# Compact CVS

LV circuit breakers from 100 to 800A

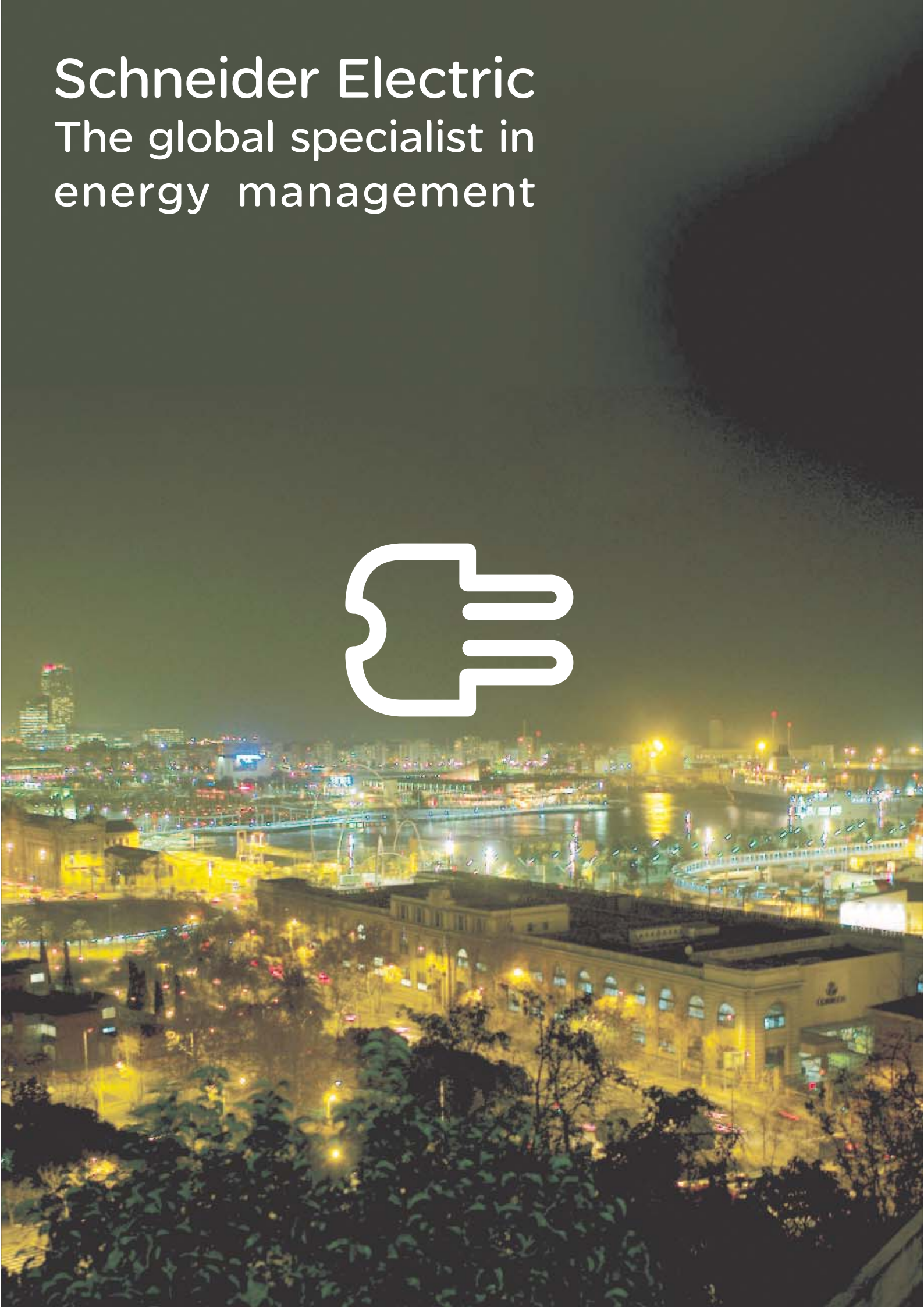
Catalogue

2010

Schneider Electric

# Schneider Electric

## The global specialist in energy management



# Schneider Electric, undisputed global leader in Circuit Breakers

## Ever since the launch of first MCCB in 1950

- At Forefront in developing products with cutting-edge technology
- Compact NSX Power Circuit Breakers with integrated metering, communication capabilities & high performance levels have set new standards around the world
- We also understand the optimum needs of our customers and we continue to innovate

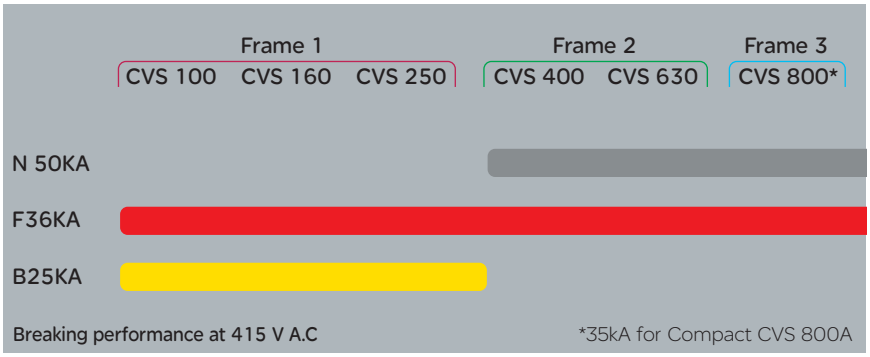
## Inheriting the key values of Compact Family – “Safety, Reliability and Simplicity”, now we introduce

# Compact CVS

## from 100 to 800A

## Compact Value System






Compact CVS 100 - 800A Adjustable version

- Various breaking capacities level are available as per the need of electrical distribution network 25/36/50kA.
- Available in 3P and 4P Variants.
- Entire range is Ics=100% Icu.

Safety Reliability Simplicity

# Compact CVS stands for...

Safety

Reliability

Simplicity

# Compact CVS stands for...**Safety**

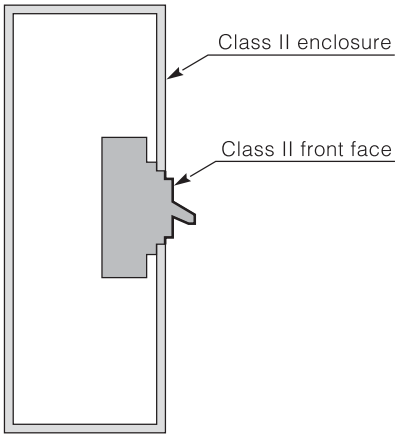
## Isolation

> Compact 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 the personnel may carry out work on the isolated part with complete safety.

> MCCB locking with external pad locks* enables user to isolate and undertake maintenance with utmost safety.


## Class II front Face

> All Compact 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.

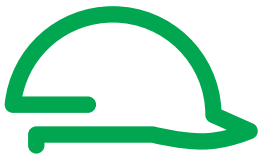



Class II panel with circuit breaker having a class II front face


## Locking in OFF position

> Key locks enables to lock* the breaker in OFF position ensuring safety and better control on installation.

> It also helps in interlocking multiple circuit breakers in an installation.



* 100 to 630 A

# Compact CVS stands for...**Reliability**

IEC 60947-2
IS/IEC 60947-2

## Conforms to IS/IEC 60947-2 for circuit breaker

> Tested & certified at CPRI

## High electrical & Mechanical endurance

> 30000 mechanical operations for 100A

> 12000 electrical operations for 100A

Ics = 100% Icu
cat A

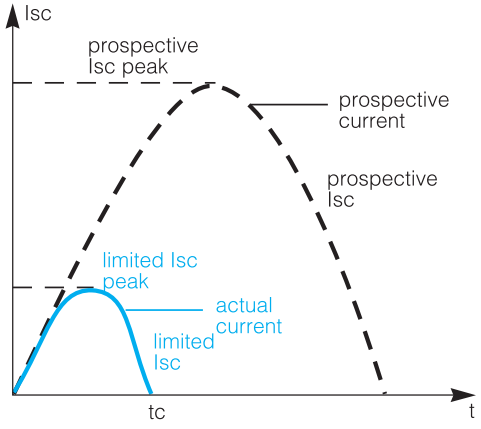
## Complete range with Ics = 100% Icu

## Continuous rated accessories (Shunt Coils)

## Fault current limitation technology

> Compact CVS double break mechanism ensures high fault current limitation

- Reduces thermal stresses on the electrical distribution network
- Increases the life of cables and installation.




*Current limitation technology*

# Compact CVS stands for...**Simplicity**

## Only three frame sizes

| | |
|---|---|
| Frame - I | 100 - 250 A |
| Frame – II | 400 - 630A |
| Frame –III | 800A |

## Common snap fit auxiliaries

> Auxiliaries such as contact (aux/alarm), shunt, under voltage are common for the complete range of Compact* family of MCCBs.

> Unique multifunction Aux/Alarm contact.

## Line load reversibility for entire Compact CVS range

> Line or load can be connected to either side of MCCB without reduction in Performances.

## Modular Ground Fault (GF) Protection

> Unique electronic adjustable GF protection device with individual LED indications for healthiness and fault trip.

## System upgradeability

> Compact NS,NSX & CVS upto 630A have the same foot print & mounting dimensions, helps easy retrofitting and system upgradeability.

