EcoStruxure™
Innovation At Every Level

Easy Series

EasyPact™ CVS

Catalog 2024

Molded-case circuit breakers and switch-disconnectors from 800 to 1600 A

se.com

Life Is On | Schneider Electric

Green Premium™

An industry leading portfolio of offers delivering sustainable value

Green Premium™

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

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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.

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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

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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)

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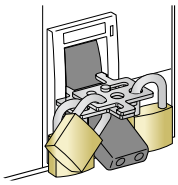
Easy choice for Quality and Value

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.

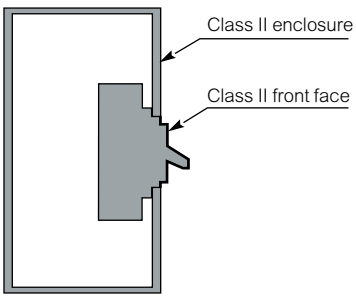


Locking in OFF Position

- Key locks enable to lock the circuit 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

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 and Mechanical Endurance

- 5000 mechanical operations for 800 to 1600 A
- 3000 electrical operations for 800 to 1600 A

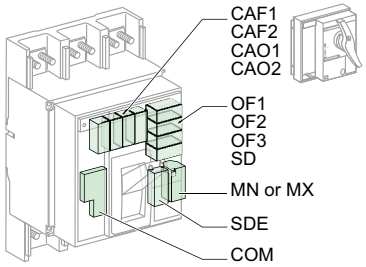
Reliable Accessories

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

EasyPact CVS is...Simple

800 to 1600 A

- Common and snap-fit accessories 800 to 1600 A
- Multiple OFF contacts for ON/OFF, Trip indication
- Single Shunt coil for remote tripping
- Single Under Voltage coil



Manually operated device.

* except CVS100BS

EasyPact CVS Stands For Customer Value

EasyPact CVS 800 to 1600 A

Panel Builders

- Single frame sizes from 800 to 1600 A
- 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

New Generation, Simpler
Commercial References
New Meaningful References to
Make your Life Easier

EasyPact Type	Frame Rating	Breaking Capacity	Pole	ETS TRIP UNIT	MOUNTING	Control	Suffix
E = EasyPact	080 : 800 A	F : 36 kA	3 = 3P	20 = ETS2.0	F: Fixed	M: Manually operated	
	100 : 1000 A	N: 50 kA	4 = 4P	NA = NA			
	125 : 1250 A	H: 70 kA					
	160 : 1600 A	S: NA					

> 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

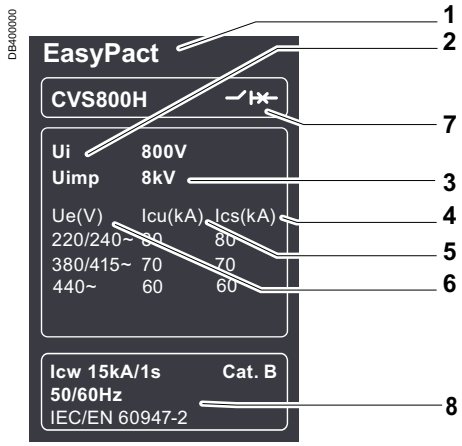
General Contents

EasyPact™ CVS

Introduction

Introduction

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.

Introduction
General Characteristics For CVS800 to 1600 Range

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

- The isolation position corresponds to the O (OFF) position.
- The operating handle cannot indicate the OFF position unless the contacts are effectively open.
- Padlocks may not be installed unless the contacts are open.

Installation of a rotary handle does not alter the reliability of the position-indication system.

The isolation function is certified by tests guaranteeing:

- Mechanical reliability of the position indication system.
- Overvoltage withstand capacity between upstream and downstream connections.

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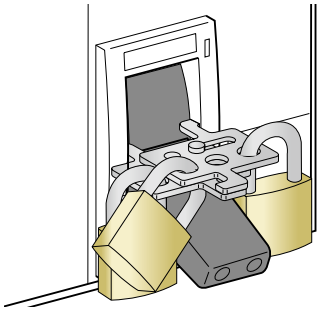
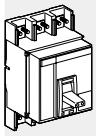
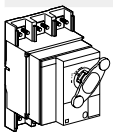
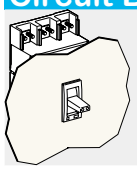
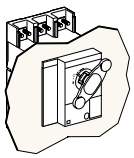
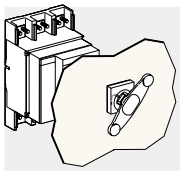


Installation in Class II Switchboards
All EasyPact circuit breakers are class II front face devices. They may be installed through the door of class II switchboards (as per IEC standard 60664), without downgrading switchboard insulation. Installation requires no special operations, even when the circuit breaker is equipped with a rotary handle.

Degree of Protection
As per standards IEC 60529 (IP degree of protection) and EN 50102 (IK degree of protection against external mechanical impacts).

Bare Circuit Breaker with Terminal Shields			
DB128015.eps 	With toggle	IP40	IK07
DB128016.eps 	With direct rotary handle standard / VDE	IP40	IK07

Circuit Breaker Installed in a Switchboard			
DB128017.eps 	With toggle	IP40	IK07
DB128018.eps 	With direct rotary handle standard / VDE MCC CNOMO	IP40 IP43 IP54	IK07 IK07 IK07
DB128019.eps 	With extended rotary handle	IP55	IK08

Introduction
Characteristics and Performance

EasyPact CVS800

Common Characteristics				
Rated voltages				
Insulation voltage (V)	**Ui**			800
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				B
Pollution degree		IEC 60664-1		3

Circuit Breakers				
Performance				
Electrical Characteristics As Per IEC 60947-2				
Rated current (A)	**In**	50 °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	415 V	In
			440 V	In
Short-time withstand current (kA rms)	**Icw**	AC	1s	
Integrated instantaneous protection	**kA peak ±10%**			
Additional Indication and Control Auxiliaries				
Indication contacts				
Voltage releases	MX shunt release/MN undervoltage release			
Installation				
Accessories	terminal extensions and spreaders terminal shields and interphase barriers escutcheons			
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		

Source Changeover System (see section on source changeover systems)		
Manual, remote-operated and automatic source changeover systems		
Protection and Measurements of ETU		
Overload protection	long time	Ir (In x …)
Short-circuit protection	short time	Isd (Ir x …)
Protection of the fourth pole		
Remote Communication by Bus		
Device-status indication		
Control	Manual	toggle
		direct or extended rotary handle

Introduction
Characteristics and Performance

CVS800			CVS1000			CVS1250			CVS1600		
	800			**1000**			**1250**			**1600**	
	3, 4			3, 4			3, 4			3, 4	
F	**N**	**H**	**F**	**N**	**H**	**F**	**N**	**H**	**F**	**N**	**H**
50	70	80	50	70	80	50	70	80	50	70	80
36	50	70	36	50	70	36	50	70	36	50	70
36	45	60	36	45	60	36	45	60	36	45	60
50	70	80	50	70	80	50	70	80	50	70	80
36	50	70	36	50	70	36	50	70	36	50	70
36	45	60	36	45	60	36	45	60	36	45	60
	5000			5000			5000			5000	
	3000			3000			3000			3000	
	2000			2000			2000			2000	
	15 kA			15 kA			15 kA			19.2 kA	
	40			40			40			40	
					YES						
					YES						
					YES						
					YES						
					YES						
					210 × 327 ×147						
					280 × 327 ×147						
					14						
					18						
					70/95						
					YES						
					YES						
					YES						
					YES						
					YES						
					YES						
					YES						

Switch-Disconnectors
Characteristics and Performance

EasyPact CVS800NA

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**		
Rated short-time withstand current (kA rms)	**Icw**	for	0.5 s
			1 s
Durability (C-O cycles)	mechanical		
	electrical	AC	
		440 V	In
Control	manual	toggle	
		direct or extended rotory handle	
Additional Indication and Control Auxiliaries			
Indication contacts			
Voltage releases	MX shunt release		
	MN undervoltage release		
Remote Communication by Bus			
Indication contacts			
Voltage releases	MX shunt release		
Installation			
Accessories	terminal extensions and spreaders		
	terminal shields and interphase barriers		
	escutcheons		
Dimensions (mm)	fixed, front connections	3P	
W x H x D		4P	
Weight (kg)	fixed, front connections	3P	
		4P	
Source-Changeover System (see section on source-changeover systems)			
Manual source-changeover systems, remote-operated and automatic			

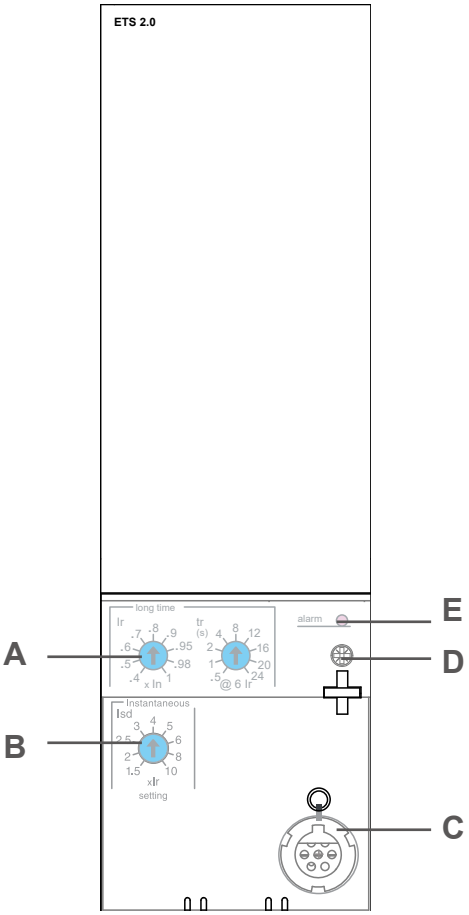
Note: Installation standards require upstream protection.

Switch-Disconnectors
Characteristics and Performance

	CVS800NA	CVS1000NA	CVS1250NA	CVS1600NA
	800	1000	1250	1600
	3, 4	3, 4	3, 4	3, 4
	AC23A	AC23A	AC23A	AC23A
	800	800	800	800
	800	800	800	800
	800	800	800	800
	40	40	40	40
	20	20	20	20
	15	15	15	15
	5000	5000	5000	5000
	AC23A	AC23A	AC23A	AC23A
	2000	2000	2000	1000
			YES	
			YES	
			YES	
			YES	
			YES	
			YES	
			YES	
			YES	
			YES	
			210 x 327 x 147	
			280 x 327 x 147	
			14	
			18	
			YES	

ETS Control Units
For **Easy**Pact CVS800 to 1600

ETS 2.0 electronic trip unit can be used on EasyPact CVS800-1600 circuit breakers with performance levels F/N/H.



A. long-time threshold and tripping delay
B. short-time pick-up and tripping delay
C. test connector
D. fixing screw for long-time rating plug
E. overload alarm(LED)

Note: ETS trip units are equipped with a transparent lead-seal cover as standard.

Protection
Protection thresholds and delays are set using the adjustment dials.

Overload Protection
True rms long-time protection.

Thermal memory: thermal image before and after tripping.

Setting accuracy may be enhanced by limiting the setting range using a long-time rating plug.

Overload protection can be cancelled using a specific LT rating plug Off.

Short-Circuit Protection
Short-time (rms) and instantaneous protection.

Selection of I^2t type (ON or OFF) for short-time delay.

