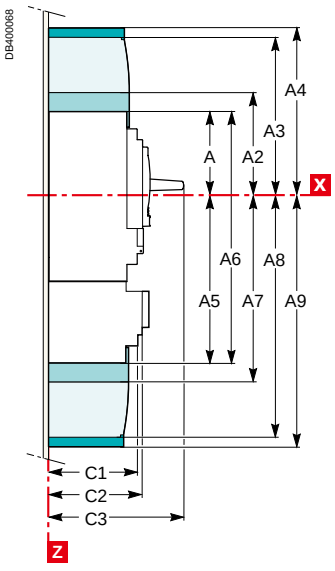
Dimensions and mounting
Vigi CVS100 to 630

Dimensions

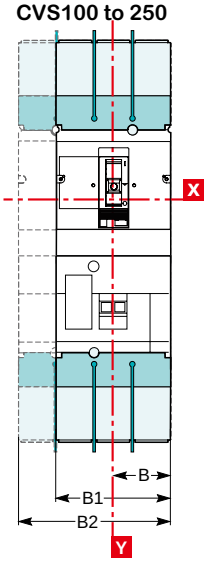
3/4P



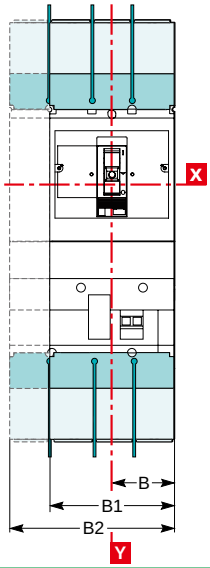


3/4P

CVS100 to 250



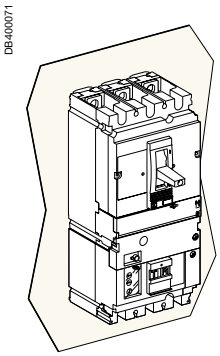
CVS400/630

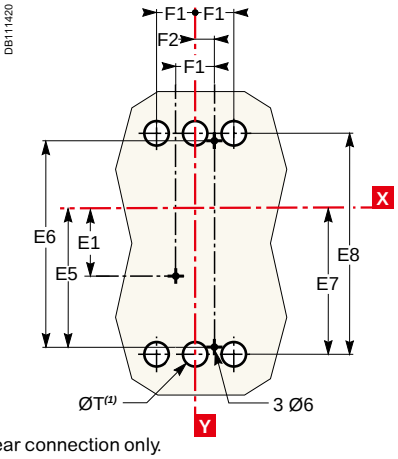


Mounting

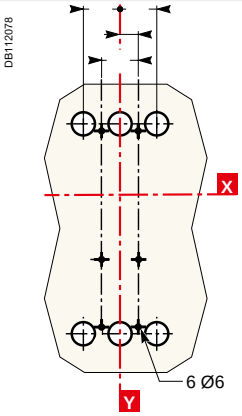
On backplate

CVS100 to 250 — 3P

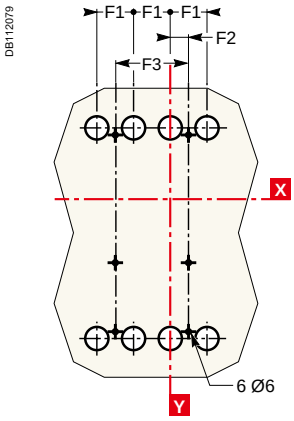




CVS400/630 — 3P



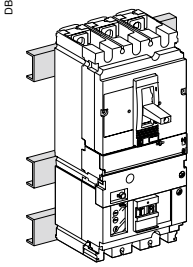
CVS100 to 630 — 4P

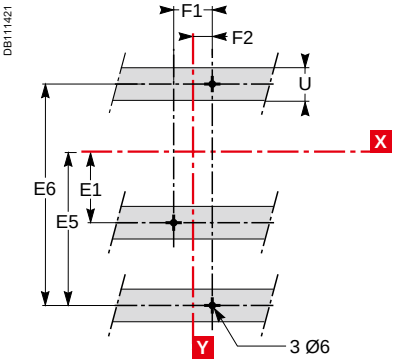


(1) The ØT holes are required for rear connection only.

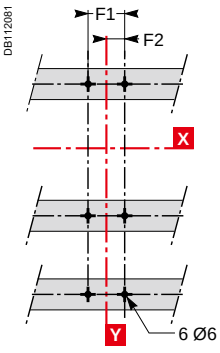
On rails

CVS100 to 250 — 3P

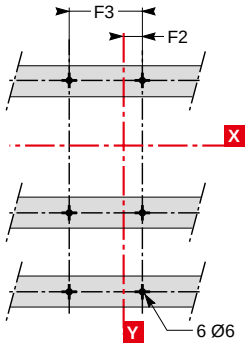




CVS400/630 — 3P



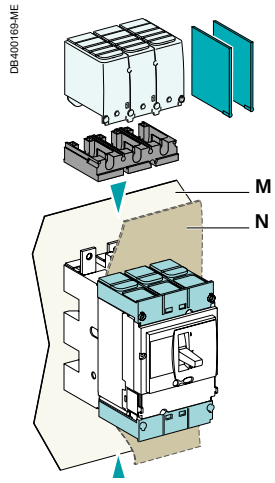
CVS100 to 630 — 4P

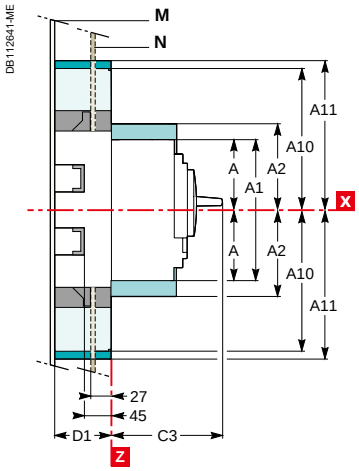


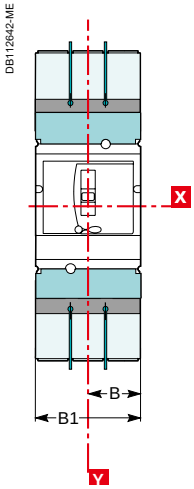
Type	A	A1	A2	A3	A4	A5	A6	A7	A8	A9	B	B1	B2	C1	C2	C3	E1
CVS100 to 250	80.5	161	94	145	178.5	155.5	236	169	220	253.5	52.5	105	140	81	86	126	62.5
CVS400/630	127.5	255	142.5	200	237	227.5	355	242.5	300	337	70	140	185	95.5	110	168	100
Type	**E2**	**E3**	**E4**	**E5**	**E6**	**E7**	**E8**	**F1**	**F2**	**F3**	**G1**	**G2**	**G3**	**G4**	**G5**	**ØT**	**U**
CVS100 to 250	125	70	140	137.5	200	145	215	35	17.5	70	95	75	13.5	23	17.5	24	⩽32
CVS400/630	200	113.5	227	200	300	213.5	327	45	22.5	90	-	-	-	-	-	32	⩽35

Dimensions and mounting
EasyPact CVS100 to 630 plug-in

Mounting — 3P







Interphase barriers.
Short terminal shields.

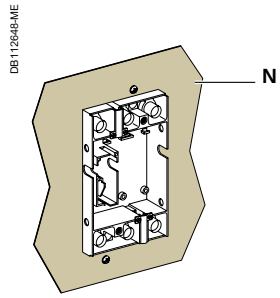
Long terminal shields (also available for CVS400/630 spreaders with 52.5 mm pitch: B1 = 157.5 mm, B2 = 210 mm).

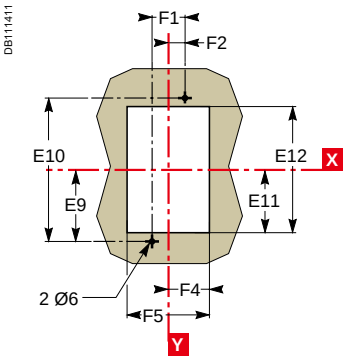
Adapter for base, required to mount long terminal shields or interphase barriers.

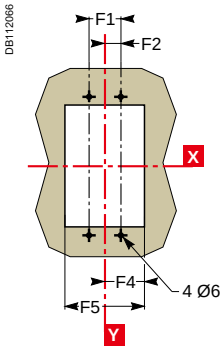
Mounting

Through front panel (N) — **3P** — **3P**

CVS100 to 250 — **CVS400 to 630**







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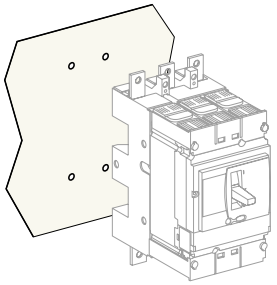
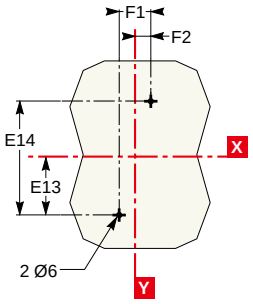
Dimensions and mounting
EasyPact CVS100 to 630 plug-in

Mounting

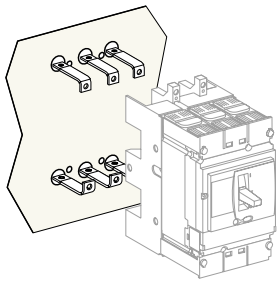
On backplate (M) **3P**

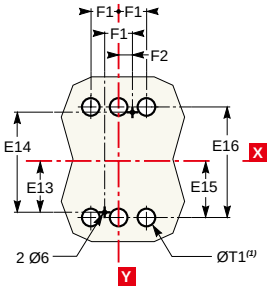
Front connection (an insulating screen is supplied with the base and must be fitted between the base and the backplate)





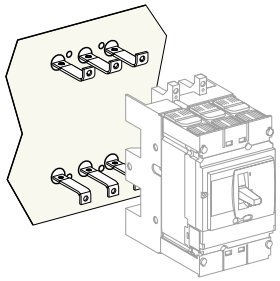
Connection by exterior-mounted rear connectors

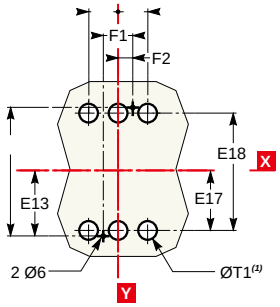




(1) The ØT1 holes are required for rear connection only (for two-pole circuit breakers, the middle holes are not required).

Connection by interior-mounted rear connectors

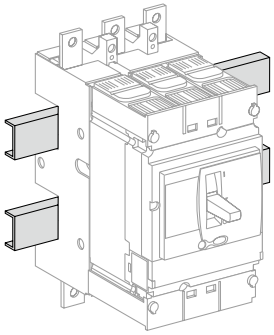


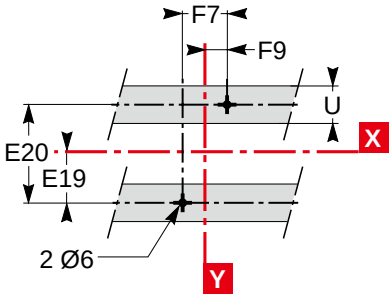


(1) The ØT1 holes are required for rear connection only (for two-pole circuit breakers, the middle holes are not required).

Mounting

On rail **3P**





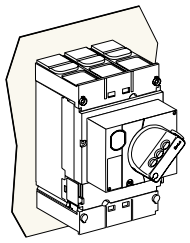
Type	A	A1	A2	A3	A4	A5	A6	A7	A8	A9	B	B1	B2	C1	C2	C3	E1
CVS100 to 250	80.5	161	94	145	178.5	155.5	236	169	220	253.5	52.5	105	140	81	86	126	62.5
CVS400/630	127.5	255	142.5	200	237	227.5	355	242.5	300	337	70	140	185	95.5	110	168	100
Type	**E2**	**E3**	**E4**	**E5**	**E6**	**E7**	**E8**	**F1**	**F2**	**F3**	**G1**	**G2**	**G3**	**G4**	**G5**	**ØT**	**U**
CVS100 to 250	125	70	140	137.5	200	145	215	35	17.5	70	95	75	13.5	23	17.5	24	⩽32
CVS400/630	200	113.5	227	200	300	213.5	327	45	22.5	90	-	-	-	-	-	32	⩽36

Dimensions and mounting
Direct rotary handle

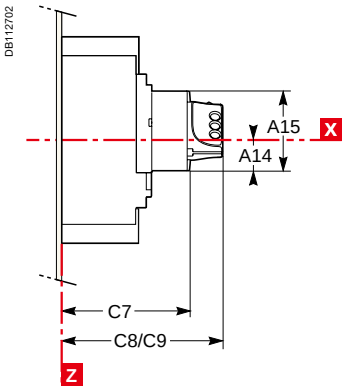
Dimensions — 3P — 4P

Fixed circuit breaker

DB112701



DB112702



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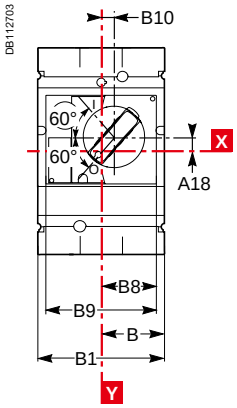

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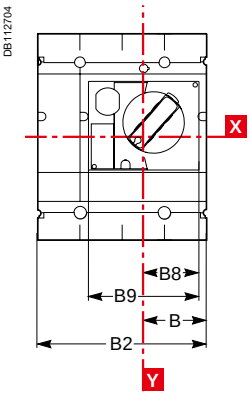


C8: without keylock
C9: with keylock

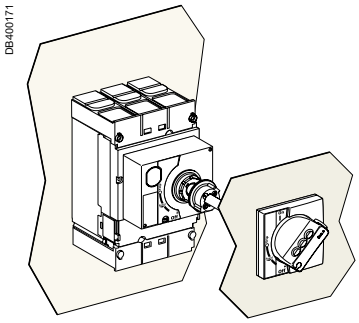
Type	A14	A15	A18	B8	B9	B10	C7	C8	C9
CVS100 to 250	27.5	73	9	45.5	91	9.25	121	155	164
CVS400/630	40	123	24.6	61.5	123	5	145	179	188

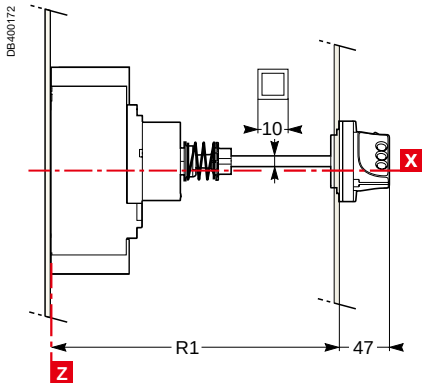
Life Is On Schneider Electric

Dimensions and mounting
Extended rotary handle

Dimensions

Fixed circuit breaker

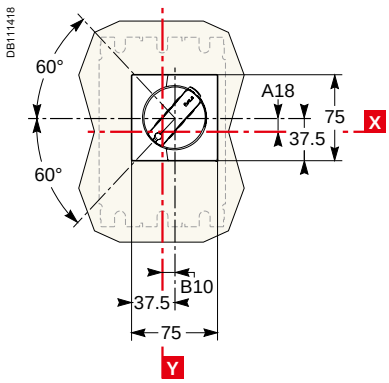


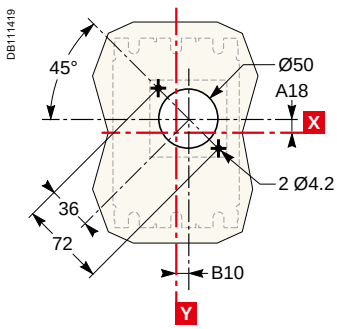


Cutout for shaft (mm)

Type	R1
CVS100/160/250	min. 171 max. 600
CVS400/630	min. 195 max. 600

Dimensions and front-panel cutout

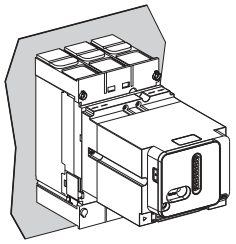


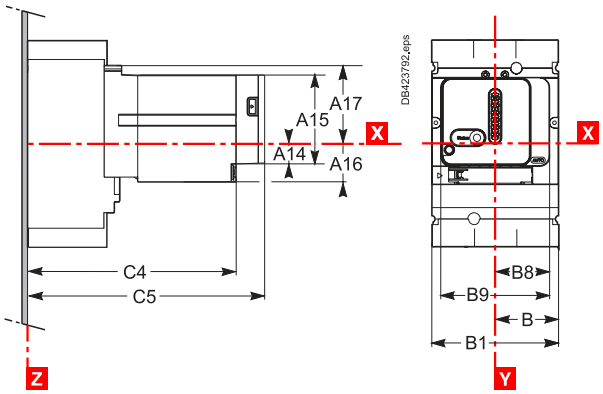


Type	A18	B10
CVS100 to 250	9	9.25
CVS400/630	24.6	5

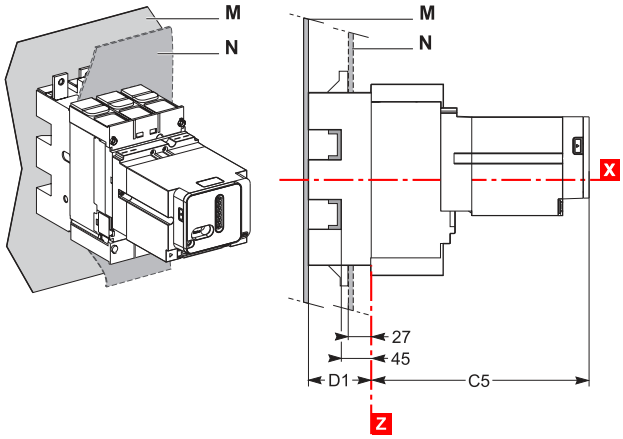
Dimensions and mounting
Motor Mechanism

Dimensions — 3P — 4P
Fixed circuit breaker





Dimensions
Plug-in circuit breaker



Type	A14	A15	A16	A17	B	B1	B2	B8	B9	C4	C5	D1
CVS100 to 250	19	73.5	33.5	55	52.5	105	140	45	90	180.5	204	75
CVS400/630	29.5	119.5	50	90	70	140	185	65	130	228.5	264	100

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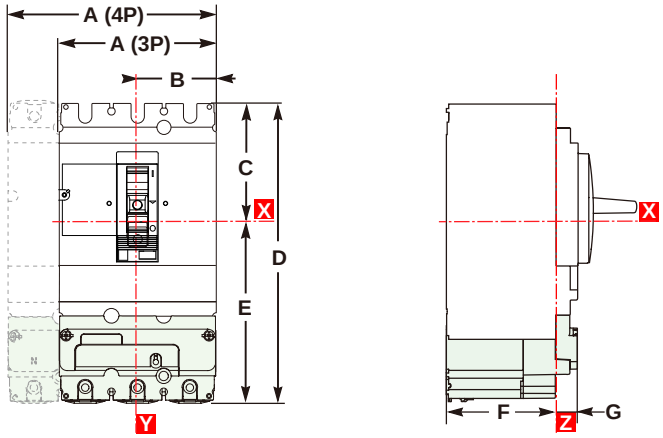
Dimensions and mounting

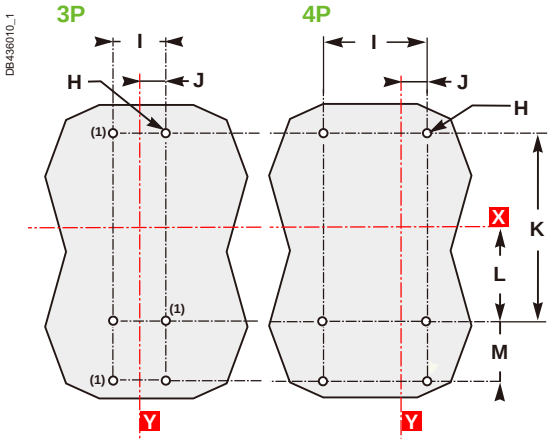
Additional measurement module:

PowerLogic™ PowerTag Energy Monoconnect 250 A & 630 A

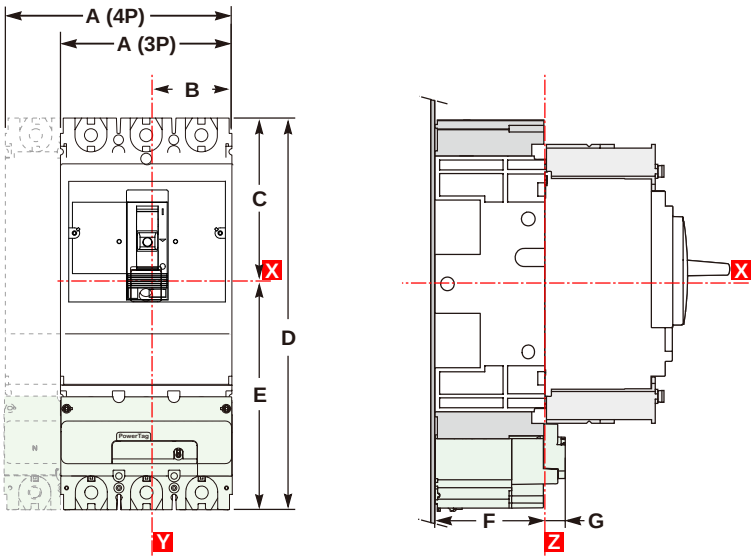
Dimensions

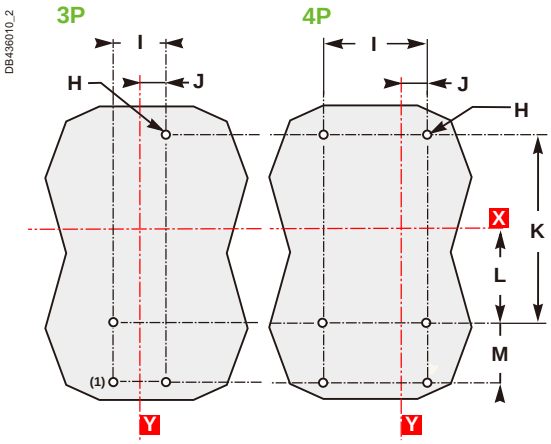
PowerLogic PowerTag Energy





(1) Only for PowerTag M630





(1) Only for PowerTag M630

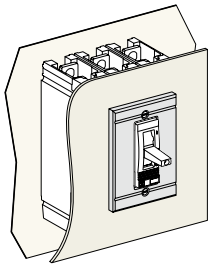
mm in	A 3P	 4P	B	C	D	E	F	G	H 3P	 4P	I 3P	 4P	J 3P	 4P	K	L	M
CVS100-250	105 4.13	140 5.51	52.5 2.06	80.5 3.17	201 7.91	120.5 4.74	72 2.83	14 0.55	3 Ø6 3 Ø0.23	6 Ø6 6 Ø0.23	35 1.34	70 2.75	17. 5 0.68	17. 5 0.68	125 4.92	62.5 2.46	40 1.57
CVS400-630	140 5.51	185 7.28	70 2.75	127.5 5.02	320 12.59	192.5 7.57	96 3.78	14 0.55	6 Ø6 6 Ø0.23	6 Ø6 6 Ø0.23	45 1.77	90 3.5	22.5 0.88	22.5 0.88	200 7.87	100 3.93	65 2.56
CVS100-250 with plug-in base	105 4.13	140 5.51	52.5 2.06	109 4.29	260 10.23	151 5.94	72 2.83	14 0.55	3 Ø6 3 Ø0.23	6 Ø6 6 Ø0.23	35 1.34	70 2.75	17. 5 0.68	17. 5 0.68	155 6.10	77.5 3.05	55 2.16
CVS400-630 with plug-in base	140 5.51	185 7.28	70 2.75	153 6.02	406 15.98	253 9.96	100 3.93	14 0.55	4 Ø06 4 Ø0.23	6 Ø6 6 Ø0.23	45 1.77	90 3.5	22.5 0.88	22.5 0.88	250 9.84	125 4.92	83 3.26

Front-panel accessories
EasyPact and Vigi CVS100 to 630

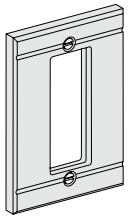
IP40 front-panel escutcheons

For toggle

DB400041



E21641



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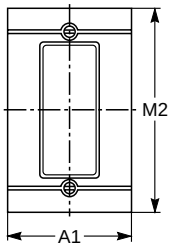

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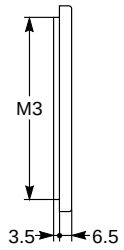
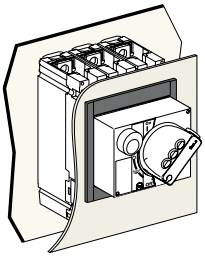


For rotary handle or module and protection collar

DB400089



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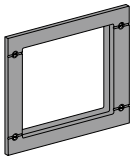

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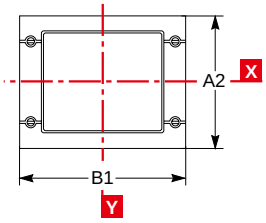

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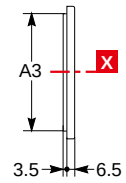
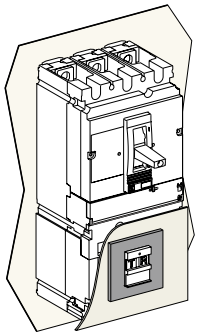


For Vigi

DB400097



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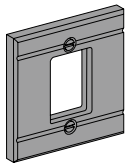

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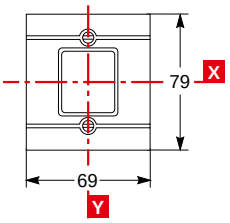
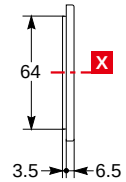


DB115020



Type	A1	A2	A3	B1	M2	M3
CVS100 to 250	91	114	101	157	115	102
CVS400/630	123	164	151	189	155	142

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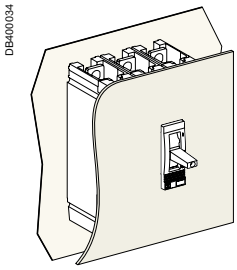
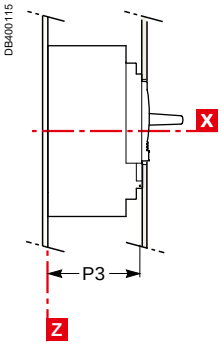
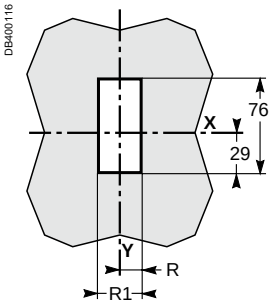
Front-panel cutouts
EasyPact CVS100 to 630

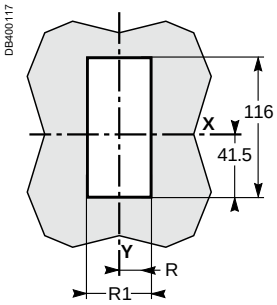
Bare sheet metal	CVS100 to 250	CVS400/630

For toggle

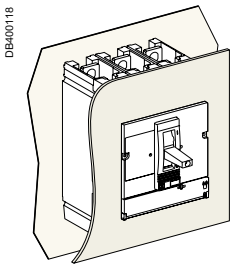


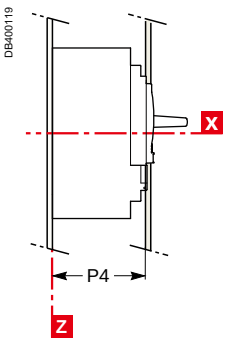


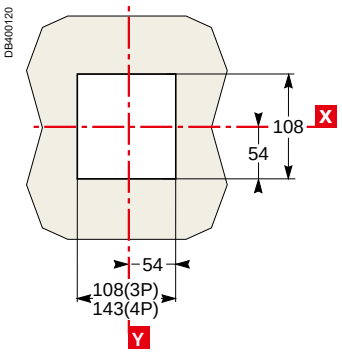


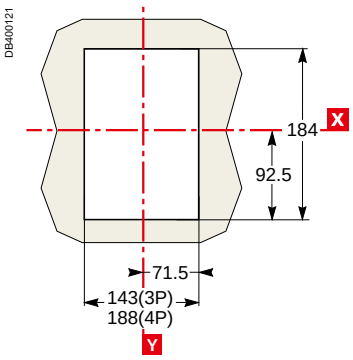


For toggle with access to trip unit







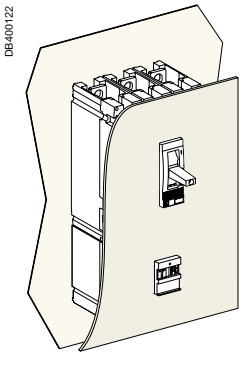


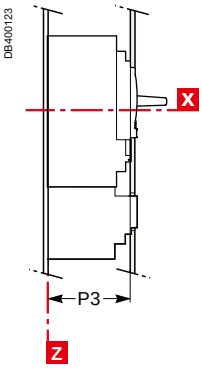
Type	P3	P4	R	R1
CVS100 to 250	88	83	14.5	29
CVS400/630	112	107	31.5	63

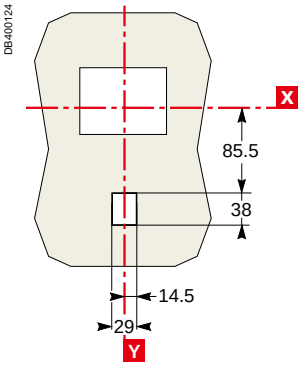
Front-panel cutouts
Vigi CVS100 to 630

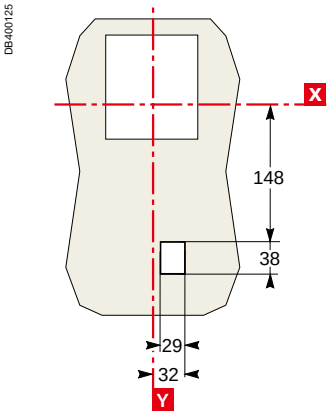
Bare sheet metal	CVS100 to 250	CVS400/630