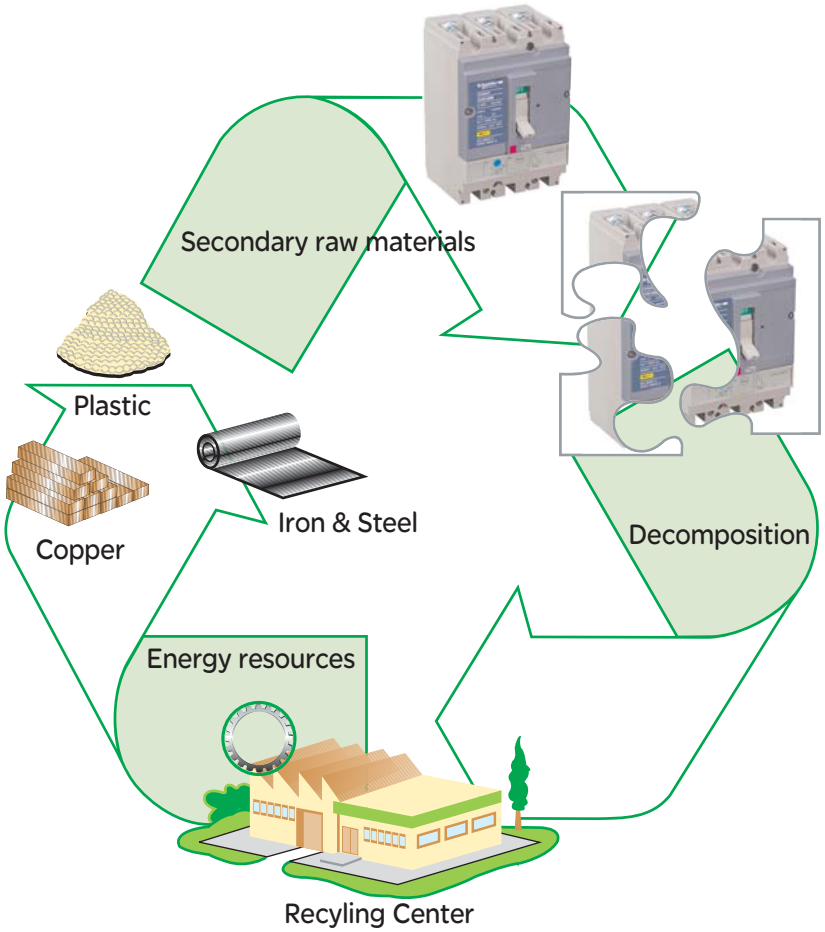
* Auxiliaries are common for Compact CVS & Compact NSX upto 630A.

# **Environmentally** responsible

> Compact CVS is part of the Schneider Electric energy efficiency approach. Designed for easy disassembly and recycling at end of life, Compact CVS complies with environmental directives RoHS* and WEEE**, and with ISO 14001 standards, thanks to non - polluting factories.

Schneider Electric fully takes into account environmental requirements, starting right from the design phase of every product through to the end of its service life:

- the materials used for Compact CVS are not potentially dangerous to the environment
- the production facilities are non-polluting in compliance with the ISO 14001 standard
- the energy dissipated per pole is low, making energy losses insignificant
- the materials are marked to facilitate sorting for recycling at the end of product service life.




Compact CVS moulded case circuit breakers and accessories can be recycled and reused optimally.

* RoHS = Restriction of Hazardous Substances

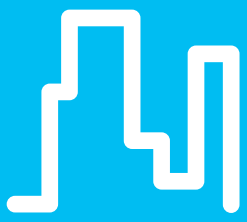
** WEEE = Waste Electrical and Electronic Equipment

# Ideal for variety of **Applications**

Energy & infrastructure

Industry

Buildings

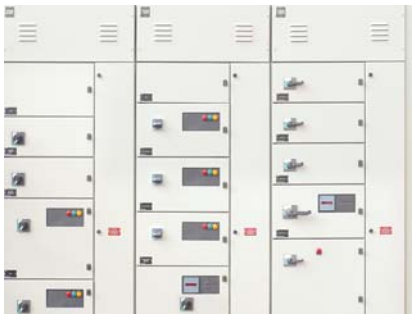


Residential


AD
AD

# Compact CVS stands for **customer value**

## Panel builders



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

*Compact CVS innovative design ,less frame sizes, common accessories enhances Panel Builder shop floor efficiency and increase speed of production.*

## End Users

> Isolation as a standard feature enhances safety.
> Front accessible snap fit accessories.
> Excellent current limiting capability reduces stresses on cables, bas bars and loads.
> Two frame sizes and common accessories reduces inventory costs.
> Continuous rated accessories increase system reliability.

*Compact CVS Simple in design offer enhanced productivity of plants, upgrade system reliability and reduce stresses on an electrical distribution network.*

## OEMs

> Compact size and ruggedness helps to achieve optimized design of machinery.
> High endurance's and maintenance free operation assure continuous performance of machines.
> Unique common accessories help standardization of components.

*Compact CVS help OEMs to enhance the machine performance.*

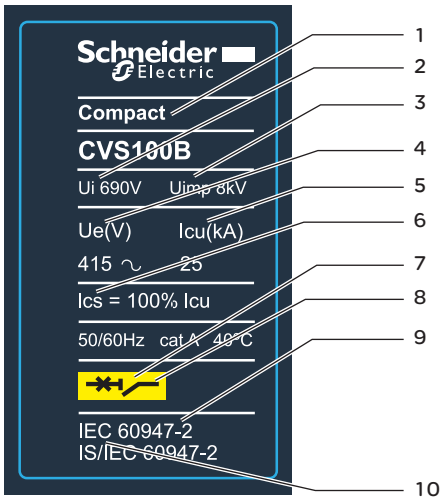
## Contractors

> Sufficient pole pitch helps to terminate Copper and Aluminum busbars or cables.
> Systems with ground fault protection can be implemented at any point of time in an electrical distribution network.
> Designed to perform in demanding applications.

*Compact CVS circuit breakers assures you unmatched safety, reliability and simplicity.*

*refer page no. (CVS 800 1st page) for Compact CVS 800A.

# Compact CVS offer introduction




**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 Colour label indicating the breaking capacity class.
8 Circuit breaker-disconnector symbol.
9 Reference standard.
10 Main standards with which the device complies.

**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

Compact CVS circuit breakers and auxiliaries comply with the following:

**> International Standards**

IEC 60947-1 - general rules
IEC 60947-2 -circuit breakers

**> Indian Standards**

IS/IEC 60947-2 (Part -1)
IS/IEC 60947-2 (Part - 2)

### Pollution degree

Compact CVS circuit breakers are certified for operation in pollution-degree III environments as defined by IEC standards 60947 (industrial environments).

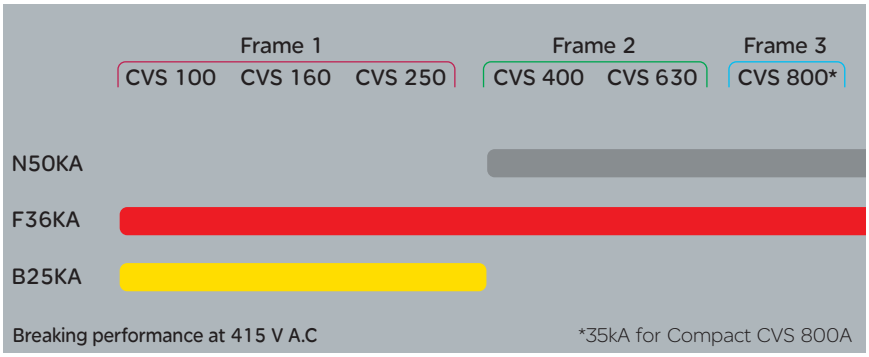
### Tropicalisation

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

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

## Compact CVS Offer introduction

Compact CVS is available from 100-800A in three frame sizes. Compact CVS MCCBs are modular, safe and simple to use. Compact CVS MCCBs are available in thermal magnetic trip unit 100-250/800A and electronic trip unit 400/630A. Compactness, modularity & true Ics value makes Compact CVS a perfect choice of all kinds of Distribution Network.




Compact CVS 100 - 800A Adjustable version

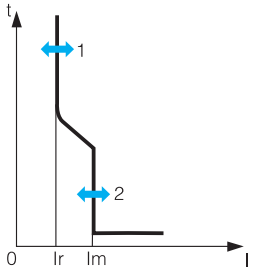
> Various breaking capacities level are available as per the need of electrical distribution network 25/36/50kA.

> Available in 3P and 4P Variants.

> Entire range is Ics=100% Icu.

# Protection of distribution systems
## Thermal Magnetic and Electronic trip units for Compact CVS 100-630A

### Compact CVS TM thermal-magnetic trip units

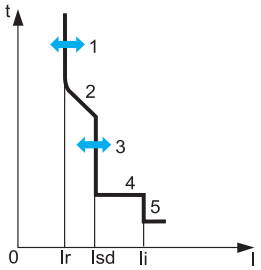

*1 overload protection threshold*
*2 short-circuit protection pick-up*

### Protection
The protection functions may be set using the adjustment dials.

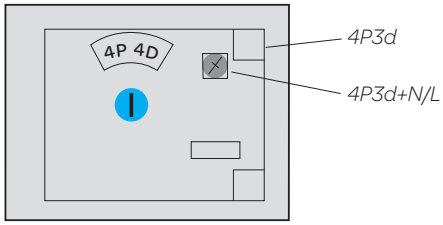
### Overload protection
Thermal protection with an adjustable threshold from 70 - 100% Ir.

### Short-circuit protection
Magnetic protection with a fixed pick-up.

| TM thermal-magnetic trip units | | TM16D to 250D | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ratings (A) | In at 40 °C | 16 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 160 | 200 | 250 |
| Circuit breaker | Compact CVS 100 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | - | - | - | - |
| | Compact CVS 160 | - | - | - | - | - | - | - | - | ■ | ■ | - | - |
| | Compact CVS 250 | - | - | - | - | - | - | - | - | - | - | ■ | ■ |
| **Overload protection (thermal)** | | | | | | | | | | | | | |
| Current setting (A) | Ir | adjustable from 0.7 to 1 x In | | | | | | | | | | | |
| **Short-circuit protection (magnetic)** | | | | | | | | | | | | | |
| Current setting (A) | Im | fixed | | | | | | | | | | | |
| | Compact CVS 100/160/250 | 190 | 300 | 400 | 500 | 500 | 500 | 640 | 800 | 1250 | 1250 | 1600 | 2000 |



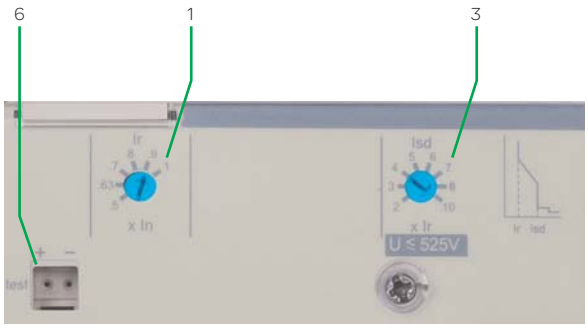

*1 long-time threshold (overload protection) Ir*
*2 long-time tripping delay*
*3 short-time pick-up (short-circuit protection) Isd*
*4 short-time tripping delay*
*5 instantaneous pick-up (short-circuit protection) Ii*
*6 test connector*




*Protection of the fourth pole*
*with adjustable neutral*

# Protection of distribution systems
## Electronic trip units
## for Compact CVS400 to 630

### Compact CVS electronic trip units





### Protection
The protection functions may be set using the adjustment dials.

### Overload protection
Long time protection with an adjustable threshold and fix tripping delay.
**Ir = adjustable from 50 -100% of In in six steps.**