Neutral Protection
On three-pole circuit breakers, neutral protection is not possible.

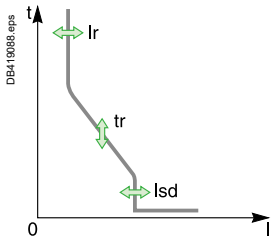
On four-pole circuit breakers, neutral protection may be set using a three-position switch: neutral unprotected (4P 3d), neutral protection at 0.5 Ir (4P 3d + N/2) or neutral protection at Ir (4P 4d).

Indications
Overload indication by alarm LED on the front; the LED goes on when the current exceeds the long-time trip threshold.

Test
A mini test kit or a portable test kit may be connected to the test connector on the front to check circuit-breaker operation after installing the trip unit or accessories.

ETS Control Units
For **Easy**Pact CVS800 to 1600

ETS

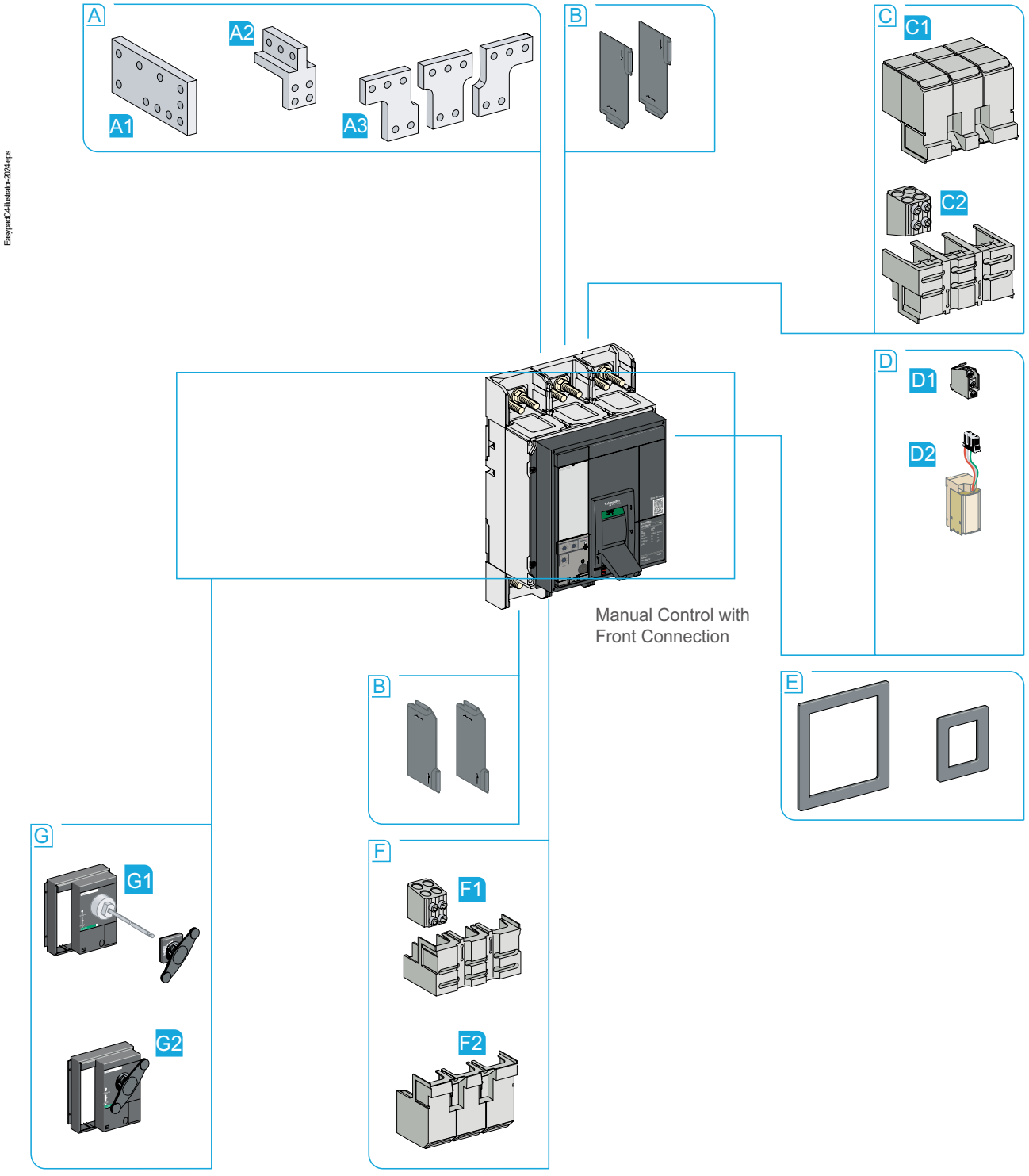


Long-Time											
Current setting (A)	**Ir** = In x …		0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1
tripping between 1.05 and 1.20 x Ir			other ranges or disable by changing long-time rating plug								
Time setting		t_r (s)	**tr** = 0.5 s to 24 s, step 0.5 s for 6 Ir								
Time setting exemple: time delay (s)	Accuracy: 0 to -30 %	1.5 x Ir	12.5	25	50	100	200	300	400	500	600
	Accuracy: 0 to -20 %	6 x Ir	0.5 [1]	1	2	4	8	12	16	20	24
	Accuracy: 0 to -20 %	7.2 x Ir	0.7 [2]	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6
Thermal memory			20 minutes before and after tripping								
Instantaneous											
Pick-up (A)	**Isd** = Ir x …		1.5	2	2.5	3	4	5	6	8	10
Accuracy: ±10 %											
Time delay			Max resettable time: 20 ms Max break time: 80 ms								

[1] 0 to - 40%
[2] 0 to - 60%

Accessories and Auxiliaries

Electrical and Mechanical Accessories for **Easy**Pact CVS800 to 1600



A1. Terminal Extension for Cables with Lugs
A2. Vertical Connection Adapter
A3. Spreader
B. Interphase Barriers
C1. Sealable Terminal Shield
C2. Connection kit for Connectors
D1. Auxiliary Contact
D2. Voltage Release
E. Escutcheon
F1. Connection kit for Connectors
F2. Sealable Terminal Shield
G1. Extended Rotary Handle
G2. Direct Rotary Handle

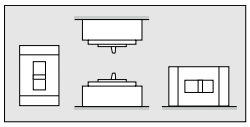
Accessories and Auxiliaries
Electrical and Mechanical Accessories for **Easy**Pact CVS800 to 1600

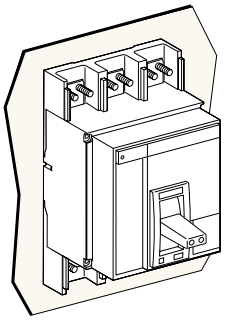
Manually Operated Fixed **Easy**Pact CVS800

Installation
Fixed Configuration

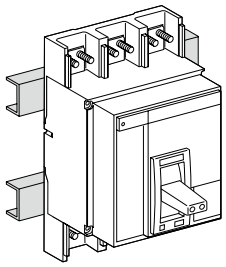
EasyPact CVS800 to 1600 circuit breakers may be installed vertically, horizontally or flat on their back.

■ Possible installation positions



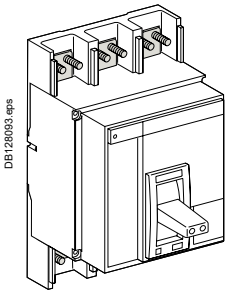


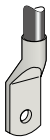
Mounting on a Backplate



Mounting on Rails

Accessories and Auxiliaries
Electrical and Mechanical Accessories for **Easy**Pact CVS800 to 1600





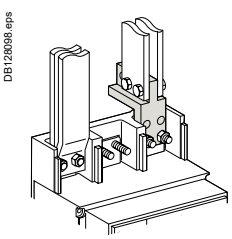
Front Connection of Fixed Devices

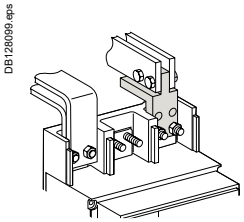
Bars

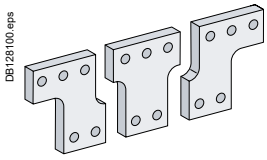
Fixed, front-connection EasyPact CVS800 to 1600 devices are equipped with terminals comprising captive screws for direct connection of bars.

Other connection possibilities for bars include vertical-connection adapters for edgewise bars and spreaders to increase the pole pitch to 95 mm.

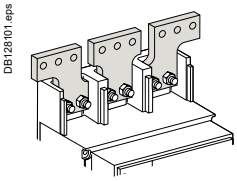
If the vertical connection adapters are front oriented, then it is mandatory to install the arc chute screen in order to comply with the safety clearances.

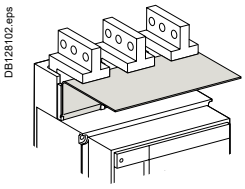


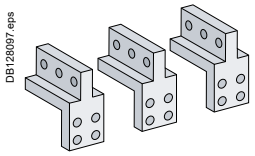




Spreaders



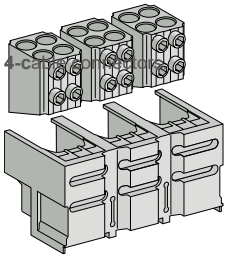


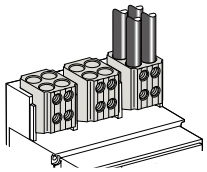


Vertical-connection adapters

Bare Cables

Special sets of connectors and terminal shields may be used to connect up to four 240 mm² copper or aluminium cables for each phase. Bare cable connection is possible for ratings up to and including 1250 A.





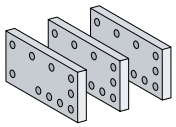
Cables With Lugs

Cable lug adapters are combined with the vertical-connection adapters.

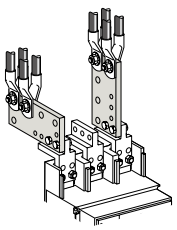
One to four cables with crimped lugs (≤ 300 mm²) may be connected.

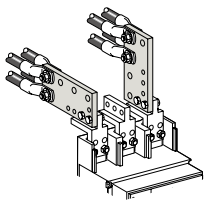
To ensure stability, spacers must be positioned between the terminal extensions.

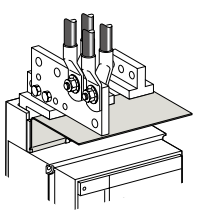
If the cable lug adapters are installed over the top of the arc chute chambers, then it is mandatory to install the arc chute screen in order to comply with the safety clearances.



Cable lug adapters



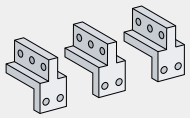
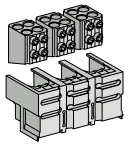
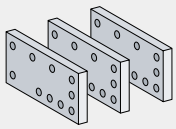
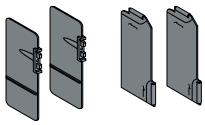
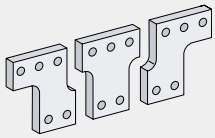
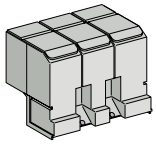
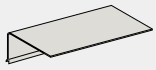




Accessories and Auxiliaries
Electrical and Mechanical Accessories for **Easy**Pact CVS800 to 1600

To ensure performance and isolation, depending on the type of circuit breaker (F, N, H) and type of connection, certain isolation accessories are mandatory.