For toggle

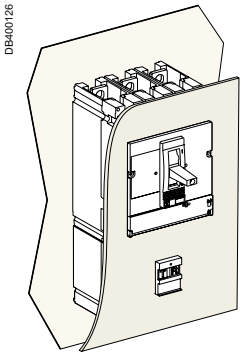


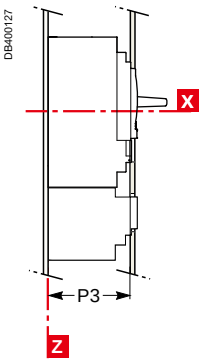


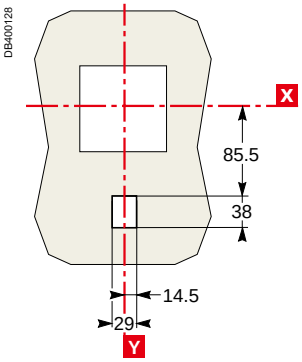


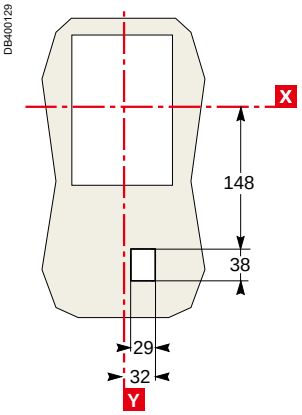


For toggle with access to trip unit









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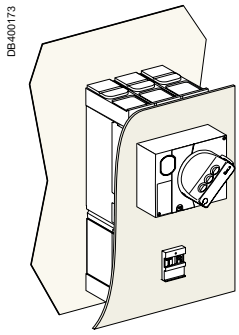
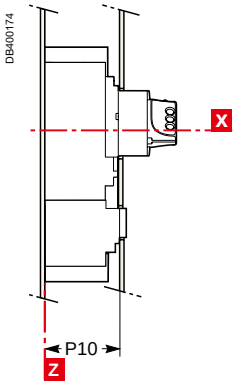
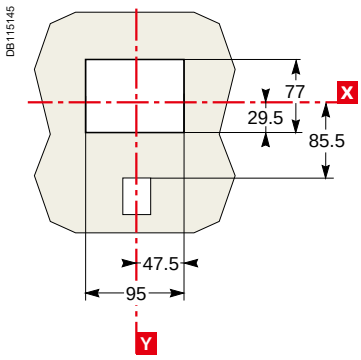
Front-panel cutouts
Direct rotary handle

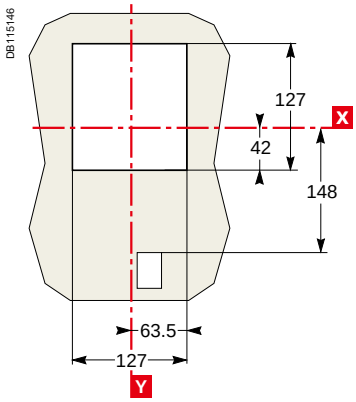
Fixed circuit breakers	CVS100 to 250	CVS400/630

Bare sheet metal

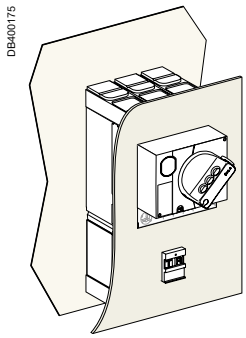


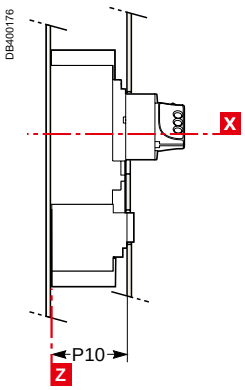


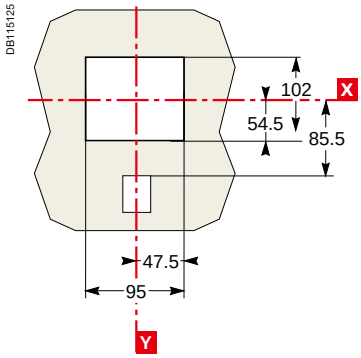


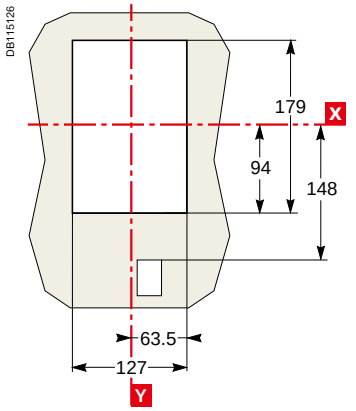


Bare sheet metal with access to the trip unit

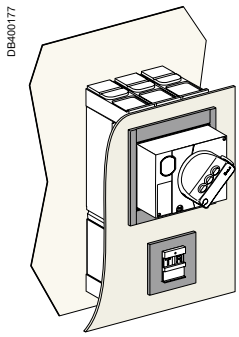


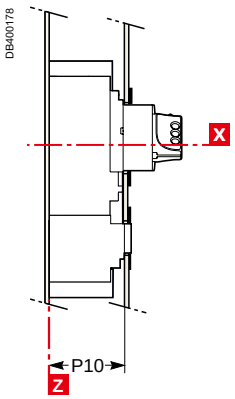


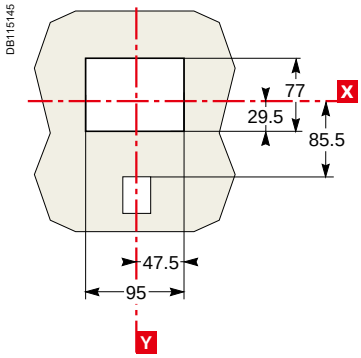


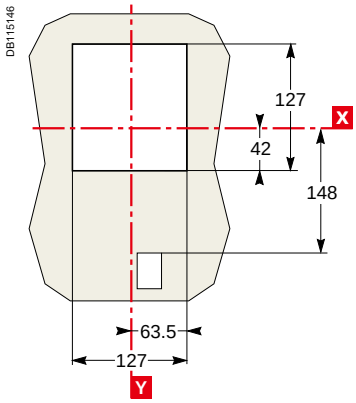


With IP30 front-panel escutcheon





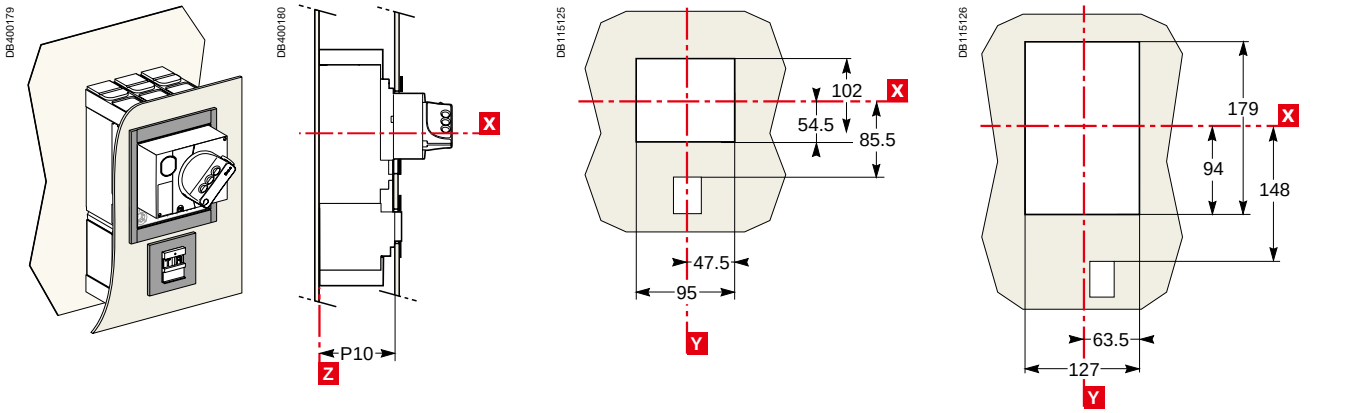




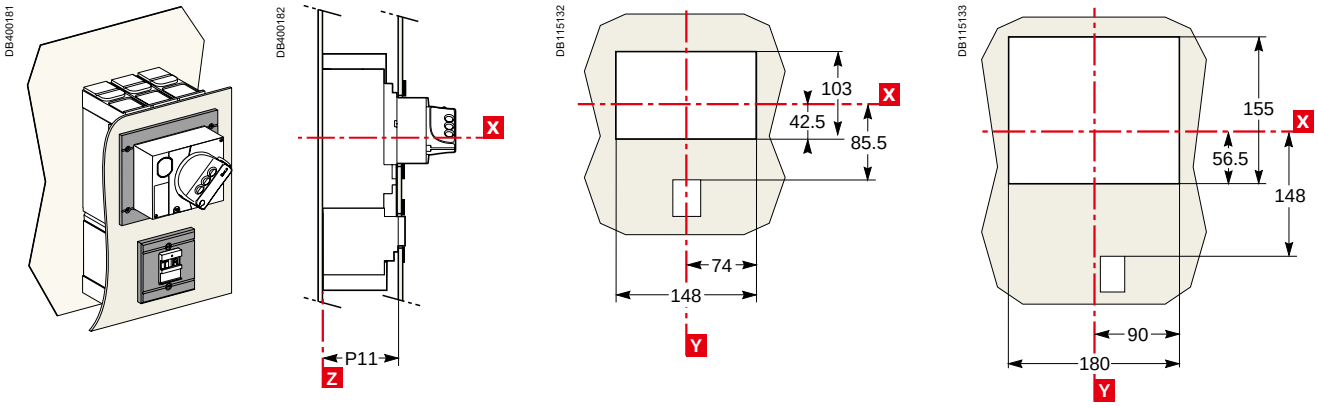
Front-panel cutouts
Direct rotary handle

Fixed circuit breakers (cont.) **CVS100 to 250** **CVS400/630**

With IP30 front-panel escutcheon with access to the trip unit



With IP40 front-panel escutcheon



Type	P10	P11	P12
CVS100 to 250	89	90	123
CVS400/630	112	113	147

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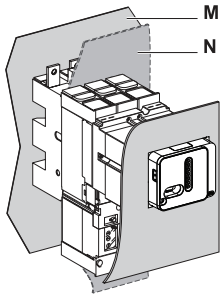
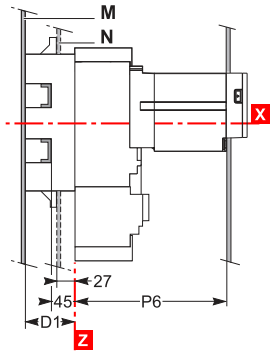
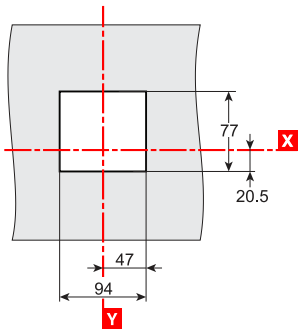
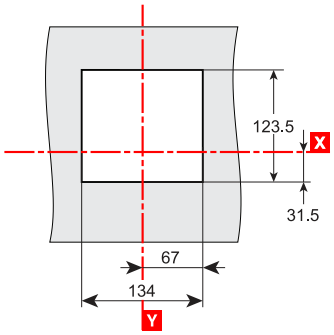
Front-panel cutouts
Motor Mechanism

Fixed / Plug-in circuit breakers **CVS100 to 250** **CVS400/630**





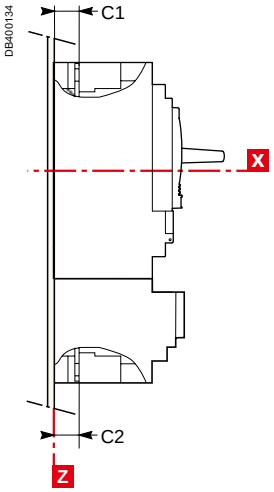


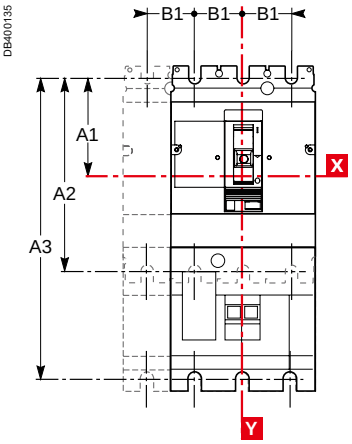


Type	D1	P6
CVS100 to 250	75	182.5
CVS400/630	100	230.5

Power connections
EasyPact and Vigi CVS100 to 630

Connection locations

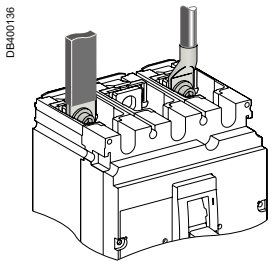




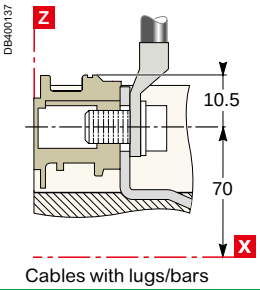
Type	A1	A2	B1	C1	C2
CVS100/160	70	140	35	19.5	19.5
CVS250	70	140	35	21.5	19.5
CVS400/630	113.5	227	45	26	26

Type	A1	A3	B1	C1	C2
CVS100/160 + Vigi	70	215	35	19.5	21.5
CVS250 + Vigi	70	215	35	21.5	21.5
CVS400/630 + Vigi	113.5	327	45	26	26

Front connection without accessories

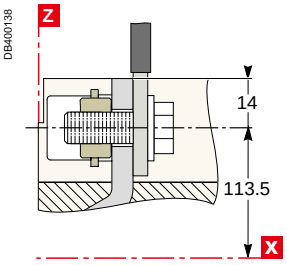


CVS100 to 250



Cables with lugs/bars

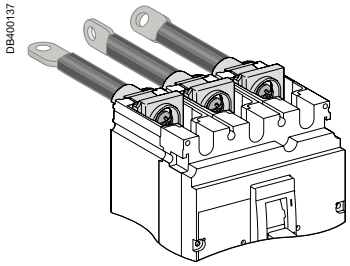
CVS400/630



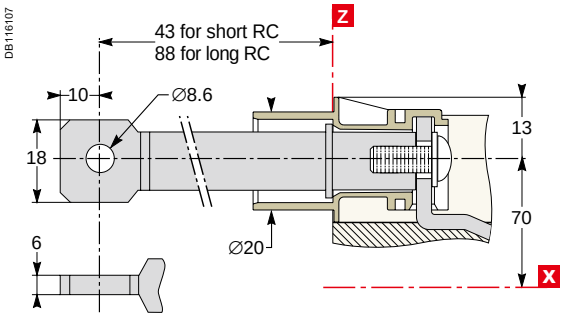
Bars/cables with lugs

Connection with accessories

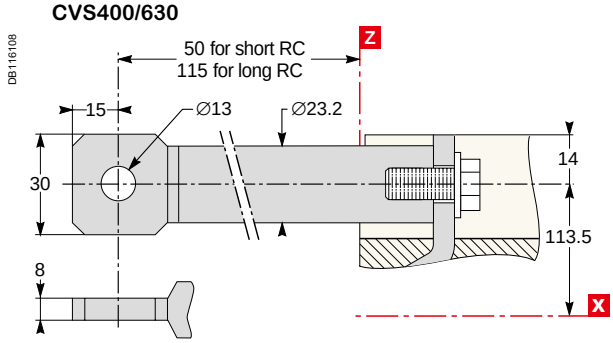
Long and short rear connectors



CVS100 to 250



CVS400/630



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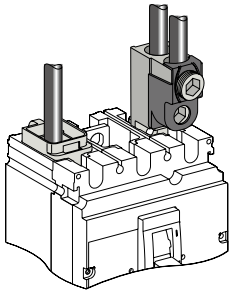
Power connections
EasyPact and Vigi CVS100 to 630

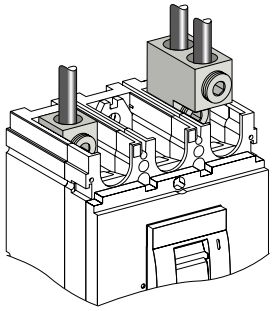
Connection with accessories (cont.)

Bare-cable connectors

DB400138

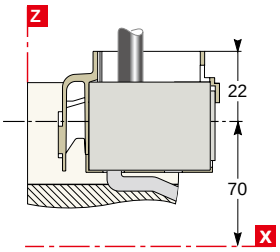


DB400139

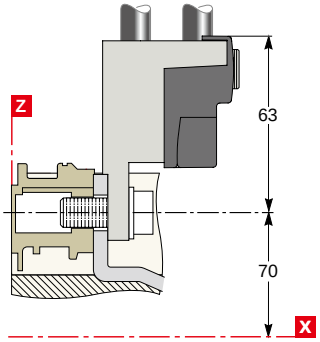


CVS100 to 250

DB115451

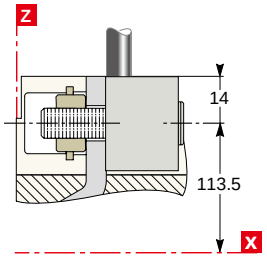


DB115452



CVS400/630

DB115454



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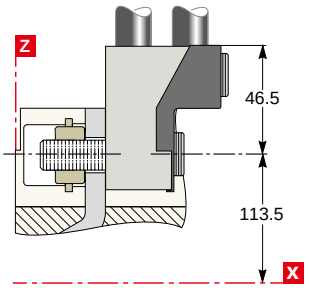
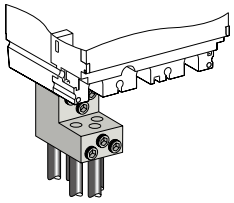
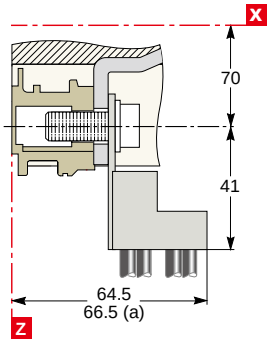


Distribution connectors (for CVS100 to 250 only)

DB115456



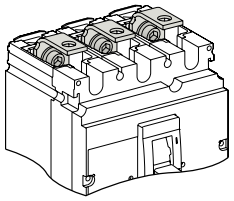
DB115457



(a) Vigi module or CVS250.

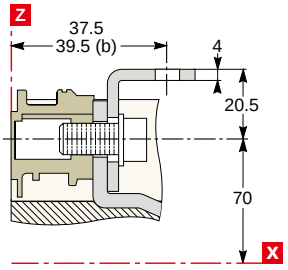
Right-angle terminal extensions (upstream only)

DB400140



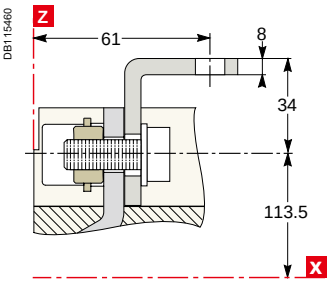
CVS100 to 250

DB115459



CVS400/630

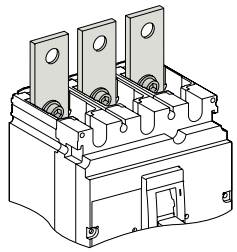
DB115460



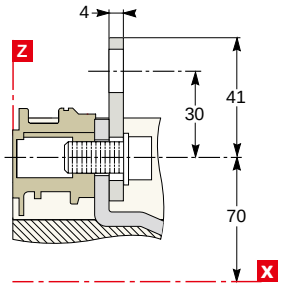
(b) CVS250.

Straight terminal extensions (for CVS100 to 250 only)

DB400141



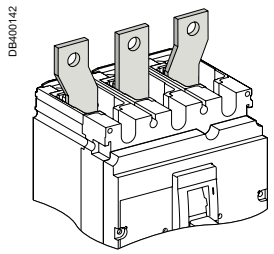
DB115462



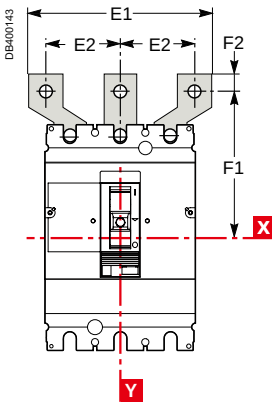
Power connections
EasyPact and Vigi CVS100 to 630

Connection with accessories (cont.)

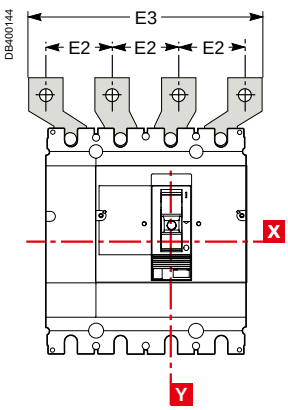
Spreaders



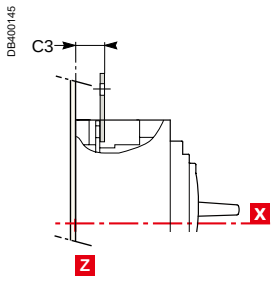
3P



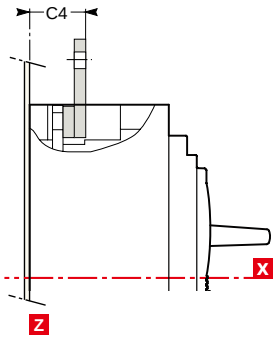
4P



CVS100 to 250



CVS400/630



Type	C3	C4	E1	E2	E3	F1	F2
CVS100 to 250	23.5	-	114	45	159	100	11
CVS400/630	-	44	135 170	52.5 70	187.5 240	152.5 166	15 15

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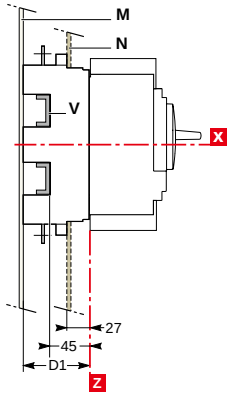
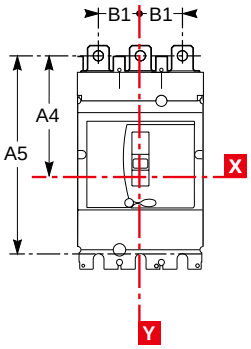
Power connections
EasyPact CVS100 to 630 plug-in

Connection locations



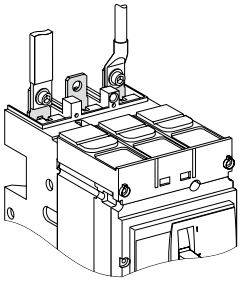


Type	A4	A5	B1	D1
CVS100 to 250	100	200	35	75
CVS400/630	156.5	313	45	100

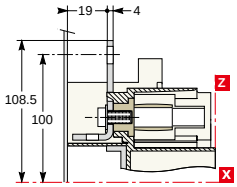
Note:
- for mounting on a backplate, the insulating screen supplied with the plug-in base must be installed.

Connection without accessories

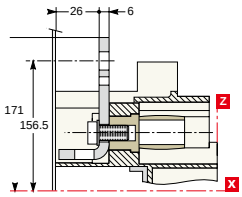
Front connection: mounting on backplate (M) or rails (V)



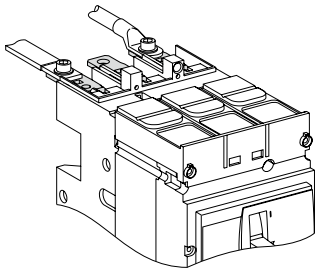
CVS100 to 250



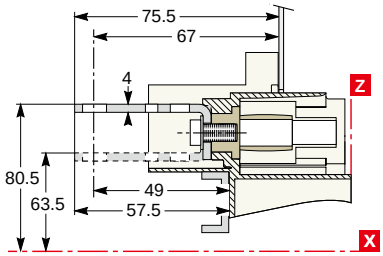
CVS400 to 630

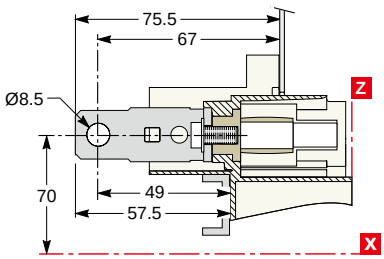


Rear connection: mounting through front panel (N) or on rails (V)

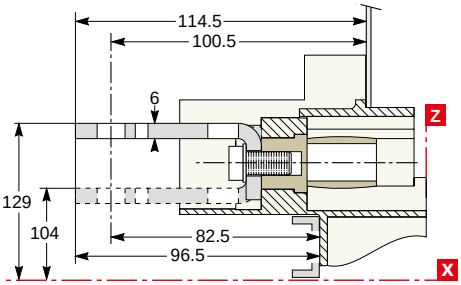


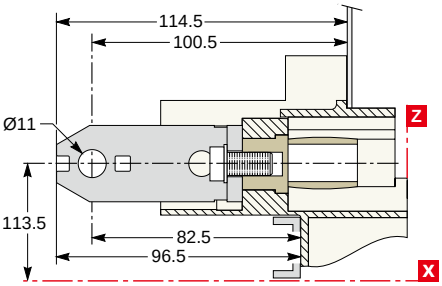
CVS100 to 250





CVS400 to 630

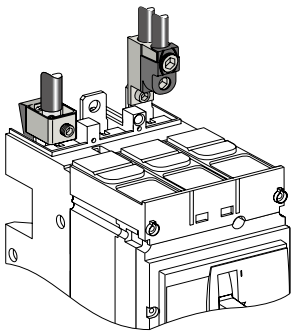




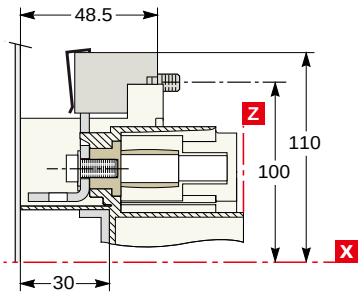
Power connections
EasyPact CVS100 to 630 plug-in

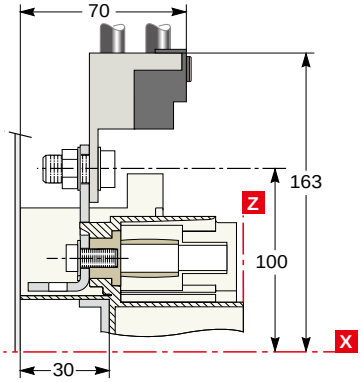
Connection without accessories

Bare-cable connections: mounting on backplate (M) or rails (V)

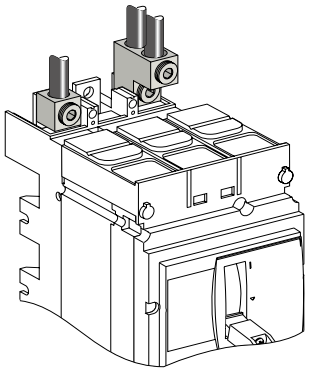


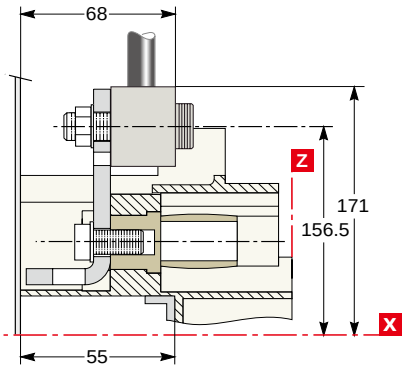
CVS100 to 250

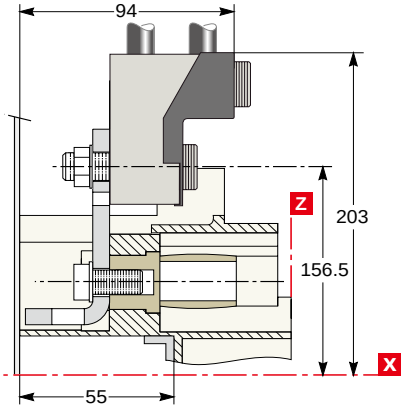




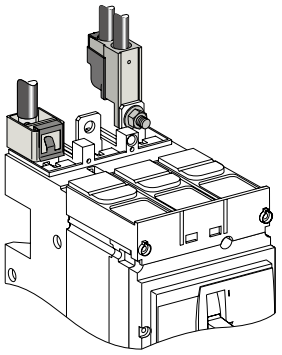
CVS400 to 630



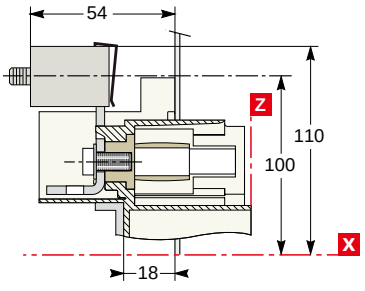


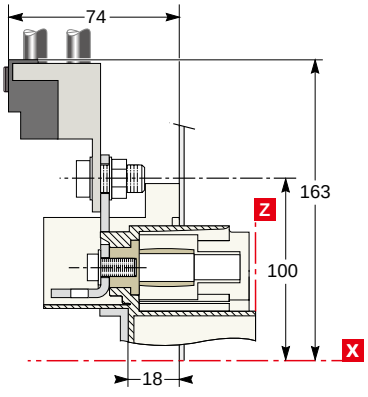


Bare-cable connections: mounting through front panel (N) or on rails (V)

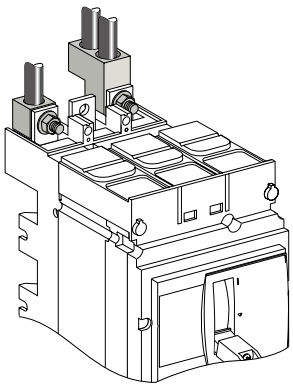


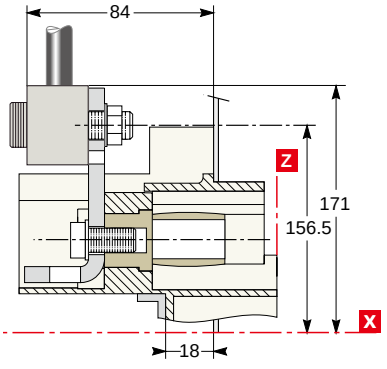
CVS100 to 250

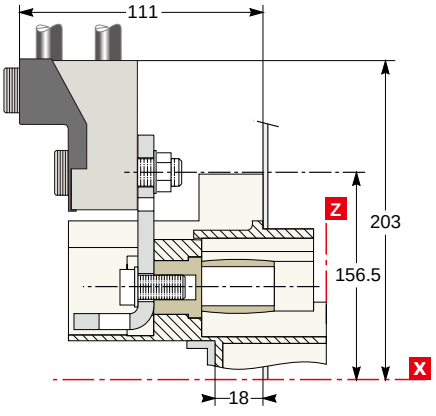




CVS400 to 630





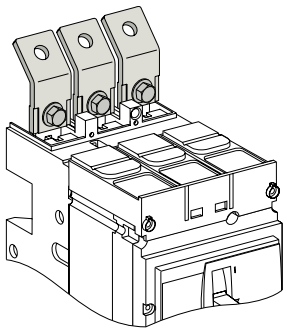


Life Is On Schneider Electric

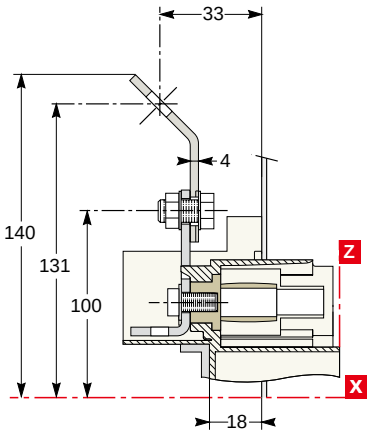
Power connections
EasyPact CVS100 to 630 plug-in

Connection without accessories (cont.)