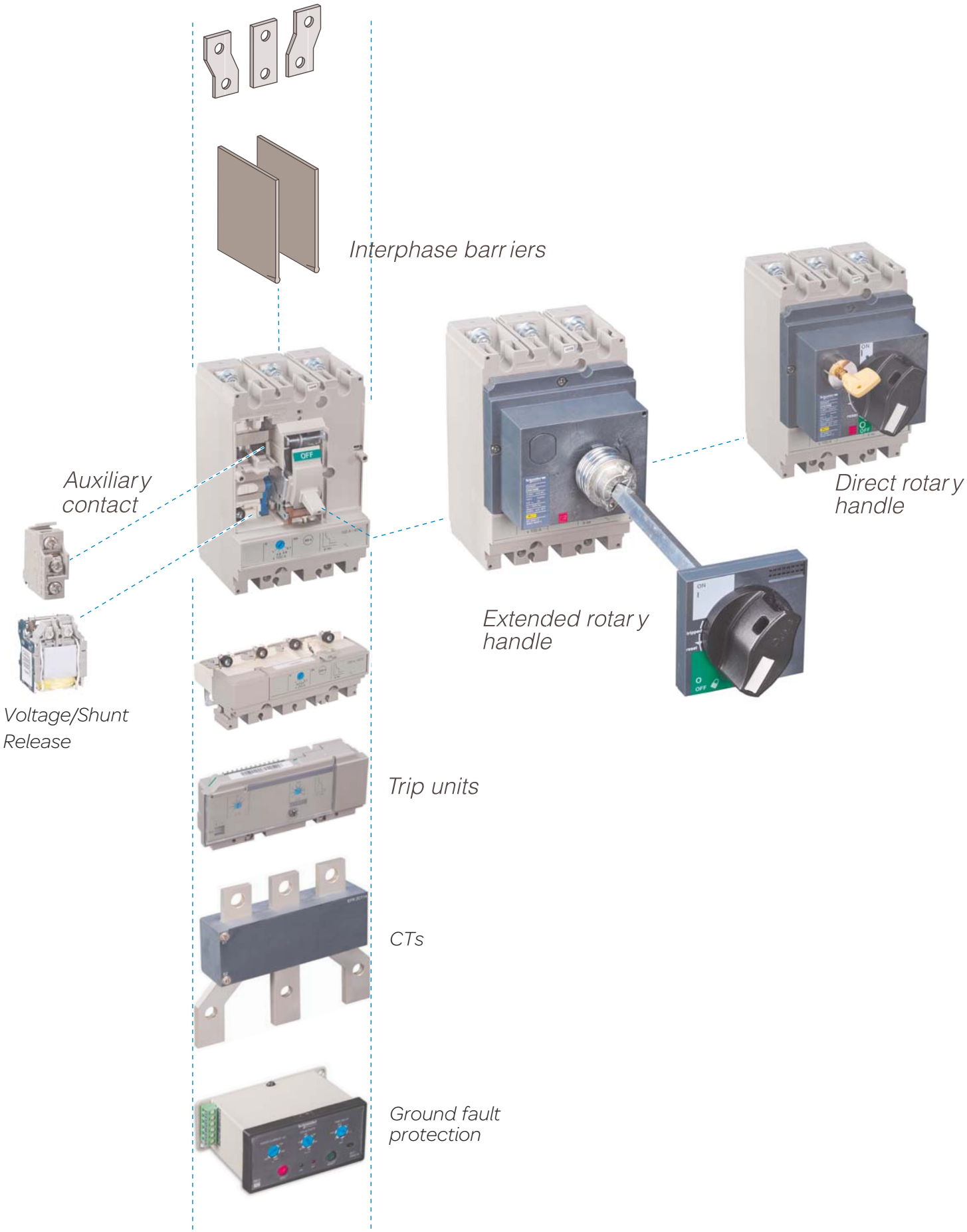
### Short-circuit protection
Short time protection with an adjustable pick up and
fix tripping dealy.
Isd = 2 – 10 Ir.
**Instantaneous protection** with fix pickup

### Protection of the fourth pole
On four-pole circuit breakers, neutral protection is set using a three-position switch to 4P 3d (neutral unprotected), 4P 3d + N/2 (neutral protection at 0.5In) or 4P 4d (neutral protection at In).

### Test
The testing connector is located in the panel (6), which can be connected to small test instrument and specified test box to check circuit-breaker operation after installing the trip unit.

| Trip unit[1] | | | |
|---|---|---|---|
| Rated current (A) | | 400 | 630 |
| Circuit breaker | Compact CVS 400 | ■ | - |
| | Compact CVS 630 | - | ■ |
| **Overload protection (long time)** | | | |
| Trip current setting | Ir = In x ... | Adjustable in 6 steps from 0.5 to 1. | |
| Time delay (s) (Min...Max.) | | Fixed | |
| | 1.5 x Ir | 90...180 | |
| | 6 x Ir | 5...7.5 | |
| | 7.2 Ir | 3.2...5.0 | |
| **Short-circuit current protection (short time)** | | | |
| Pick-up (A) | Isd = Ir x ... | Adjustable in 8 steps from 2 to10. | |
| Time delay (ms) | Maximum over-current time before tripping | ≤40 | |
| | Total breaking time | ≤ 60 | |
| **Short-circuit current protection (Instantaneous)** | | | |
| Trip current (A) | Ii = In x ... | 11, fixed | |
| **4-pole protection** | | | |
| Neutral unprotected | 4P 3d | Without protection | |
| Neutral protection at 0.5In | 4P 3d + N/2 | 0.5 x Ir | |
| Neutral protection at In | 4P 4d | 1 x Ir | |

# Electrical and mechanical accessories
## Compact CVS100 to 630 (fixed version)



# Electrical and mechanical accessories
## Compact CVS100 to 630

*Unique multifunction Aux/Alarm contact (OF/SD)*

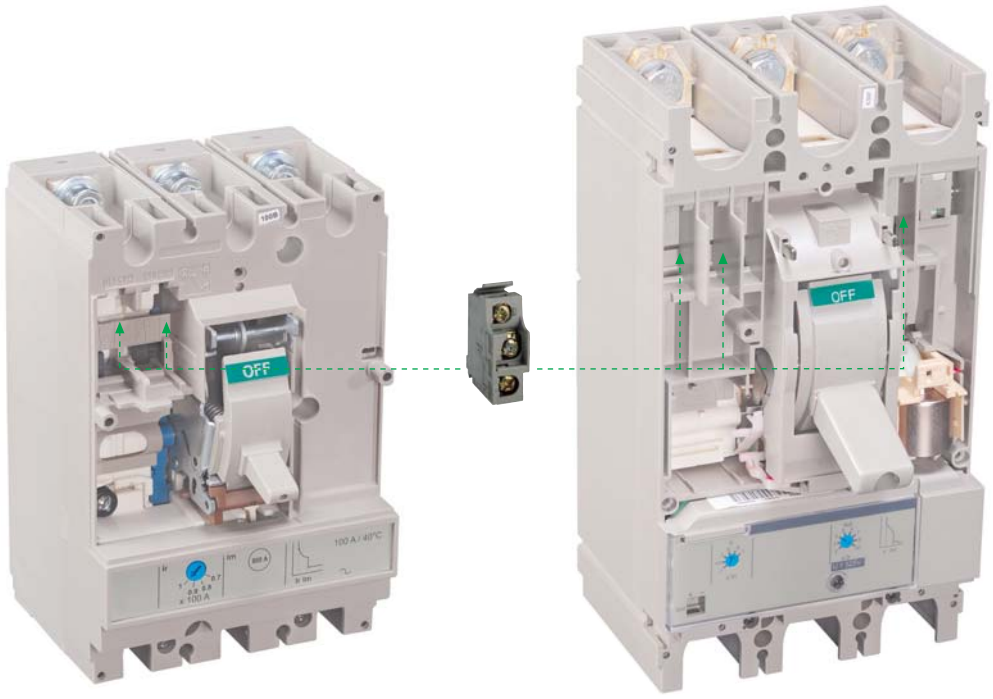
### Indication contacts

Common-point 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 circuit breaker contacts
- SD (trip indication) - indicates that the circuit breaker has tripped due to:
  - an overload
  - a short-circuit
  - operation of a voltage release
  - operation of the “push to trip” button

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




### Installation

- OF, SD 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

### Electrical characteristics of auxiliary contacts

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

# Electrical and mechanical accessories
## Compact CVS100 to 630

*Shunt/Under voltage release (MX/MN)*

### Remote tripping

MX or MN voltage releases are used to trip the circuit breaker.

**MN under voltage release**

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

For a lower value, circuit breaker closing cannot be guaranteed.
Circuit breaker tripping by an MN release meets the requirements of standard IEC 60947-2.

**MX shunt release**

Trips the circuit breaker when the control voltage rises above 0.7 x Un.
Control signals can be of the impulse type (20 ms) or maintained.

**Operation**

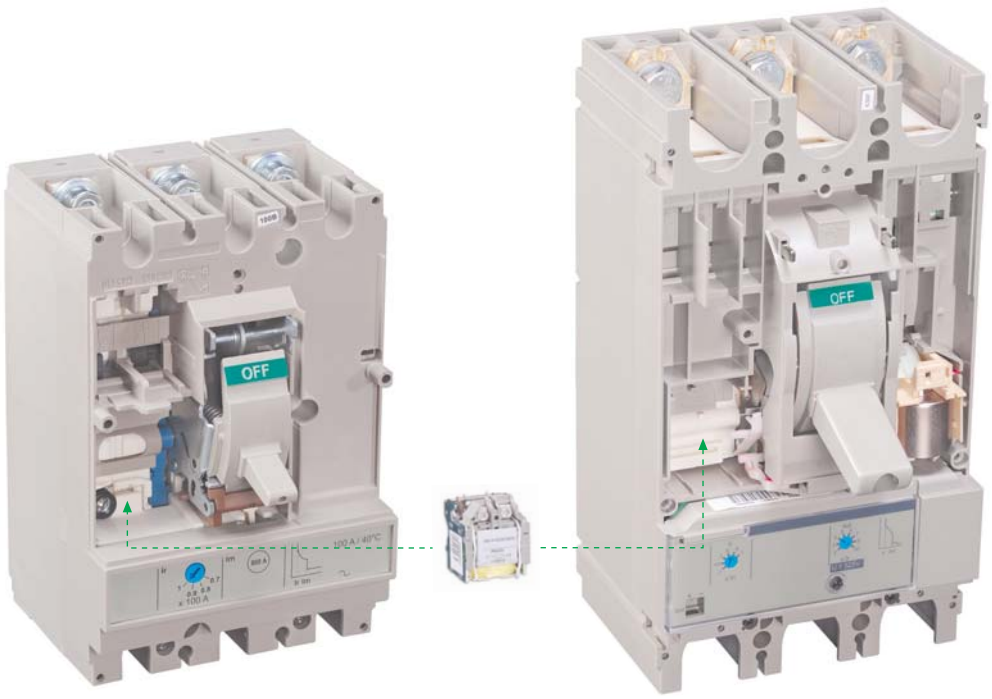
When the circuit breaker has been tripped by an MN or MX release, it must be reset locally.
MN or MX tripping takes priority over manual closing.
In the presence of a standing trip order, closing of the contacts, even temporary, is not possible.