Connection Accessories

Type of Accessories		For EasyPact CVS800 to 1600
		Fixed:
		Front Connection
Vertical-Connection Adapters	 [1]	F, N, H
Set of Bare-Cable Connectors and Terminal Shields for Ratings ⩽ 1250 A		F, N, H
Cable Lug Adapters	 [1]	F, N, H
Interphase Barriers	 [2]	F, N, H
Spreaders	 [1]	F, N, H
Connection Shield		F, N, H
Arc Chute Screen		F, N, H

[1] Spreaders, vertical connection adapters, and cable lugs adapters are not compatible with voltages ⩾ 500 V.
[2] Mandatory for voltages ⩾ 500 V unless using the bare-cable connector + terminal shield kit.

Accessories and Auxiliaries
Electrical and Mechanical Accessories for **Easy**Pact CVS800 to 1600

All the auxiliary contacts opposite are also available in low-level versions capable of switching very low loads (e.g. for the control of PLCs or electronic circuits).

OF, SD, and SDE changeover contacts

wireless OF, SD

Indication Contacts

Contacts Installed in the Device

Changeover contacts are used to remote circuit breaker status information and can thus be used for indications, electrical locking, relaying, etc.
They comply with the IEC 60947-5 international recommendation.

Functions

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

Returns to de-energised state when the circuit breaker is reset.

- SDE (fault indication) - indicates that the circuit breaker has tripped due to:
  - an overload
  - a short-circuit
  - an earth-leakage fault

Returns to de-energised state when the circuit breaker is reset.

- CAF/CAO (early-make or early-break function) - indicates the position of the rotary handle. Used in particular for advanced opening of safety trip devices (early break) or to energise a control device prior to circuit breaker closing (early make).

Installation

- OF, SD, and SDE 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
- CAF/CAO function - the contact fits into the rotary-handle unit (direct or extended).

Electrical Characteristics of the OF/SD/SDE/CAF/CAO Auxiliary Contacts

Contacts		Standard				Low level			
Rated thermal current (A)		6				5			
Minimum load		100 mA at 24 V				1 mA at 4 V			
Utilisation cat. (IEC 60947-5-1)		AC12	AC15	DC12	DC14	AC12	AC15	DC12	DC14
Operational current (A)	24 V	6	6	6	1	5	3	5	1
	48 V	6	6	2.5	0.2	5	3	2.5	0.2
	110 V	6	5	0.6	0.05	5	2.5	0.6	0.05
	220/240 V	6	4	-	-	5	2	-	-
	250 V	-	-	0.3	0.03	5	-	0.3	0.03
	380/440 V	6	2	-	-	5	1.5	-	-
	480 V	6	1.5	-	-	5	1	-	-
	660/690 V	6	0.1	-	-	-	-	-	-

Electrical Characteristics of the CE/CD/CT Auxiliary Contacts

Contacts		Standard				Low level			
Rated thermal current (A)		8				5			
Minimum load		100 mA at 24 V				2 mA at 15 V			
Utilisation cat. (IEC 60947-5-1)		AC12	AC15	DC12	DC14	AC12	AC15	DC12	DC14
Operational current (A)	24 V	8	6	2.5	1	5	3	5	1
	48 V	8	6	2.5	0.2	5	3	2.5	0.2
	110 V	8	5	0.8	0.05	5	2.5	0.8	0.05
	220/240 V	8	4	-	-	5	2	-	-
	250 V	-	-	0.3	0.03	5	-	0.3	0.03
	380/440 V	8	3	-	-	5	1.5	-	-
	660/690 V	6	0.1	-	-	-	-	-	-

Accessories and Auxiliaries
Electrical and Mechanical Accessories
for **Easy**Pact CVS800 to 1600

Rotary Handles

There are two types of rotary handle:

- direct rotary handle
- extended rotary handle

There are two models:

- standard with a black handle
- VDE with a red handle and yellow front for machine-tool control

Direct Rotary 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
- circuit breaker locking capability in the OFF position by one to three padlocks, shackle diameter 5 to 8 mm (not supplied).

It replaces the circuit breaker front cover.

Accessories transform the standard direct rotary handle for the following situations:

- a higher degree of protection (IP43, IK07)
- machine-tool control, complying with CNOMO E03.81.501, IP54, IK07

Extended Rotary Handle

Degree of protection IP55, IK07.

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

It maintains:

- suitability for isolation
- indication of the three positions O (OFF), I (ON) and tripped
- access to trip unit settings, when the switchboard door is open
- circuit breaker locking capability in the OFF position by one to three padlocks, shackle diameter 5 to 8 mm (not supplied).

The door cannot be opened if the circuit breaker is ON or locked.

The extended rotary handle is made up of:

- 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 218/605 mm.

EasyPact CVS with a direct rotary handle

EasyPact CVS with an extended rotary handle

Accessories and Auxiliaries
Electrical and Mechanical Accessories for **Easy**Pact CVS800 to 1600

Manually operated circuit breakers may be equipped with an MX shunt release, an MN undervoltage release or a delayed undervoltage release (MN + delay unit).

EasyPact CVS800

Remote Tripping

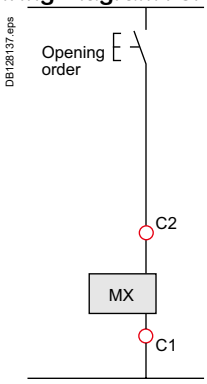
This function opens the circuit breaker via an electrical order. It is made up of:

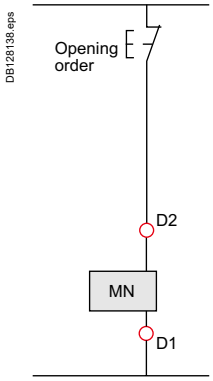
- a shunt release (2nd MX)
- or an undervoltage release MN
- or a delayed undervoltage release MN + delay unit.

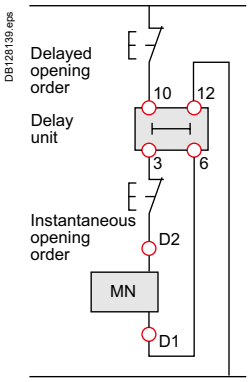
These releases (2nd MX or MN) cannot be operated by the communication bus.

The delay unit, installed outside the circuit breaker, may be disabled by an emergency OFF button to obtain instantaneous opening of the circuit breaker.

Wiring Diagram For the Remote-Tripping Function







Voltage Releases 2nd MX

When energised, the 2nd MX voltage release instantaneously opens the circuit breaker. A continuous supply of power to the 2nd MX locks the circuit breaker in the OFF position. The MX release instantaneously opens the circuit breaker when energised, the minimum duration of the pulse operating order must be 200 ms.
The MX release locks the circuit breaker in OFF position if the order is maintained (except for MX communicating releases).

Characteristics		
Power supply	Vac 50/60 Hz	24 - 48 - 100/130 - 200/250 - 277 - 380/480
	Vdc	12 - 24/30 - 48/60 - 100/130 - 200/250
Operating threshold		0.7 to 1.1 Un
Permanent locking function		0.85 to 1.1 Un
Consumption (VA or W)		pick-up: 200 (200 ms) hold: 4.5
Circuit breaker response time at Un		50 ms ±10

Instantaneous Voltage Releases MN

The MN release instantaneously opens the circuit breaker when its supply voltage drops to a value between 35 % and 70 % of its rated voltage. If there is no supply on the release, it is impossible to close the circuit breaker, either manually or electrically. Any attempt to close the circuit breaker has no effect on the main contacts. Circuit breaker closing is enabled again when the supply voltage of the release returns to 85 % of its rated value.

Characteristics			
Power supply	Vac 50/60 Hz	24 - 48 - 100/130 - 200/250 - 380/480	
	Vdc	24/30 - 48/60 - 100/130 - 200/250	
Operating threshold	opening	0.35 to 0.7 Un	
	closing	0.85 Un	
Consumption (VA or W)		pick-up: 200 (200 ms)	hold: 4.5
MN consumption with delay unit (VA or W)		pick-up: 400 (200 ms)	hold: 4.5
Circuit breaker response time at Un		90 ms ±5	

MX voltage release

MN Delay Units

To eliminate circuit breaker nuisance tripping during short voltage dips, operation of the MN release can be delayed. This function is achieved by adding an external delay unit in the MN voltage-release circuit. Two versions are available, adjustable and non-adjustable.

Accessories and Auxiliaries
Electrical and Mechanical Accessories for **Easy**Pact CVS800 to 1600

Characteristics		
Power supply	non-adjustable	100/130 - 200/250
V AC 50-60 Hz /DC	adjustable	48/60 - 100/130 - 200/250 - 380/480
Operating threshold	opening	0.35 to 0.7 Un
	closing	0.85 Un
Consumption of delay unit alone (VA or W)	pick-up: 200 (200 ms)	hold: 4.5
Circuit breaker response time at Un	non-adjustable	0.25 s
	adjustable	0.5 s - 1 s - 1.5 s - 3 s

Toggle Locked by Removable Padlocking Device

Rotary Handle Locked by a Keylock

Locking on Manually Operated Devices

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).

Control device	Function	Means	Required accessories
Toggle	lock in		
	■ OFF position	padlock	removable device
	■ OFF or ON position	padlock	fixed device
Direct rotary handle	lock in		
	■ OFF position	padlock	
	■ OFF or ON position	keylock	locking device + keylock
CNOMO direct rotary handle	lock in		
	■ OFF position	padlock	
Extended rotary handle	lock in OFF position,	padlock	
	door opening prevented	keylock	keylock

Locking in ON position does not prevent the device from tripping in the event of a fault or remote tripping order.

Installation Recommendations

Installation Recommendations

Temperature Derating
EasyPact CVS Devices Equipped with Electronic Trip Units

EasyPact circuit breakers have been tested for operation in industrial atmospheres.
It is recommended that the equipment be cooled or heated to the proper operating temperature and kept free of excessive vibration and dust.

EasyPact CVS800 to 1600

The table below indicates the maximum rated-current value for each type of connection, depending on the ambient temperature.

Version	**Fixed Device**						
Connection	**Front Connection**						
Temp. Ti[1]	**40**	**45**	**50**	**55**	**60**	**65**	**70**
CVS 800 F/N/H	800	800	800	800	800	800	800
CVS 1000 F/N	1000	1000	1000	1000	1000	968	895
CVS 1000 H	1000	1000	1000	1000	1000	1000	1000
CVS 1250 F/N	1250	1250	1250	1250	1196	1140	1080
CVS 1250 H	1250	1250	1250	1250	1250	1240	1090
CVS 1600 F/N/H	1600	1600	1560	1510	1470	1420	1360

[1] ***Ti: temperature around the circuit breaker and its connections***

Power Dissipation/Resistance
EasyPact CVS Devices Equipped with Electronic Trip Units

The values indicated in the tables opposite are typical values.

Power Dissipated per Pole (P/pole) in Watts (W)
The value indicated in the table is the power dissipated at I_N, 50/60 Hz, for a three-pole or four-pole circuit breaker (these values can be higher than the power calculated on the basis of the pole resistance). Measurement and calculation of the dissipated power 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 (expert card ABT no. FE 05e).