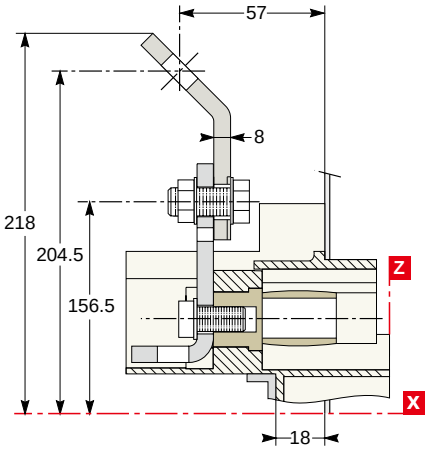
45° extensions: mounting through front panel (N) or on rails (V)



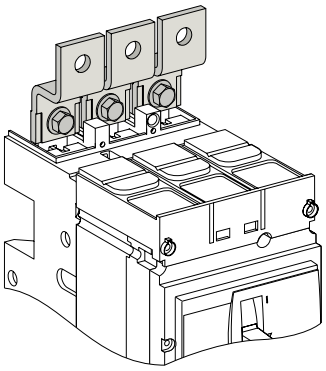
CVS100 to 250



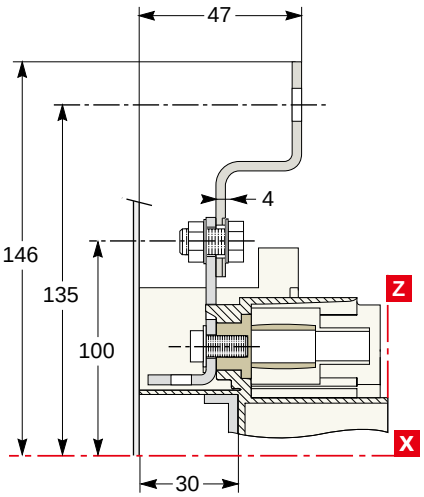
CVS400 to 630



Double-L extensions: mounting on backplate (M) or rails (V)

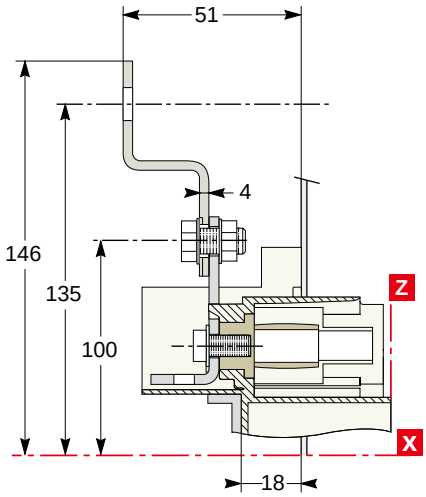


CVS100 to 250



Double-L extensions: mounting through front panel (N) or on rails (V)

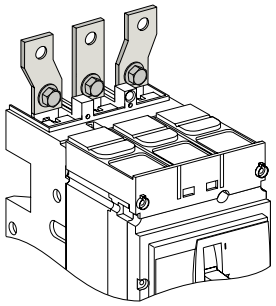
CVS100 to 250



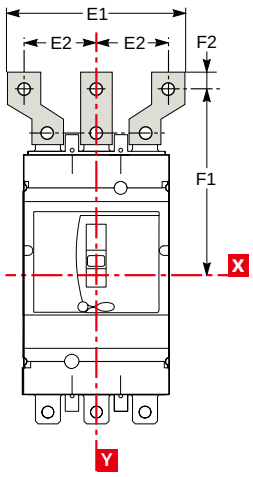
Power connections
EasyPact CVS100 to 630 plug-in

Connection without accessories (cont.)

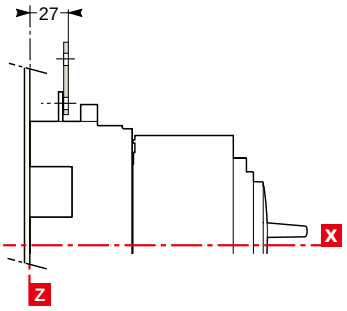
Spreaders: mounting on backplate (M) or rails (V)



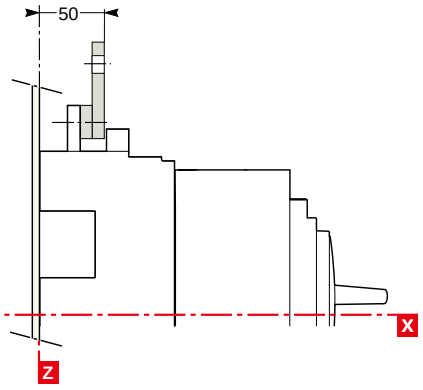
3P



CVS100 to 250



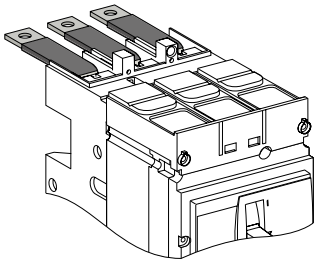
CVS400 to 630



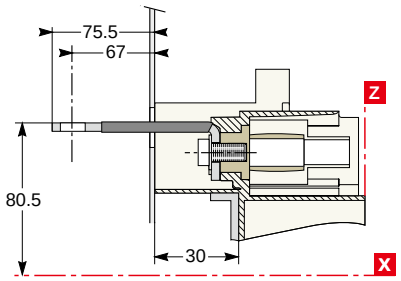
Type	E1	E2	E3	F1	F2
CVS100 to 250	114	45	159	130	11
CVS400/630	135 170	52.5 70	187.5 240	195.5 209	15 15

Long insulated rear connectors: mounting on backplate (M) or rails (V)

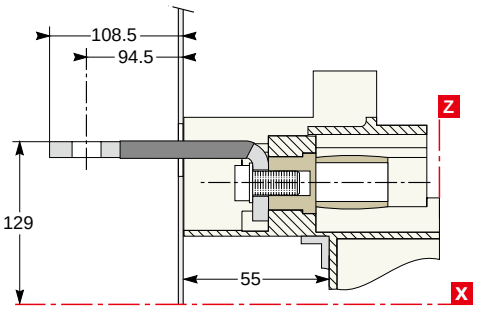
Exterior-mounted rear connectors



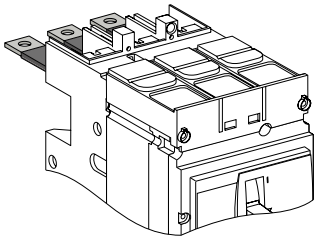
CVS100 to 250



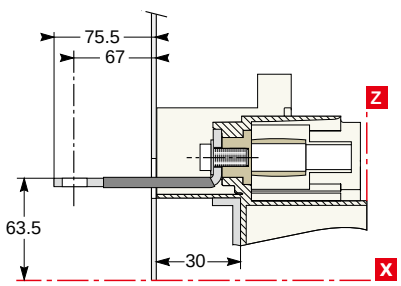
CVS400 to 630



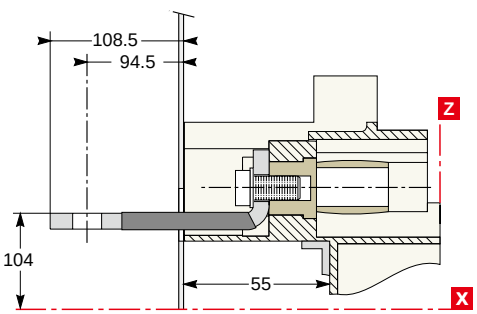
Interior-mounted rear connectors



CVS100 to 250



CVS400 to 630



Long, insulated connectors are mandatory.

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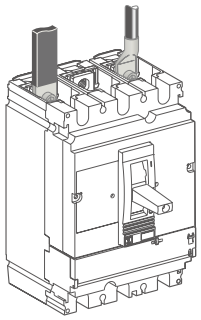
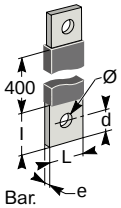
Power connections

Connection of insulated bars or cables with lugs to **Easy**Pact and Vigi CVS100 to 630

DB400013

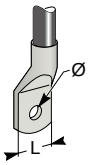


DB115653



Bar.

DB115654

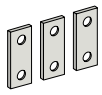


Lug.

Accessories for CVS100 to 250

Straight terminal extensions

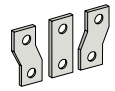
DB112172



Tinned copper

Spreaders: separate parts

DB112177

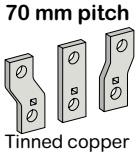


Tinned copper

Accessories for CVS400 and 630

Spreaders made up of separate parts for 52.5 and 70 mm pitch

DB115657

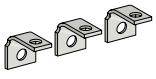


Tinned copper

Accessories for CVS100 to 630

Right-angle terminal extensions

DB112173



Tinned copper
To be mounted on upstream side.

Direct connection to CVS100 to 630

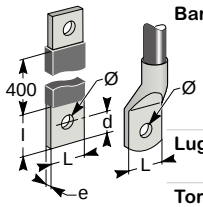
Dimensions		CVS100	CVS160/250	CVS400/630
Bars	L (mm)	⩽ 25	⩽ 25	⩽ 32
	I (mm)	d + 10	d + 10	d + 15
	d (mm)	⩽ 10	⩽ 10	⩽ 15
	e (mm)	⩽ 6	⩽ 6	3 ⩽ e ⩽ 10
	Ø (mm)	6.5	8.5	10.5
Lugs	L (mm)	⩽ 25	⩽ 25	⩽ 32
	Ø (mm)	6.5	8.5	10.5
Torque (Nm) (1)		10	15	50
Torque (Nm) (2)		5/5	5/5	20/11

(1) Tightening torque on the circuit breaker for lugs or bars.
(2) Tightening torque on fixed devices for rear connectors.

Connection with accessories to CVS100 to 250 (IEC 228)

Pole pitch		
Without spreaders		35 mm
With spreaders		45 mm
Dimensions		**With spreaders or terminal extensions**
		CVS100 / **CVS160/250**

DB115665



		CVS100	CVS160/250
Bars	L (mm)	⩽ 25	⩽ 25
	I (mm)	20 ⩽ I ⩽ 25	20 ⩽ I ⩽ 25
	d (mm)	⩽ 10	⩽ 10
	e (mm)	⩽ 6	⩽ 6
	Ø (mm)	6.5	8.5
Lugs	L (mm)	⩽ 25	⩽ 25
	Ø (mm)	6.5	8.5
Torque (Nm) (1)		10	15

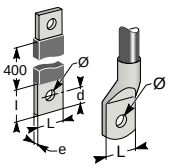
(1) Tightening torque on the circuit breaker for spreaders or terminal extensions.

Spreaders and straight, right-angle, 45°, double-L and edgewise terminal extensions are supplied with flexible interphase barriers.

Connection with accessories to CVS400 and 630 (IEC 228)

Pole pitch		
Without spreaders		45 mm
With spreaders		52.5 or 70 mm
Dimensions		**With spreaders** / **With terminal extensions**

DB115665

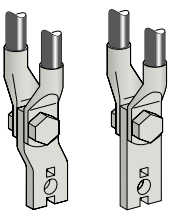


		With spreaders	With terminal extensions
Bars	L (mm)	⩽ 40	⩽ 32
	I (mm)	d + 15	30 ⩽ I ⩽ 34
	d (mm)	⩽ 20	⩽ 15
	e (mm)	3 ⩽ e ⩽ 10	3 ⩽ e ⩽ 10
	Ø (mm)	12.5	10.5
Lugs	L (mm)	⩽ 40	⩽ 32
	Ø (mm)	12.5	10.5
Torque (Nm) (1)		50	50

(1) Tightening torque on the circuit breaker for spreaders or terminal extensions.

Spreaders and right-angle, 45° and edgewise terminal extensions are supplied with flexible interphase barriers.

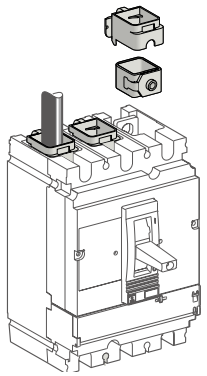
DB115658



Mounting detail: 2 cables with lugs.

Power connections
Connection of bare cables to **Easy**Pact and Vigi CVS100 to 630

DB400149

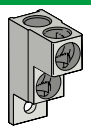


Connection for CVS100 to 250

DB112315

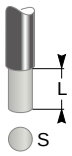
1-cable connector

DB112317



2-cable connector

DB115663



	1-cable connector	Steel ⩽ 160 A	Aluminium ⩽ 250 A		
	L (mm)	25	25		
	S (mm²) Cu/Al	1.5 to 95 (1)	25 to 50	70 to 95	120 to 185 150 max. flex.
	Torque (Nm)	12	20	26	26
	2-cable connector				
	L (mm)	25 or 50			
	S (mm²) Cu/Al	2 x 50 to 2 x 120			
	Torque (Nm)	22			

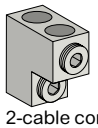
(1) For flexible cables from 1.5 to 4 mm², connection with crimped or self-crimping ferrules.

Connection to CVS400 and 630

DB112316

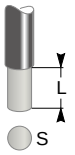
1-cable connector

DB111326



2-cable connector

DB115663



	1-cable connector	2-cable connector
L (mm)	30	30 or 60
S (mm²) Cu/Al	35 to 300 rigid 240 max. flex.	2 x 35 to 2 x 240 rigid 240 max. flex.
Torque (Nm)	31	31

Conductor materials and electrodynamic stresses

EasyPact CVS circuit breakers can be connected indifferently with bare-copper, tinned-copper and tinned-aluminium conductors (flexible or rigid bars, cables).
In the event of a short-circuit, thermal and electrodynamic stresses will be exerted on the conductors. They must therefore be correctly sized and held in place by supports.
Electrical connection points on switchgear devices (switch-disconnectors, contactors, circuit breakers, etc.) should not be used for mechanical support.
Any partition between upstream and downstream connections of the device must be made of non-magnetic material.

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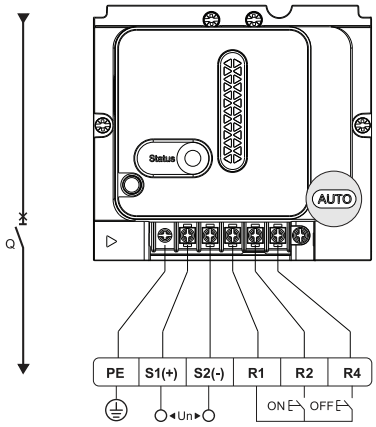
Power connections
Motor Mechanism

The diagram is shown with circuits de-energized with all devices open

After tripping initiated by the “Push to trip” button or by the undervoltage (MN) release or the shunt (MX) release, device reset can be automatic, remote or manual.

Following tripping due to an electrical fault, device reset can be remote or manual.

Connection for CVS100 to 630



Symbols	
Q:	**circuit breaker**
PE:	**Earth**
S1(+):	**power supply - AC/DC(+)**
S1(-):	**power supply - AC/DC(-)**
R1:	**remote control common terminal**
R2:	**remote closing order terminal**
R4:	**remote opening order terminal**

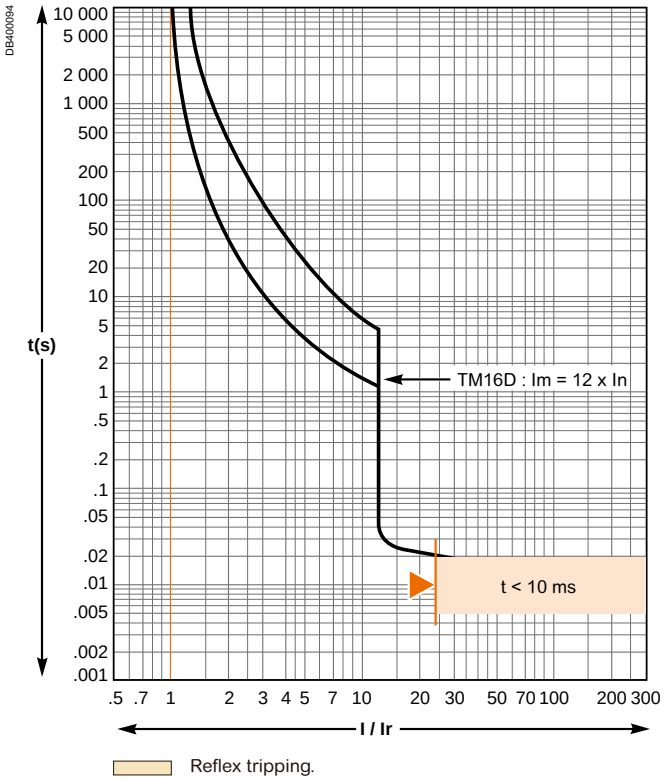
Additional characteristics

Additional characteristics

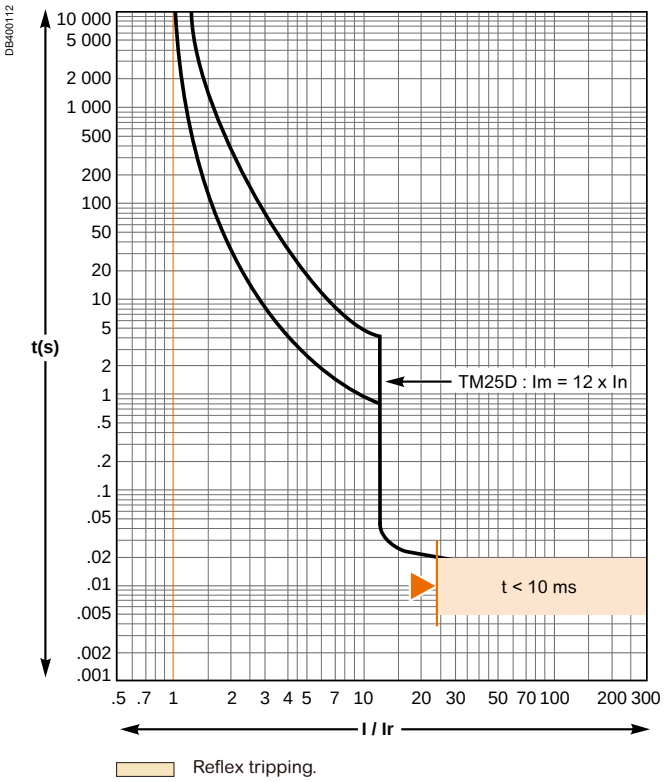
Tripping curves
EasyPact CVS100 to 630
Protection of distribution systems

TM magnetic trip units

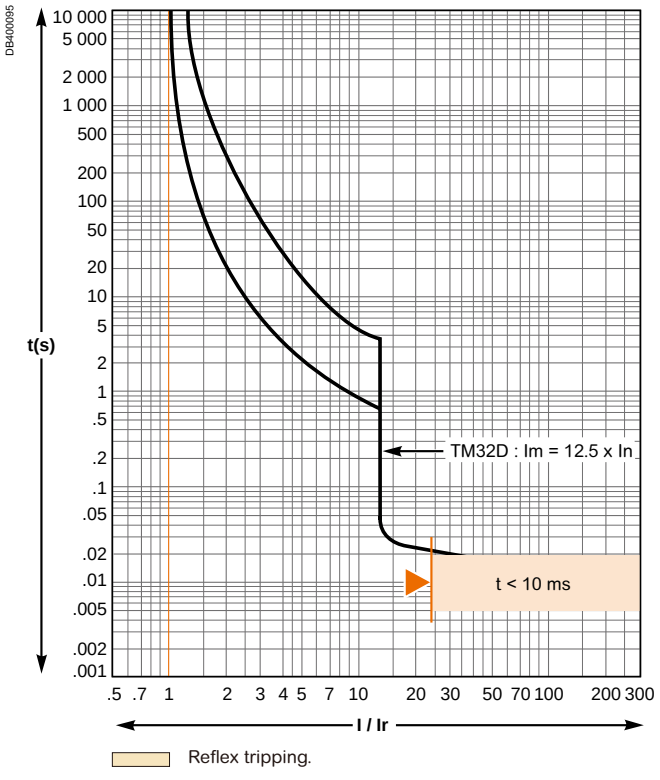
TM16D



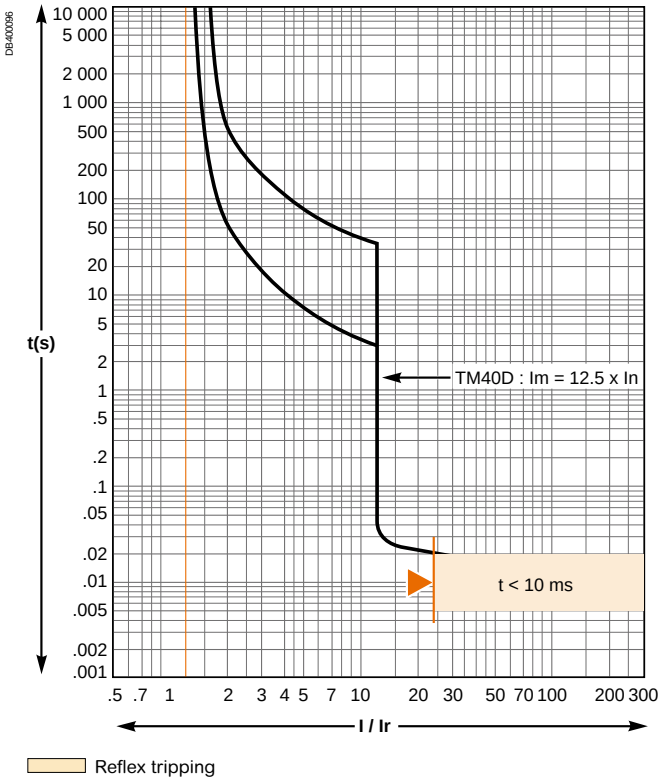
TM25D



TM32D



TM40D



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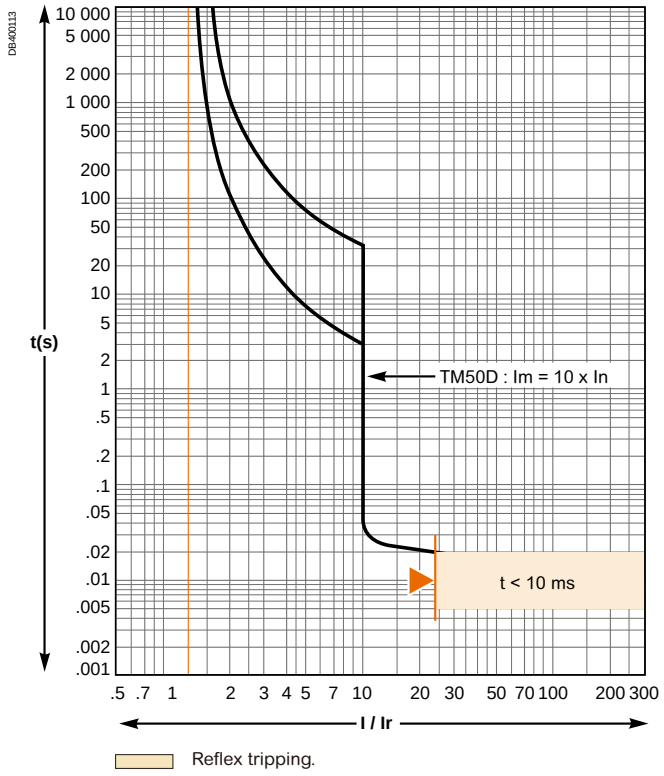
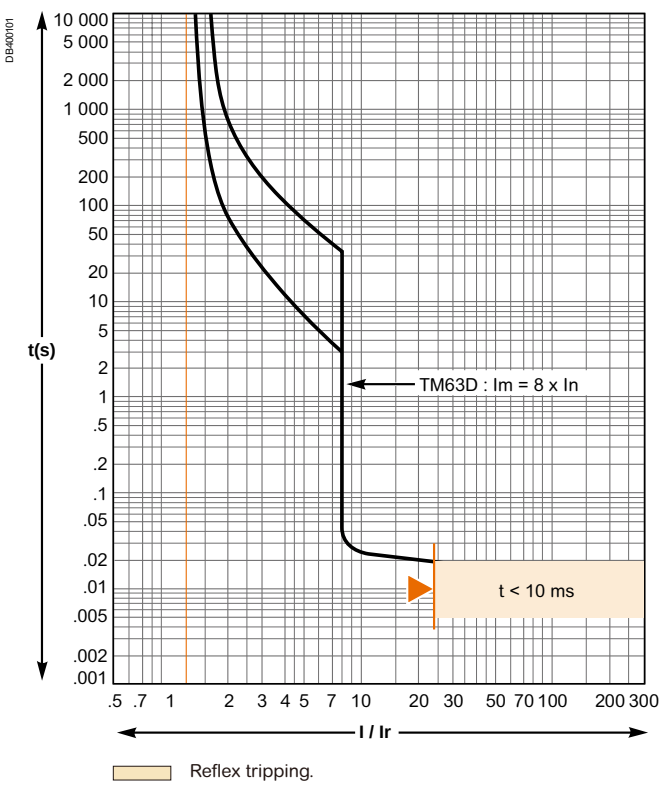
Tripping curves
EasyPact CVS100 to 630
Protection of distribution systems