**Mechanical characteristics**

- endurance is equal to 50 % of the mechanical endurance of the circuit breaker
- the releases clip in behind the front cover
- connection using wires up to 1.5 mm2, to integrated terminal blocks.

**Electrical characteristics**

- consumption:
  - pick-up (MX): < 10 VA
  - seal-in (MN and MNR): < 5 VA.
- response time: < 50 ms.



# Electrical and mechanical accessories
## Compact CVS100 to 630

*Compact CVS with a direct rotary handle*

*Compact CVS with an extended rotary handle*

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

### 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:
- motor control centre (MCC) switchboards:
  - door opening disabled when the circuit breaker is ON
  - circuit-breaker closing is disabled if the door is open
- a higher degree of protection (IP43, IK07)

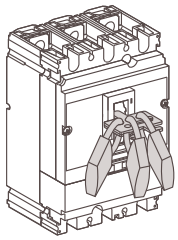
### Extended rotary handle
Degree of protection IP 55, IK08.
This handle makes it possible to operate circuit breakers installed at the back of switchboards, from the switchboard front.

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).

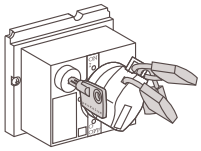
The door cannot be opened if the circuit breaker is ON or locked.
The extended rotary handle is made up of:
- a unit that replaces the front cover of the circuit breaker (secured by screws)
- an assembly (handle and front plate) on the door that is always secured in the same position, whether the circuit 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:
  - 185 to 600 mm for Compact CVS100 to 250
  - 210 to 625 mm for Compact CVS400 to 630.

### Locking systems
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<br>lock in OFF or ON position | padlock<br>padlock | removable device<br>fixed device |
| Direct rotary handle | lock in OFF position | padlock<br>keylock | <br>locking device + keylock |
| MCC rotary handle | lock in OFF position | padlock | |
| Rotary handle | lock in OFF position | padlock | |
| Extended rotary handle | lock in OFF position, door opening prevented | keylock | keylock |



*Locking of the toggle using a removable device*



*Locking of the rotary handle using a padlock or a keylock.*

# Compact CVS 800A MCCBs

Compact CVS 800A MCCBs are available in 3P/4P version with 35/50kA breaking performances with Ics = 100% Icu. Compact CVS comes with host of features including Adjustable overload, Short Circuit Setting, Line load reversibility.

- Ics=100% Icu.
- Adjustable over load setting (0.8 to 1 x In)
- Adjustable Short Circuit setting for individual phase (3.5 to 10 In)
- Line load reversibility



## Compact CVS 800

| Overload protection (thermal) | |
|---|---|
| Tripping threshold (A) In | Adjustable 0.8...1 x In |
| **Short-circuit protection (magnetic)** | |
| Tripping threshold (A) Im | Adjustable |
| Compact CVS 800 | 3.5...10 In |

## Accessories and Auxiliaries

- Auxiliary Contact with 1C/O & 2 C/O options.
- Alarm Contact with 1C/O & 2 C/O options.
- Shunt trip Coil.
- Under Voltage Coil.
- Direct and Extended Rotary Handle.
- Unique modular ground fault protection for 3 phase 3 wire and 3 phase 4 wire systems.

# Functions & Characteristics
# Protection of distribution systems
for Compact CVS 100 to 630

*100-250A*

*400&630A*

| Compact CVS Circuit Breakers | | | |
|---|---|---|---|
| Number of Poles | | | |
| Control/manual/toggle | | | |
| Direct or extended rotary handle | | | |
| **Electrical characteristics as per IEC 60947-2 & IS/IEC 60947-2** | | | |
| Rated current (A) | | In | 40°C |
| Rated insulation voltage (V) | | Ui | |
| Impulse withstand voltage (kV) | | Uimp | |
| Rated operational voltage (V) | | Ue | AC 50/60 Hz |
| **Type of circuit Breaker** | | | |
| Ultimate Breaking Capacity (kA) | | Icu | AC 415 V 50/60Hz |
| Service Breaking Capacity (KA) | | Ics | %Icu |
| Suitability for isolation | | | |
| Utilisation category | | | |
| Durability *(C-O cycles)* | mechanical | | |
| | electrical | In | |
| **Protection** | | | |
| Overload release setting (A) | | | |
| | | Adjustable Ir | (In x ...) |
| Short Circuit Protection | | | |
| Short Circuit release setting | | Isd (Ir x...) | |
| Ground Fault Protection* | | | |
| | | GFP Release setting = 10-60% of In | |
| | | Time Delay Setting (0.5 - 3 Sec./Inst.) | |
| **Indication & control auxiliaries** | | | |
| Indication Contacts | | | |
| Alarm Contacts | | 1 C/0 | |
| | | 3 C/0 (3 nos. OF) | |
| Auxiliary Contacts | | 1 C/0 | |
| | | 3 C/0 (3 nos. OF) | |
| MX shunt and MN undervoltage Release | | | |
| Voltage Presence Indicatior | | | |
| **Installation and Connection** | | | |
| Bus Bar Max | width (mm) | Without spreaders | |
| Bus Bar Max | width (mm) | Without spreaders | |
| Installation Accessories | | | |
| Spreaders | | | |
| Phase Barrier | | | |
| **Dimensions & Weight** | | | |
| Overall dimensions W X H X D | | (mm) | 3 Pole |
| | | (mm) | 4 Pole |
| Weight (kg) | | 3 Pole | |
| Weight (kg) | | 4 Pole | |

*Unique modular electronic adjustable ground fault protection

| CVS100 | CVS160 | CVS250 | CVS400 | CVS630 |
|---|---|---|---|---|
| 3/4 | 3/4 | 3/4 | 3/4 | 3/4 |
| ■ | ■ | ■ | ■ | ■ |
| ■ | ■ | ■ | ■ | ■ |
| | | | | |
| 16,25,32,40,50,63,80,100 | 125,160 | 200,250 | 400 | 630 |
| 690 | | | | |
| 8 | | | | |
| 415 | | | | |
| B F | B F | B F | F N | F N |
| 25 36 | 25 36 | 25 36 | 36 50 | 36 50 |
| 100% | 100% | 100% | 100% | 100% |
| ■ | ■ | ■ | ■ | ■ |
| A | A | A | A | A |
| 30000 | 25000 | 20000 | 15000 | 15000 |
| 12000 | 12000 | 10000 | 6000 | 4000 |
| Thermal Magnetic | | | Electronic | |
| ■ | ■ | ■ | ■ | ■ |
| Centralised 0.7..... I | Centralised 0.7..... I | Centralised 0.7 ..... I | Centralised 0.5 ..... I | Centralised 0.5..... I |
| ■ | ■ | ■ | ■ | ■ |
| Fix | Fix | Fix | Adjustable 2 - 10 In | Adjustable 2 - 10 In |
| ■ | ■ | ■ | ■ | ■ |
| ■ | ■ | ■ | ■ | ■ |
| ■ | ■ | ■ | ■ | ■ |
| | | | | |
| ■ | ■ | ■ | ■ | ■ |
| ■ | ■ | ■ | ■ | ■ |
| - | - | - | ■ | ■ |
| ■ | ■ | ■ | ■ | ■ |
| - | - | - | ■ | ■ |
| ■ | ■ | ■ | ■ | ■ |
| ■ | ■ | ■ | ■ | ■ |
| | | | | |
| 35 | | | 45 | |
| 45 | | | 70 | |
| | | | | |
| ■ | ■ | ■ | ■ | ■ |
| ■ | ■ | ■ | ■ | ■ |
| | | | | |
| 105 x 161 x 86 | | | 140 x 255 x 110 | |
| 140 x 161 x 86 | | | 185 x 255 x 110 | |
| 2.0 to 2.2 | | | 6.2 to 8.1 | |
| 2.6 to 2.8 | | | 6.2 to 8.1 | |

# Functions & Characteristics
## Protection of distribution systems
for Compact CVS 800

| Function and characteristics | | | Protection of distribution system Compact CVS 800 A | |
|---|---|---|---|---|
| **Compact CVS Circuit breakers** | | | **CVS 800** | |
| Number of Poles | | | 3/4 | |
| Control/manual/toggle | | | ■ | |
| | Direct or extended rotary handle | | ■ | |
| **Electrical characteristics as per IEC 60947- 2 & IS 13947 (Part 2)** | | | | |
| Rated current(A) | In | 40°C | 800 | |
| Rated insulation voltage(V) | Ui | | 690 | |
| Impulse withstand voltage(kV) | Uimp | | 8 | |
| Rated operational voltage(V) | Ue | AC 50/60 Hz | 415 | |
| **Type of circuit Breaker** | | | **F** | **N** |
| Ultimate Breaking Capacity(kA) | Icu | AC 415V 50/60HZ | 35 | 50 |
| Service Breaking Capacity (KA) | Ics | %Icu | 100% | |
| Utilisation category | | | A | |
| Durability (C-O cycles) | mechanical | | 8000 | |
| | electrical | In | 2500 | |
| **Protection** | | | **Thermal Magnetic** | |
| Overload release setting (A) | | | ■ | |
| | | Adjustable Ir(In x ...) | Centralised 0.8.....1 | |
| Short Circuit Protection | | | ■ | |
| Short Circuit Release setting | | Isd (Ir x...) | 3.5 to 10 (independent adjustment of each phase) | |
| Ground Fault Protection* | | | ■ | |
| GFP Release setting = 10-60% of In | | | ■ | |
| Time Delay Setting (0.5 - 3 Sec./Inst.) | | | ■ | |
| **Additional indication & control auxiliaries** | | | | |
| Indication Contacts | | | ■ | |
| Alarm Contacts | | 1 C/O | ■ | |
| | | 2 C/O | ■ | |
| Auxiliary Contacts | | 1 C/O | ■ | |
| | | 2 C/O | ■ | |
| Alarm - Auxiliary Contacts | | 1 C/O each | ■ | |
| MX shunt and MN under voltage Release | | | ■ | |
| **Installation and Connection** | | | | |
| Bus Bar Max. | width (mm) | | 40 | |
| Cable Crimped lugs AL/CU (mm)2 | | | 300*2 | |
| **Installation Accessories** | | | | |
| Spreaders | | | ■ | |
| Phase Barriers | | | ■ | |
| **Dimensions & Weight** | | | | |
| Overall dimensions W X H X D | (mm) | 3Pole | 210 x 274 x 103 | |
| | (mm) | 4Pole | 280 x 274 x 103 | |
| Weight(kg) | 3 /4Pole | | 10.3/13.7 | |