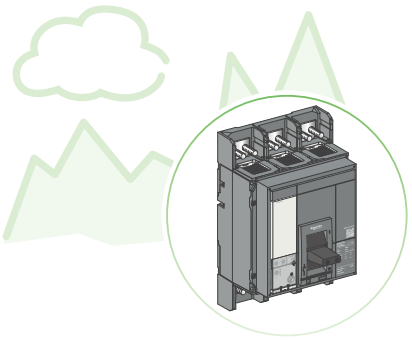
Note: this measurement is not sufficient to determine the quality of the contacts, i.e. the capacity of the circuit breaker to carry its rated current.

EasyPact CVS800 to 1600

Version	Fixed Device					
	F		N		H	
	R (mΩ)/pole	P (W)/pole	R (mΩ)/pole	P (W)/pole	R (mΩ)/pole	P (W)/pole
CVS800	0.058	39	0.058	39	0.035	24
CVS1000	0.058	61	0.058	61	0.035	37
CVS1250	0.048	78	0.048	78	0.035	57
CVS1600	0.026	74	0.026	74	0.026	74

Operating Conditions

EasyPact circuit breakers have been tested for operation in industrial atmospheres.
It is recommended that the equipment be cooled or heated to the proper operating temperature and kept free of excessive vibration and dust.



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.
The following table gives the corrections to be applied for altitudes above 2000 metres. The breaking capacities remain unchanged.

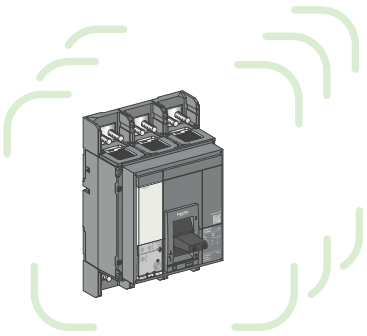
Altitude (m)	2000	3000	4000	5000
Impulse withstand voltage Uimp (kV)	8	7.1	6.4	5.6
Rated insulation voltage (Ui)	800	710	635	560
Maximum rated operationnal voltage 50/60 Hz Ue (V)	440	440	440	440
Rated current 40 °C	1 x In	0.99 x In	0.96 x In	0.94 x In

Intermediate values may be obtained by interpolation.

Vibrations

EasyPact 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.

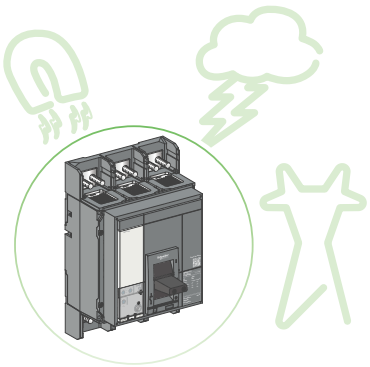


Electromagnetic Disturbances

EasyPact devices are protected against:
- overvoltages caused by devices that generate electromagnetic disturbances
- overvoltages caused by an atmospheric disturbances or by a distribution-system outage (e.g. failure of a lighting system)
- devices emitting radio waves (radios, walkie-talkies, radar, etc.)
- electrostatic discharges produced by users.

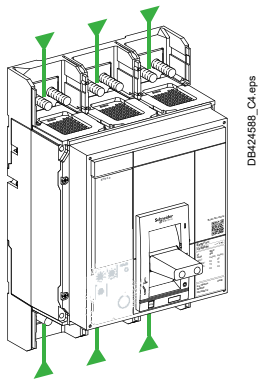
EaysPact devices have successfully passed the electromagnetic-compatibility tests (EMC) defined by the following international standards:
- IEC 60947-2, appendix F
- IEC 60947-2, appendix B (trip units with Vigi earth-leakage function).

The above tests guarantee that:
- no nuisance tripping occurs
- tripping times are respected.



Installation in Switchboards
Power Supply and Weights

Power Supply
EasyPact CVS800 to 1600 circuit breakers can be supplied from either the top or the bottom without any reduction in performance. This capability facilitates connection when installed in a switchboard.



Weights

		Circuit breaker
CVS800 to 1600 manual operation	3P	14
	4P	18

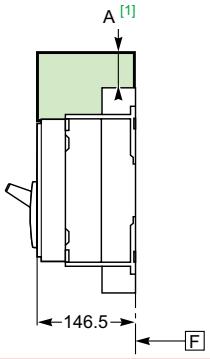
The table above presents the weights (in kg) of the circuit breakers and the main accesories, which must be summed to obtain the total weight of complete configurations.

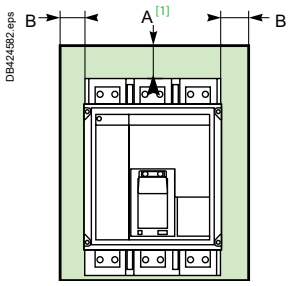
Installation in Switchboards
Safety Clearances and Minimum Distances

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
- block off the busbars using insulating screens.

EasyPact CVS800 to 1600 (fixed devices)

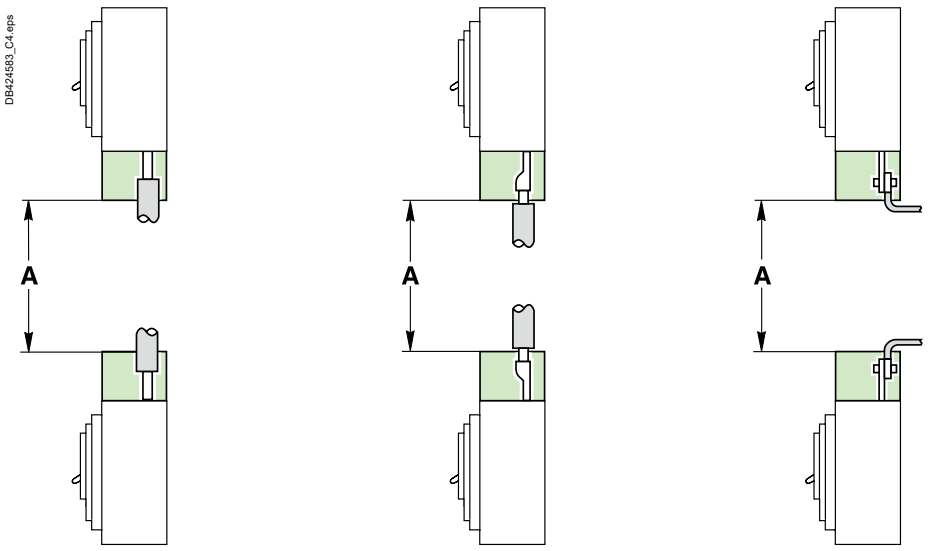




Insulated parts	Metal parts	Live parts
CVS 800 to 1600		
A 0	120	180
B 0	10	60

[1] An overhead clearance of 50 mm is required to remove the arc chutes.

Installation in Switchboards
Installation Example



Direct connection by bare cables, devices with terminal shields.

Connection by cables with lugs, devices with terminal shields.

Connection by insulated bars, devices with terminal shields.

Minimum dimensions (mm) EasyPact circuit breaker	A
CVS800 to 1600	250

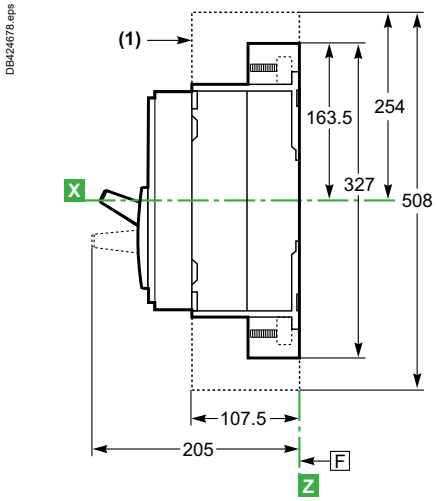
Dimensions and Connection

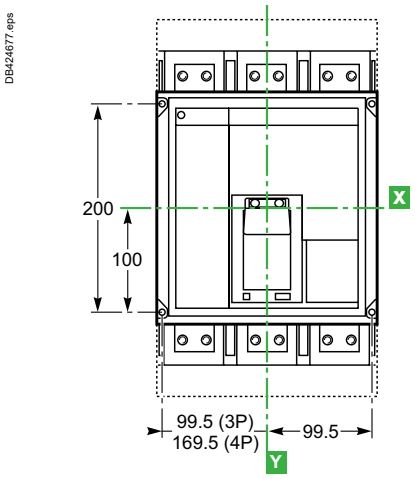
Dimensions and Connection

Dimensions and Mounting
EasyPact CVS800 to 1600
(Fixed version)

Manual Control

Front Connection (F, N, H)

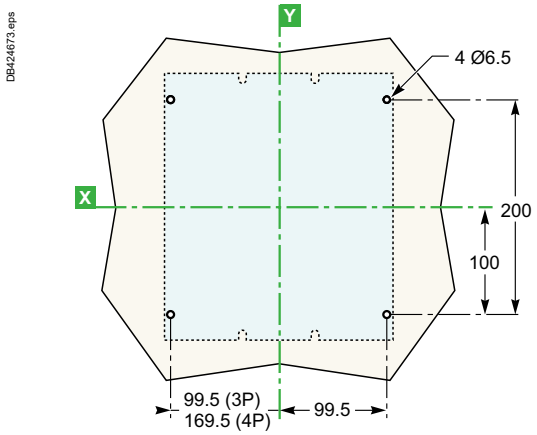




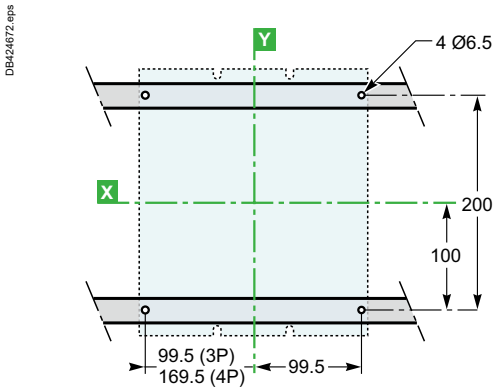
[1] Terminal shields are optional.