TM magnetic trip units

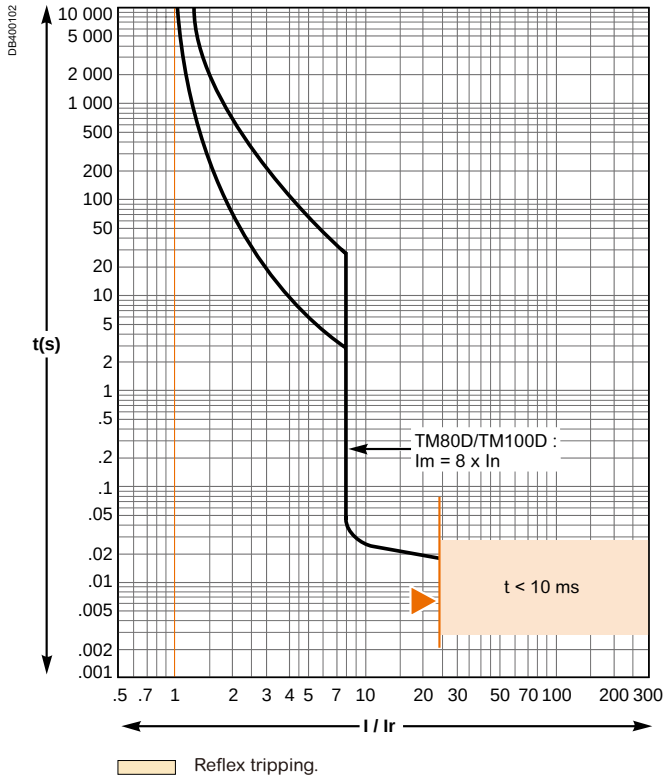
TM50D



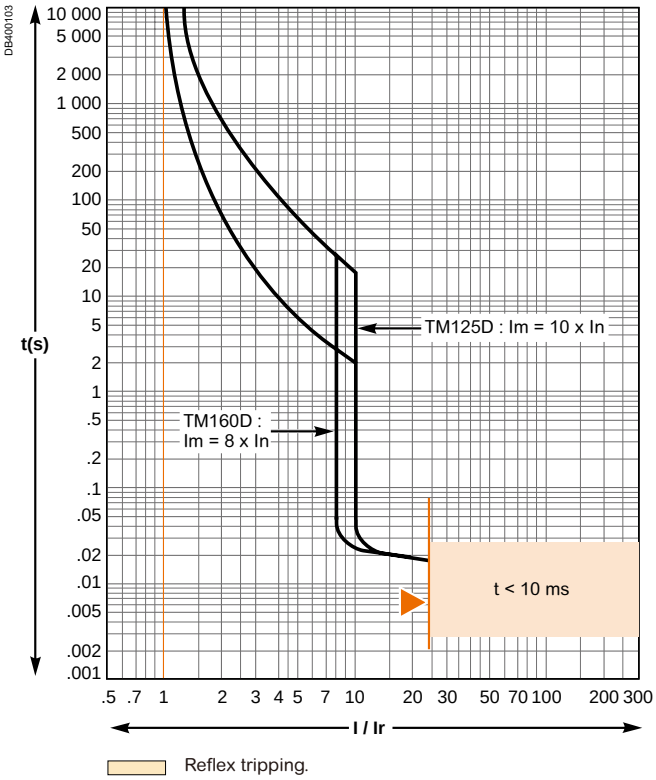
TM63D



TM80D/100D

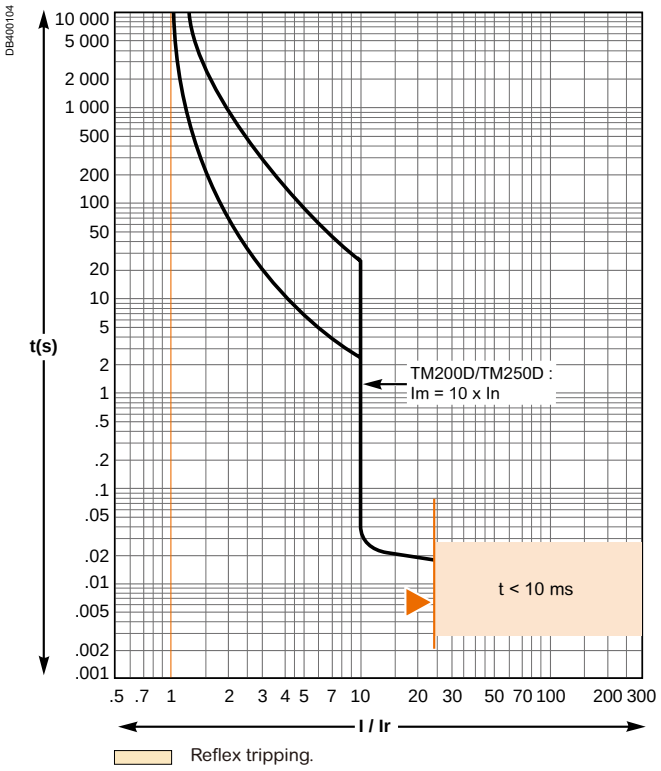


TM125D/160D

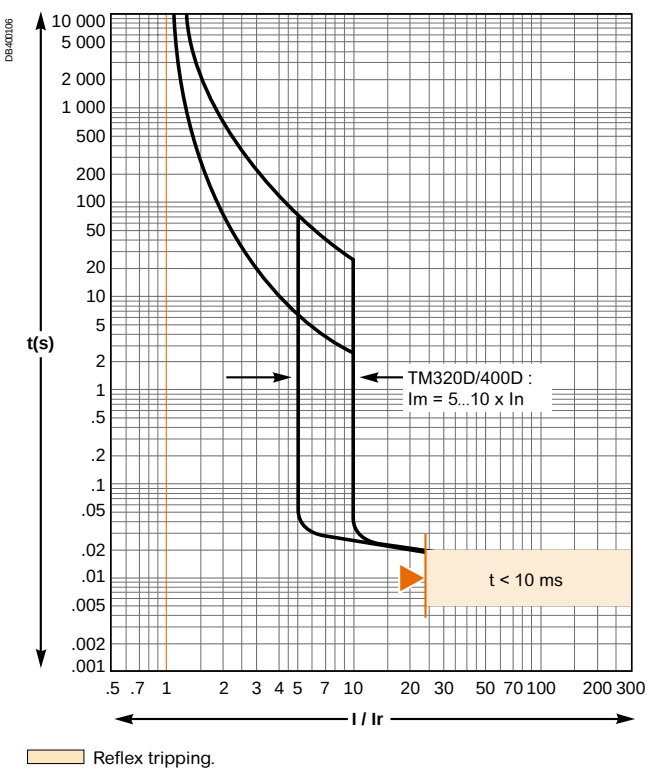


Tripping curves
EasyPact CVS100 to 630
Protection of distribution systems

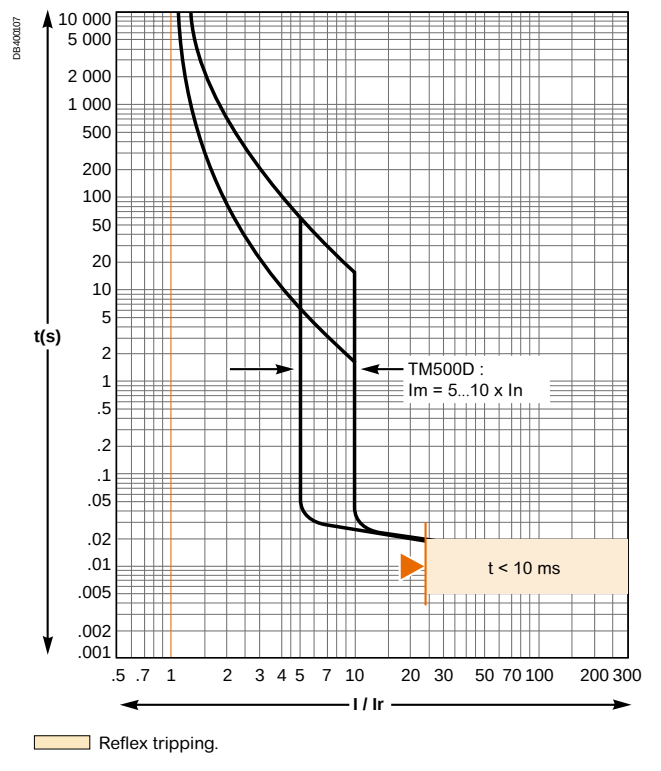
TM200D/250D



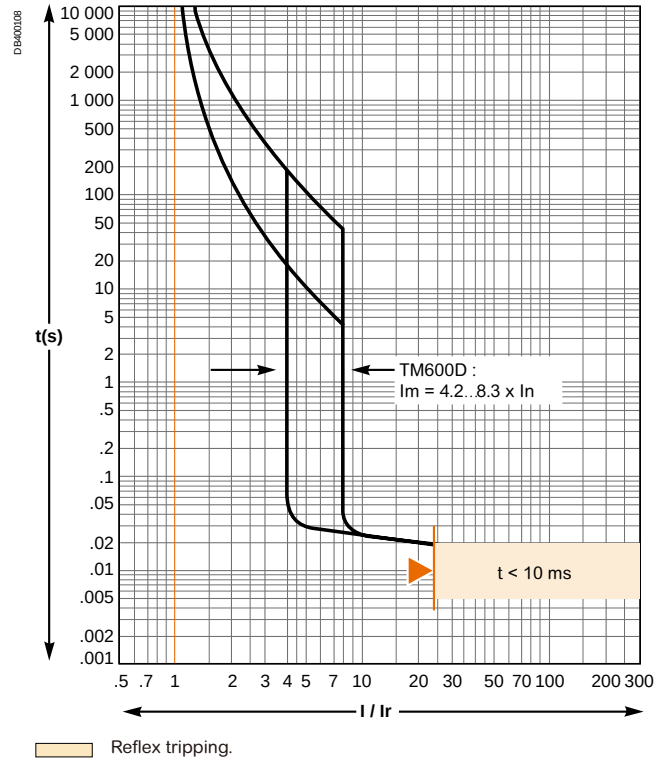
TM320D/400D



TM500D



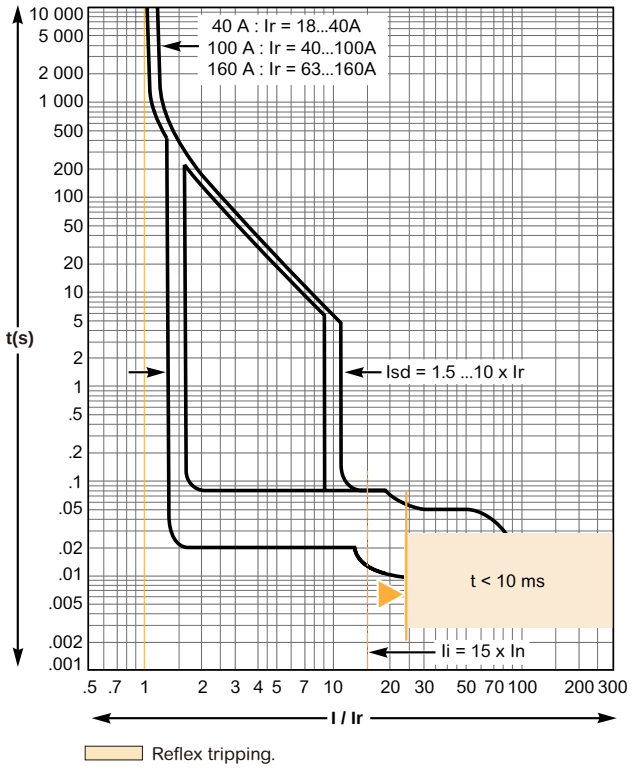
TM600D



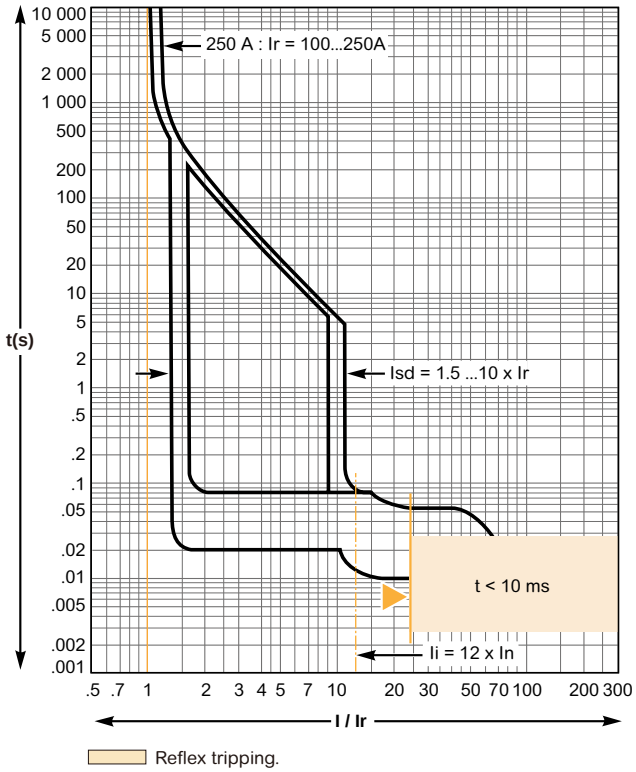
Tripping curves
EasyPact CVS100 to 630
Protection of distribution systems

ETS2.2 electronic trip units

ETS2.2 40... 160 A

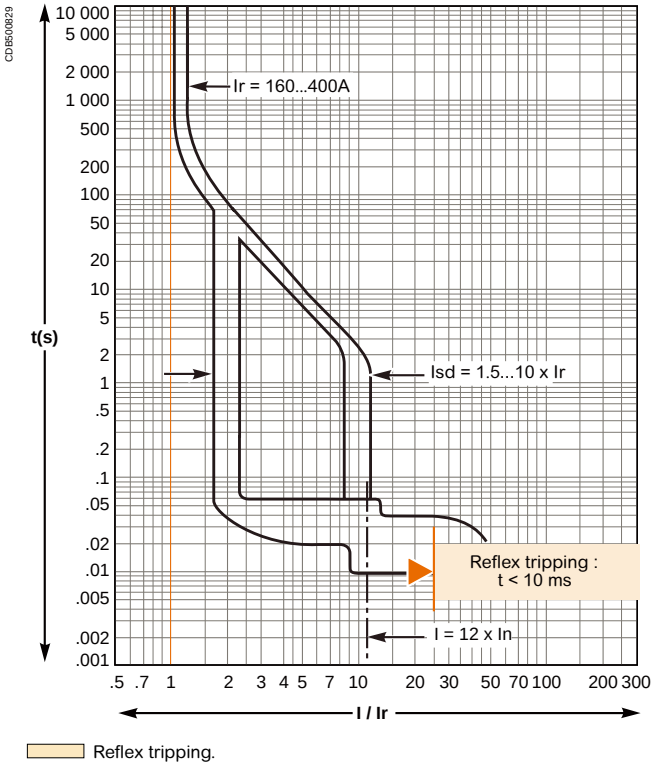


ETS2.2 250 A

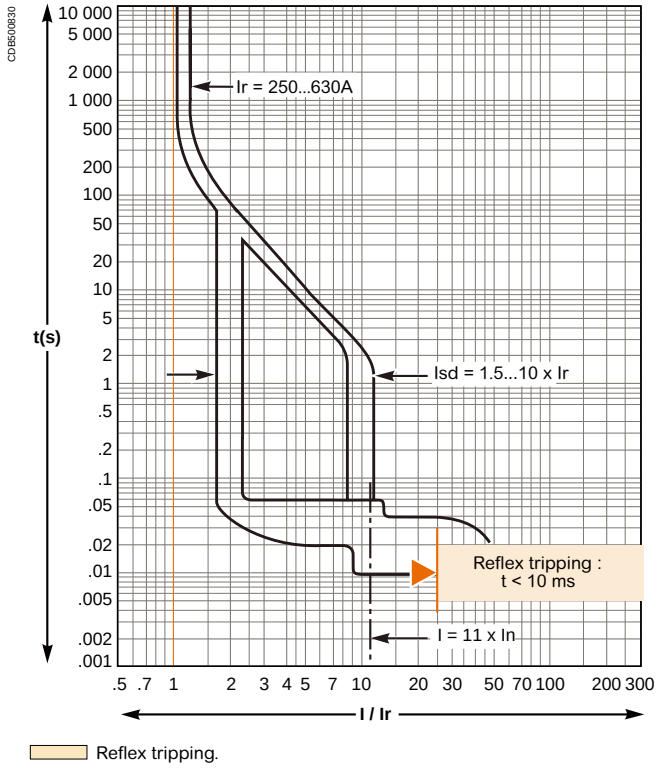


ETS2.3 electronic trip units

ETS2.3 400 A



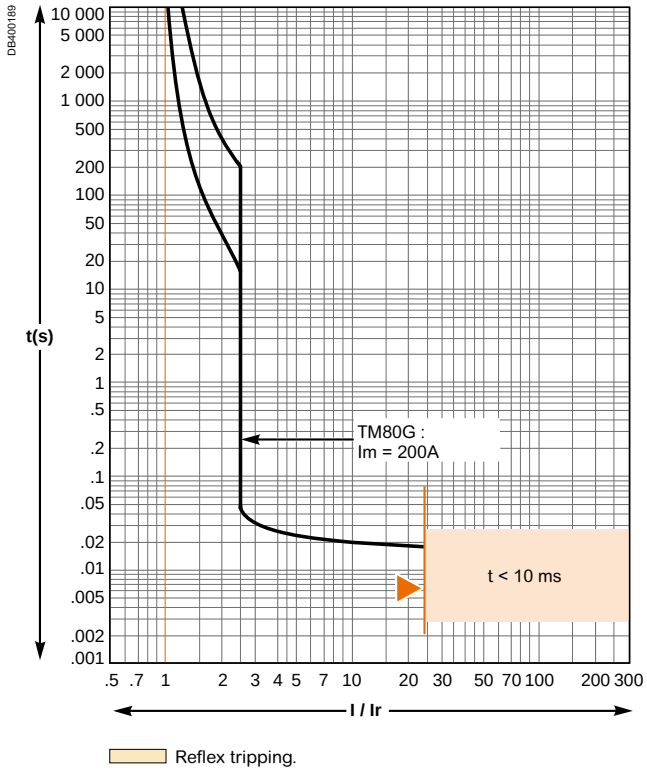
ETS2.3 630 A



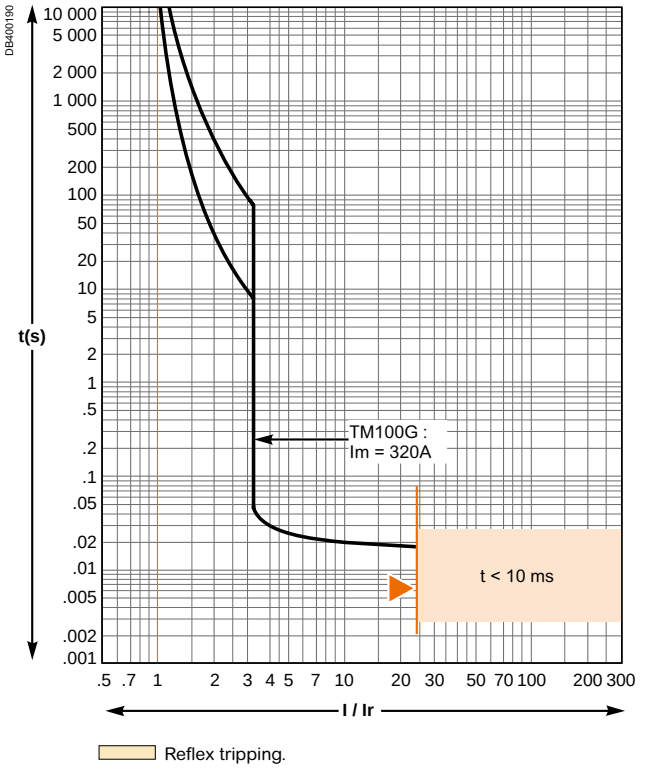
Tripping curves
EasyPact CVS100 to 250
Protection of generator systems

TM magnetic trip units

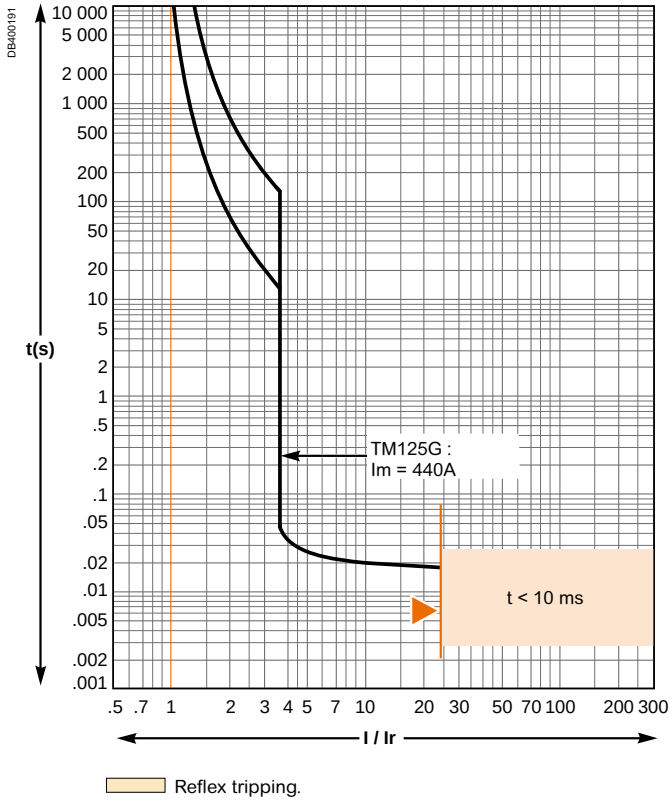
TM80G



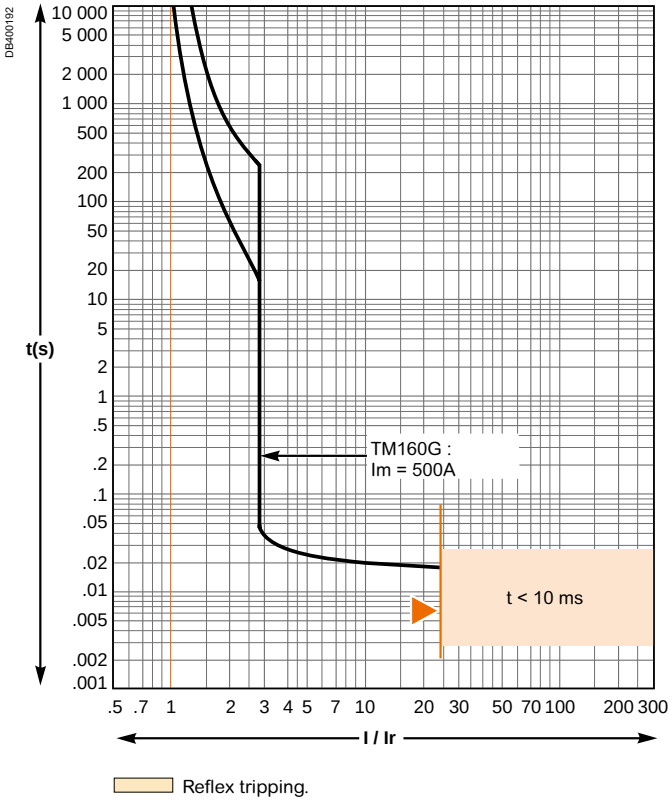
TM100G



TM125G



TM160G



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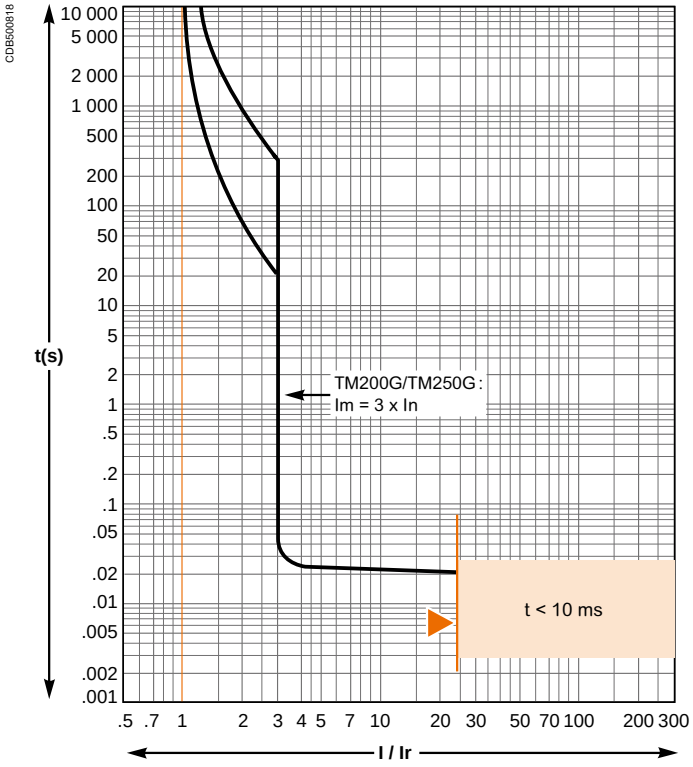
Tripping curves
EasyPact CVS100 to 250
Protection of generator systems

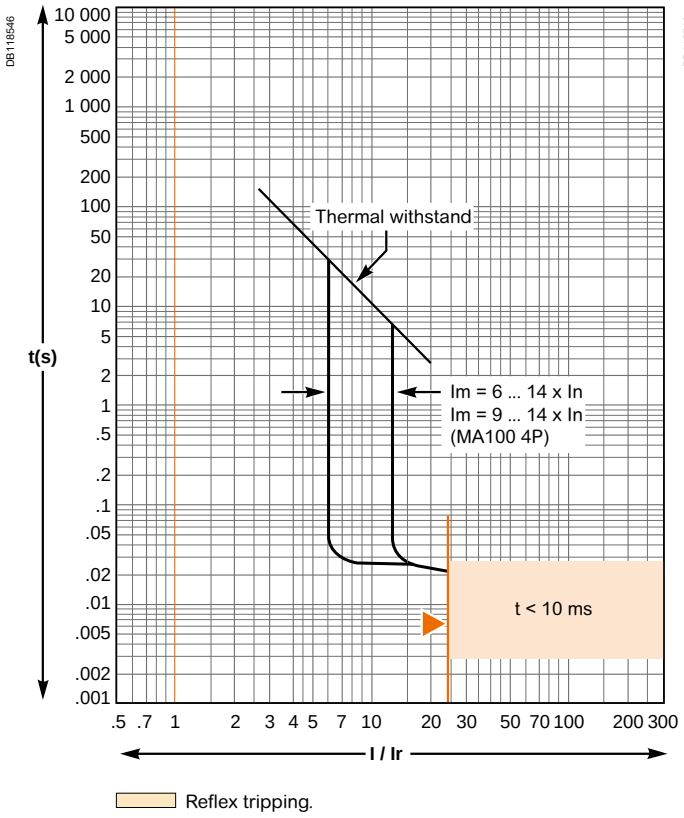
TM200G and TM250G



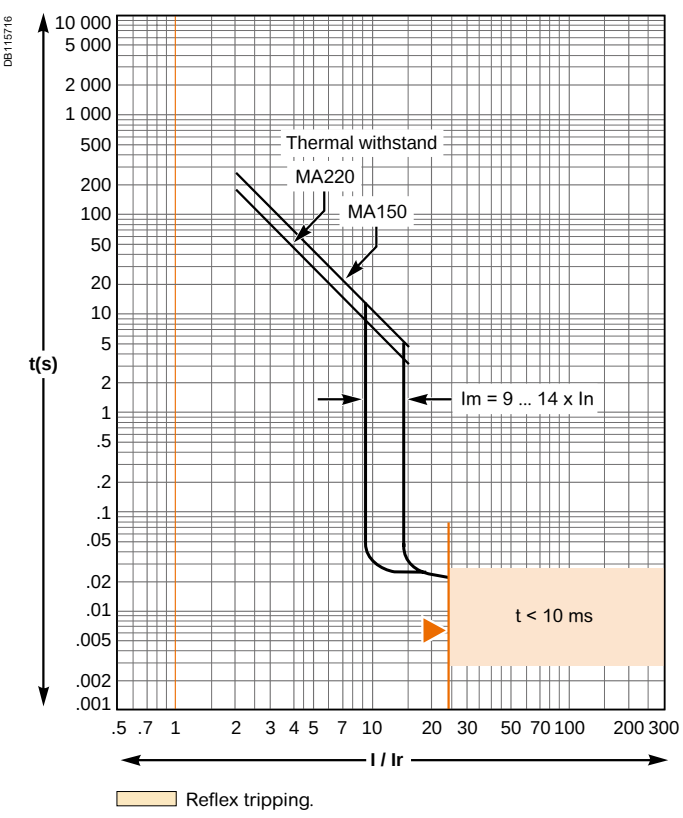
Tripping curves
EasyPact CVS100 to 250
Motor protection

MA magnetic trip units

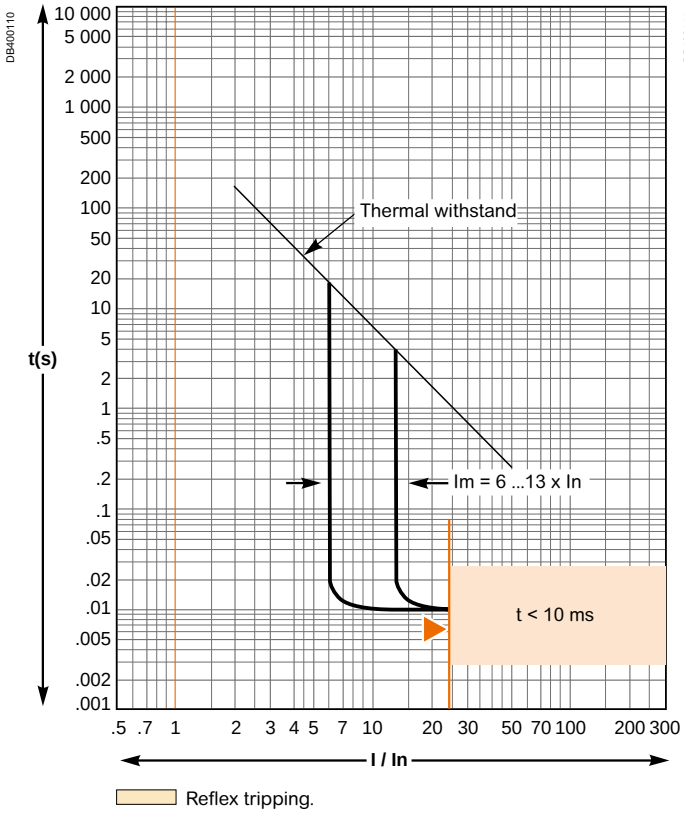
MA2.5... MA100



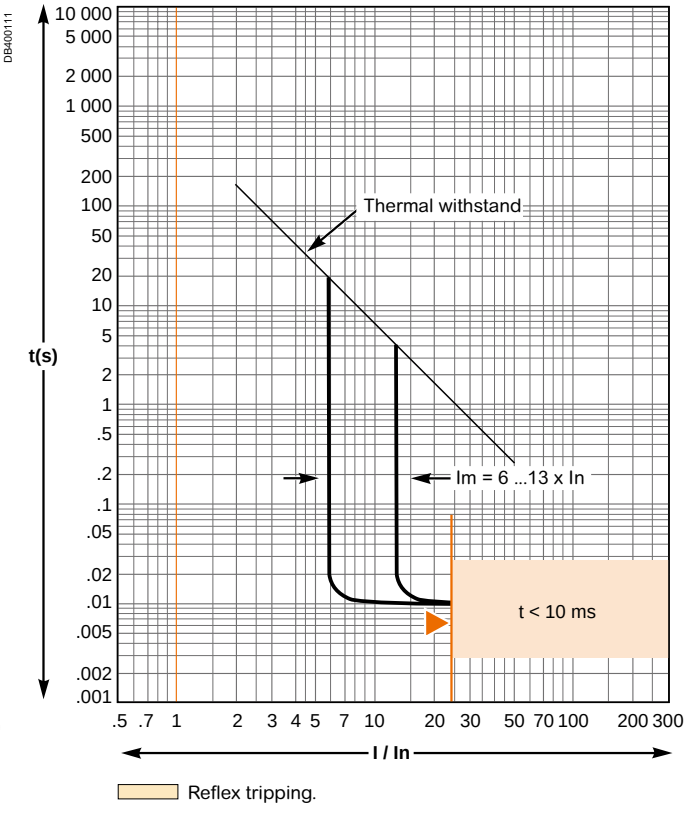
MA150 and MA220



MA320

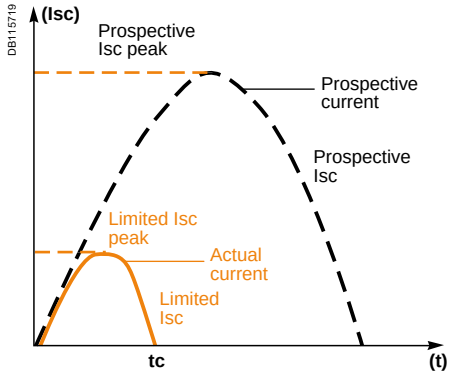


MA500



Tripping curves
Current and energy limiting curves

The limiting capacity of a circuit breaker is its aptitude to let through a current, during a short-circuit, that is less than the prospective short-circuit current.