# Ground Fault Protection Compact CVS

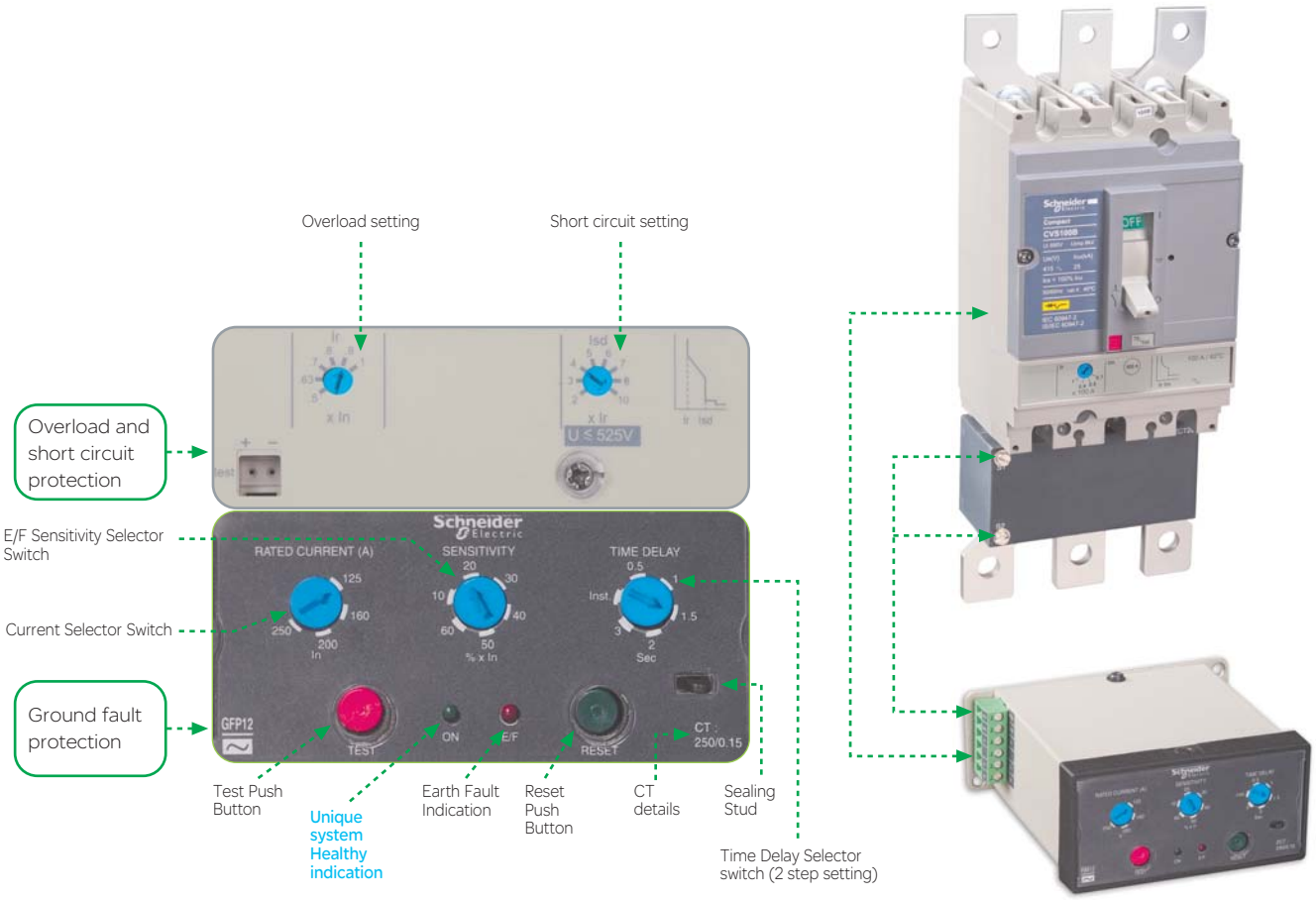
Compact CVS Ground fault protection is meant for human safety and to prevent fires due to low level faults resulting from a deterioration of electrical insulation or high resistive faults.

## Ground fault protection should be installed in the following installations

- Building housing inflammable or explosive material
- Line voltage to ground exceeds 150V AC
- Electrical equipments like welding sets
- Electrical equipments used in close Proximity of water/other liquids and Metallic object
- Cable protection when distance between source and load is high

## Selection for Ground fault Protection is based on following:

- Current sensitivity required
- Rated Voltage, Rated Current and Frequency
- Operation time
- Detection device and protection device co-ordination




## Ground fault protection relay setting details

| Relay | Ir selection in RM | Sensitivity selection | Time delay selection |
|---|---|---|---|
| GFP11 | 32, 40, 50, 63, 80, 100 | 10 - 60% of In | 0.5 to 3 Sec. /Instantaneous |
| GFP12 | 125, 160, 200, 250 | 10 - 60% of In | 0.5 to 3 Sec. /Instantaneous |
| GFP13 | 400, 630 | 10 - 60% of In | 0.5 to 3 Sec. /Instantaneous |
| GFP14 | 800 | 10 - 60% of In | 0.5 to 3 Sec. /Instantaneous |

# Compact CVS MCCBs catalogue nos.
for 100 - 800A

## Compact CVS Catalogue Nos.
### Compact CVS 100/160/250B

| Compact CVS 100B (25 KA at 415 V AC) | | |
|---|---|---|
| Rating | Reference 3 P | Reference 4P |
| 16A | LV510300N | LV510310N |
| 25A | LV510301N | LV510311N |
| 32A | LV510302N | LV510312N |
| 40A | LV510303N | LV510313N |
| 50A | LV510304N | LV510314N |
| 63A | LV510305N | LV510315N |
| 80A | LV510306N | LV510316N |
| 100A | LV510307N | LV510317N |
| **Compact CVS 160B (25 KA at 415 V AC)** | | |
| 125A | LV516308N | LV516318N |
| 160A | LV516309N | LV516319N |
| **Compact CVS 250B (25 KA at 415 V AC)** | | |
| 200A | LV525310N | LV525320N |
| 250A | LV525311N | LV525321N |

### Compact CVS 100/160/250F

| Compact CVS 100F (36 KA at 415 V AC) | | |
|---|---|---|
| Rating | Reference 3 P | Reference 4P |
| 16A | LV510330N | LV510340N |
| 25A | LV510331N | LV510341N |
| 32A | LV510332N | LV510342N |
| 40A | LV510333N | LV510343N |
| 50A | LV510334N | LV510344N |
| 63A | LV510335N | LV510345N |
| 80A | LV510336N | LV510346N |
| 100A | LV510337N | LV510347N |
| **Compact CVS 160F (36 KA at 415 V AC)** | | |
| 125A | LV516338N | LV516348N |
| 160A | LV516339N | LV516349N |
| **Compact CVS 250B (36 KA at 415 V AC)** | | |
| 200A | LV525340N | LV525350N |
| 250A | LV525341N | LV525351N |

### Compact CVS 400/630F

| Compact CVS 400F (36 KA at 415 V AC) | | |
|---|---|---|
| Description | Reference | Reference |
| 400A | LV540505N | LV540506N |
| **Compact CVS 630F (36 KA at 415 V AC)** | | |
| 630A | LV563505N | LV563506N |

### Compact CVS 400/630N

| Compact CVS 400N (50 KA at 415 V AC) | | |
|---|---|---|
| 400A | LV540510N | LV540511N |
| **Compact CVS 630N (50 KA at 415 V AC)** | | |
| 630A | LV563510N | LV563511N |

### Compact CVS 800F

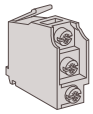
| Compact CVS 800F (35 KA at 415 V AC) | | |
|---|---|---|
| Rating | 3P | 4P |
| 800A | LV580300 | LV580301 |

### Compact CVS 800N

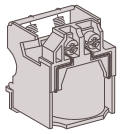
| Compact CVS 800N (50 KA at 415 V AC) | | |
|---|---|---|
| Rating | 3P | 4P |
| 800A | LV580302 | LV580303 |

# Compact CVS MCCBs Accessories catalogue nos.
for 100 - 630A

## Electrical auxiliaries

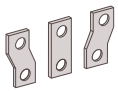


| Auxiliary/Alarm contacts (common for 100 - 630) | Reference |
|---|---|
| OF or SD | 29450 |



| Shunt/Under voltage coil (common for 100 - 630) | | Reference | Reference |
|---|---|---|---|
| AC (50Hz) | Voltage | MX | MN |
| | 110-130 V | LV429386 | LV429406 |
| | 220-240 V | LV429387 | LV429407 |
| | 380-415 V | LV429388 | LV429408 |
| DC | Voltage | MX | |
| | 24 V | LV429390 | |
| | 48 V | LV429392 | |
| | 110 V | LV429393 | |
| | 250 V | LV429394 | |

## Spreaders

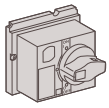


| | | Ref. 100 to 250 (45mm pole pitch) | Ref. 400 to 630 (70mm pole pitch) |
|---|---|---|---|
| Spreaders* | 3P (3 nos.) | 31563SEI | 32492SEI |
| | 4P (4 nos.) | 31564SEI | 32493SEI |

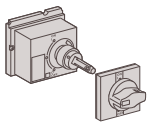
| | Ref. 100 to 250 | Ref. 400 to 630 |
|---|---|---|
| Phase barriers 3P/4P (6 nos.) | LV429329 | LV432570 |