Front Connection

On Backplate

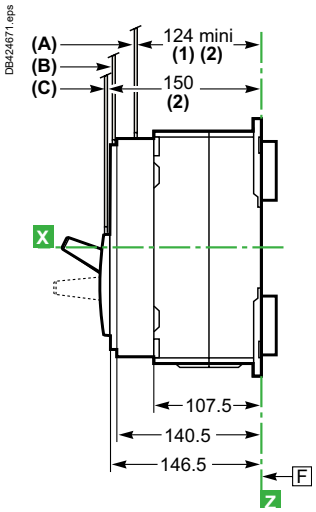


On Rails



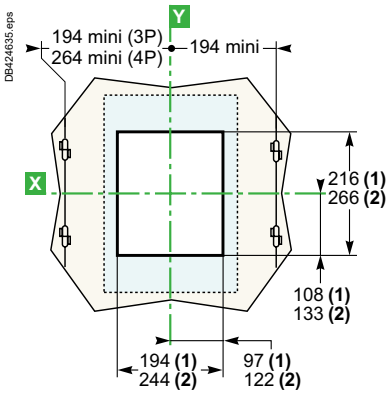
Front-panel Cutouts
EasyPact CVS800 to 1600 (Fixed version)

Toggle Control

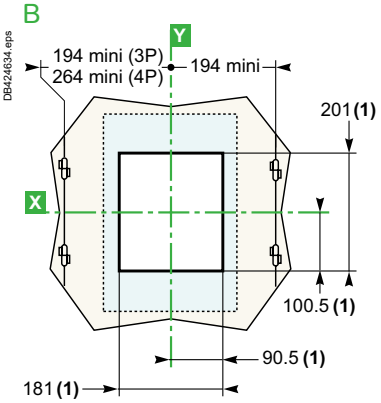


Door Cutout

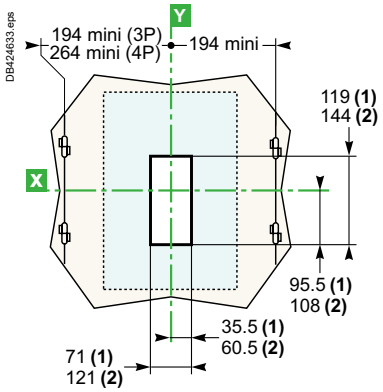
A



B



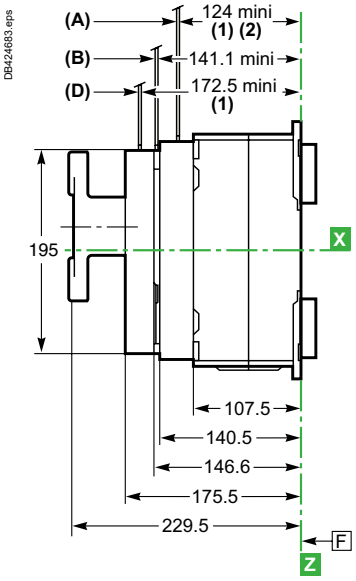
F : Datum.
[1] Without escutcheon.
[2] With escutcheon.

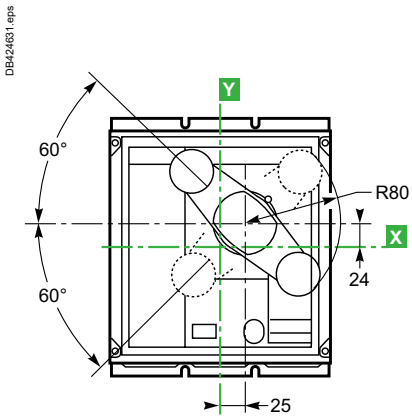


Rotary Handle
EasyPact CVS800 to 1600
(Fixed version)

Direct Rotary Handle

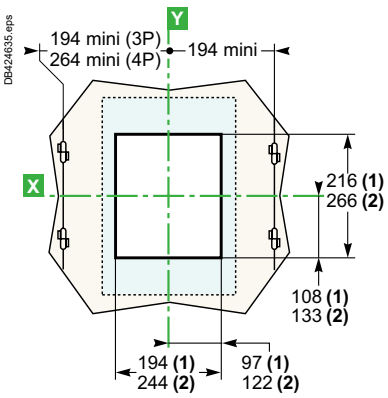
Dimensions



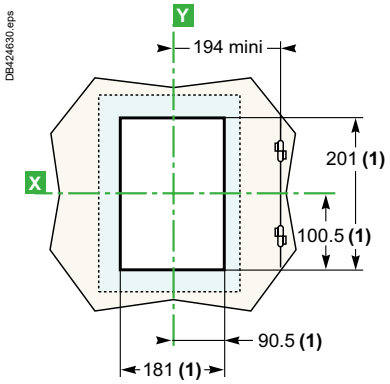


Door Cutout

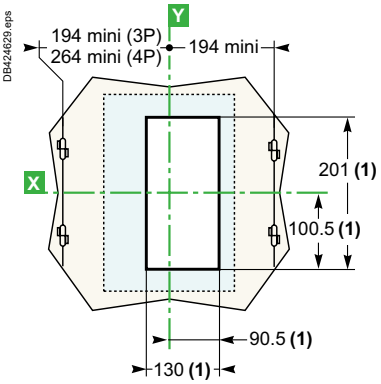
A



B



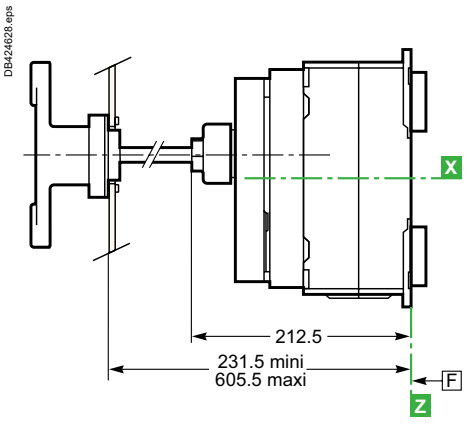
D

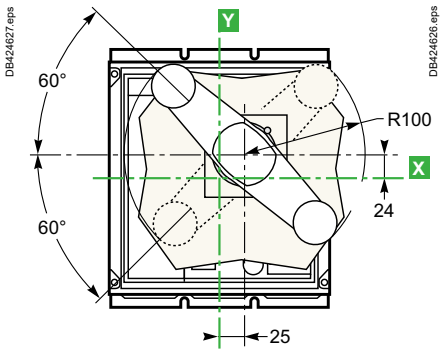


[1] Without escutcheon.
[2] With escutcheon.

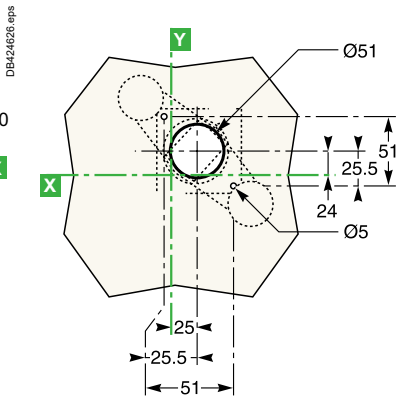
Extended rotary handle

Dimensions





Door cutout



F : Datum.

Life Is On Schneider Electric

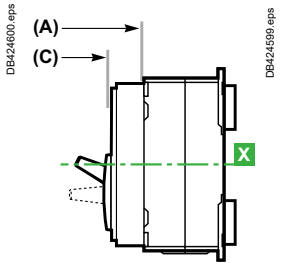
Note: X and Y are the symmetry planes for a 3-pole device Z is the back plane of the device.

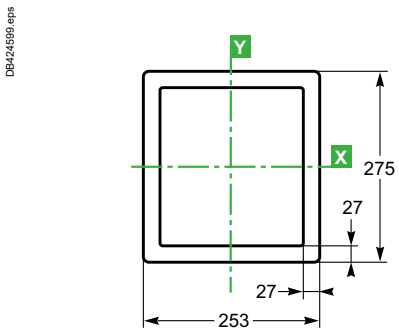
Accessories
EasyPact CVS800 to 1600 (Fixed version)

Escutcheon

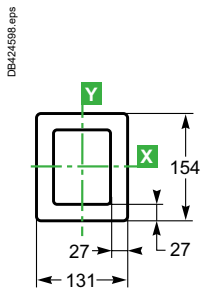
EasyPact CVS 800 to 1600 (Fixed Control)

A



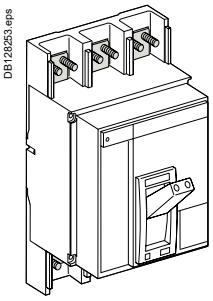


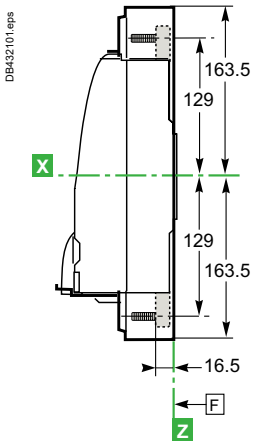
C

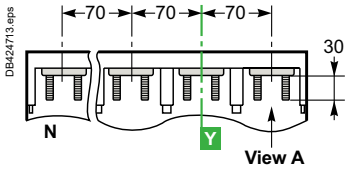


Bar
EasyPact CVS800 to 1600 (Fixed version)

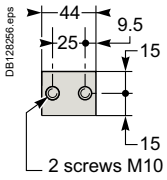
Front Connection



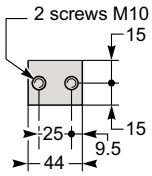




Top terminal



Bottom terminal



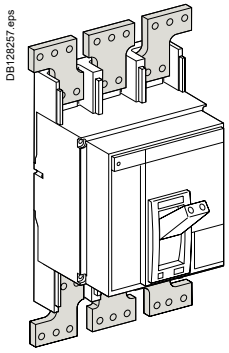
View A detail.

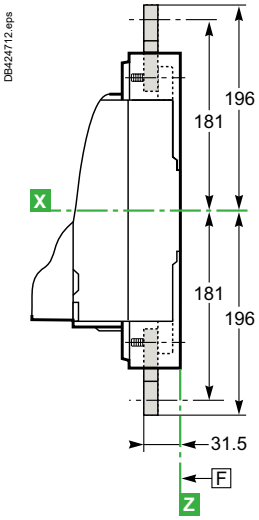
F : Datum.

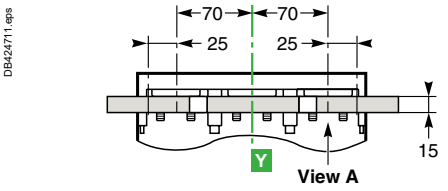
Note: Recommended connection screws: **M10** class 8.8. Tightening torque: **50 Nm** with contact washer.

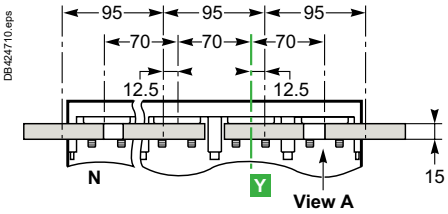
Bar
EasyPact CVS800 to 1600 (Fixed version)

Front Connection With Spreaders



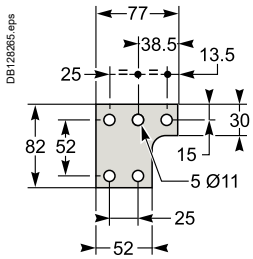




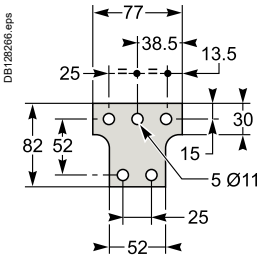


Spreader Detail

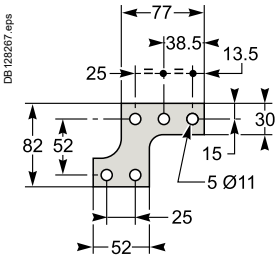
Middle left or middle right spreader for 4P



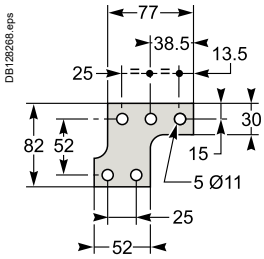
Middle spreader for 3P



Left or right spreader for 4P



Left or right spreader for 3P



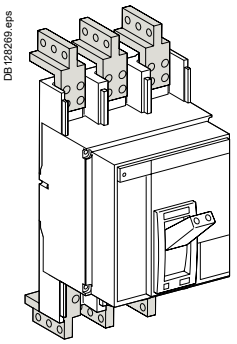
View A detail.