The exceptional limiting capacity of the EasyPact CVS range is due to the rotating double-break technique (very rapid natural repulsion of contacts and the appearance of two arc voltages in-series with a very steep wavefront).

Ics = 100 % Icu

The exceptional limiting capacity of the EasyPact CVS range greatly reduces the forces created by fault currents in devices.
The result is a major increase in breaking performance.
In particular, the service breaking capacity Ics is equal to 100 % of Icu.
The Ics value, defined by IEC standard 60947-2, is guaranteed by tests comprising the following steps:

- ■ break three times consecutively a fault current equal to 100% of Icu
- ■ check that the device continues to function normally, that is:
- □ it conducts the rated current without abnormal temperature rise
- □ 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 busbars being deformed or broken.

Electromagnetic effects

Fewer disturbances for measuring devices located near electrical circuits.

Current and energy limiting curves

The 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.

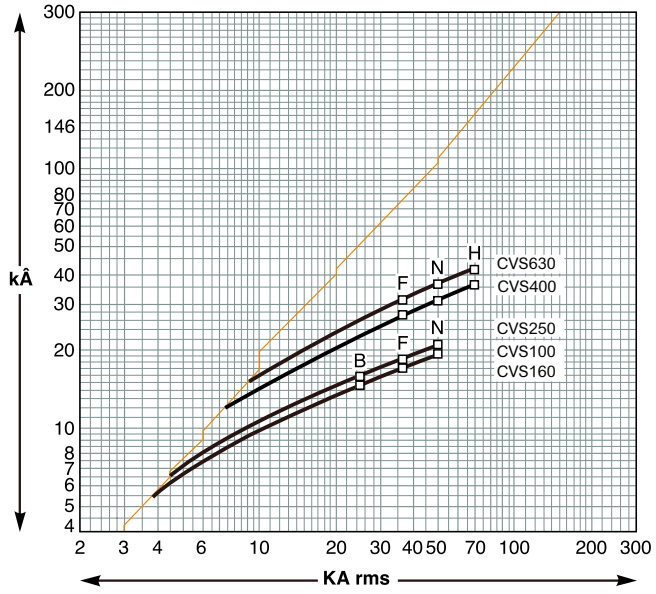
Maximum permissible cable stresses

The table below indicates the maximum permissible thermal stresses for cables depending on their insulation, conductor (Cu or Al) and their cross-sectional area (CSA). CSA values are given in mm^2 and thermal stresses in A^2s.

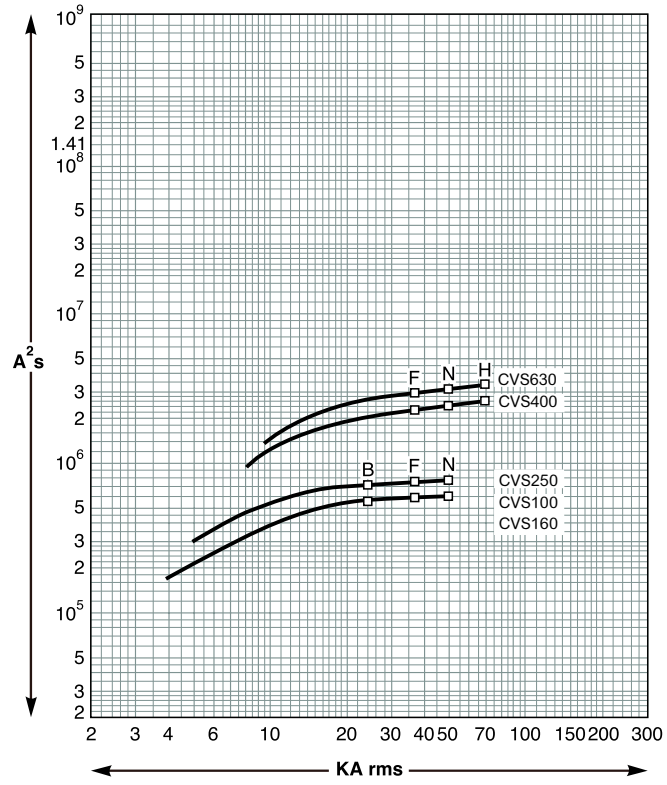
CSA		1.5 mm²	2.5 mm²	4 mm²	6 mm²	10 mm²
PVC	Cu	$2.97x10^4$	$8.26x10^4$	$2.12x10^5$	$4.76x10^5$	$1.32x10^6$
	Al					$5.41x10^5$
PRC	Cu	$4.10x10^4$	$1.39x10^5$	$2.92x10^5$	$6.56x10^5$	$1.82x10^6$
	Al					$7.52x10^5$
CSA		**16 mm²**	**25 mm²**	**35 mm²**	**50 mm²**	
PVC	Cu	$3.4x10^6$	$8.26x10^6$	$1.62x10^7$	$3.31x10^7$	
	Al	$1.39x10^6$	$3.38x10^6$	$6.64x10^6$	$1.35x10^7$	
PRC	Cu	$4.69x10^6$	$1.39x10^7$	$2.23x10^7$	$4.56x10^7$	
	Al	$1.93x10^6$	$4.70x10^6$	$9.23x10^6$	$1.88x10^7$	

Tripping curves
Current and energy limiting curves

Current-limiting curves



Energy-limiting curves

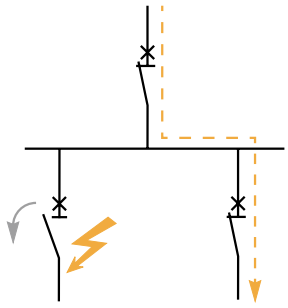


Life Is On Schneider Electric

Coordination between circuit breakers
Introduction to selectivity

E002487-37.eps

Selectivity of over-current protection is covered by circuit breakers standards: IEC 60947-2 Annex A and IEC 60898-1 Annex D.
Selectivity of residual current protection is covered by IEC 60364 series and product standards IEC 60947-2 Annex B and M, IEC 61009-1.



DB430717-CVS.eps

Selectivity is essential to ensure continuity of supply and fast fault localization.

Selectivity (Discrimination)

Selectivity is achieved by overcurrent and earth fault protective devices if a fault condition, occurring at any point in the installation, is cleared by the protective device located immediately upstream of the fault, while all the other protective devices remain unaffected.

Selectivity is required for installation supplying critical loads where one fault on one circuit shall not cause the interruption of the supply of other circuits. In the IEC 60364 series it is mandatory for installation supplying safety services (IEC60364-5-56 2009 560.7.4). Selectivity may also be required by some local regulations or for some special applications like:
- Medical location
- Marine
- High-rise building.

Selectivity is highly recommended when power availability and reliability is critical due to the nature of the loads such as:
- Data centers
- Infrastructure (tunnel, airport…)
- Critical processes.

From installation point of view: selectivity is achieved when the maximum short-circuit current at a point of installation is below selectivity limit of the circuit breakers supplying this point of installation. Selectivity shall be checked for all circuits supplied by one source and for all types of fault:
- Overload
- Short-circuit
- Earth fault.

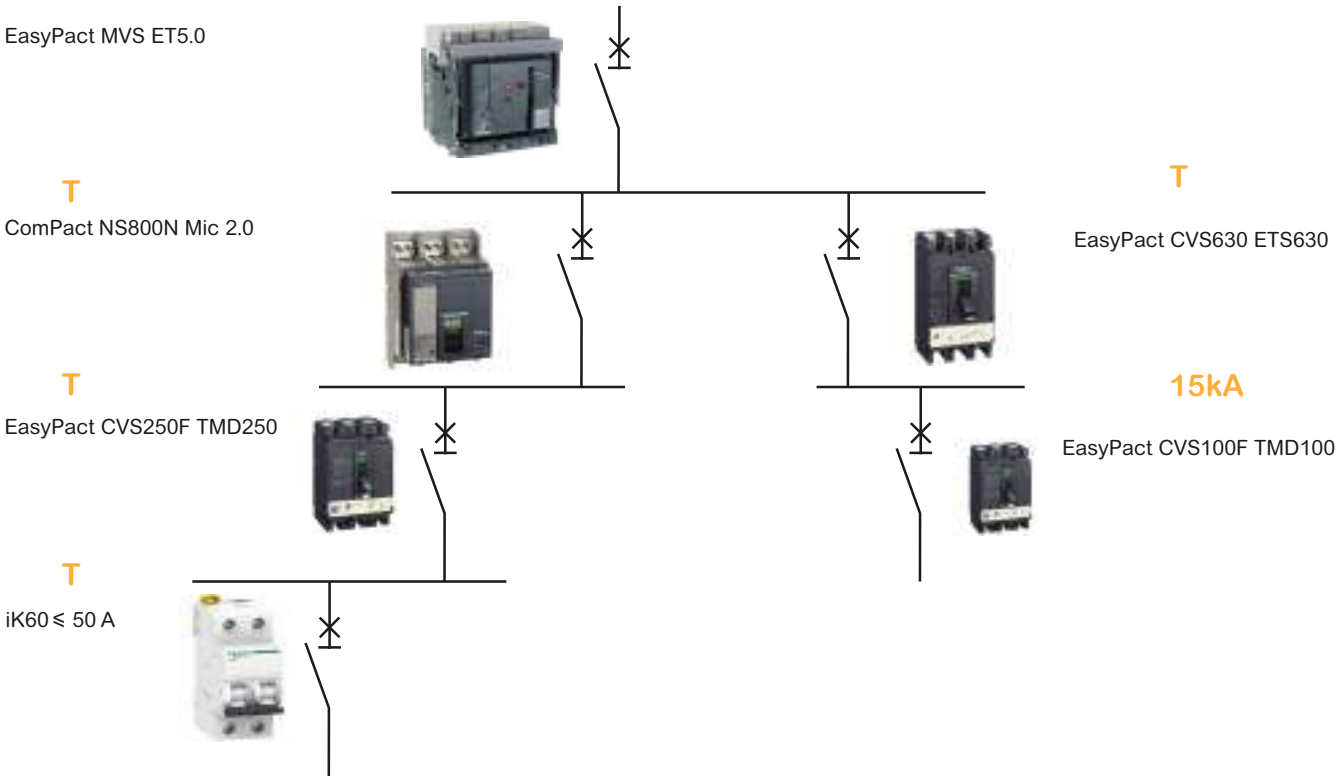
When system can be supplied by different sources (Grid or Generator Set for instance) selectivity shall be checked in both cases.

To know more:

https://www.electrical-installation.org/enwiki/Coordination_between_circuit-breakers#Principles_of_Selectivity

https://www.se.com/ww/en/download/document/LVPED318033EN/

Coordination between circuit breakers
Introduction to selectivity



Practical example of selectivity at several levels with Schneider Electric circuit breakers

Life Is On Schneider Electric

Coordination between circuit breakers
Introduction to selectivity

Selectivity limits given in the selectivity tables are the best performance that can be achieved between two given circuit breakers. When the upstream circuit breaker is adjustable and its setting values are not specified, it is considered that it is set to its maximum values.
Nevertheless, high selectivity performance is possible with lower settings.

How to use the selectivity tables

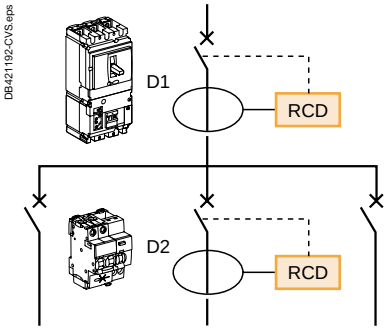
Combinations providing full selectivity are indicated by the symbol T (up to downstream breaker Icu)
If selectivity is partial, the table indicates the maximum fault current value (kA) until which selectivity is ensured.

Requisite conditions
The value indicated in the tables are valid for operational rated voltage 380V 400V 415V 50-60Hz. Following ratios shall be respected to avoid overlapping of tripping curves.

Upstream	Downstream	Ir up / Ir down	Im up / Im down
TM	**TM**	**1.6**	**2**
	MA + O/L	**3**	**2**
ETS	**TM**	**1.6**	**2**
	ETS	**1.3 (1)**	**1.5**
	MA + O/L = separate overload relay	**3**	**2**
Micrologic	**TM**	**1.6**	**2**
	ETS	**1.3 (1)**	**1.5**
	MA + O/L = separate overload relay	**3**	**2**

When Magnetic threshold is adjustable, table is based on maximum setting Im (= 10xIr typically).
When tr is adjustable tr upstream > tr downstream.
When tsd is adjustable tsd upstream > tsd downstream.

Coordination between circuit breakers
Introduction to selectivity



Selectivity of RCDs

When circuit breakers are equipped with RCD function, selectivity tables are valid for short-circuit and earth fault with high amplitude current.

Residual Current Devices are by design very sensitive to fault and shall be coordinated properly to achieve total selectivity in addition to overcurrent protection.

Schneider Electric proposes a wide range of solutions with the RCD function.

All these devices from Schneider Electric are following by design the same rules for sensitivity and tripping time even if they are covered by different standard (IEC/EN 61009-1, IEC/EN 60947-2 Annex B or Annex M, IEC 61008). So, whatever the type of RCD is, the following rules apply:

- the sensitivity of the upstream residual current device must be at least equal to three times the sensitivity of the downstream residual current device
- the upstream residual current device must be:
  - of the selective (S) type (or setting) if the downstream residual current device is an instantaneous type,
  - of the delayed (R) type (or setting) if the downstream residual current device is a selective type. The minimum non-tripping time of the upstream device will therefore be greater than the maximum tripping time of the downstream device for all current values.

$I\Delta n\ D1 \geq 3 \times I\Delta n\ D2$ & $\Delta t\ (D1) > \Delta t\ (D2)$.

Selectivity

Upstream: **Easy**Pact CVS16-250 B/F/N TM•D

Downstream: iC40, iC60, iC120

Ue ≤ 415 Vac

Upstream Trip Unit		EasyPact CVS100 B/F/N TM•D								CVS160 B/F/N TM•D			CVS250 B/F/N TM•D		
Downstream	Rating	16	25	32	40	50	63	80	100	100	125	160	160	200	250
	Im	190	300	400	500	500	500	640	800	800	1250	1250	1250	1000	1250
														2000	2500
Selectivity Limit (kA)															
iC40, iC40N	≤ 10	**0.19**	**0.3**	**0.4**	**0.9**	**0.9**	**0.9**	**0.63**	**0.8**	**0.8**	T	T	T	T	T
B-C Curves	16		**0.3**	**0.4**	**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	T	T	T	T	T
1 P+N 240V	20			**0.4**	**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	T	T	T	T	T
3P 3P+N 415V	25				**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**2**	**2**	**2**	**4**	T
	32					**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3.5**	T
	40						**0.5**	**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3.5**	T
iC60a	≤ 10	**0.19**	**0.3**	**0.4**	**0.9**	**0.9**	**0.9**	**0.63**	**0.8**	**0.8**	T	T	T	T	T
B-C-D Curves	16		**0.3**	**0.4**	**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	T	T	T	T	T
1P 240V	20			**0.4**	**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	T	T	T	T	T
2,3,4P 415V	25				**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**2**	**2**	**2**	**4**	T
	32					**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3.5**	T
	40						**0.5**	**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3.5**	T
	50							**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3**	**4**
	63								**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3**	**4**
iC60N	≤ 10	**0.19**	**0.3**	**0.4**	**0.9**	**0.9**	**0.9**	**0.63**	**0.8**	**0.8**	**6**	**6**	**6**	T	T
B-C-D Curves	16		**0.3**	**0.4**	**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**6**	**6**	**6**	T	T
1P 240V	20			**0.4**	**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**6**	**6**	**6**	T	T
2,3,4P 415V	25				**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**2**	**2**	**2**	**4**	**5.5**
	32					**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3.5**	**5.5**
	40						**0.5**	**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3.5**	**5**
	50							**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3**	**4**
	63								**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3**	**4**
iC60H	≤ 10	**0.19**	**0.3**	**0.4**	**0.9**	**0.9**	**0.9**	**0.63**	**0.8**	**0.8**	**6**	**6**	**6**	**10**	**10**
B-C-D Curves	16		**0.3**	**0.4**	**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**6**	**6**	**6**	**10**	**10**
1P 240V	20			**0.4**	**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**6**	**6**	**6**	**10**	**10**
2,3,4P 415V	25				**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**2**	**2**	**2**	**4**	**5.5**
	32					**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3.5**	**5.5**
	40						**0.5**	**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3.5**	**5**
	50							**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3**	**4**
	63								**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3**	**4**
iC60L	≤ 10	**0.19**	**0.3**	**0.4**	**0.9**	**0.9**	**0.9**	**0.63**	**0.8**	**0.8**	**6**	**6**	**6**	**10**	**10**
B-C-D-K-Z	16		**0.3**	**0.4**	**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**6**	**6**	**6**	**10**	**10**
Curves	20			**0.4**	**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**6**	**6**	**6**	**10**	**10**
1P 240V	25				**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**2**	**2**	**2**	**4**	**5.5**
2,3,4P 415V	32					**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3.5**	**5.5**
	40						**0.5**	**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3.5**	**5**
	50							**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3**	**4**
	63								**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3**	**4**
iC120N	63								**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**2**	**3**
B-C-D Curves	80										**1.25**	**1.25**	**1.25**	**2**	**2.5**
1P 240V	100											**1.25**	**1.25**	**2**	**2.5**
2,3,4P 415V	125													**2**	**2.5**
iC120H	63								**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**2**	**3**
B-C-D Curves	80										**1.25**	**1.25**	**1.25**	**2**	**2.5**
1P 240V	100											**1.25**	**1.25**	**2**	**2.5**
2,3,4P 415V	125													**2**	**2.5**

4 Selectivity limit = 4kA

T Total selectivity, up to the breaking capacity of the downstream circuit breaker.

No Selectivity

Note: respect the basic rules of selectivity for overload and short-circuit, particularly for D curves downstream.

Selectivity

Upstream: **Easy**Pact CVS 16-250 B/F/N ETS

Downstream: iC40, iC60, iC120

Ue ≤ 415 Vac

Upstream Trip Unit		EasyPact CVS100 B/F/N ETS								CVS160 B/F/N ETS			CVS250 B/F/N ETS		
Downstream	Rating	40			100					160			250		
	Ir	18	32	40	40	50	63	80	100	100	125	160	160	200	250
	Isd	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr
Selectivity Limit (kA)															
iC40, iC40N	≤ 10	T	T	T	T	T	T	T	T	T	T	T	T	T	T
B-C Curves	16		0.6	0.6	T	T	T	T	T	T	T	T	T	T	T
1 P+N 240V	20			0.6	T	T	T	T	T	T	T	T	T	T	T
3P 3P+N 415V	25				T	T	T	T	T	T	T	T	T	T	T
	32					6	6	6	6	T	T	T	T	T	T
	40						6	6	6	T	T	T	T	T	T
iC60a	≤ 10	T	T	T	T	T	T	T	T	T	T	T	T	T	T
B-C-D Curves	16		0.6	0.6	T	T	T	T	T	T	T	T	T	T	T
1P 240V	20			0.6	T	T	T	T	T	T	T	T	T	T	T
2,3,4P 415V	25				T	T	T	T	T	T	T	T	T	T	T
	32					T	T	T	T	T	T	T	T	T	T
	40						T	T	T	T	T	T	T	T	T
	50							1	1	T	T	T	T	T	T
	63								1	T	T	T	T	T	T
iC60N	≤ 10	T	T	T	T	T	T	T	T	T	T	T	T	T	T
B-C-D Curves	16		0.6	0.6	T	T	T	T	T	T	T	T	T	T	T
1P 240V	20			0.6	T	T	T	T	T	T	T	T	T	T	T
2,3,4P 415V	25				T	T	T	T	T	T	T	T	T	T	T
	32					6	6	6	6	T	T	T	T	T	T
	40						6	6	6	T	T	T	T	T	T
	50							1	1	6	6	6	10	10	10
	63								1	6	6	6	10	10	10
iC60H	≤ 10	T	T	T	T	T	T	T	T	T	T	T	T	T	T
B-C-D Curves	16		0.6	0.6	T	T	T	T	T	T	T	T	T	T	T
1P 240V	20			0.6	10	10	10	10	10	T	T	T	T	T	T
2,3,4P 415V	25				10	10	10	10	10	T	T	T	T	T	T
	32					6	6	6	6	10	10	10	T	T	T
	40						6	6	6	10	10	10	T	T	T
	50							1	1	6	6	6	10	10	10
	63								1	6	6	6	10	10	10
iC60L	≤ 10	T	T	T	T	T	T	T	T	T	T	T	T	T	T
B-C-D-K-Z	16		0.6	0.6	T	T	T	T	T	T	T	T	T	T	T
Curves	20			0.6	10	10	10	10	10	T	T	T	T	T	T
1P 240V	25				10	10	10	10	10	T	T	T	T	T	T
2,3,4P 415V	32					6	6	6	6	10	10	10	T	T	T
	40						6	6	6	10	10	10	T	T	T
	50							1	1	6	6	6	10	10	10
	63								1	6	6	6	10	10	10
iC120N	63								0.8	0.8	1.25	1.25	1.25	2	3
B-C-D Curves	80										1.25	1.25	1.25	2	2.5
1P 240V	100											1.25	1.25	2	2.5
2,3,4P 415V	125													2	2.5
iC120H	63								0.8	0.8	1.25	1.25	1.25	2	3
B-C-D Curves	80										1.25	1.25	1.25	2	2.5
1P 240V	100											1.25	1.25	2	2.5
2,3,4P 415V	125													2	2.5

4 Selectivity limit = 4kA

T Total selectivity, up to the breaking capacity of the downstream circuit breaker.

No Selectivity

Note: respect the basic rules of selectivity for overload and short-circuit, particularly for D curves downstream.

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Selectivity

Upstream: **Easy**Pact CVS100BS

Downstream: iK60N

Ue ≤ 415 Vac

Upstream Trip Unit		EasyPact CVS100BS TM•D								
Downstream	Rating	16	20	25	32	40	50	63	80	100
	Im	300	300	300	300	500	500	750	1000	1000
Selectivity Limit (kA)										
iK60N	⩽ 10	**0.3**	**0.3**	**0.3**	**0.3**	**0.5**	**0.5**	**0.75**	**1**	**1**
B-C Curves	16			**0.3**	**0.3**	**0.5**	**0.5**	**0.75**	**1**	**1**
1P 230V	20				**0.3**	**0.5**	**0.5**	**0.75**	**1**	**1**
2,3,4P 400V	25					**0.5**	**0.5**	**0.75**	**1**	**1**
	32						**0.5**	**0.75**	**1**	**1**
	40							**0.75**	**1**	**1**
	50								**1**	**1**
	63									**1**

4 Selectivity limit = 4kA

T Total selectivity, up to the breaking capacity of the downstream circuit breaker.

No Selectivity

Note: respect the basic rules of selectivity for overload and short-circuit. See Introduction.

Selectivity

Upstream: **Easy**Pact CVS16-250 B/F/N TM•D & ETS

Downstream: iK60N

Ue ≤ 415 Vac

Upstream Trip Unit		EasyPact CVS100 B/F/N TM•D								CVS160 B/F/N TM•D			CVS250 B/F/N TM•D		
Downstream	Rating	16	25	32	40	50	63	80	100	100	125	160	160	200	250
	Im	190	300	400	500	500	500	640	800	800	1250	1250	1250	1000	1250
														2000	2500
Selectivity Limit (kA)															
iK60N	≤ 10	**0.19**	**0.3**	**0.4**	**0.9**	**0.9**	**0.9**	**0.63**	**0.8**	**0.8**	**2.5**	**5**	**5**	T	T
B-C Curves	16		**0.3**	**0.4**	**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**3**	**3**	**3**	T	T
1P 230V	20			**0.4**	**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**2.5**	**2.5**	**2.5**	T	T
2,3,4P 400V	25				**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**2**	**2**	**2**	T	T
	32					**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**5**	T
	40						**0.5**	**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**4.5**	T
	50							**0.63**	**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**4**	T
	63								**0.8**	**0.8**	**1.5**	**1.5**	**1.5**	**3**	**5**

Upstream Trip Unit		EasyPact CVS100 B/F/N ETS								CVS160 B/F/N ETS			CVS250 B/F/N ETS		
Downstream	Rating	40			100					160			250		
	Ir	18	32	40	40	50	63	80	100	100	125	160	160	200	250
	Isd	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr
Selectivity Limit (kA)															
iK60N	≤ 10	T	T	T	T	T	T	T	T	T	T	T	T	T	T
B-C Curves	16		**0.6**	**0.6**	T	T	T	T	T	T	T	T	T	T	T
1P 230V	20			**0.6**	T	T	T	T	T	T	T	T	T	T	T
2,3,4P 400V	25				T	T	T	T	T	T	T	T	T	T	T
	32					T	T	T	T	T	T	T	T	T	T
	40						T	T	T	T	T	T	T	T	T
	50							1	1	T	T	T	T	T	T
	63								1	T	T	T	T	T	T

4 Selectivity limit = 4kA

T Total selectivity, up to the breaking capacity of the downstream circuit breaker.

No Selectivity

Note: respect the basic rules of selectivity for overload and short-circuit. See Introduction.

Selectivity

Upstream: **Easy**Pact CVS16-250 B/F/N TM•D

Downstream: **Easy**Pact CVS16-250 BS/B/F/N

Ue ≤ 415 Vac

Upstream Trip Unit		EasyPact CVS100 B/F/N TM•D								CVS160 B/F/N TM•D			CVS250 B/F/N TM•D		
Downstream	Rating	16	25	32	40	50	63	80	100	100	125	160	160	200	250
	Im	190	300	400	500	500	500	640	800	800	1250	1250	1250	1000	1250
														2000	2500
Selectivity Limit (kA)															
CVS100 BS	16		**0.3**	**0.4**	**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
TM•D	20			**0.4**	**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
	25				**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
	32					**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
	40						**0.5**	**0.63**	**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
	50							**0.63**	**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
	63								**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
	80										**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
	100											**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
CVS100 B/F/N	16		**0.3**	**0.4**	**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
TM•D	25				**0.5**	**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
	32					**0.5**	**0.5**	**0.63**	**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
	40						**0.5**	**0.63**	**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
	50							**0.63**	**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
	63								**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
	80										**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
	100											**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
CVS160 B/F/N	100											**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
TM•D	125													**1-2**	**1.25 - 2.5**
	160														**1.25 - 2.5**
CVS100 B/F/N ETS40	40						**0.5**	**0.63**	**0.8**	**0.8**	**1.25**	**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
CVS100 B/F/N ETS100	100											**1.25**	**1.25**	**1-2**	**1.25 - 2.5**
CVS160 B/F/N ETS160	160														**1.25 - 2.5**

4 Selectivity limit = 4kA

T Total selectivity. up to the breaking capacity of the downstream circuit breaker.

No Selectivity

Note: respect the basic rules of selectivity for overload and short-circuit. See Introduction.

Selectivity

Upstream: **Easy**Pact CVS16-250 B/F/N ETS

Downstream: **Easy**Pact CVS16-250 BS/B/F/N

Ue ≤ 415 Vac

Upstream Trip Unit		EasyPact CVS100 B/F/N ETS								CVS160 B/F/N ETS			CVS250 B/F/N ETS		
Downstream	Rating	40			100					160			250		
	Ir	18	32	40	40	50	63	80	100	100	125	160	160	200	250
	Isd	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr	10xIr
Selectivity Limit (kA)															
CVS100 BS	16		0.3	0.4	0.4	0.5	0.63	0.8	1	1	1.25	1.6	1.6	2	2.5
TM•D	20			0.4	0.4	0.5	0.63	0.8	1	1	1.25	1.6	1.6	2	2.5
	25				0.4	0.5	0.63	0.8	1	1	1.25	1.6	1.6	2	2.5
	32					0.5	0.63	0.8	1	1	1.25	1.6	1.6	2	2.5
	40						0.63	0.8	1	1	1.25	1.6	1.6	2	2.5
	50							0.8	1	1	1.25	1.6	1.6	2	2.5
	63								1	1	1.25	1.6	1.6	2	2.5
	80										1.25	1.6	1.6	2	2.5
	100											1.6	1.6	2	2.5
CVS100 B/F/N	16		0.3	0.4	0.4	0.5	0.63	0.8	1	1	1.25	1.6	1.6	2	2.5
TM•D	25			0.4	0.4	0.5	0.63	0.8	1	1	1.25	1.6	1.6	2	2.5
	32					0.5	0.63	0.8	1	1	1.25	1.6	1.6	2	2.5
	40						0.63	0.8	1	1	1.25	1.6	1.6	2	2.5
	50							0.8	1	1	1.25	1.6	1.6	2	2.5
	63								1	1	1.25	1.6	1.6	2	2.5
	80										1.25	1.6	1.6	2	2.5
	100											1.6	1.6	2	2.5
CVS160 B/F/N	100											1.6	1.6	2	2.5
TM•D	125													2	2.5
	160														2.5
CVS100 B/F/N ETS40	40						0.63	0.8	1	1	1.25	1.6	1.6	2	2.5
CVS100 B/F/N ETS100	100											1.6	1.6	2	2.5
CVS160 B/F/N ETS160	160														2.5

4 Selectivity limit = 4kA

T Total selectivity, up to the breaking capacity of the downstream circuit breaker.

No Selectivity

Note: respect the basic rules of selectivity for overload and short-circuit. See Introduction.

Selectivity

Upstream: **Easy**Pact CVS400-630 F/N/H TM•D & ETS

Downstream: iK60N

Ue ≤ 415 Vac

Upstream Trip Unit		CVS320 F/N/H TM•D				CVS400 F/N/H TM•D				CVS500 F/N/H TM•D				CVS600 F/N/H TM•D			
Downstream	Rating	320				400				500				600			
	Setting	225	255	290	320	280	320	360	400	350	400	450	500	420	480	540	630
		Im = 5- 10In				Im = 5- 10In				Im = 5- 10In				Im = 4- 8In			
	Im (A)	3200				4000				5000				5000			
Selectivity Limit (kA)																	
iK60N	≤ 10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
B-C Curves	16	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
1P 230V	20	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
2,3,4P 400V	25	T	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	T
	40	T	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	T
	63	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T

Upstream Trip Unit		CVS400 F/N/H ETS						CVS630 F/N/H ETS					
Downstream	Rating	400						630					
	Setting	200	250	280	320	360	400	315	400	440	500	570	630
		Im = 2- 10Ir		Ii = 11In				Im = 2- 10Ir		Ii = 11In			
Selectivity Limit (kA)													
iK60N	≤ 10	T	T	T	T	T	T	T	T	T	T	T	T
B-C Curves	16	T	T	T	T	T	T	T	T	T	T	T	T
1P 230V	20	T	T	T	T	T	T	T	T	T	T	T	T
2,3,4P 400V	25	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
	40	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
	63	T	T	T	T	T	T	T	T	T	T	T	T

4	Selectivity limit = 4kA
T	Total selectivity, up to the breaking capacity of the downstream circuit breaker.
	No Selectivity

Note: respect the basic rules of selectivity for overload and short-circuit. See Introduction.