## Rotary handles

| Direct rotary handles | Ref. 100 to 250 | Ref. 400 to 630 |
|---|---|---|
| Standard black handle | 29337 | 32597 |

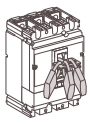


| Standard extended rotary handle | Ref. 100 to 250 | Ref. 400 to 630 |
|---|---|---|
| Standard extended rotary handle | 29338 | 32598 |

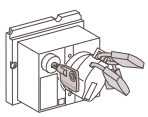


## Locks

| Toggle locking device for 1 to 3 padlocks | Reference |
|---|---|
| By removable device | 29370 |
| By fixed device | 29371 |



| Locking of the rotary handle | Reference | Reference |
|---|---|---|
| | CVS 100 - 250 | CVS 400 - 630 |
| Locking Device | LV429344 | LV432604 |
| Ronis Keylock | 41940 | 41940 |
| Ronis Keylock 2 Locks + 1 key Set | 41950 | 41950 |



## Ground Fault Protection

| | Ref. 32/40/50/63/80/100 | Ref. 125/160/200/250 |
|---|---|---|
| 3 PH 3W | GFP11CT13P | GFP12CT23P |
| 3 PH 4W | GFP11CT14P | GFP12CT24P |
| | 400 / 630 | |
| | Reference 400/630 | |
| 3 PH 3W | GFP13CT33P | |
| 3 PH 4W | GFP13CT34P | |

# Compact CVS MCCBs Accessories catalogue nos.
for 800A

## Auxiliary contacts ON/OFF/Trip (change - over)

| | Reference |
|---|---|
| Auxilary Contact 1 C/O | LV580075 |
| Auxilary Contact 2 C/O | LV580076 |
| Alarm Contact 1 C/O | LV580077 |
| Alarm Contact 2 C/O | LV580078 |
| Alarm Auxilary Contact | LV580079 |

## Shunt/Under voltage coil


| | Shunt / Under voltage | Reference Shunt (MX) |
|---|---|---|
| AC 50Hz | 110-130 V | LV580060 |
| | 220-240 V | LV580061 |
| | 380-415 V | LV580062 |
| | 440 V | LV580063 |
| | **Voltage** | **Reference** |
| DC | 24 V | LV580064 |
| | 48 V | LV580065 |
| | 110 V | LV580066 |
| | 220 V | LV580067 |

| Reference Under Voltage (MN) |
|---|
| LV580070 |
| LV580071 |
| LV580072 |

## Rotary handles

### Direct rotary handles

| Reference |
|---|
| LV580080 |

### Extended rotary handle

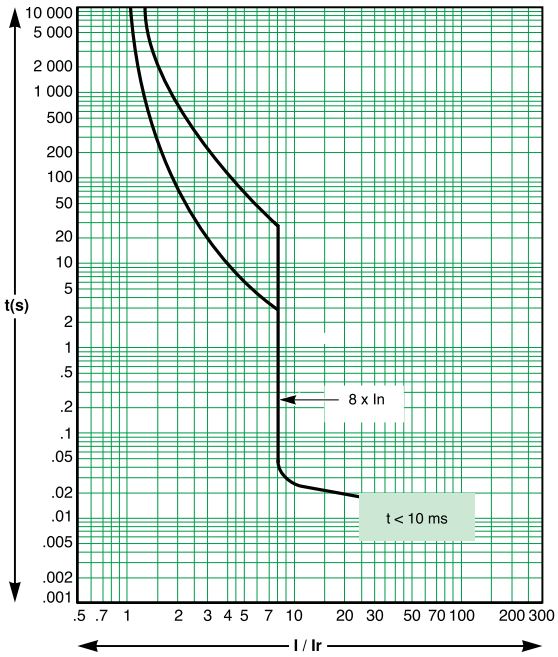
| Reference |
|---|
| LV580081 |

## Ground Fault Protection

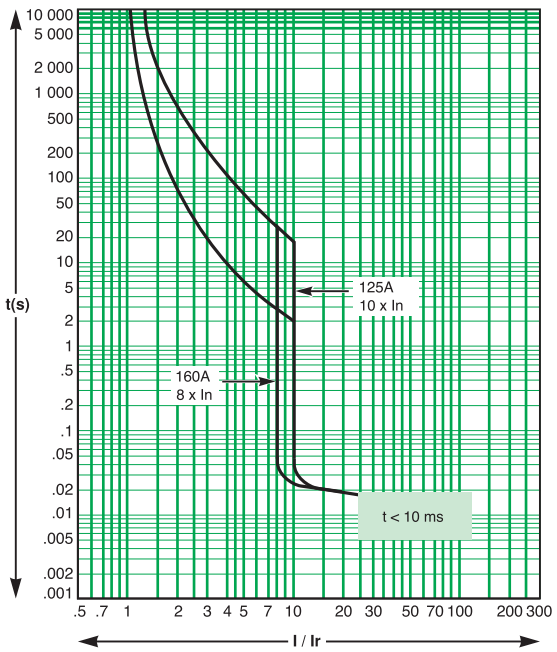
| | Ground Fault Relay + CT Ref. |
|---|---|
| 3 Phase 3 Wire | GFP14CT43P |
| 3 Phase 4 Wire | GFP14CT44P |

# Tripping curves
# Compact CVS 100 to 630
## Protection of distribution system

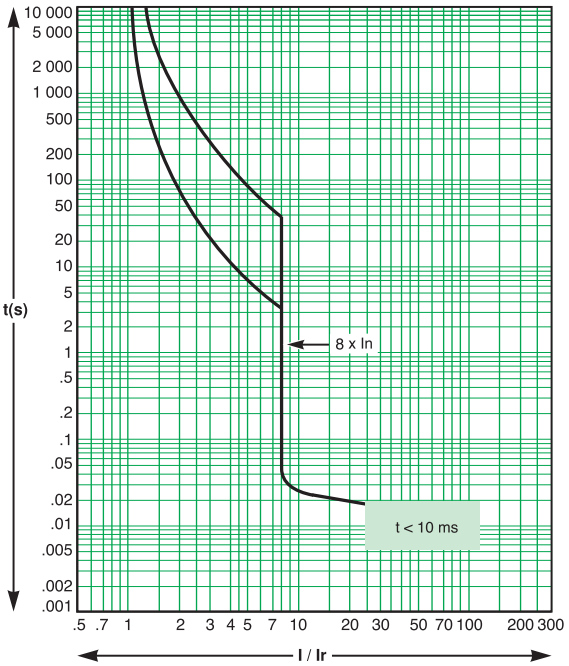
### TM80D / TM100D



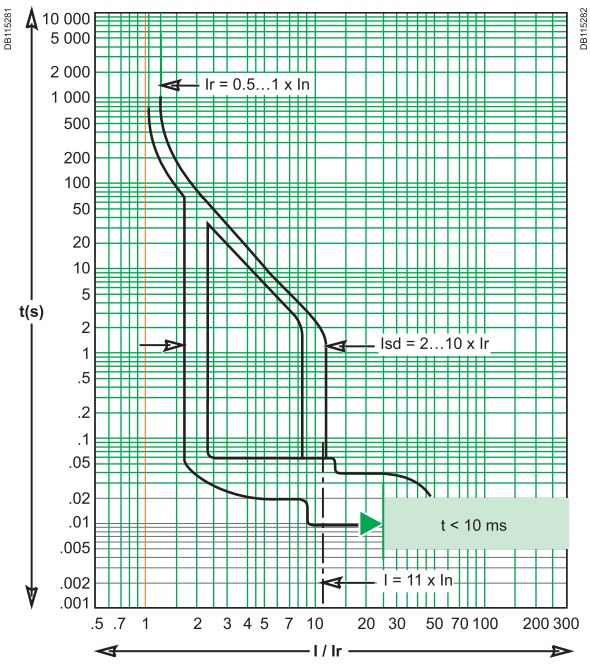

### TM125D / TM160D




### TM200D / TM250D

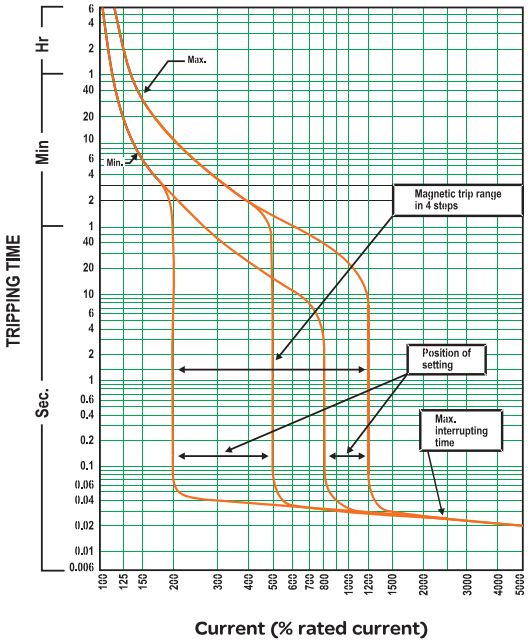



### Electronic trip unit 400 / 630



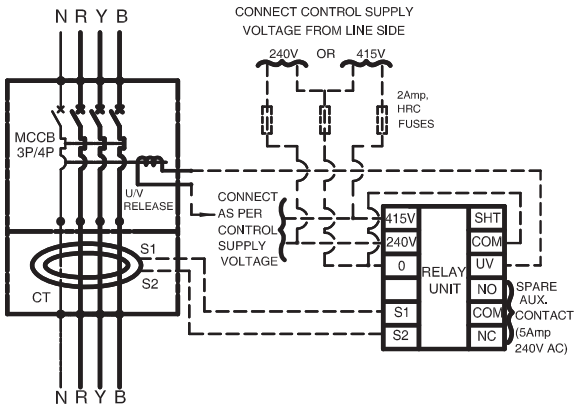
# Tripping curve
# Compact CVS 800
## Protection of distribution system

### Compact CVS 800



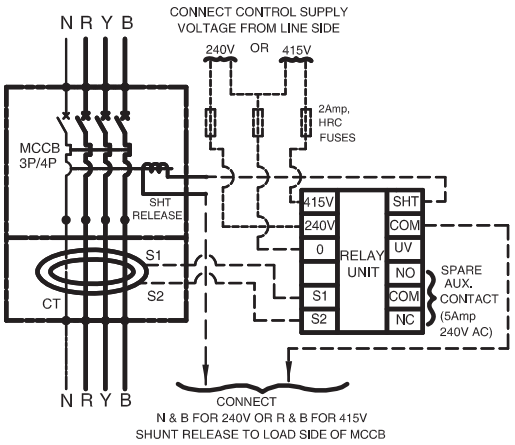
# Electrical Wiring Diagram Compact CVS
## 3 Phase 3 Wire and 3 Phase 4 Wire operated GFP

### Wiring diagram for under voltage release operated GFP




- Supply to RELAY UNIT & UNDER VOLTAGE RELEASE shall be taken from SUPPLY SIDE of MCCB.