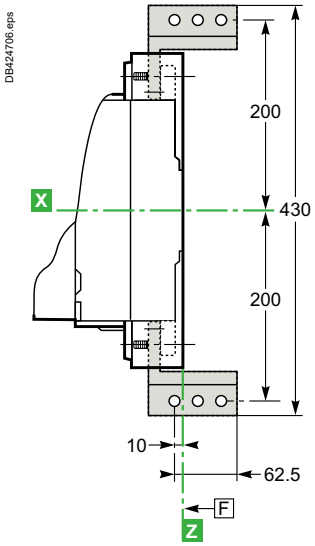
F : Datum.

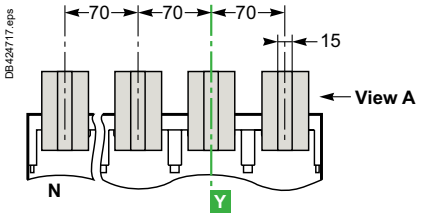
Note: X and Y are the symmetry planes for a 3-pole device.

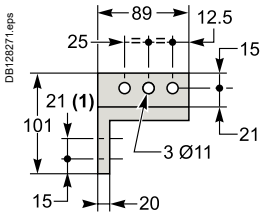
Bar
EasyPact CVS800 to 1600 (Fixed version)

Front Connection With Vertical-Connection Adapters







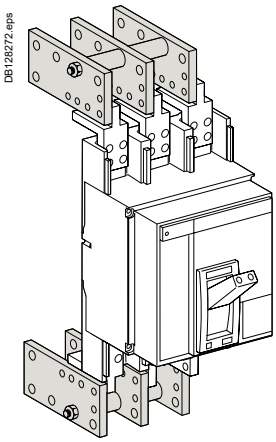


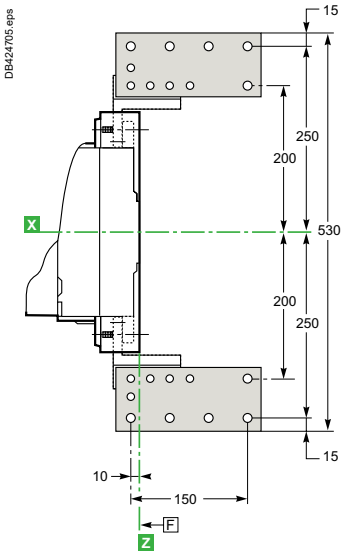
View A detail.

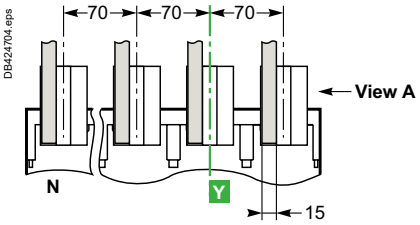
Cables with Lugs and Bare Cables

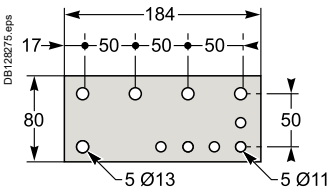
EasyPact CVS800 to 1600
(Fixed version)

Front Connection With Vertical-Connection Adapters and Cable-Lug Adapters



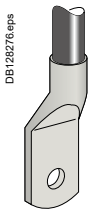


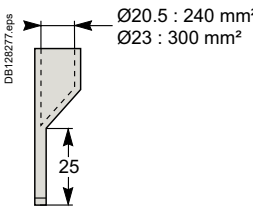


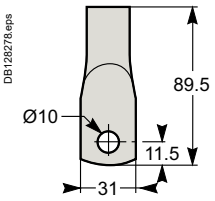


View A detail.

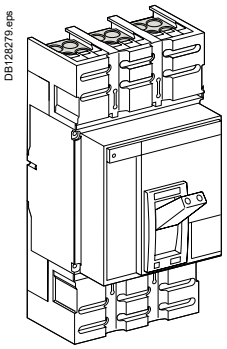
Lugs

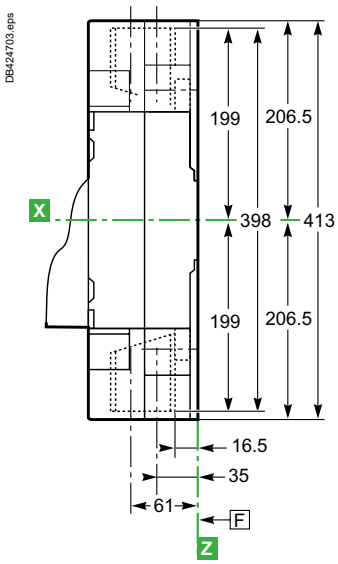


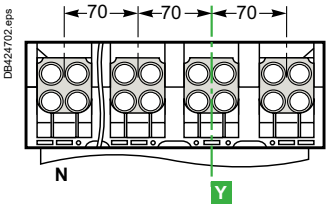


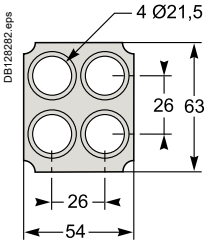


Fixed Circuit Breaker With 4-Cable Bare-Cable Connectors (240 mm²)







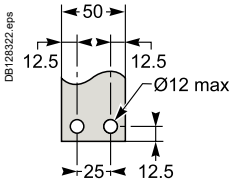


F : Datum.

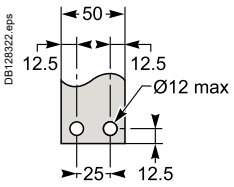
Recommended Drilling Dimensions

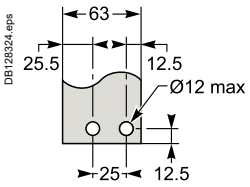
EasyPact CVS800 to 1600 (Fixed version)

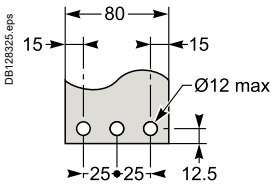
Front Connection



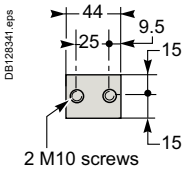
Front Connection With Vertical-Connection Adapter



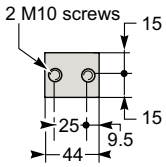


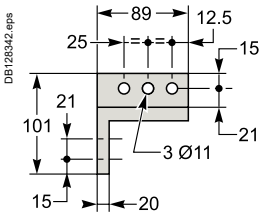


Top terminal



Bottom terminal





Dimensions and Connection

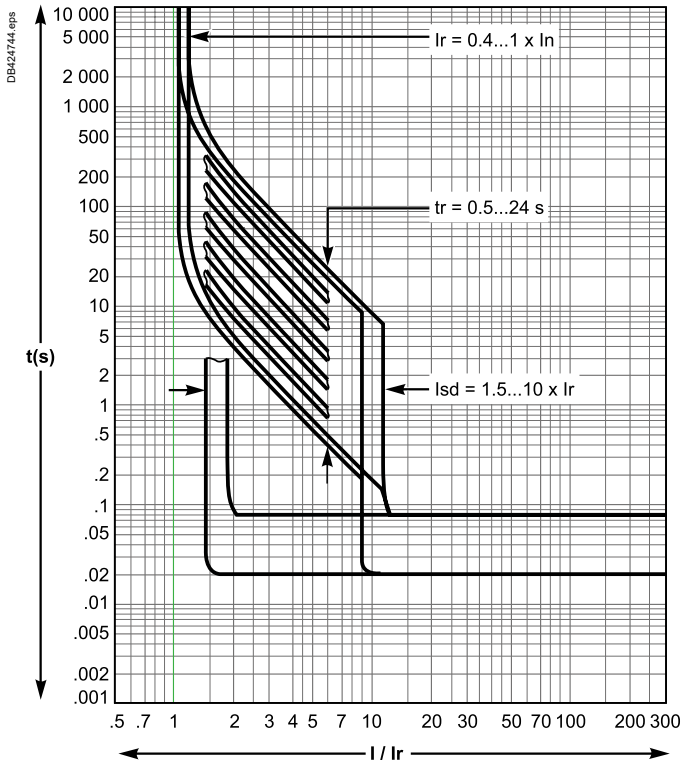
Additional Characteristics

Additional Characteristics

Tripping curves
EasyPact CVS800 to 1600
Protection of Distribution Systems

ETS Electronic Control Unit

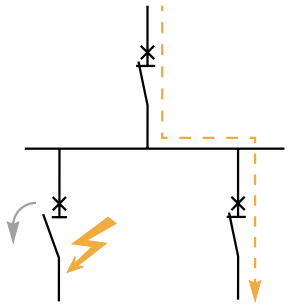
ETS 2.0



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.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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, etc.)
- 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.

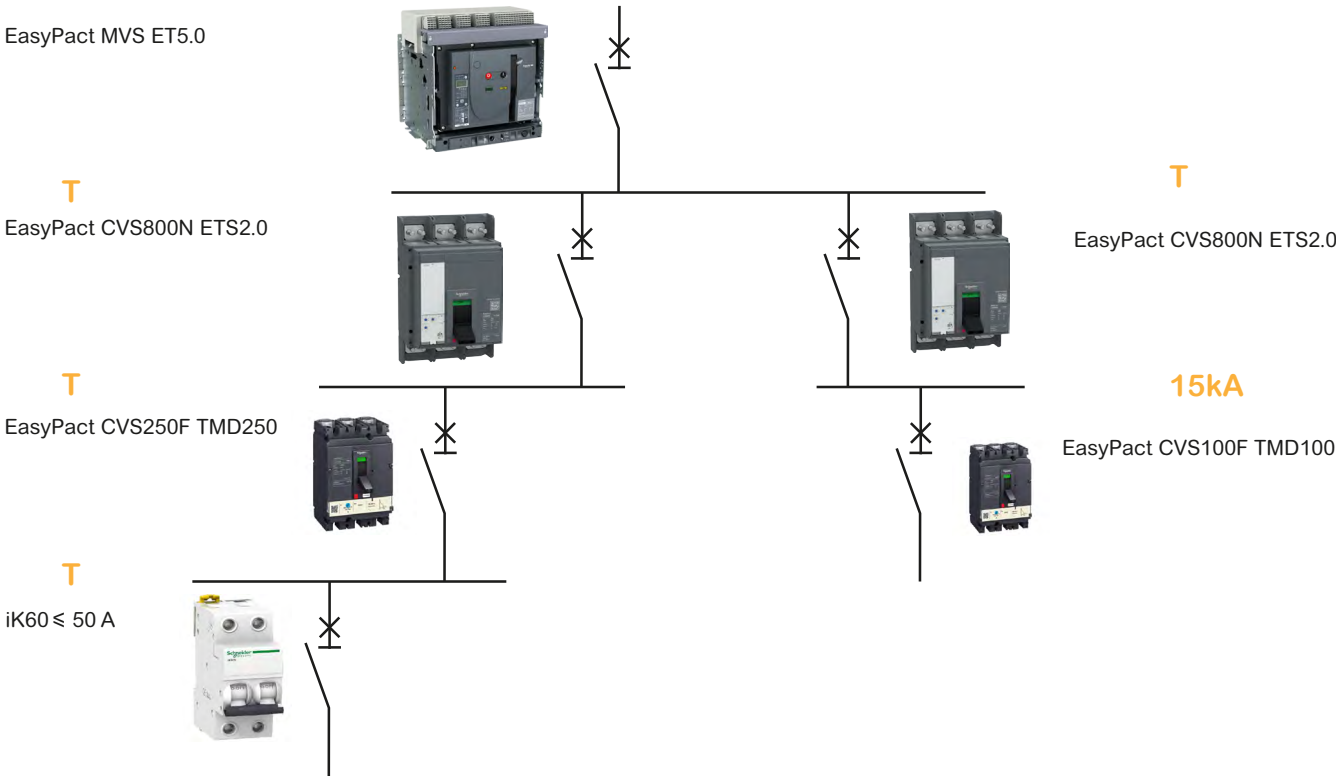
To know more:

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

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.