Selectivity

Upstream: **Easy**Pact CVS400-600 F/N/H TM•D

Downstream: **Easy**Pact CVS

Ue ≤ 415 Vac

Upstream Trip Unit		CVS320 F/N/H TM•D				CVS400 F/N/H TM•D				CVS500 F/N/H TM•D				CVS600 F/N/H TM•D			
Downstream	Rating	320				400				500				600			
	Ir (A)	225	255	290	320	280	320	360	400	350	400	450	500	420	480	540	630
	Im (kA)	3.2				4				5				5			
		Im = 5- 10In				Im = 5- 10In				Im = 5- 10In				Im = 5- 8In			
Selectivity Limit (kA)																	
CVS100 BS	16	3.2	3.2	3.2	3.2	4	4	4	4	7	7	7	7	7	7	7	7
TM•D	20	3.2	3.2	3.2	3.2	4	4	4	4	6	6	6	6	6	6	6	6
	25	3.2	3.2	3.2	3.2	4	4	4	4	6	6	6	6	6	6	6	6
	32	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
	40	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
	50	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
	63	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
	80	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
	100	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
CVS100 B/F/N	16	3.2	3.2	3.2	3.2	4	4	4	4	7	7	7	7	7	7	7	7
TM•D	25	3.2	3.2	3.2	3.2	4	4	4	4	6	6	6	6	6	6	6	6
	32	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
	40	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
	50	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
	63	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
	80	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
	100	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
CVS 160 B/F/N	100	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
TM•D	125	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
	160			3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
CVS 250 B/F/N	160			3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
TM•D	200							4	4	5	5	5	5	5	5	5	5
	250								4		5	5	5		5	5	5
CVS100 B/F/N ETS	40	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
	100	3.2	3.2	3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
CVS160 B/F/N ETS	160			3.2	3.2	4	4	4	4	5	5	5	5	5	5	5	5
	250								4		5	5	5		5	5	5
CVS400 F/N/H	320															5	5
TM-D	400																5
CVS400 F/N/H ETS	400																5

4 Selectivity limit = 4kA

T Total selectivity, up to the breaking capacity of the downstream circuit breaker.

No Selectivity

Note: respect the basic rules of selectivity for overload and short-circuit. See Introduction.

Selectivity

Upstream: **Easy**Pact CVS400/600 F/N/H ETS

Downstream: **Easy**Pact CVS

Ue ≤ 415 Vac

Upstream Trip Unit		CVS400 F/N/H ETS						CVS600 F/N/H ETS					
Downstream	Rating	400						630					
	Ir (A)	200	250	280	320	360	400	315	400	440	500	570	630
	Im (kA)	2	2.5	2.8	3.2	3.6	4	3.1	4	4.4	5	5.7	6.3
		Im = 2- 10Ir		Ii = 11In				Im = 2- 10Ir		Ii = 11In			
Selectivity Limit (kA)													
EasyPact CVS100 BS	16	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**5**	**7**	**10**	**15**
TM•D	20	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**5**	**6**	**10**	**12**
	25	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**5**	**6**	**10**	**12**
	32	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**6**	**7**	**10**
	40	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**6**	**7**	**10**
	50	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**5.5**	**6.6**	**8**
	63	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**5**	**5.7**	**7**
	80	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**5**	**5.7**	**6.3**
	100	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**5**	**5.7**	**6.3**
EasyPact CVS100 B/F/N	16	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**5**	**7**	**10**	**15**
TM•D	25	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**5**	**6**	**10**	**12**
	32	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**6**	**7**	**10**
	40	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**6**	**7**	**10**
	50	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**5.5**	**6.6**	**8**
	63	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**5**	**5.7**	**7**
	80	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**5**	**5.7**	**6.3**
	100	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**5**	**5.7**	**6.3**
CVS160 B/F/N	100	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**5**	**5.7**	**6.3**
TM•D	125	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**5**	**5.7**	**6.3**
	160			**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**5**	**5.7**	**6.3**
CVS250 B/F/N	160			**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**5**	**5.7**	**6.3**
TM•D	200					**3.6**	**4**	**3.1**	**4**	**4.4**	**5**	**5.7**	**6.3**
	250						**4**		**4**	**4.4**	**5**	**5.7**	**6.3**
CVS100 B/F/N ETS	40	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**6**	**7**	**10**
	100	**2**	**2.5**	**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**5**	**5.7**	**6.3**
CVS160 B/F/N ETS	160			**2.8**	**3.2**	**3.6**	**4**	**3.1**	**4**	**4.4**	**5**	**5.7**	**6.3**
	250						**4**		**4**	**4.4**	**5**	**5.7**	**6.3**
CVS400 F/N/H TM-D	320											**5.7**	**6.3**
	400												**6.3**
CVS400 F/N/H ETS	400												**6.3**

4 Selectivity limit = 4kA

T Total selectivity, up to the breaking capacity of the downstream circuit breaker.

No Selectivity

Note: respect the basic rules of selectivity for overload and short-circuit. See Introduction.

Selectivity

Upstream: ComPact NS 630-1600 N/H

Downstream: EasyPact CVS 100-630

Ue ≤ 415 Vac

Upstream Trip Unit		ComPact NS 630-1600 N/H Micrologic 2 Isd = 10In						ComPact NS 630-1600 N/H Micrologic 5,6 Inst 15In or OFF					
Downstream	Rating		630	800	1000	1250	1600		630	800	1000	1250	1600
	Setting Ir (A)	400	630	800	1000	1250	1600	400	630	800	1000	1250	1600
Selectivity Limit (kA)													
CVS 100 BS	16	T	T	T	T	T	T	T	T	T	T	T	T
TM•D	20	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
	32	T	T	T	T	T	T	T	T	T	T	T	T
	40	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
	63	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
	100	T	T	T	T	T	T	T	T	T	T	T	T
CVS 100 B/F/N	16	T	T	T	T	T	T	T	T	T	T	T	T
TM•D	25	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
	40	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
	63	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
	100	T	T	T	T	T	T	T	T	T	T	T	T
CVS100 B/F/N ETS	40	T	T	T	T	T	T	T	T	T	T	T	T
	100	T	T	T	T	T	T	T	T	T	T	T	T
CVS 160 B/F/N	100	T	T	T	T	T	T	T	T	T	T	T	T
TM•D	125	T	T	T	T	T	T	T	T	T	T	T	T
	160	T	T	T	T	T	T	T	T	T	T	T	T
CVS 250 B/F/N	160	T	T	T	T	T	T	T	T	T	T	T	T
TM•D	200	T	T	T	T	T	T	T	T	T	T	T	T
CVS160 B/F/N ETS	160	T	T	T	T	T	T	T	T	T	T	T	T
	250	T	T	T	T	T	T	T	T	T	T	T	T
CVS250 B/F/N ETS	250	T	T	T	T	T	T	T	T	T	T	T	T
CVS 400 F/N/H	320		T	T	T	T	T		T	T	T	T	T
TM•D	400		T	T	T	T	T		T	T	T	T	T
CVS 600 F/N/H	500		T	T	T	T	T		T	T	T	T	T
TM•D	600			T	T	T	T			T	T	T	T
CVS 400 F/N/H ETS	320		T	T	T	T	T		T	T	T	T	T
	400		T	T	T	T	T		T	T	T	T	T
CVS 630 F/N/H ETS	500			T	T	T	T			T	T	T	T
	630				T	T	T				T	T	T

Upstream Trip Unit		ComPact NS 630-1600 N/H Micrologic 2 Isd = 10In						ComPact NS 630-1600 N/H Micrologic 5,6 Inst 15In or OFF					
Downstream	Rating		630	800	1000	1250	1600		630	800	1000	1250	1600
	Setting Ir (A)	400	630	800	1000	1250	1600	400	630	800	1000	1250	1600
Selectivity Limit (kA)													
CVS 100 B/F/N	2.5	T	T	T	T	T	T	T	T	T	T	T	T
MA + O/L R	6.3	T	T	T	T	T	T	T	T	T	T	T	T
	12.5	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
	50	T	T	T	T	T	T	T	T	T	T	T	T
	100	T	T	T	T	T	T	T	T	T	T	T	T
CVS 160 B/F/N	100	T	T	T	T	T	T	T	T	T	T	T	T
MA + O/L R	150		T	T	T	T	T		T	T	T	T	T
CVS 250 B/F/N	220			T	T	T	T			T	T	T	T
MA + O/L R													
CVS 400 F/N/H	320				T	T	T				T	T	T
MA + O/L R													
CVS 600 F/N/H	500						T						T
MA + O/L R													

4	Selectivity limit = 4kA
T	Total selectivity, up to the breaking capacity of the downstream circuit breaker.
	No Selectivity

Note: respect the basic rules of selectivity for overload and short-circuit. See Introduction.

Selectivity
Upstream: **Easy**Pact MVS
Downstream: **Easy**Pact CVS

Ue ≤ 415 Vac

Upstream Trip Unit		EasyPact MVS C 06 - 16 ET 2,5,6					EasyPact MVS C 08-40N ET 2,5,6								EasyPact MVS C 08-40H ET 2,5,6							
Downstream	Rating	630	800	1000	1250	1600	800	1000	1250	1600	2000	2500	3200	4000	800	1000	1250	1600	2000	2500	3200	4000
	Setting Ir (A)	630	800	1000	1250	1600	800	1000	1250	1600	2000	2500	3200	4000	800	1000	1250	1600	2000	2500	3200	4000
Selectivity Limit (kA)																						
CVS100 BS	16	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
TM•D	20	T	T	T	T	T	T	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	T	T	T	T	T	T
	32	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	40	T	T	T	T	T	T	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	T	T	T	T	T	T
	63	T	T	T	T	T	T	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	T	T	T	T	T	T
	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
CVS 100 B/F/N	16	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
TM•D	25	T	T	T	T	T	T	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	T	T	T	T	T	T
	40	T	T	T	T	T	T	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	T	T	T	T	T	T
	63	T	T	T	T	T	T	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	T	T	T	T	T	T
	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
CVS100 B/F/N ETS	40	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
CVS 160 B/F/N	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
TM•D	125	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	160	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
CVS160 B/F/N ETS	160	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
CVS 250 B/F/N	160	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
TM•D	200	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	250	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
CVS250 B/F/N ETS	250	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
CVS 400 F/N/H	320	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
TM•D	400		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
CVS 600 F/N/H	500		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
TM•D	600			T	T	T		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
CVS 400 F/N/H	320	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
ETU	400	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
CVS 630 F/N/H	500		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
ETU	630			T	T	T		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T

Upstream Trip Unit		EasyPact MVS C 06 - 16 ET 2,5,6					EasyPact MVS C 08-40N ET 2,5,6								EasyPact MVS C 08-40H ET 2,5,6							
Downstream	Rating	630	800	1000	1250	1600	800	1000	1250	1600	2000	2500	3200	4000	800	1000	1250	1600	2000	2500	3200	4000
	Setting Ir (A)	630	800	1000	1250	1600	800	1000	1250	1600	2000	2500	3200	4000	800	1000	1250	1600	2000	2500	3200	4000
Motor protection																						
CVS 100 B/F/N	2.5	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
MA + O/L R	6.3	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	12.5	T	T	T	T	T	T	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	T	T	T	T	T	T
	50	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
CVS 160 B/F/N	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
MA + O/L R	150	T	T	T	T	T	T		T	T	T	T	T	T	T	T	T	T	T	T	T	T
CVS 250 B/F/N	220	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
MA + O/L R																						
CVS 400 F/N/H	320			T	T	T		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
MA +0/L R																						
CVS 600 F/N/H	500					T				T	T	T	T	T	T	T	T	T	T	T	T	T
MA + O/L R																						

4	Selectivity limit = 4kA
T	Total selectivity, up to the breaking capacity of the downstream circuit breaker.
	No Selectivity

Note: respect the basic rules of selectivity for overload and short-circuit. See Introduction.

Cascading

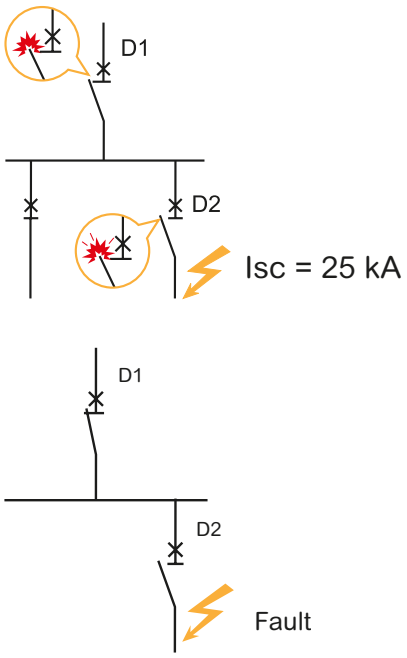
Cascading is the legacy name used by Schneider Electric.

Product standards such as IEC/EN 60947,60898, 61009-1 call this performance of two circuit-breakers “back-up protection”.

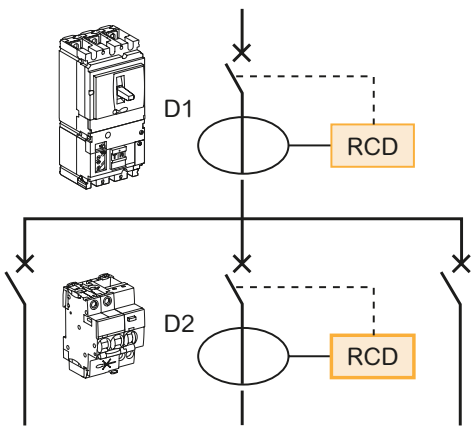
Low voltage Electrical installation standard IEC 60364 series and in particular IEC 60364-5-53 (2019) Clause 535.5 use the wording “Combined short-circuit protection”.

In this document we’ll keep “Cascading”, but the three wordings are equivalent.

In North America and UL standards this performance is known as “Series rating”.



D1 and D2 in series.



IEC 60947-2, Annex A
IEC 60364-4-43 (2008) § 434.5.1

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 of:

- design and manufacture of circuit breakers (IEC 60947-2, Annex A),
- electrical distribution networks (IEC 60364-4-43 Ed 3 2008 § 434.5.1).

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.

Cascading tables

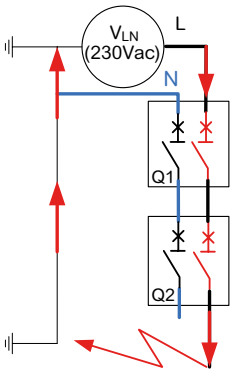
Schneider Electric cascading tables are:

- 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.

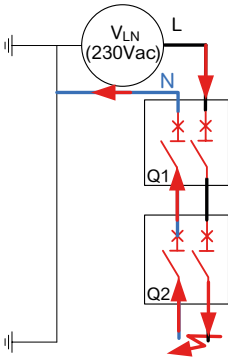
Circuit breaker with Vigi module (Add-On Residual Current Device - RCD):
When circuit breakers are equipped with Vigi module, the following cascading tables are still applicable.

How to use the table
The reinforced breaking capacity given in the table shall be compared to the presumed short-circuit current (rms value) at the point of installation without taking in consideration the limitation effect of the upstream circuit-breaker.

Cascading



Line to Earth Fault
(If)



Line to Neutral Fault
(Ik1)

Difference between Line to Neutral and Line to earth fault regarding cascading

The number of poles breaking the current is different in case of line to neutral fault and line to earth fault.

The reinforced breaking capacity published in tables for a given “Line to Line” system voltage applies to all type of faults including line to earth.

Application of cascading

Both “Industrial” circuit-breaker standard (IEC/EN 60947) and “residential” circuit breaker standards (IEC/EN 60898 & 61009) define and provide test method for this “cascading” performance.

Anyway, Schneider Electric doesn’t recommend to apply cascading in installation used by uninstructed persons. The following tables are therefore providing a “reinforced breaking capacity” according to IEC 60947-2, Annex A.

Cascading

Upstream: **Easy**Pact CVS

Downstream: ik60, **Easy**Pact CVS

Ue ≤ 415 Vac

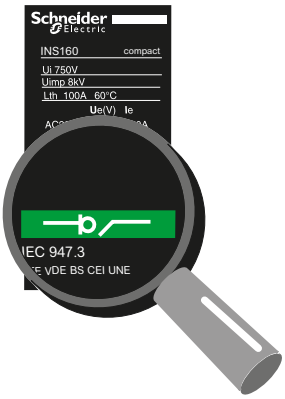
Upstream		CVS100	CVS100			CVS160			CVS250			CVS400			CVS630		
		BS	B	F	N	B	F	N	B	F	N	F	N	H	F	N	H
	Icu (kA) 415V	25	25	36	50	25	36	50	25	36	50	36	50	70	36	50	70
Downstream																	
iK60N	6	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**						
CVS100BS	25			**36**	**36**		**36**	**36**		**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**
CVS100B	25			**36**	**36**		**36**	**36**		**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**
CVS100F	36				**50**			**50**			**50**		**50**	**50**		**50**	**50**
CVS100N	50																
CVS160B	25				**36**			**36**		**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**
CVS160F	36				**50**			**50**			**50**		**50**	**50**		**50**	**50**
CVS160N	50																
CVS250B	25											**36**	**36**	**36**	**36**	**36**	**36**
CVS250F	36												**50**	**50**		**50**	**50**
CVS250N	50																
CVS400F	36												**50**	**50**		**50**	**50**
CVS400N	50																**70**

Consult your SE representative

Life Is On Schneider Electric

Use of LV switches

Introduction



Functions and positions of LV switches

Switches are necessary in different level of low voltage installation for the following main applications:

- functional switching
- supplying installation from different sources (transfer-switching equipment)
- starting stopping equipments
- emergency switching
- switching off and disconnection for isolation of one circuit or switchboard for maintenance.

IEC 60364-5-53 Electrical installations of buildings – Part 5-53: Selection and erection of electrical equipment

Isolation, switching and control standard provides requirement for isolation of circuits, functional switching, and emergency switching.

IEC 60204-1 Safety of machinery - Electrical equipment of machines - Part 1: General requirements

standard provides requirements for disconnection of machines.

“Suitability for isolation” is necessary to ensure people safety in open position.

Suitable for isolation

Switch-disconnector

“Isolation” function i.e disconnection from supply is required for all circuits or equipment in order to guarantee the safety of people during repairs or maintenance.

Low voltage electrical installation standards (IEC 60364 series for example) provide requirements to ensure properly this function:

Device for isolation shall:

- isolate all live conductors (including neutral but not PEN)
- withstand specified impulse voltage in open position
- have a leakage current below specified values in open position
- be lockable in the “open” position so as to prevent any risk of involuntary reclosing
- ensure that the isolating distance between open contacts of the device is visible or be clearly and reliably indicated by “off” or “open” marking.

These requirements are totally covered with devices compliant to IEC 60947-1/2/3 suitable for isolation.

This characteristic is clearly marked on product by the symbol of switch-disconnector.

Coordination

All switches must be protected by an overcurrent protection device placed upstream.

The tables below give the coordination performance of circuit breakers and switch-disconnector of main Schneider Electric ranges: in the event of an overload or a short-circuit the circuit breaker proposed in the table will protect the switch-disconnector according to its electrodynamic withstand and short-time and permanent withstand.

Switch disconnector coordination

Upstream: Circuit breaker **Easy**Pact CVS or gG fuses

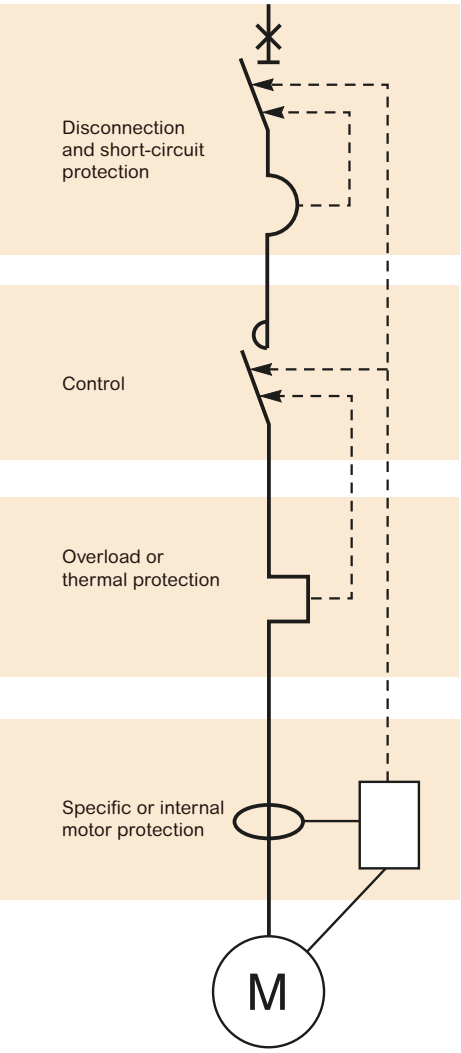
Downstream: Switch disconnector **Easy**Pact CVS NA

Ue ≤ 415 Vac

Switch disconnector EasyPact NA		CVS100NA	CVS160NA	CVS250NA	CVS400NA	CVS630NA
Upstream protection = CVS						
type / rating (A)		CVS100B/100	CVS160B/160	CVS250B/250		
Conditional short circuit current	kA rms	25	25	25		
making current	kA peak	53	53	53		
type / rating (A)		CVS100F/100	CVS160F/160	CVS250F/250	CVS400F/400	CVS630F/630
Conditional short circuit current	kA rms	36	36	36	36	36
making current	kA peak	76	76	76	76	76
type / rating (A)		CVS100N/100	CVS160N/160	CVS250N/250	CVS400N/400	CVS630N/630
Conditional short circuit current	kA rms	50	50	50	50	50
making current	kA peak	105	105	105	105	105
type / rating (A)					CVS400H/400	CVS630H/630
Conditional short circuit current	kA rms				70	70
making current	kA peak				154	154
Upstream protection = gG fuses						
type / rating (A)		gG 80	gG 125	gG 200	gG 315	gG 500
Conditional short circuit current	kA rms	100	100	100	100	100
making current	kA peak	220	220	220	220	220

Motor protection coordination

Protection of motor circuit with circuit-breaker



Introduction

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 for providing optimum operation of the motor.

Protection of a motor circuit involves a number of parameters that depend on:

- the application (type of machine driven, 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:

- protection (motor-dedicated for overloads)
- 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 coordination
Protection of motor circuit with circuit-breaker

Applicable standards
A circuit supplying a motor must comply with the general rules set out in IEC standard 60947-4-1 and in particular with those concerning contactors, motor starters and their protection as stipulated in IEC 60947-4-1, notably:
- coordination of the components of the motor circuit
- trip class for thermal relays
- contactor utilisation categories
- coordination of insulation.

Coordination of the components of the motor circuit
Two types of coordination
The standard defines tests at different current levels. The purpose of these tests is to place the switchgear and controlgear in extreme conditions. Depending on the state of the components following the tests, the standard defines two types of coordination:
- **type 1:**

Deterioration of the contactor and the relay is acceptable under two conditions:
- no danger to operating personnel
- no danger to any components other than the contactor and the relay

- **type 2:**

Only minor welding of the contactor or starter contacts is permissible and the contacts must be easily separated.
- following type-2 coordination tests, the switchgear and controlgear functions must be fully operational.

Motor protection coordination
Type 1 coordination (IEC 947-4-1)

380V - 415 Vac

EasyPact CVS motors								EasyPact TVS type 1		
P(kW)	I(A) 380V	I(A) 415V	Ie max	type	cal(A)	setting	Irm(A)	Contactor	O/L	Irth
0.37	1.2	1.1	1.6	CVS100-MA	2.5	6..13	22.5	LC1E06	LRE06	1..1.6
0.55	1.6	1.5	1.6	CVS100-MA	2.5	6..14	32.5	LC1E06	LRE06	1..1.6
0.75	2	1.8	2.5	CVS100-MA	2.5	6..14	32.5	LC1E06	LRE07	1.6..2.5
1.1	2.8	2.6	4	CVS100-MA	6.3	6..14	57	LC1E06	LRE08	2.5..4
1.5	3.7	3.4	4	CVS100-MA	6.3	6..14	57	LC1E06	LRE08	2.5..4
2.2	5.3	4.8	6	CVS100-MA	6.3	6..14	82	LC1E06	LRE10	4..6
3	7	6.5	8	CVS100-MA	12.5	6..14	113	LC1E09	LRE12	5.5..8
4	9	8.2	10	CVS100-MA	12.5	6..14	138	LC1E09	LRE14	7..10
5.5	12	11	12.5	CVS100-MA	12.5	6..14	163	LC1E12	LRE16	9..13
7.5	16	14	18	CVS100-MA	25	6..14	250	LC1E18	LRE21	16..24
10	21	19	25	CVS100-MA	25	6..14	325	LC1E25	LRE22	16..24
11	23	21	25	CVS100-MA	25	6..14	325	LC1E25	LRE22	16..24
15	30	28	32	CVS100-MA	50	6..14	450	LC1E32	LRE32	23..32
18.5	37	34	40	CVS100-MA	50	6..14	550	LC1E40	LRE355	30..40
22	43	40	50	CVS100-MA	50	6..14	650	LC1E50	LRE357	37..50
30	59	55	63	CVS100-MA	100	6..14	900	LC1E65	LRE359	48..65
37	72	66	100	CVS100-MA	100	6..14	1100	LC1E80	LRE363	63..80
45	85	80	100	CVS100-MA	100	6..14	1300	LC1E95	LRE481	62..99
55	105	100	135	CVS160-MA	150	9..14	1500	LC1E120	LRE482	84..135
75	140	135	150	CVS160-MA	150	9..14	1950	LC1E200	LRE483	124..198
90	170	160	185	CVS250-MA	220	9..14	2420	LC1E200	LRE484	146..234
110	210	200	220	CVS250-MA	220	9..14	2860	LC1E200	LRE484	146..234
			265	CVS400-MA	320	6..13	3500	LC1E250	LRE484	146..234
132	250	230	265	CVS400-MA	320	6..13	3500	LC1E300	LRE485	174..279
160	300	270	315	CVS400-MA	320	6..13	4160	LC1E300	LRE486	208..333
200	380	361	400	CVS630-MA	500	6..13	5700	LC1F400	LR9-F73 79	300..500
220	420	380	500	CVS630-MA	500	6..13	6500	LC1F500	LR9-F73 79	300..500
250	460	430	500	CVS630-MA	500	6..13	6500	LC1F500	LR9-F73 79	300..500

(1)Separate mounting with LAEB1 terminal block.
(2)Separate mounting with LAEB3 terminal block.