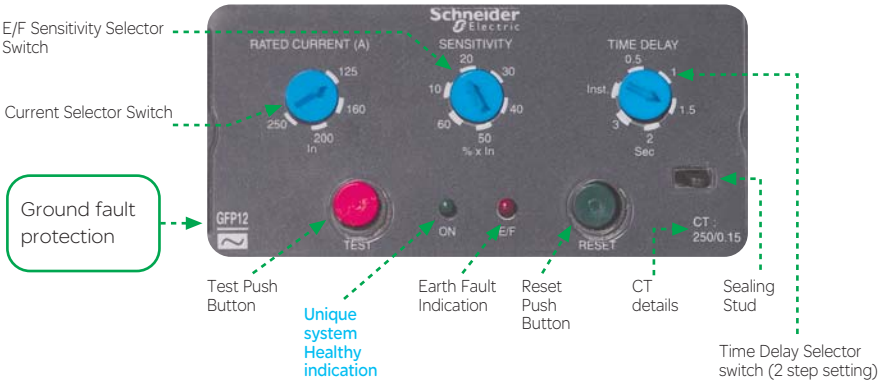
### Wiring diagram for shunt release operated GFP




- Control Voltage supply to RELAY UNIT shall be taken from LINE SIDE of MCCB.
- Supply to SHUNT RELEASE shall be taken form LOAD SIDE of MCCB.

**Notes:**

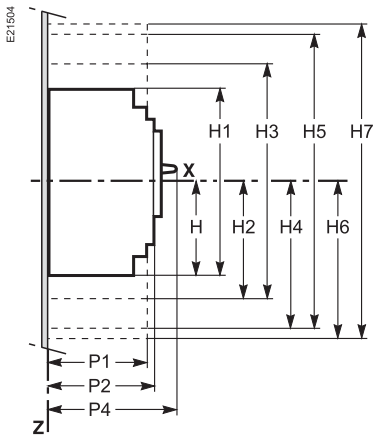
1. Connections shown in dotted lines shall be made by customer.
2. HRC fises are not in SEIPL's scope of supply.
3. Remove BOTTOM SIDE SPREADERS (if Fitted) of MCCB before mounting 'CT' on MCCB.

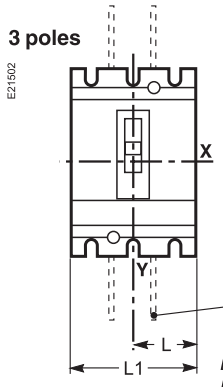


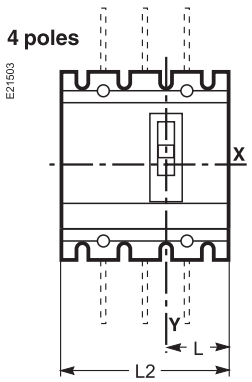

1. To change any setting switch 'OFF' the MCCB. Remove protective cover from Relay Module. Replace cover after changing setting.
2. To test E/F relay press test Push Button. E/F relay will operate according to the Time Delay Selection. Keep the Test Push Button pressed till the relay trips (indicated by red lamp).

# Installation recommendation
## Compact CVS100 to 630 (fixed version)

## Dimensions



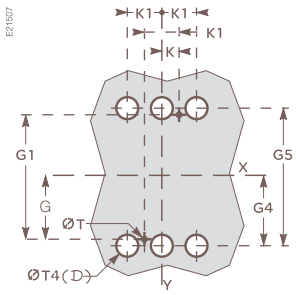




*L1 = 157.5 mm,*
*L2 = 210 mm).*
***(a)*** *interphase barriers.*

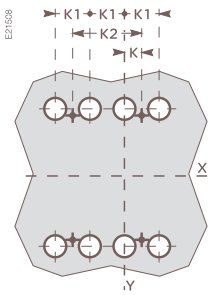
## Mounting

### On backplate

3 poles

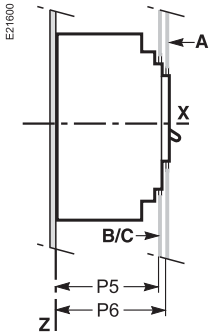



4 poles

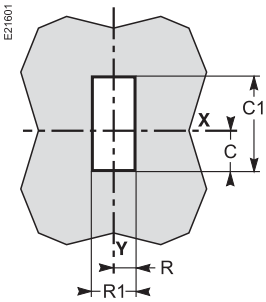



## Front-panel cutouts

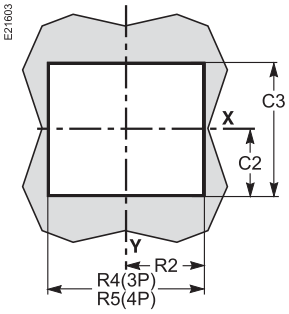
### Fixed circuit breaker



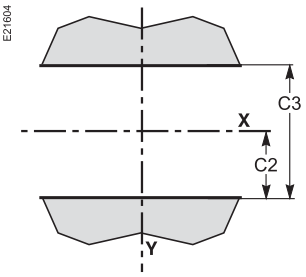

Cutout A



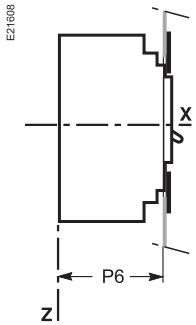

Cutout B



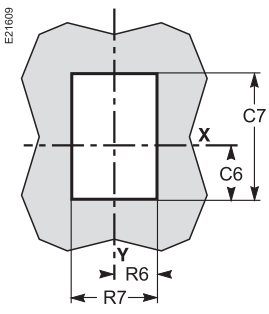

Cutout C

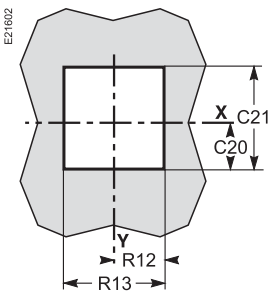



### With escutcheon




### With toggle cover



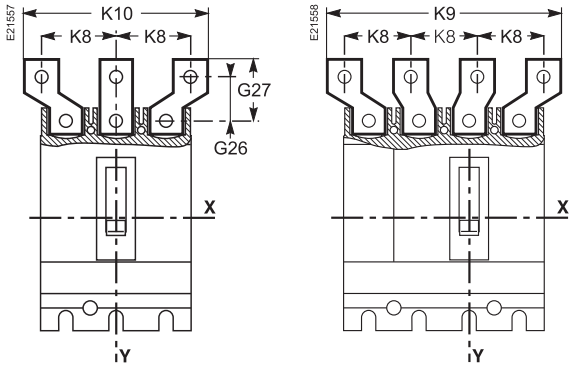



# Installation recommendation
## Compact CVS100 to 630 (fixed version)

| Dimensions (mm) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Type** | **C** | **C1** | **C2** | **C3** | **C6** | **C7** | **C20** | **C21** | **G** | **G1** | **G4** |
| CVS100/160/250 | 29 | 76 | 54 | 108 | 43 | 104 | 34 | 86 | 62.5 | 125 | 70 |
| CVS400/630 | 41.5 | 116 | 92.5 | 184 | 56.5 | 146 | 46.5 | 126 | 100 | 200 | 113.5 |
| **Type** | **G5** | **-** | **-** | **-** | **-** | **-** | **H** | **H1** | **H2** | **H3** | **H4** |
| CVS100/160/250 | 140 | - | - | - | - | - | 80.5 | 161 | 94 | 188 | 160.5 |
| CVS400/630 | 227 | - | - | - | - | - | 127.5 | 255 | 142.5 | 285 | 240 |
| **Type** | **H5** | **H6** | **H7** | **K** | **K1** | **K2** | **L** | **L1** | **L2** | **P1** | **P2** |
| CVS100/160/250 | 321 | 178.5 | 357 | 17.5 | 35 | 70 | 52.5 | 105 | 140 | 81 | 86 |
| CVS400/630 | 480 | 237 | 474 | 22.5 | 45 | 90 | 70 | 140 | 185 | 95.5 | 110 |
| **Type** | **P4** | **P5** | **P6** | **R** | **R1** | **R2** | **R4** | **R5** | **R6** | **R7** | **R12** |
| CVS100/160/250 | 111 | 83 | 88 | 14.5 | 29 | 54 | 108 | 143 | 29 | 58 | 43 |
| CVS400/630 | 168 | 107 | 112 | 31.5 | 63 | 71.5 | 143 | 188 | 46.5 | 93 | 63 |
| **Type** | **R13** | **ØT** | **ØT4** | **-** | | | | | | | |
| CVS100/160/250 | 86 | 6 | 22 | - | | | | | | | |
| CVS400/630 | 126 | 6 | 32 | - | | | | | | | |

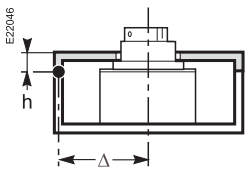
## Connection with accessories

### Spreader



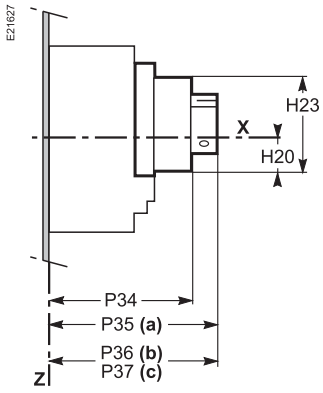

| Dimensions (mm) | | | | | |
|---|---|---|---|---|---|
| **Type** | **G26** | **G27** | **K8** | **K9** | **K10** |
| CVS100/160/200/250 | 30 | 41 | 45 | 159 | 114 |
| CVS400/630 | 52.5 | 67.5 | 70 | 240 | 170 |

*Note.*
*Door cutout dimensions are given for a device position in the enclosure where Δ ≥ 100 + (h x 5) with respect to the door hinge.*