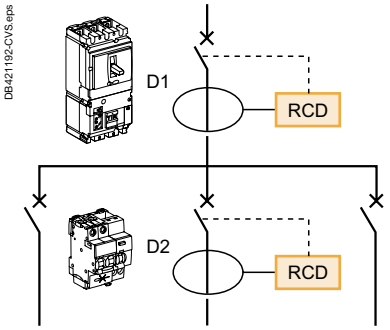
Requisite conditions
The value indicated in the tables are valid for operational rated voltage 380V 400V 415V 50-60Hz. Following ratios shall be respected to avoid overlapping of tripping curves.

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[RCD] 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 CVS800-1600 A F/N/H

Downstream: **Easy**Pact CVS100-630 A

Ue ≤ 415 Vac

Upstream Trip Unit		EasyPact CVS800-1600A F/N/H ETS 2.0 Isd = 10In			
Downstream	Rating	800	1000	1250	1600
	Setting Ir (A)	800	1000	1250	1600
Selectivity Limit (kA)					
CVS 100 BS	16	T	T	T	T
TM•D	20	T	T	T	T
	25	T	T	T	T
	32	T	T	T	T
	40	T	T	T	T
	50	T	T	T	T
	63	T	T	T	T
	80	T	T	T	T
	100	T	T	T	T
CVS 100 B/F/N	16	T	T	T	T
TM•D	25	T	T	T	T
	32	T	T	T	T
	40	T	T	T	T
	50	T	T	T	T
	63	T	T	T	T
	80	T	T	T	T
	100	T	T	T	T
CVS100 B/F/N ETS	40	T	T	T	T
	100	T	T	T	T
CVS 160 B/F/N	100	T	T	T	T
TM•D	125	T	T	T	T
	160	T	T	T	T
CVS 250 B/F/N	160	T	T	T	T
TM•D	200	T	T	T	T
CVS160 B/F/N ETS	160	T	T	T	T
	250	T	T	T	T
CVS250 B/F/N ETS	250	T	T	T	T
CVS 400 F/N	320	T	T	T	T
TM•D	400	T	T	T	T
CVS 630 F/N	500		T	T	T
TM•D	600		T	T	T
	630			T	T
CVS 400 F/N ETS	320	T	T	T	T
	400	T	T	T	T
CVS 630 F/N ETS	500	T	T	T	T
	630		T	T	T
CVS 400 H TMD	320	50	50	50	50
	400	50	50	50	50
CVS 600 HTMD	500		50	50	50
	600		50	50	50
	630			50	50
CVS 400 H ETS	320	50	50	50	50
	400	50	50	50	50
CVS 630 H ETS	500	50	50	50	50
	630		50	50	50
CVS 800 N/H ETS	800			12.5	16
CVS 1000 N/H ETS	1000				16
CVS 1250 N/H ETS	1250				
CVS 1600 N/H ETS	1600				

Selectivity

Upstream: **Easy**Pact CVS800-1600 A F/N/H

Downstream: **Easy**Pact CVS100-630 A

Ue ≤ 415 Vac

Upstream Trip Unit		EasyPact CVS800-1600A F/N/H ETS 2.0 Isd = 10In			
Downstream	Rating	800	1000	1250	1600
	Setting Ir (A)	800	1000	1250	1600
Selectivity Limit (kA)					
CVS 100 B/F/N	2.5	T	T	T	T
MA + O/L R	6.3	T	T	T	T
	12.5	T	T	T	T
	25	T	T	T	T
	50	T	T	T	T
	100	T	T	T	T
CVS 160 B/F/N	100	T	T	T	T
MA + O/L R	150	T	T	T	T
CVS 250 B/F/N	220	T	T	T	T
MA + O/L R					
CVS 400 F/N/H	320	36	36	36	36
MA + O/L R					
CVS 600 F/N/H	500				36
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 CVS800-1600A

Ue ≤ 415 Vac

Upstream Trip Unit		EasyPact MVS C 06-16 ET 2 Isd = 10Ir								EasyPact MVS C 06-16 ET5,6 (Ii = 15In Isd / Tsd according to sel rules)								EasyPact MVS C 06-16 ET5,6 (Ii = Off Isd / Tsd according to sel rules)							
Downstream	Rating	800	1000	1250	1600					800	1000	1250	1600					800	1000	1250	1600				
	Setting	800	1000	1250	1600					800	1000	1250	1600					800	1000	1250	1600				
	Ir (A)																								
Selectivity Limit (kA)																									
CVS800-1600 F ETS 2.0	800			12.5	16							18.75	24							T	T				
	1000				16								24								T				
	1250																								
	1600																								
CVS800-1600 N ETS 2.0	800			12.5	16							18.75	24							T	T				
	1000				16								24								T				
	1250																								
	1600																								
CVS800-1600 H ETS 2.0	800			12.5	16							18.75	24							T	T				
	1000				16								24								T				
	1250																								
	1600																								

Upstream Trip Unit		EasyPact MVS 08-40N ET 2 Isd = 10Ir								EasyPact MVS 08-40N ET 5,6 (Ii = 15In Isd / Tsd according to sel rules)								EasyPact MVS 08-40N ET 5,6 (Ii = OFF Isd / Tsd according to sel rules)							
Downstream	Rating	800	1000	1250	1600	2000	2500	3200	4000	800	1000	1250	1600	2000	2500	3200	4000	800	1000	1250	1600	2000	2500	3200	4000
	Setting	800	1000	1250	1600	2000	2500	3200	4000	800	1000	1250	1600	2000	2500	3200	4000	800	1000	1250	1600	2000	2500	3200	4000
	Ir (A)																								
Selectivity Limit (kA)																									
CVS800-1600 F ETS 2.0	800			12.5	16	20	25	32	T			18.75	24	30	T	T	T			T	T	T	T	T	T
	1000				16	20	25	32	T				24	30	T	T	T				T	T	T	T	T
	1250					20	25	32	T					30	T	T	T					T	T	T	T
	1600						25	32	T						T	T	T						T	T	T
CVS800-1600 N ETS 2.0	800			12.5	16	20	25	32	40			18.75	24	30	37.5	48	T			T	T	T	T	T	T
	1000				16	20	25	32	40				24	30	37.5	48	T				T	T	T	T	T
	1250					20	25	32	40					30	37.5	48	T					T	T	T	T
	1600						25	32	40						37.5	48	T						T	T	T
CVS800-1600 H ETS 2.0	800			12.5	16	20	25	32	40			18.75	24	30	37.5	48	T			T	T	T	T	T	T
	1000				16	20	25	32	40				24	30	37.5	48	T				T	T	T	T	T
	1250					20	25	32	40					30	37.5	48	T					T	T	T	T
	1600						25	32	40						37.5	48	T						T	T	T

Upstream Trip Unit		EasyPact MVS 08-40H ET 2 Isd = 10Ir								EasyPact MVS 08-40H ET 5,6 (Ii = 15In Isd / Tsd according to sel rules)								EasyPact MVS 08-40H ET 5,6 (Ii = OFF Isd / Tsd according to sel rules)							
Downstream	Rating	800	1000	1250	1600	2000	2500	3200	4000	800	1000	1250	1600	2000	2500	3200	4000	800	1000	1250	1600	2000	2500	3200	4000
	Setting	800	1000	1250	1600	2000	2500	3200	4000	800	1000	1250	1600	2000	2500	3200	4000	800	1000	1250	1600	2000	2500	3200	4000
	Ir (A)																								
Selectivity Limit (kA)																									
CVS800-1600 F ETS 2.0	800			12.5	16	20	25	32	T			18.75	24	30	T	T	T			T	T	T	T	T	T
	1000				16	20	25	32	T				24	30	T	T	T				T	T	T	T	T
	1250					20	25	32	T					30	T	T	T					T	T	T	T
	1600						25	32	T						T	T	T						T	T	T
CVS800-1600 N ETS 2.0	800			12.5	16	20	25	32	40			18.75	24	30	37.5	48	T			T	T	T	T	T	T
	1000				16	20	25	32	40				24	30	37.5	48	T				T	T	T	T	T
	1250					20	25	32	40					30	37.5	48	T					T	T	T	T
	1600						25	32	40						37.5	48	T						T	T	T
CVS800-1600 H ETS 2.0	800			12.5	16	20	25	32	40			18.75	24	30	37.5	48	60			T	T	T	T	T	T
	1000				16	20	25	32	40				24	30	37.5	48	60				T	T	T	T	T
	1250					20	25	32	40					30	37.5	48	60					T	T	T	T
	1600						25	32	40						37.5	48	60						T	T	T

Cascading

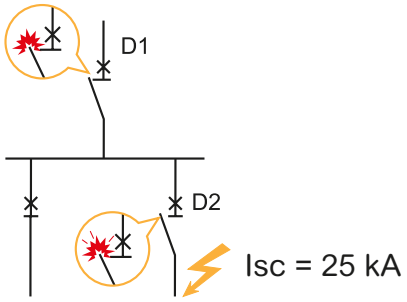
Cascading is the legacy name used by Schneider Electric.

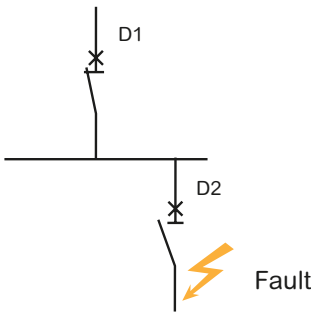
Product standards such as IEC/EN 60947,60898, 61009-1 call this performance of two circuit-breakers back-up protection.

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.

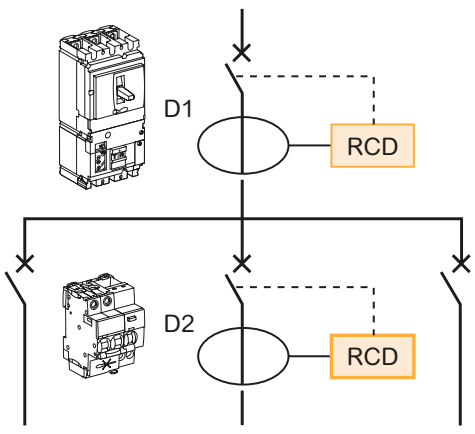
In this document we'll keep Cascading, but the three wordings are equivalent.

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

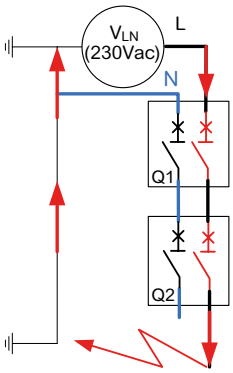
Schneider Electric cascading tables are:

- 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

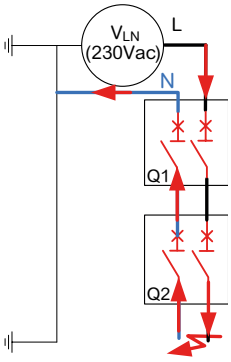
Circuit breaker with Vigi module (Add-On Residual Current Device - RCD):
When circuit breakers are equipped with Vigi module, the following cascading tables are still applicable.