Catalogue numbers

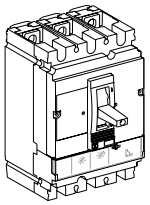
Catalogue numbers

CVS100/160/250
With TM-D thermal-magnetic trip unit

EasyPact CVS100/160/250B

With TM-D thermal-magnetic trip unit

DB400150

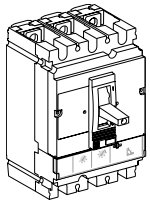


EasyPact CVS100B (25 kA at 380/415 V)			
Rating	**3P** 3d	**4P** 3d	**4P** 4d
TM16D	**LV510300**	**LV510310**	
TM25D	**LV510301**	**LV510311**	**LV510321**
TM32D	**LV510302**	**LV510312**	**LV510322**
TM40D	**LV510303**	**LV510313**	**LV510323**
TM50D	**LV510304**	**LV510314**	**LV510324**
TM63D	**LV510305**	**LV510315**	**LV510325**
TM80D	**LV510306**	**LV510316**	**LV510326**
TM100D	**LV510307**	**LV510317**	**LV510327**
EasyPact CVS160B (25 kA at 380/415 V)			
Rating	**3P** 3d	**4P** 3d	**4P** 4d
TM100D	**LV516301**	**LV516311**	
TM125D	**LV516302**	**LV516312**	**LV516322**
TM160D	**LV516303**	**LV516313**	**LV516323**
EasyPact CVS250B (25 kA at 380/415 V)			
Rating	**3P** 3d	**4P** 3d	**4P** 4d
TM160D	**LV525301**		
TM200D	**LV525302**	**LV525312**	**LV525322**
TM250D	**LV525303**	**LV525313**	**LV525323**

EasyPact CVS100/160/250F

With TM-D thermal-magnetic trip unit

DB400150

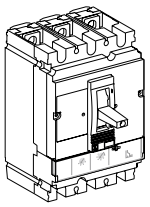


EasyPact CVS100F (36 kA at 380/415 V)			
Rating	**3P** 3d	**4P** 3d	**4P** 4d
TM16D	**LV510330**	**LV510340**	
TM25D	**LV510331**	**LV510341**	
TM32D	**LV510332**	**LV510342**	**LV510352**
TM40D	**LV510333**	**LV510343**	**LV510353**
TM50D	**LV510334**	**LV510344**	**LV510354**
TM63D	**LV510335**	**LV510345**	**LV510355**
TM80D	**LV510336**	**LV510346**	**LV510356**
TM100D	**LV510337**	**LV510347**	**LV510357**
EasyPact CVS160F (36 kA at 380/415 V)			
Rating	**3P** 3d	**4P** 3d	**4P** 4d
TM100D	**LV516331**	**LV516341**	
TM125D	**LV516332**	**LV516342**	**LV516352**
TM160D	**LV516333**	**LV516343**	**LV516353**
EasyPact CVS250F (36 kA at 380/415 V)			
Rating	**3P** 3d	**4P** 3d	**4P** 4d
TM160D	**LV525331**		
TM200D	**LV525332**	**LV525342**	**LV525352**
TM250D	**LV525333**	**LV525343**	**LV525353**

EasyPact CVS100/160/250N

With TM-D thermal-magnetic trip unit

DB400150



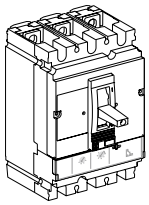
EasyPact CVS100N (50 kA at 380/415 V)		
Rating	**3P** 3d	**4P** 3d
TM16D	**LV510470**	**LV510480**
TM25D	**LV510471**	**LV510481**
TM32D	**LV510472**	**LV510482**
TM40D	**LV510473**	**LV510483**
TM50D	**LV510474**	**LV510484**
TM63D	**LV510475**	**LV510485**
TM80D	**LV510476**	**LV510486**
TM100D	**LV510477**	**LV510487**
EasyPact CVS160N (50 kA at 380/415 V)		
Rating	**3P** 3d	**4P** 3d
TM100D	**LV516461**	**LV516466**
TM125D	**LV516462**	**LV516467**
TM160D	**LV516463**	**LV516468**
EasyPact CVS250N (50 kA at 380/415 V)		
Rating	**3P** 3d	**4P** 3d
TM200D	**LV525452**	**LV525457**
TM250D	**LV525453**	**LV525458**

CVS100/160/250
With TM-G thermal-magnetic trip unit

EasyPact CVS160/250B

With TM-G thermal-magnetic trip unit

DB400150



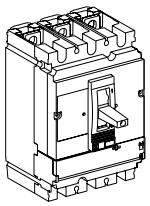
EasyPact CVS160B (25 kA at 380/415 V)		
Rating	**3P** 3d	**4P** 3d
TM80G	**LV510736**	**LV510748**
TM100G	**LV510737**	**LV510749**
TM125G	**LV516732**	**LV516742**
TM160G	**LV516733**	**LV516743**
EasyPact CVS250B (25 kA at 380/415 V)		
Rating	**3P** 3d	**4P** 3d
TM200G	**LV525732**	**LV525742**
TM250G	**LV525733**	**LV525743**

CVS100/160/250
With MA magnetic trip unit

EasyPact CVS100/160/250F

With MA magnetic trip unit

DB400150

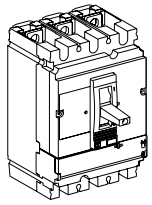


EasyPact CVS100F (36 kA at 380/415 V)	
Rating	**3P** 3d
MA2.5	**LV510440**
MA6.3	**LV510441**
MA12.5	**LV510442**
MA25	**LV510443**
MA50	**LV510444**
MA100	**LV510445**
EasyPact CVS160F (36 kA at 380/415 V)	
Rating	**3P** 3d
MA100	**LV516439**
MA150	**LV516440**
EasyPact CVS250F (36 kA at 380/415 V)	
Rating	**3P** 3d
MA220	**LV525439**

EasyPact CVS100/160/250N

With MA magnetic trip unit

DB400150

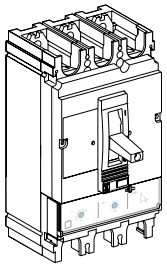


EasyPact CVS100N (50 kA at 380/415 V)	
Rating	**3P** 3d
MA2.5	**LV510450**
MA6.3	**LV510451**
MA12.5	**LV510452**
MA25	**LV510453**
MA50	**LV510454**
MA100	**LV510455**
EasyPact CVS160N (50 kA at 380/415 V)	
Rating	**3P** 3d
MA100	**LV516450**
MA150	**LV516451**
EasyPact CVS250N (50 kA at 380/415 V)	
Rating	**3P** 3d
MA220	**LV525442**

CVS100/160/250
With ETS 2.2 electronic trip unit

EasyPact CVS 100/160/250B

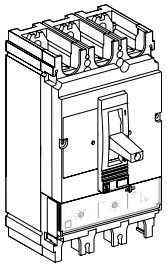
ETS 2.2 electronic trip unit (LS_0I protection)



Rating	**3P** 3d	**4P** 3d, 4d, 3d + N/2
EasyPact CVS100B (25 kA at 380/415 V)		
40	**LV510550**	**LV510580**
100	**LV510551**	**LV510581**
EasyPact CVS160B (25 kA at 380/415 V)		
160	**LV516505**	**LV516508**
EasyPact CVS250B (25 kA at 380/415 V)		
250	**LV525505**	**LV525508**

EasyPact CVS 100/160/250F

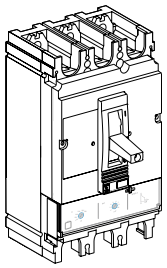
ETS 2.2 electronic trip unit (LS_0I protection)



Rating	**3P** 3d	**4P** 3d, 4d, 3d + N/2
EasyPact CVS100F (36 kA at 380/415 V)		
40	**LV510552**	**LV510582**
100	**LV510553**	**LV510583**
EasyPact CVS160F (36 kA at 380/415 V)		
160	**LV516506**	**LV516509**
EasyPact CVS250F (36 kA at 380/415 V)		
250	**LV525506**	**LV525509**

EasyPact CVS 100/160/250N

ETS 2.2 electronic trip unit (LS_0I protection)



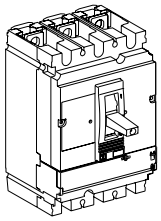
Rating	**3P** 3d	**4P** 3d, 4d, 3d + N/2
EasyPact CVS100N (50 kA at 380/415 V)		
40	**LV510554**	**LV510584**
100	**LV510555**	**LV510585**
EasyPact CVS160N (50 kA at 380/415 V)		
160	**LV516507**	**LV516510**
EasyPact CVS250N (50 kA at 380/415 V)		
250	**LV525507**	**LV525510**

CVS100/160/250
With NA switch-disconnector unit

EasyPact CVS100/160/250 NA switch-disconnector

With NA switch-disconnector unit

DB400155



EasyPact CVS100 NA		
Rating	**3P**	**4P**
100	**LV510425**	**LV510426**
EasyPact CVS160 NA		
Rating	**3P**	**4P**
160	**LV516425**	**LV516426**
EasyPact CVS250 NA		
Rating	**3P**	**4P**
250	**LV525425**	**LV525426**

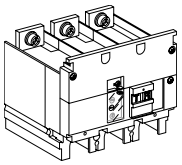
Accessories

CVS100/160/250

+ Vigi module

Vigi module

DB111464



	3P	4P
CVS100/160 (200 to 440 V)	**LV529488**	**LV529489**
CVS250 (200 to 440 V)	**LV529492**	**LV529493**

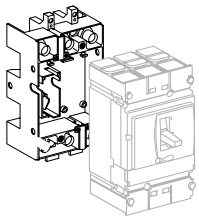
Accessories

CVS100/160/250

DB111225E

Plug-in version = fixed/FC device + plug-in kit

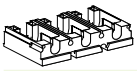
Kit for EasyPact



	3P
Plug-in kit	LV429289
Comprising:	
Base	= 1 x LV429266
Power connections	+ 3 x LV429268
Short terminal shields	+ 2 x LV429515
Safety trip interlock	+ 1 x LV429270

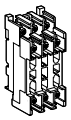
Plug-in version accessories

Insulation accessories

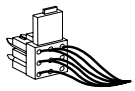


Connection adapter for plug-in base	3P	LV429306

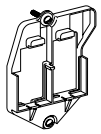
Auxiliary connections



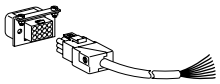
1 9-wire fixed connector (for base)		LV429273



1 9-wire moving connector (for circuit breaker)		LV429274

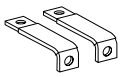


1 support for 2 moving connectors		LV429275

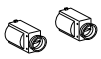


9-wire manual auxiliary connector (fixed + moving)		LV429272

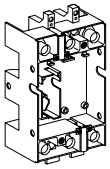
Plug-in base accessories



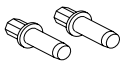
Long insulated right angle terminal extensions	Set of 2	LV429276



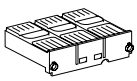
2 IP40 shutters for base		LV429271



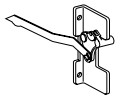
Base	3P	LV429266



Power connections	3P	LV429268



Short terminal shield	3P	LV429515



Safety trip interlock	3P	LV429270

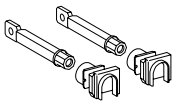
Accessories

CVS100/160/250

Connection accessories (Cu or Al)

Rear connections

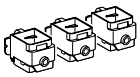
DB112225



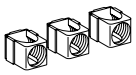
2 short			**LV429235**
2 long			**LV429236**

Bare cable connectors

DB112226

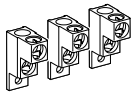


DB112225



DB112726

DB112227

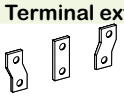


DB112724

Steel connectors	1 x (1.5 to 95 mm²) ; ≤ 160 A	Set of 3	**LV429242**
		Set of 4	**LV429243**
Aluminium connectors	1 x (25 to 95 mm²) ; ≤ 250 A	Set of 3	**LV429227**
		Set of 4	**LV429228**
	1 x (120 to 185 mm²) ; ≤ 250 A	Set of 3	**LV429259**
		Set of 4	**LV429260**
Clips for connectors		Set of 10	**LV429241**
Aluminium connectors for 2 cables (1)	2 x (50 to 120 mm²) ; ≤ 250 A	Set of 3	**LV429218**
		Set of 4	**LV429219**
6.35 mm voltage tap for steel or aluminium connectors		Set of 10	**LV429348**

Terminal extensions

DB112235



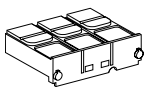
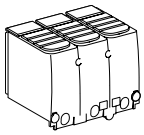
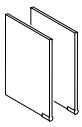
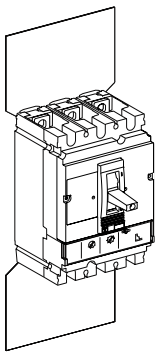
Spreaders from 35 to 45 mm pitch (1)		Set of 3	**LV431563**
		Set of 4	**LV431564**

(1) Supplied with 2 or 3 interphase barriers.

Accessories

CVS100/160/250

Insulation accessories

DB112238 	1 short terminal shield for breaker	3 P	**LV429515**
		4 P	**LV429516**
DB400045 	1 long terminal shield for breaker	3 P	**LV429517**
		4 P	**LV429518**
DB400061 	Interphase barriers for breaker	Set of 6	**LV429329**
DB400163 	2 insulating screens for breaker (45 mm pitch)	3P	**LV429330**
		4P	**LV429331**

(1) Supplied with 2 or 3 interphase barriers.

Accessories

CVS100/160/250

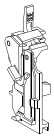
Electrical auxiliaries

Auxiliary contacts (changeover)

DB112254

OF or SD or SDE or SDV	**29450**
OF or SD or SDE or SDV low level	**29452**

CDB500821-00



SDE adaptor, mandatory for trip unit TM, MA and ETS2.2	**LV429451**

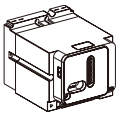
Voltage releases

DB111454

	Voltage	MX	MN
AC	110-130 V 50/60 Hz	**LV429386**	**LV429406**
	220-240 V 50/60 Hz and 208-277 V 60 Hz	**LV429387**	**LV429407**
DC	24 V	**LV429390**	**LV429410**

Motor Mechanism

E18609

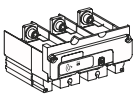


	Voltage	MT100/160/250
AC	110-230 V 50/60 Hz	**LV435001**
	400 V 50/60 Hz	**LV435002**
DC	110-230 V 50/60 Hz	**LV435001**

Indication and Measurement Modules

PowerLogic PowerTag Energy M250

E18609



Rating (A)	**250**
3P	**LV434020**
3P+N	**LV434021**

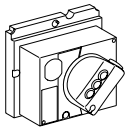
Accessories

CVS100/160/250

Rotary handles

Direct rotary handle

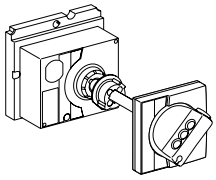
DB112259



With black handle	LV429337

Extended rotary handle

DB112260

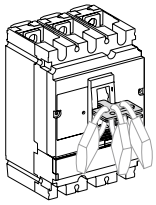


With black handle	LV429338

Locks

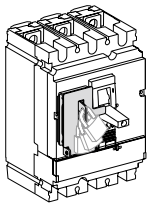
Toggle locking device for 1 to 3 padlocks

DB400164



By removable device	29370

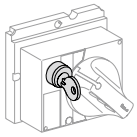
DB400165



By fixed device	29371

Locking of rotary handle

DB112263



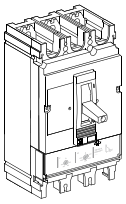
Keylock adaptor (keylock not included)		LV429344
Keylock (keylock adaptor not included)	Ronis 1351B.500	41940
	Profalux KS5 B24 D4Z	42888

CVS400/630
With TM-D thermal-magnetic trip unit

EasyPact CVS400/630F

With TM-D thermal-magnetic trip unit

DB400008

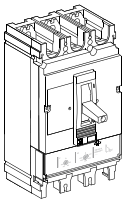


EasyPact CVS400F (36 kA at 380/415 V)			
Rating	**3P** 3d	**4P** 3d	**4P** 4d
TM320D	**LV540305**	**LV540308**	**LV540311**
TM400D	**LV540306**	**LV540309**	**LV540312**
EasyPact CVS630F (36 kA at 380/415 V)			
Rating	**3P** 3d	**4P** 3d	**4P** 4d
TM500D	**LV563305**	**LV563308**	**LV563311**
TM600D	**LV563306**	**LV563309**	**LV563312**

EasyPact CVS400/630N

With TM-D thermal-magnetic trip unit

DB400008

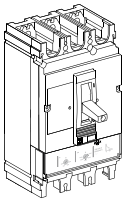


EasyPact CVS400N (50 kA at 380/415 V)			
Rating	**3P** 3d	**4P** 3d	**4P** 4d
TM320D	**LV540315**	**LV540318**	
TM400D	**LV540316**	**LV540319**	**LV540322**
EasyPact CVS630N (50 kA at 380/415 V)			
Rating	**3P** 3d	**4P** 3d	**4P** 4d
TM500D	**LV563315**	**LV563318**	**LV563321**
TM600D	**LV563316**	**LV563319**	**LV563322**

EasyPact CVS400/630H

With TM-D thermal-magnetic trip unit

DB400008



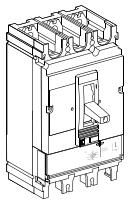
EasyPact CVS400H (70 kA at 380/415 V)		
Rating	**3P** 3d	**4P** 3d
TM320D	**LV540325**	**LV540328**
TM400D	**LV540326**	**LV540329**
EasyPact CVS630H (70 kA at 380/415 V)		
Rating	**3P** 3d	**4P** 3d
TM500D	**LV563325**	**LV563328**
TM600D	**LV563326**	**LV563329**

CVS400/630
With MA magnetic trip unit

EasyPact CVS400/630F/N/H

With MA magnetic trip unit

DB400020



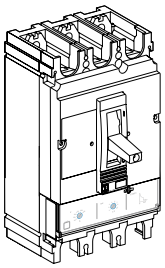
EasyPact CVS400F (36 kA at 380/415 V)	
Rating	**3P** 3d
MA320	**LV540550**
EasyPact CVS400N (50 kA at 380/415 V)	
Rating	**3P** 3d
MA320	**LV540552**
EasyPact CVS400H (70 kA at 380/415 V)	
Rating	**3P** 3d
MA320	**LV540554**
EasyPact CVS630F (36 kA at 380/415 V)	
Rating	**3P** 3d
MA500	**LV563550**
EasyPact CVS630N (50 kA at 380/415 V)	
Rating	**3P** 3d
MA500	**LV563552**
EasyPact CVS630H (70 kA at 380/415 V)	
Rating	**3P** 3d
MA500	**LV563554**

CVS400/630
With ETS 2.3 electronic trip unit

EasyPact CVS400/630F

ETS 2.3 electronic trip unit (LS_0I protection)

DB400021

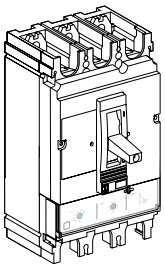


		3P 3d	**4P** 3d, 4d, 3d + N/2
EasyPact CVS400F (36 kA at 380/415 V)	400 A	**LV540505**	**LV540506**
EasyPact CVS630F (36 kA at 380/415 V)	630 A	**LV563505**	**LV563506**

EasyPact CVS400/630N

ETS 2.3 electronic trip unit (LS_0I protection)

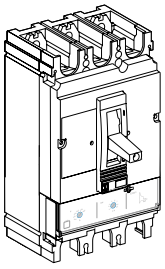
DB400021



		3P 3d	**4P** 3d, 4d, 3d + N/2
EasyPact CVS400N (50 kA at 380/415 V)	400 A	**LV540510**	**LV540511**
EasyPact CVS630N (50 kA at 380/415 V)	630 A	**LV563510**	**LV563511**

EasyPact CVS400/630H

ETS 2.3 electronic trip unit (LS_0I protection)



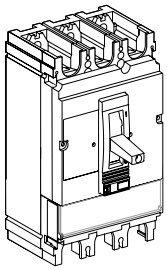
		3P 3d	**4P** 3d, 4d, 3d + N/2
EasyPact CVS400H (70 kA at 380/415 V)	400 A	**LV540515**	**LV540516**
EasyPact CVS630H (70 kA at 380/415 V)	630 A	**LV563515**	**LV563516**

CVS400/630
With NA switch-disconnector unit

EasyPact CVS400/630 NA switch-disconnector

NA switch disconnector

DB400023



	3P	4P
EasyPact CVS400 NA	**LV540400**	**LV540401**
EasyPact CVS630 NA	**LV563400**	**LV563401**

Life Is On Schneider Electric

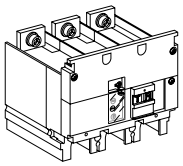
Accessories

CVS400/630

+ Vigi module

Vigi module

DB111464

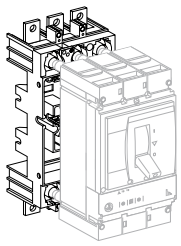


	3P	4P
CVS400/630 (200 to 440 V)	**LV532464**	**LV532465**

Accessories
CVS400/630

Plug-in version = fixed/FC device + plug-in kit

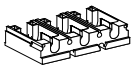
Kit for EasyPact



	3P
Plug-in kit	LV432538
Comprising:	
Base	= 1 x LV432516
Power connections	+ 3 x LV432518
Short terminal shields	+ 2 x LV432591
Safety trip interlock	+ 1 x LV432520

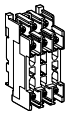
Plug-in version accessories

Insulation accessories

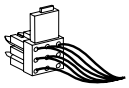


Connection adapter for plug-in base	3P	**LV432584**

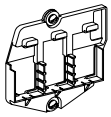
Auxiliary connections



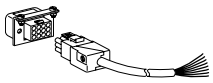
1 9-wire fixed connector (for base)		**LV429273**



1 9-wire moving connector (for circuit breaker)		**LV432523**

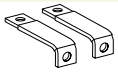


1 support for 3 moving connectors		**LV432525**



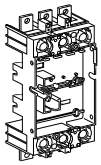
9-wire manual auxiliary connector (fixed + moving)		**LV429272**

Plug-in base accessories

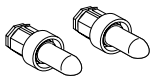


Long insulated right angle terminal extensions	Set of 2	**LV432526**

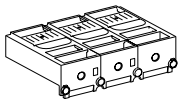
2 IP40 shutters for base		**LV432521**



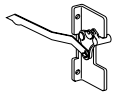
Base	3P	**LV432516**



Power connections	3P	**LV432518**



Short terminal shield	3P	**LV432591**

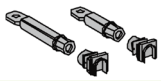


Safety trip interlock	3P	**LV432520**

Accessories
CVS400/630

Connection accessories (Cu or Al)

Rear connections


DB112225

2 short		**LV432475**
2 long		**LV432476**

Cable connectors (1)


E22040


E22041

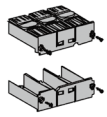
Aluminium connector 1x (35 to 300 mm²)	Set of 3	**LV432479**
	Set of 4	**LV432480**
Aluminium connector 2x (35 to 240 mm²)	Set of 3	**LV432481**
	Set of 4	**LV432482**
Voltage plug for aluminium connector 1 or 2 cables	Set of 10	**LV429348**

Terminal extension (1)


E21012

Spreaders	52.5 mm	3P	**LV432490**
		4P	**LV432491**
	70 mm	3P	**LV432492**
		4P	**LV432493**

Insulation accessories


E18618


E18606

Short terminal shield, 45 mm (1 piece)	3P	**LV432591**
	4P	**LV432592**
Long terminal shield, 45 mm (1 piece)	3P	**LV432593**
	4P	**LV432594**
Interphase barriers	Set of 6	**LV432570**
Long terminal shield for spreaders, 52,5mm (1 piece) (supplied with insulating plate)	3P	**LV432595**
	4P	**LV432596**
2 insulating screens (70 mm pitch)	3P	**LV432578**
	4P	**LV432579**

(1) supplied with 2 or 3 interphase barriers

Accessories
CVS400/630

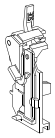
Electrical auxiliaries

Auxiliary contacts (changeover)

E18608

OF or SD or SDE or SDV	**29450**
OF or SD or SDE or SDV low level	**29452**

CDB5000821-00



SDE adaptor mandatory for trip unit TM, MA and ETS2.3	**LV540050**

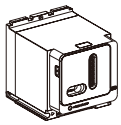
Voltage releases

E18609

	Voltage	MX	MN
AC	110-130 V 50/60 Hz	**LV429386**	**LV429406**
	220-240 V 50/60 Hz and 208-277 V 60 Hz	**LV429387**	**LV429407**
DC	24 V	**LV429390**	**LV429410**

Motor Mechanism

E18609

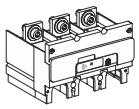


	Voltage	MT400/630
AC	110-230 V 50/60 Hz	**LV435010**
	400 V 50/60 Hz	**LV435005**
DC	110-230 V 50/60 Hz	**LV435010**

Indication and Measurement Modules

PowerLogic PowerTag Energy M630

E18609



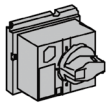
Rating (A)	630
3P	**LV434022**
3P+N	**LV434023**

Accessories
CVS400/630

Rotary handles

Direct rotary handle

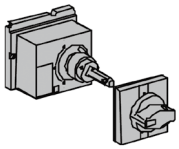
E18611



Standard black handle	**LV432597**

Extended rotary handle

E18612



Standard extended rotary handle	**LV432598**

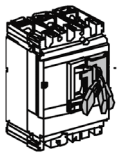
Locks

Toggle locking device for 1 to 3 padlocks

E18621

By removable device	**29370**

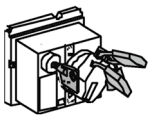
E18613



By fixed device	**32631**

Locking of the rotary handle

E18620

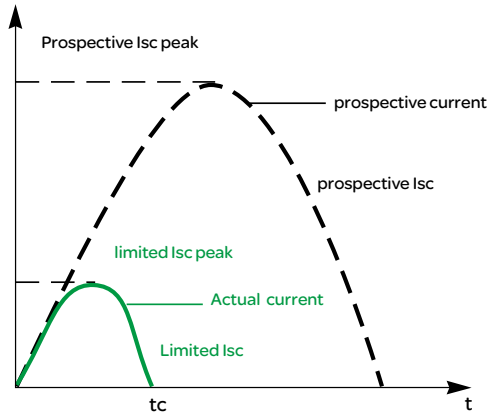


Keylock adaptor (keylock not included)		**LV432604**
Keylock (keylock adaptor not included)	Ronis 1351B.500	**41940**
	Profalux KS5 B24 D4Z	**42888**

EasyPact™ CVS100BS

EasyPact CVS100BS

EasyPact CVS100BS



EasyPact CVS100BS

Simplicity and perfection – That's what Schneider Electric brings to you. EasyPact CVS100BS not only reflects high quality of Schneider Electric, but also features performance, protection functions, and performance/price ratio.

EasyPact CVS100BS

- up to 100A 3 Pole/4 Pole products
- Icu 25kA, Ics 17kA
- Reliable protections of power distribution systems
- Flexible installation solutions including fixed, plug-in types
- Complete solutions for AC and DC networks

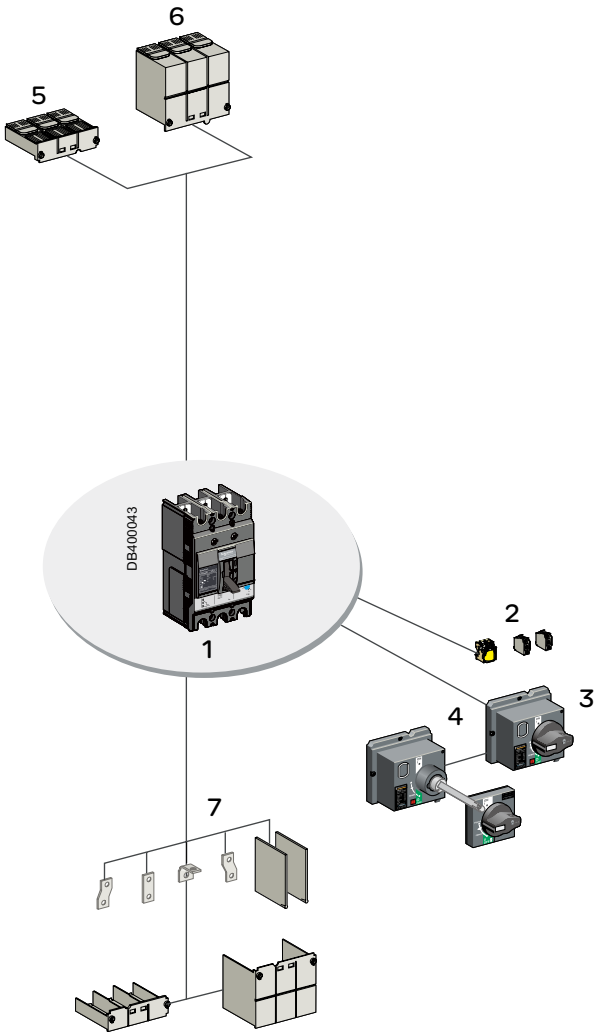
More reliable and safer

Powerful current-limiting capacity to ensure more cost-effective and more reliable protection.

Optimal Combination

Modularized System

As shown below, a wide range of modules or accessories are available.



1. Breaking unit
2. MN and MX voltage releases
3. Direct rotary handle
4. Extended rotary handle
5. Short terminal shield
6. Long terminal shield
7. Connection accessories

General characteristics

PB106445

EasyPact CVS100BS

Compliance with standards

- IEC 60947-1: General rules (GB/T 14048.1)
- IEC 60947-2: Circuit Breakers (GB/T 14048.2)
- IEC 60947-4: Contactors and Motor Starters (GB 14048.4)
- IEC 60946-5.1: Control circuit devices and Switching elements; automatic Control Components (GB 14048.5)

Tropicalization

EasyPact CVS100BS circuit breakers have successfully passed the tests prescribed by following standards for extreme atmospheric conditions:

- IEC 68-2-30, damp heat (95% relative humidity at 55ºC)
- IEC 68-2-52 Salt mist (severity level 2)

Positive contact indication

All EasyPact CVS100BS 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 "OFF" position unless the contacts are effectively open
- padlocks may not be installed unless the contacts are open

Installation of a rotary handle or a motor mechanism 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

Protection of LV Power Distribution System

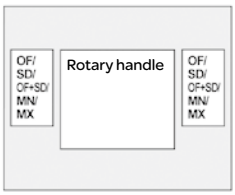
EasyPact CVS100BS

PB106445

EasyPact CVS100BS

EasyPact circuit breaker					**CVS100BS**
Number of Poles					**3, 4**
Control	Manual		Toggle		■
			Direct or extended rotary handle		■
Connection	Fixed		Front connection		■
	Plug-in		Front connection		■
Electrical characteristics as per IEC 60947-2 and EN 60947-2					
Rated current (A)		In	40°C		**100**
Rated insulation voltage (V)		Ui			**690**
Rated impulse withstand voltage (kV)		Uimp			**6**
Rated operational voltage (V)		Ue	AC 50/60 Hz		**440**
			DC		
Circuit breaker type					**BS**
Ultimate breaking capacity (kA rms)		Icu	AC 50/60 Hz	220/240 V	**50**
				380/415 V	**25**
Service breaking capacity (kA)		Ics		220/240 V	**25**
				380/415 V	**17**
Suitability for Isolation					■
Utilisation category					A
Durability (C-O cycles)	Mechanical				**13000**
	Electrical	415 V	In		**4000**
Protection					
Trip units					Thermal-magnetic
Overload protection		Long time	Ir (In x ...)		0.8 to 1xIn
Short-circuit protection		Short time	Isd (Ir x ...)		-
		Instantaneous	Ii (In x ...)		■
Indication and control auxiliaries					
Auxiliary switch					■
MX shunt release					■
MN under-voltage release					■
Installation					
Accessories		Terminal extensions and spreaders			-
		Terminal shields			■
		interphase barriers			■
Dimensions (mm) W×H×D		Fixed, front connection 3P/4P			**75x130x60/ 100x130x60**
Weight (kg)		Fixed, front connection 3P/4P			**0.78/1.0**

Installation and Connection
EasyPact CVS100BS

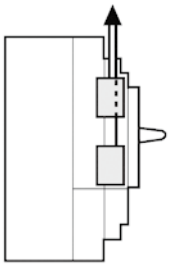


EasyPact CVS100BS

Connection of electrical auxiliaries

Fixed configuration

Auxiliary circuits exit the device through a knock-out in the front cover.



Each auxiliary device is equipped with a terminal block with numbered terminals for connection of wires up to:
- 1.5mm^2 for auxiliary contacts and voltage releases

Life Is On Schneider Electric

Electrical and Mechanical Accessories

EasyPact CVS100BS

EasyPact CVS100BS auxiliary contacts

All auxiliary contacts can be used to switch on/off electronic loads.