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 does not recommend to apply cascading in installation
used by uninstructed person. 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

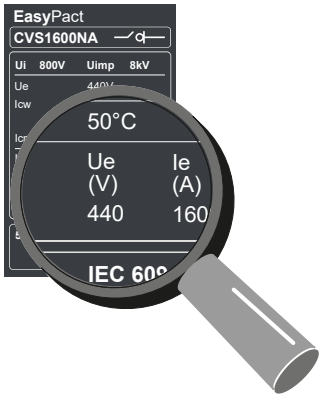
Ue ≤ 415 Vac

Upstream		CVS 100	CVS100			CVS160			CVS250			CVS400			CVS630			CVS800-1600		
		BS	B	F	N	B	F	N	B	F	N	F	N	H	F	N	H	F	N	H
	Icu (kA) 415 V	25	25	36	50	25	36	50	25	36	50	36	50	70	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**	**36**	**36**	**36**
CVS100F	36				**50**			**50**			**50**		**50**	**50**		**50**	**50**	**50**	**50**	**50**
CVS100N	50																			
CVS160B	25				**36**			**36**		**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**
CVS160F	36				**50**			**50**			**50**		**50**	**50**		**50**	**50**	**50**	**50**	**50**
CVS160N	50																			
CVS250B	25											**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**
CVS250F	36												**50**	**50**		**50**	**50**	**50**	**50**	**50**
CVS250N	50																			
CVS400F	36												**50**	**50**		**50**	**50**		**50**	**50**
CVS400N	50																**70**			
CVS400F	70																			
CVS630F	36																		**50**	**50**
CVS630N	50																			
CVS630H	70																			

Consult your SE representative

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

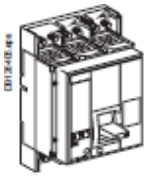
Switch Disconnector EasyPact NA		CVS100NA	CVS160NA	CVS250NA	CVS400NA	CVS630NA	CVS800-1600NA
Upstream protection = CVS							
type / rating (A)		**CVS100B/100**	**CVS160B/160**	**CVS250B/250**			
Conditional short circuit current	kA rms	**25**	**25**	**25**			
making current	kA peak	**53**	**53**	**53**			
type / rating (A)		**CVS100F/100**	**CVS160F/160**	**CVS250F/250**	**CVS400F/400**	**CVS630F/630**	**CVS800-1600F/800-1600**
Conditional short circuit current	kA rms	**36**	**36**	**36**	**36**	**36**	**36**
making current	kA peak	**76**	**76**	**76**	**76**	**76**	**76**
type / rating (A)		**CVS100N/100**	**CVS160N/160**	**CVS250N/250**	**CVS400N/400**	**CVS630N/630**	**CVS800-1600N/800-1600**
Conditional short circuit current	kA rms	**50**	**50**	**50**	**50**	**50**	**50**
making current	kA peak	**105**	**105**	**105**	**105**	**105**	**105**
type / rating (A)					**CVS400H/400**	**CVS630H/630**	**CVS800-1600H/800-1600**
Conditional short circuit current	kA rms				**70**	**70**	**70**
making current	kA peak				**154**	**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**	

Catalogue Numbers

Catalogue Numbers

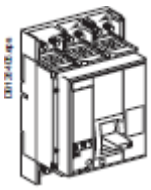
CVS800 to 1600 Fixed Manually Operated
Complete Device

Front-Connected Circuit Breaker With ETS 2.0 Control Unit



EasyPact CVS type F		
Icu = 36 kA at 220/415 V	**3P**	**4P**
CVS800	**E080F320FM**	**E080F420FM**
CVS1000	**E100F320FM**	**E100F420FM**
CVS1250	**E125F320FM**	**E125F420FM**
CVS1600	**E160F320FM**	**E160F420FM**
EasyPact CVS type N		
Icu = 50 kA at 220/415 V	**3P**	**4P**
CVS800	**E080N320FM**	**E080N420FM**
CVS1000	**E100N320FM**	**E100N420FM**
CVS1250	**E125N320FM**	**E125N420FM**
CVS1600	**E160N320FM**	**E160N420FM**
EasyPact CVS type H		
Icu = 70 kA at 220/415 V	**3P**	**4P**
CVS800	**E080H320FM**	**E080H420FM**
CVS1000	**E100H320FM**	**E100H420FM**
CVS1250	**E125H320FM**	**E125H420FM**
CVS1600	**E160H320FM**	**E160H420FM**

Front-Connected Switch-Disconnector

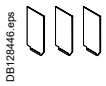


	3P	4P
CVS800	**E080S3NAFM**	**E080S4NAFM**
CVS1000	**E100S3NAFM**	**E100S4NAFM**
CVS1250	**E125S3NAFM**	**E125S4NAFM**
CVS1600	**E160S3NAFM**	**E160S4NAFM**

Accessories

CVS800 to 1600

Connection Accessories

	Front Connection
Bare-Cable Connectors + 1 Connector Shield for 4 Cables (240 mm²)	
 DB128420.eps 3P (3 parts)	**33640**
4P (4 parts)	**33641**
1 Long Connection Shield	
 DB128421.eps 3P	**33628**
4P	**33629**
Vertical-Connection Adapters	
 DB128422.eps 3P (3 parts)	**33642**
4P (4 parts)	**33643**
Cable Lug Adapters	
 DB128423.eps 3P (3 parts)	**33644**
4P (4 parts)	**33645**
Interphase Barriers	
 DB128425.eps  DB128446.eps 3P/4P top (3 parts)	**33646**
3P/4P bottom (3 parts)	**33646**
Arc chute screen	
 DB128426.eps 3P	**64907**
4P	**33597**
Brackets for mounting on a horizontal surface	
3P/4P (2 parts)	
Spreaders	
 DB128427.eps 3P	**33622**
4P	**33623**

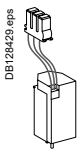
Electrical Auxiliaries

Indication Contacts

	6 A - 240 V
 DB128428.eps OF, ON/OFF indication contacts	**29450**
SD, trip indication contact for manually operated devices	**29450**
SDE, fault indication contact operated devices	**29450**

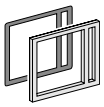
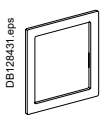
Up to 3 OF, 1 SD and 1 SDE can be connected (the SDE contact is standard for electrically operated devices).

Instantaneous Voltage Releases

 DB128429.eps

	MX	MN			
			Delay unit	**R** (non-adjustable)	**Rr** (adjustable)
24/30 V DC, 24 V AC	**33659**	**33668**			
48/60 V DC, 48 V AC	**33660**	**33669**	48/60 V AC/DC		**33680**
100/130 V AC/DC	**33661**	**33670**	100/130 V AC/DC	**33684**	**33681**
200/250 V AC/DC	**33662**	**33671**	200/250 V AC/DC	**33685**	**33682**
277 V AC	**33663**				
380/480 V AC	**33664**	**33673**	380/480 V AC/DC		**33683**

Installation Accessories

 DB128430.eps Escutcheon (small cut-out) for manually operated device with toggle	**33717**
 DB128431.eps Escutcheon for: device with toggle (large cutout), - device with rotary handle,	**33718**

ref. 33717 **ref**. 33718

Blanking Plate

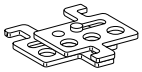
 DB128432.eps	**33858**

Fixed Devices

CVS800 to 1600 Fixed Devices

Locking for Manually Operated Devices

Removable Toggle Locking System



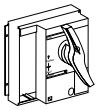
Locking by three padlocks		**44936**

Fixed Toggle Locking System

Locking by three padlocks		**32631**

Rotary Handle for Manually Operated Devices

Devices with direct rotary handles

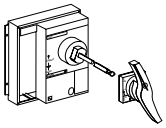


Handle and front	Black handle and black front	**E33863**	
Conversion accessory	CNOMO	**33866**	
Locking by keylocks		**Ronis**	**Profalux**
	OFF position	**33870**	**33869**
	OFF and ON positions	**33872**	**33871**
Keylock kit (without keylocks)		**33868**	**33868**

Mechanical Interlocking

For two devices with extended rotary handles		**33890**

Devices With Extended Rotary Handles



Handle and front	Black handle and black front	**E33878**

Control Accessories

	Fixed	Withdrawable
two advanced indication contacts (6 A - 240 V)		
Early break	**33882**	**33884**
Early make	**33883**	**33885**

Spare Parts
EasyPact CVS800 to 1600 Fixed Circuit Breaker

Connections for Circuit Breakers and Switch-Disconnectors

Front Connection/Replacement kit (3 or 4 parts)

		3P	4P
800 - 1250 A	Top	**33598**	**33608**
	Bottom	**33599**	**33609**
1600 A	Top	**33602**	**33612**
	Bottom	**33603**	**33613**

Connection Accessories

Bare-Cable Connectors + 1 Connector Shield for 4 Cables (240 mm²)

3P	**33640**
4P	**33641**

1 Long Connection Shield/1 part

3P	**33628**
4P	**33629**

Vertical-Connection Adapters/Replacement kit (3 or 4 parts)

3P	**33642**
4P	**33643**

Cable Lug Adapters/Replacement kit (3 or 4 parts)

3P	**33644**
4P	**33645**

Interphase Barriers/Replacement Kit (3 parts)

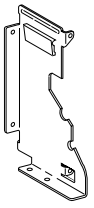
	Front connection
3P/4P top/bottom	**33646**

	Rear connection
3P/4P top/bottom	**33648**

Arc Chute Screen(1 Part)

3P	**64907**
4P	**33597**

Brackets for Mounting on a Horizontal Surface (2 parts)



3P/4P	**64908**

Spreaders/Replacement Kit (3 or 4 parts)

3P	**33622**
4P	**33623**

Spare Parts
EasyPact CVS800 to 1600 Fixed Circuit Breaker

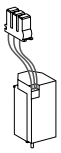
Electrical Auxiliaries

Indication Contact(1 part)

	6 A - 240 V
OF, ON/OFF indication contacts	**29450**
SD trip indication contact for manually operated devices	**29450**
SDE fault indication contact operated devices	**29450**

Up to 3 OF, 1 SD and 1 SDE can be connected (the SDE contact is standard for electrically operated devices).

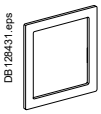
Remote Tripping (1 part)



	MX	**MN**			
			Delay unit	**R** (non-adjustable)	**Rr** (adjustable)
24/30 V DC, 24 V AC	**33659**	**33668**			
48/60 V DC, 48 V AC	**33660**	**33669**	48/60 V AC/DC		**33680**
100/130 V AC/DC	**33661**	**33670**	100/130 V AC/DC	**33684**	**33681**
200/250 V AC/DC	**33662**	**33671**	200/250 V AC/DC	**33685**	**33682**
277 V AC	**33663**				
380/480 V AC	**33664**	**33673**	380/480 V AC/DC		**33683**

Installation Accessories(1 part)

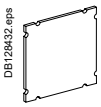
Escutcheon (small cut-out) for manually operated device with toggle — **33717**



Escutcheon for:
- device with toggle (large cutout)
- device with rotary handle

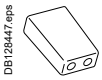
33718

Blanking Plate (1 part)

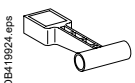


Blanking plate — **33858**

Toggle Extension(1 part)



Toggle extension — **46996**



Additional toggle extension — **33195**

Life Is On | Schneider Electric

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