EasyPact CVS100BS auxiliary switch

This auxiliary contact can display the status of circuit breakers remotely, and therefore can be used for indications electrical interlocking, relay control. etc.

Functions

- OF (On/off): Indicate the position of circuit breaker contacts.
- SD (Trip indication): Indicate trip conditions of circuit breakers due to overload, short-circuit, under-voltage or operation of the "push to trip" button. It returns to de-energised state when the circuit breaker is reset.

EasyPact CVS100BS multifunctional auxiliary switch

- OF/SD (Auxiliary + alarm): Indicate position of circuit breaker contacts and trip conditions of circuit breakers.

Standard

These auxiliary contacts comply with IEC 60947-5.

Installation and connection

- This auxiliary contact clip into the slot behind the front cover of the circuit breaker.
- The conductor connected to the central terminal block has a cross-section up to 1.0mm^2.

Electrical characteristics		In: 100A	
Rated thermal current (A)		5	
Minimum load		10mA, 24V	
Utilisation (IEC 947-4-1)		AC12	AC15
Operating current (A)	110V	5	3
	220~240V	3	2
	380~440V	-	-

EasyPact CVS100BS Voltage Release

Voltage tripping

The voltage releases can trip the circuit breaker.

Under-voltage release (MN) trips the circuit breaker:

- When the tripping threshold drops below the rated voltage of the trip unit.
- The tripping threshold is 0.35 to 0.7 times the rated voltage.
- If the circuit breaker can be closed when the voltage exceeds 0.85 times the rated voltage.

Circuit breaker tripping by an MN release meets the requirements of standard IEC60947-2.

Shunt releases (MX)

The circuit breaker will trip by this release if the control voltage exceeds 0.7 × Un. Control signals can be of the impulse type (≥20 ms) or maintained.

Operation

- The circuit breaker can be reset locally or remotely after tripping by an MN or MX release.
- MN or MX tripping is faster than manual tripping (or trip by electric mechanism). In the presence of a standing trip order, other operations will not be executed.
- Endurance:

□ EasyPact CVS100BS circuit breaker, typically 50% of the rated mechanical endurance of the circuit breaker

Installation and connection

- The circuit breaker panel has MX and MN releases at the rear part.
- Connection using wires up to 1.5mm^2.

For EasyPact CVS100BS		EasyPact CVS100BS	
		AC	DC
Consumption	Pick-up (MX)	< 10VA	< 10W
	Seal-in (MN, MNR)	< 5VA	< 5W
Response time (ms)		< 50	< 50

Note: 1. CVS100BS: select any two from three auxiliary switches (OF, SD, OF/SD).

Electrical and Mechanical Accessories
EasyPact CVS100BS

EasyPact CVS100BS with a direct rotary handle

Rotary handle

Two types of rotary handle are available:

- Direct rotary handle
- Extended rotary handle

Direct rotary handle

Protection degree: IP40, IK07, IP54

Operation

- Function:
  - Suitability for isolation
  - Indications of three positions including O (OFF), I (ON) and Tripped
  - Access to "push-to-trip" button
- Circuit breaker locking capability in the OFF position by 1 to 3 padlocks, with a shackle diameter 5 to 8 mm (not supplied)

Installation

The front cover of the circuit breaker can be removed and replaced by the extended handle.

EasyPact CVS100BS series

The direct rotary handle is used in the following cases:

- Switchboards in motor control center (MCC):
  - Circuit-breaker closing is disabled if the door is open.
  - Door opening is disabled when the circuit breaker is ON.
  - Protection degree: IP43, IK07 (IP54, IK08)
  - Machine tool control, in compliance with CNOMO E03.81.501N, with a protection degree of IP54, IK08

EasyPact CVS100BS with an extended rotary handle

Extended rotary handle

The circuit breaker on the switch cabinet can be operated with the rotary handle on the front.

Protection degree: IP55, IK08, IP54

Operation Functions:

- Suitability for isolation
  - Indications of three positions including O (OFF), I (ON) and Tripped
  - Access to trip unit settings, when the switchboard door is open.
- Circuit breaker closing is disabled if the door is open.
- Circuit breaker locking capability in the OFF position by 1 to 3 padlocks, with a shackle diameter 5 to 8 mm (not supplied). These are used to prevent the door from being opened.

The extended rotary handle is made up of:

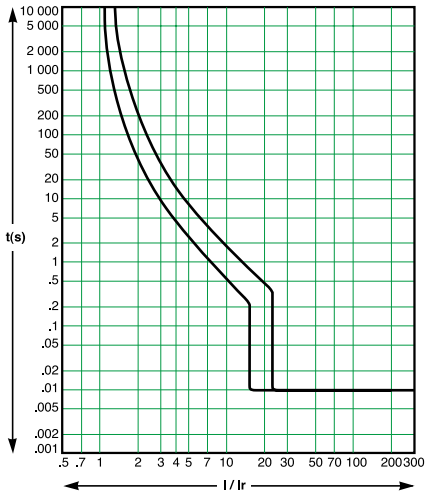
- A unit that replaces the front cover of the circuit breaker [1].
- An assembly (handle and front plate) on the door that is always secured in the same position, whether the circuit breaker is horizontally or vertically installed.
- An extension shaft that must be adjusted to the distance. The distance between the back of the circuit breaker and door is:
  - EasyPact CVS100BS: 145~422mm

Tripping Curve

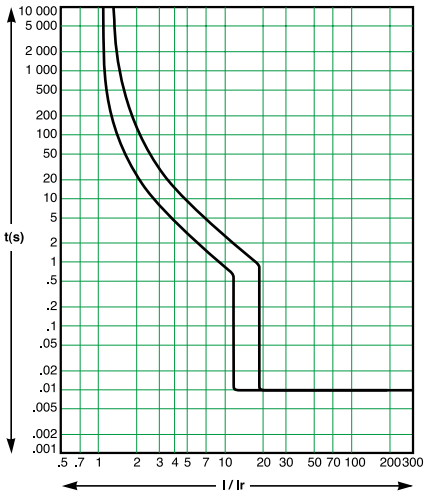
EasyPact CVS100BS

Power Distribution Protection System

16 A



20 A



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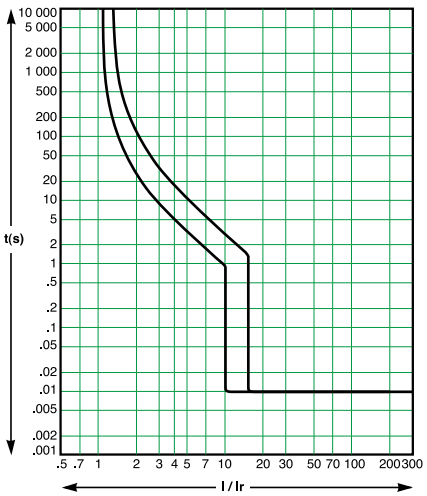

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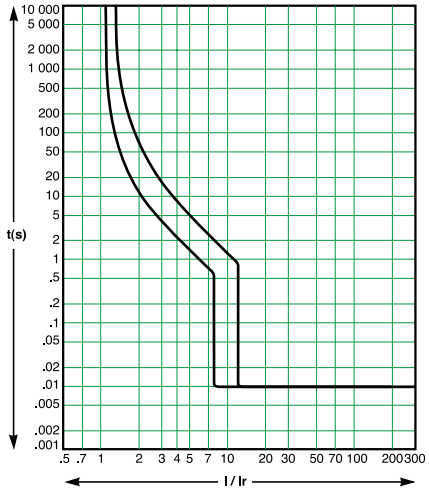

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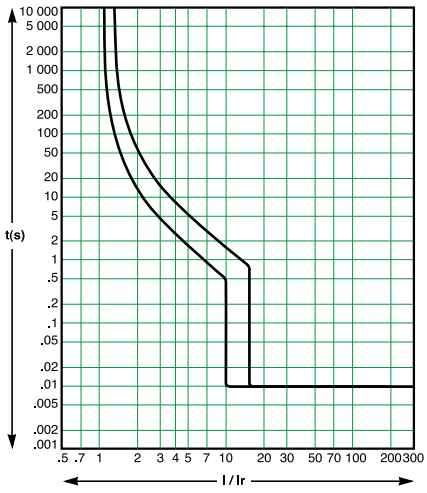

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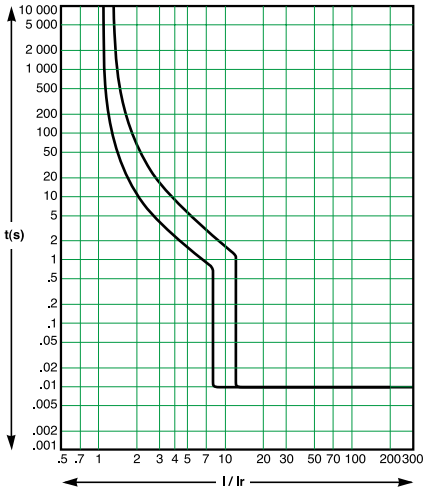
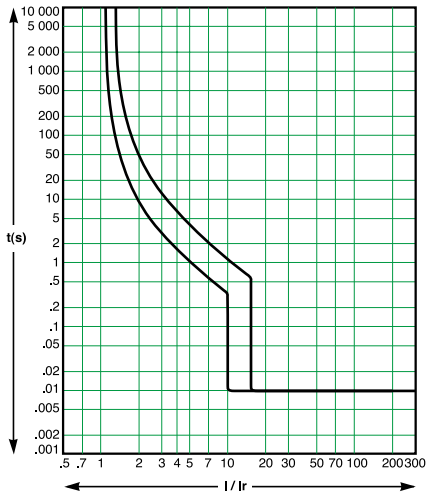


Tripping Curve

EasyPact CVS100BS

Power Distribution Protection System

63 A



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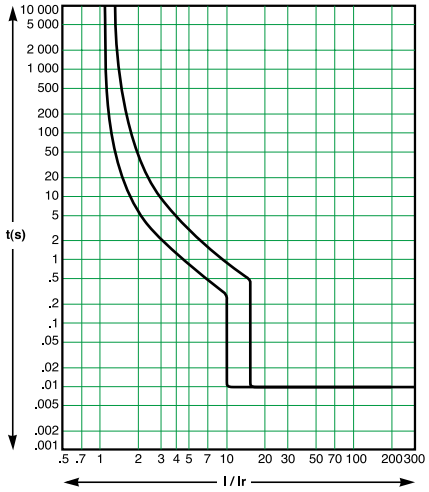
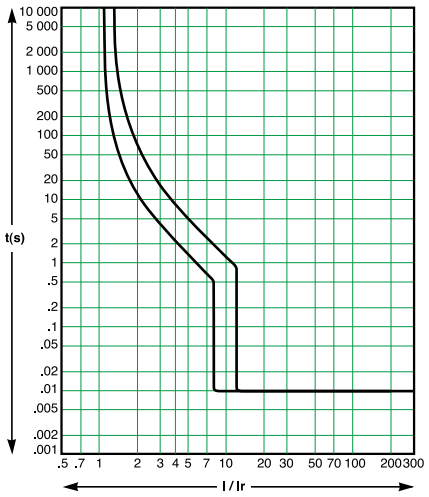


100 A



Life Is On Schneider Electric

Temperature and Altitude Derating

Temperature derating of trip units

EasyPact CVS100BS

Rating (A)	40°C	45°C	50°C	55°C	60°C	65°C	70°C
16	16.7	16.3	16.0	15.7	15.6	15.1	14.7
20	20.4	20.2	20.0	19.7	19.2	18.9	18.5
25	25.7	25.3	25.0	24.7	24.5	24.3	24.0
32	33.5	32.7	32.0	31.4	31.0	30.4	29.9
40	40.9	40.4	40.0	39.5	38.0	37.6	37.1
50	52.1	51.0	50.0	49.3	48.1	47.3	46.6
63	64.9	63.9	63.0	62.0	60.4	59.4	58.5
80	82.2	81.1	80.0	78.6	77.3	76.7	76.1
100	103.0	101.0	100.0	99.0	94.0	94.0	93.0

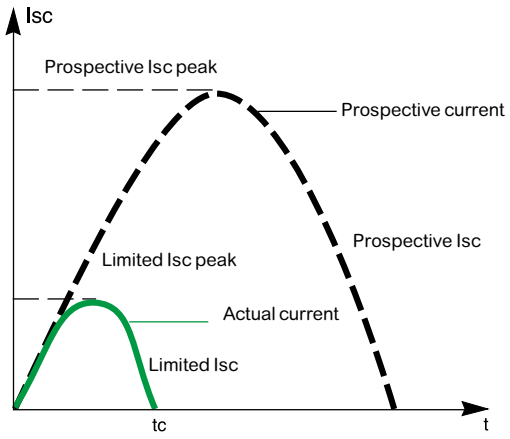
Altitude Derating of trip units

Altitude does not significantly affect circuit-breaker characteristics up to 2000 m. Above this altitude, it is necessary to take into account the decrease in the dielectric strength and cooling capacity of air. It should be noted that the breaking capacity remained unchanged.

EasyPact CVS100BS			
Height (m)	2000	2600	3900
Dielectric strength (V)	3000	2850	2400
Maximum operation voltage (V)	690	655.5	552
Nominal current at 40°C (A)	1 x In	0.95 x In	0.8 x In

Current-limiting

Current-limiting capacity refers to the ability of a circuit breaker to limit short-circuit current.



Ics 17kA

Current-limiting performance of EasyPact CVS100BS series helps lower power generated by fault current, and consequently improves the breaking capacity of the circuit-breaker. Ics 17kA.

Extension of service life of electrical installation

Circuit breaker current-limiting technology greatly reduces damage to installation caused by short-circuit current.

Thermal effect
lowers temperature rise and extend the service life of the cable.

Mechanical effect
Risks of contact and busbar distortion and damage are greatly reduced since the electrodynamic force is decreased.

Electromagnetic effect
Disturbance on surrounding measurement instrument is relieved.

Current-limiting curve

Current-limiting capacity of a circuit breaker can be represented by two curves. It varies with the value of prospective short-circuit current (short-circuit current without any protective device).

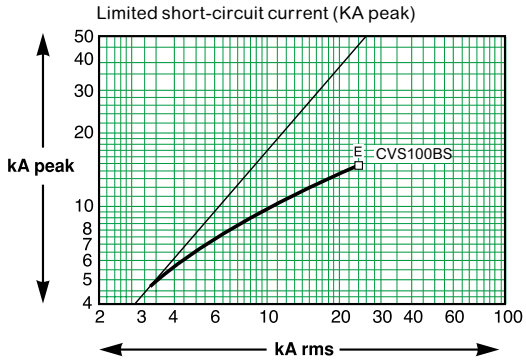
- Actual peak current (current-limiting)
- Thermal effect (A^2s), which means energy loss of a 1Ω conductor carrying the short-circuit current.

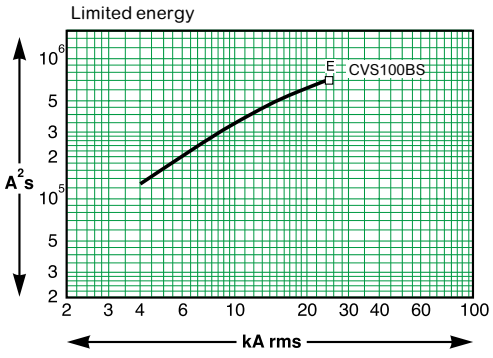
Maximum allowable thermal stress of cable

The maximum allowable overheat values (in A^2s), dependent on cable insulation material (Cu or Al) and cross-section (mm^2), are listed in the following table.

Cross section (mm^2)		1.5	2.5	4	6	10
PVC	Copper	2.97×10^4	8.26×10^4	2.12×10^5	4.76×10^5	1.32×10^6
	Aluminum	-	-	-	-	5.41×10^5
PRC	Copper	4.10×10^4	1.39×10^5	2.92×10^5	6.56×10^5	1.82×10^6
	Aluminum	-	-	-	-	7.52×10^5
Cross section (mm^2)		**16**	**25**	**35**	**50**	
PVC	Copper	3.4×10^6	8.26×10^6	1.62×10^7	3.31×10^7	
	Aluminum	1.39×10^6	3.38×10^6	6.64×10^6	1.35×10^7	
PRC	Copper	4.69×10^6	1.39×10^7	2.23×10^7	4.56×10^7	
	Aluminum	1.93×10^6	4.70×10^6	9.23×10^6	1.88×10^7	

Current-limiting curves of EasyPact CVS100BS





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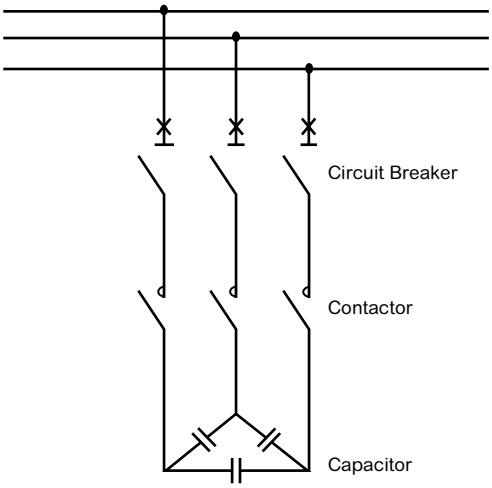
Capacitor protection

PB106445

EasyPact CVS100BS



EasyPact CVS100BS circuit breaker is suitable for capacitor protection following the rules below:

■ **Inc = Nominal current of the capacitor**

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

Inc = Nominal Current Capacitor (A)
Qc = Reactive power (kVAR)
U = Nominal Voltage (V)

■ **Inb = Nominal current of the circuit breaker**

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

■ **Icu = Ultimate breaking capacity of the circuit breaker**

Icu short-circuit level is given by the installation.

Example:

Table at 400 V AC - 3 phases 50 Hz for standard equipment.

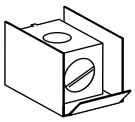
Reactive power (kVAR)	Inc (A)	Inb (A)	Breaking capacity to Circuit Breaker 30 kA
7.5	11	16	**LV510930**
10	14	20	**LV510931**
15	22	30	**LV510933**
20	29	40	**LV510934**
30	43	60	**LV510936**
40	58	80	**LV510937**
50	72	100	**LV510938**

EasyPact CVS100BS			
With TM-D thermal magnetic trip unit			
	EasyPact CVS100BS (25 kA at 380/415 V)		
	Rating	3P3d	4P3d
	TM16D	**LV510930**	
	TM20D	**LV510931**	
	TM25D	**LV510932**	**LV510952**
	TM32D	**LV510933**	**LV510953**
	TM40D	**LV510934**	**LV510954**
	TM50D	**LV510935**	**LV510955**
	TM63D	**LV510936**	**LV510956**
	TM80D	**LV510937**	**LV510957**
	TM100D	**LV510938**	**LV510958**

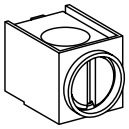
Accessories

Connection accessories

Cable lugs

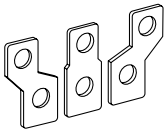


≤50A	Cables from 2.5 to 16 mm²	Set of 2	**EZALUG0502**
		Set of 3	**EZALUG0503**



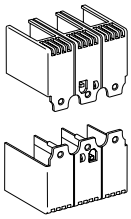
> 50A	Cables from 10 to 50 mm² 24V	Set of 2	**EZALUG1002**
		Set of 3	**EZALUG1003**

Spreaders



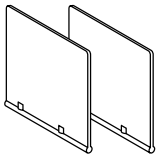
Spreaders for 3P breaker	Set of 3	**EZASPDR3P**
Spreaders for 4P breaker	Set of 4	**EZASPDR4P**

Terminal shields



Terminal shields for 3P breaker	Set of 2	**EZATSHD3P**
Terminal shields for 4P breaker	Set of 2	**EZATSHD4P**

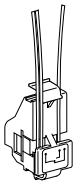
Phase barriers



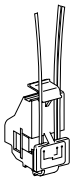
Phase barriers	Set of 2	**EZAFASB2**

Electrical auxiliaries

Indication contacts



Auxiliary switch (AX)	**EZAUX10**



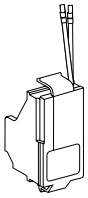
Alarm switch (AL)	**EZAUX01**

Auxiliary switch + alarm switch (AX + AL)	**EZAUX11**

Accessories

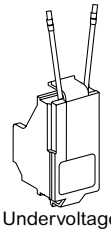
Electrical auxiliaries (Cont.)

Voltage releases



Shunt trip (SHT)

	Voltage	MX/SHT
AC	100-130V	**EZASHT100AC**
	200-277V	**EZASHT200AC**
	380-480V	**EZASHT380AC**
DC	24V	**EZASHT024DC**



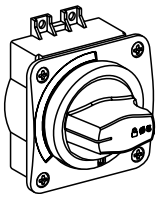
Undervoltage release (UVR)

	Voltage	MN/UVR
AC	110-130V	**EZAUVR200AC**

Accessories

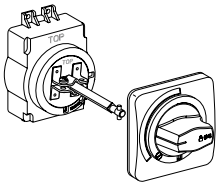
Rotary handles

Direct rotary handle (for 3/4P breaker)



Direct rotary handle (black)	**EZAROTDS**

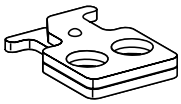
Extended rotary handle (for 3/4P breaker)



Extended rotary handle (black)	**EZAROTE**

Locks

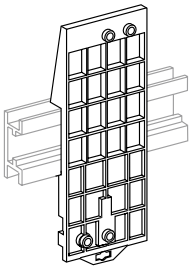
Padlocking system



Padlocking system	**EZALOCK**

Installation accessory

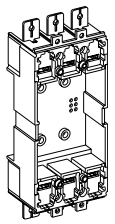
DIN rail adaptor



For 2 x 1P or 1 x 2P or 1 x 3P breaker	**EZADINR**

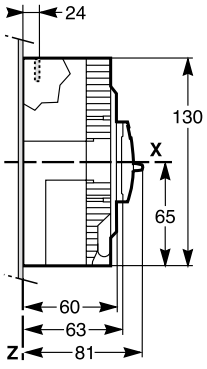
Note: for 4P breaker, use 2 adaptors

Plug-in 100 A

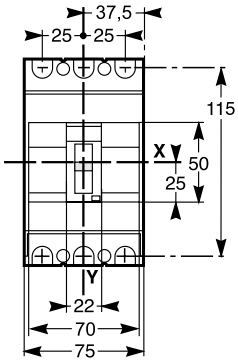


Kit, plug-in base 3P 15 A-50 A	**EZAPLUG3L**
Kit, plug-in base 3P 60 A-100 A	**EZAPLUG3H**
Fishbone connectors set of 3	**EZAFSHB3**

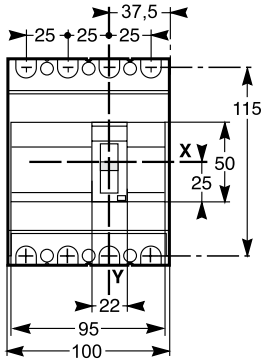
Dimensions



3P

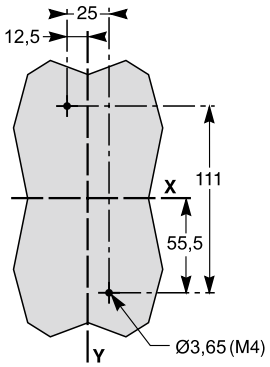


4P

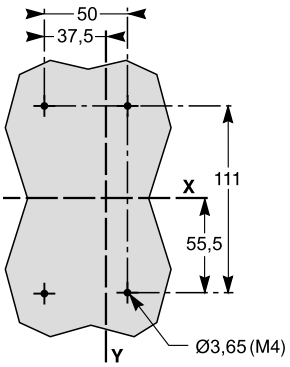


Backplate mounting

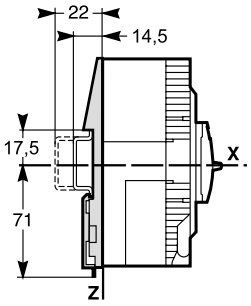
3P

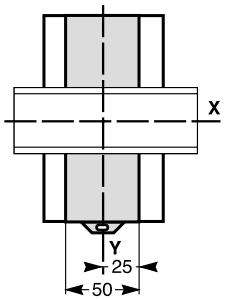


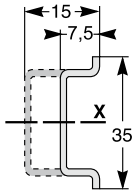
4P



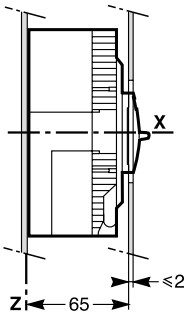
DIN rail mounting







Front panel cutout (small)



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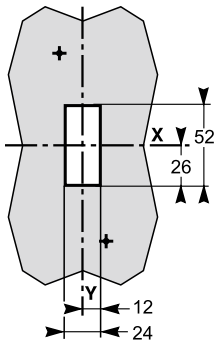
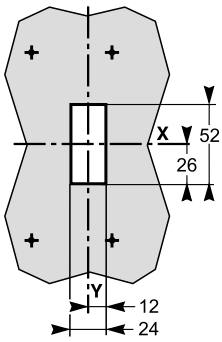
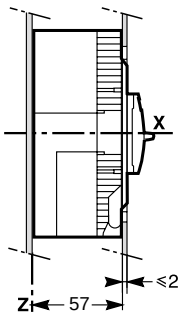


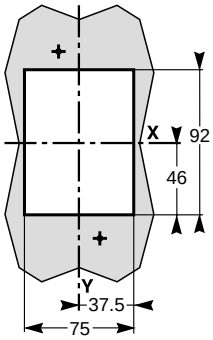
4P



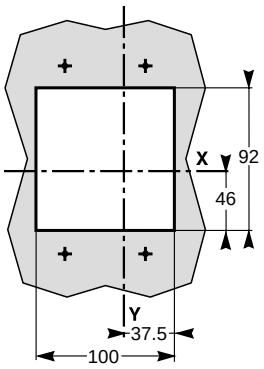
Front panel cutout (large)



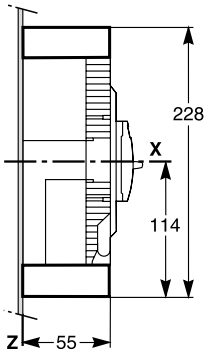
3P

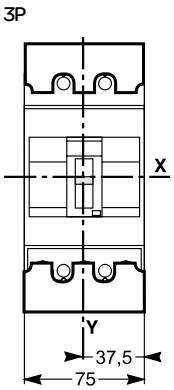


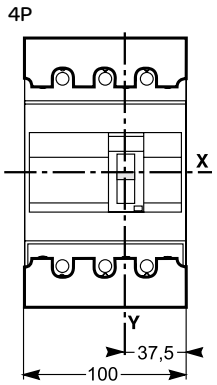
4P



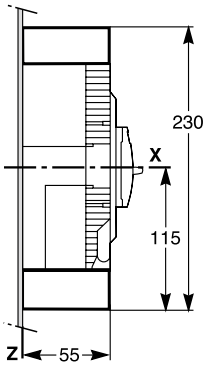
Terminal shield

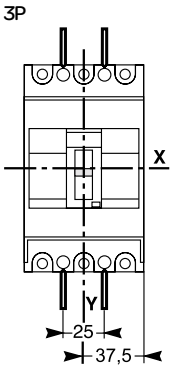


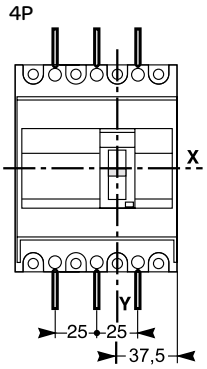




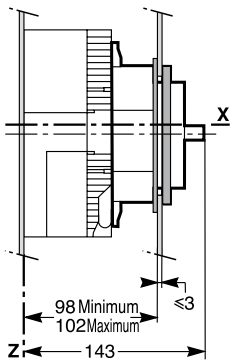
Interphase barrier

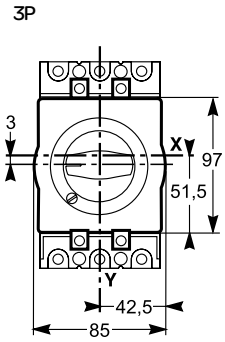


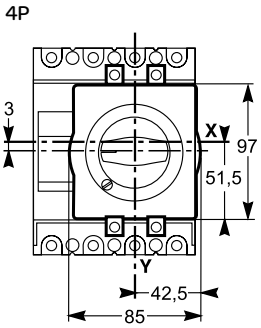


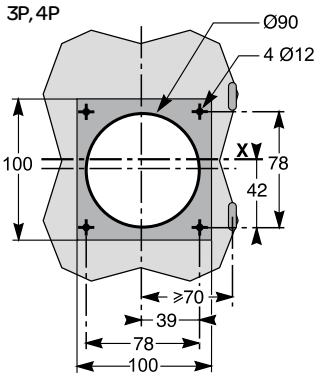


Direct rotary handle

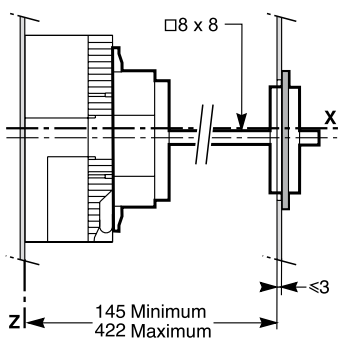


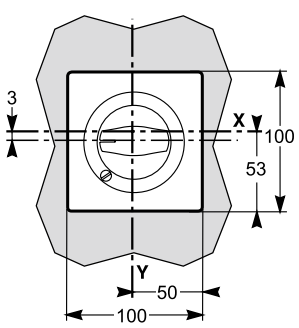


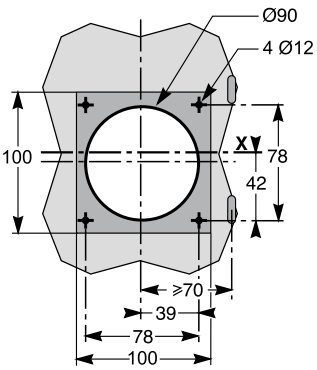




Extended rotary handle







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04-2022

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Document reference LVED210011EN

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