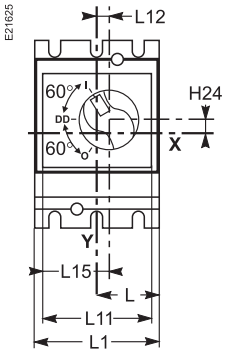


# Installation recommendation
## Compact CVS Rotary handle100 to 630

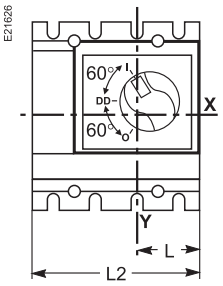
### Direct rotary handle




**3 poles**



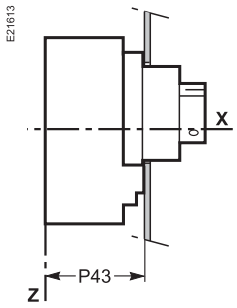

**4 poles**

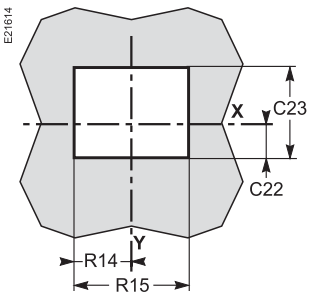



### Front-panel cutouts

#### Fixed circuit breaker

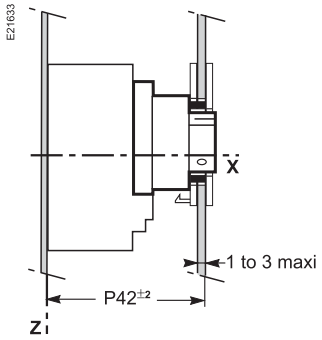
**Compact**

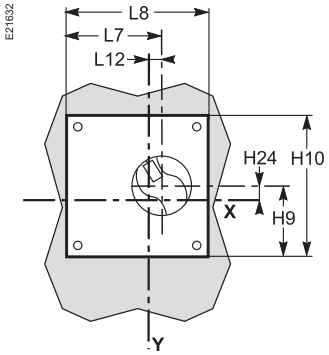


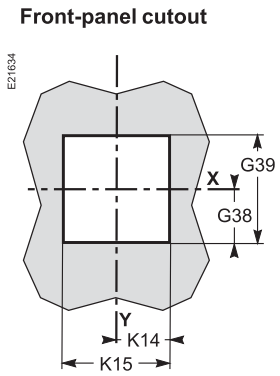



# Installation recommendation
## Compact CVS Rotary handle100 to 630

## MCC direct rotary handle



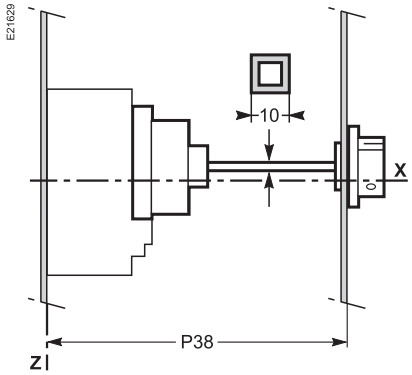



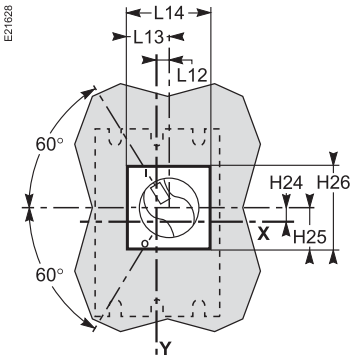




## Extended rotary handle

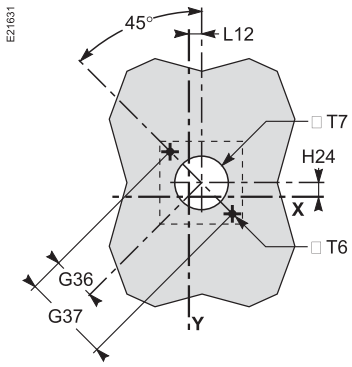
### Fixed circuit breaker

Cut shaft at length:
P38-126 mm (CVS100 to 250)
P38-150 mm (CVS400 to 630)




### Front-panel cutout




| Dimensions (mm) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type | G36 | G37 | G38 | G39 | H9 | H10 | H20 | H23 | H24 | | | | | | | | |
| CVS100/160/250 | 36 | 72 | 41 | 100 | 60 | 120 | 28 | 73 | 9 | | | | | | | | |
| CVS400/630 | 36 | 72 | 51 | 145 | 83 | 160 | 40 | 123 | 24.5 | | | | | | | | |
| Type | H25 | H26 | K14 | K15 | L | L1 | L2 | L7 | L8 | L11 | L12 | L13 | L14 | L15 | P34 | P35 | P36 |
| CVS100/160/250 | 37.5 | 75 | 50 | 100 | 52.5 | 105 | 140 | 69 | 120 | 91 | 9.25 | 37.5 | 75 | 55 | 121 | 155 | 156 |
| CVS400/630 | 37.5 | 75 | 72.5 | 145 | 70 | 140 | 185 | 85 | 160 | 123 | 5 | 37.5 | 75 | 66.5 | 145 | 179 | 180 |
| Type | P37 | P38(1) | | P42 | | P44 | R1 | R8 | R9 | | | | | | ØT6 | ØT7 | |
| CVS100/160/250 | 164 | ≥ 185 | | 125 | | 123 | 29 | 74 | 148 | | | | | | 4.2 | 50 | |
| CVS400/630 | 188 | ≥ 209 | | 149 | | 147 | 29 | 90 | 180 | | | | | | 4.2 | 50 | |

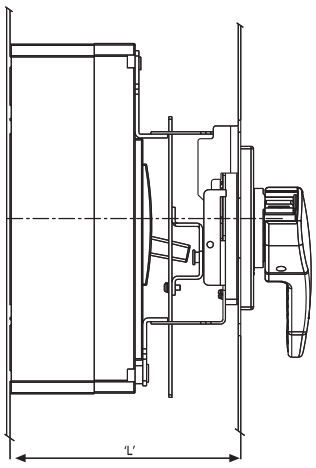
*(1) ≤ 600 mm.*

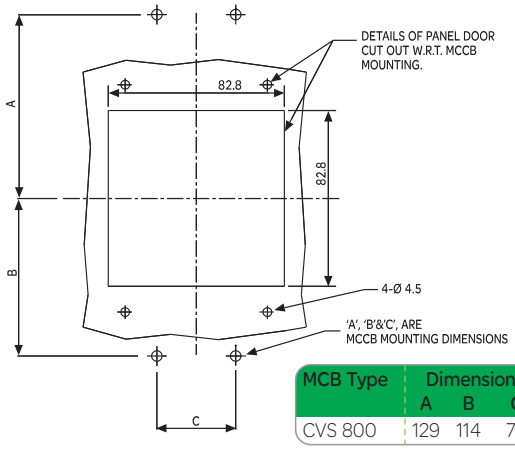
***Note:***

*Door cutout dimensions are given for a device position in the enclosure where Δ ≥ 100 + (h x 5) with respect to the door hinge.*

# Installation recommendation
## Compact CVS 800

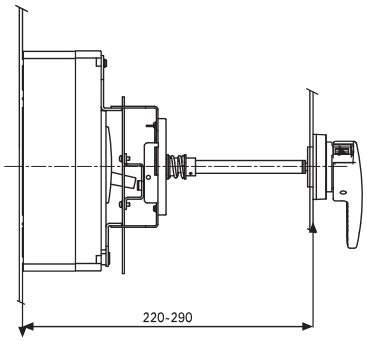
### Direct Rotary handle compact CVS 800

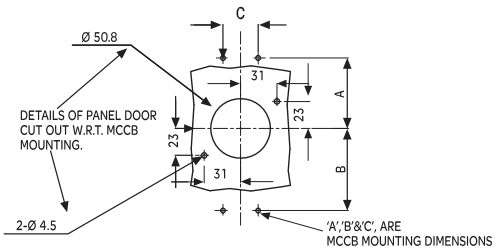


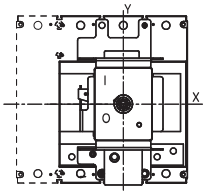




| MCB Type | Dimension A | B | C | Panel Depth 'L' |
|---|---|---|---|---|
| CVS 800 | 129 | 114 | 70 | 179±1 |

### Extended rotary Handle



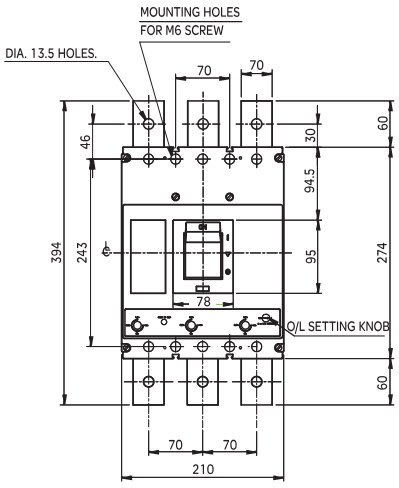



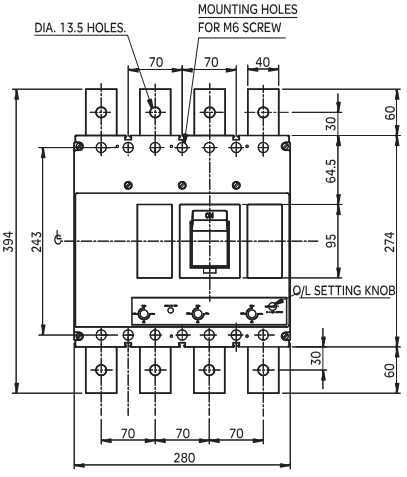

| MCB Type | Dimension A | B | C |
|---|---|---|---|
| CVS 800 | 129 | 114 | 70 |

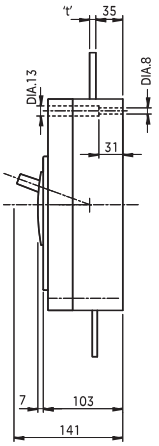
### CVS 800 F/N

**3 P**



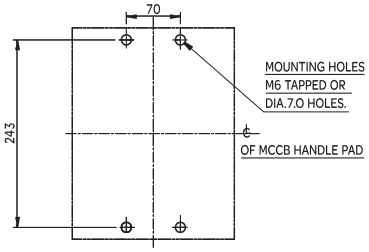

**4 P**



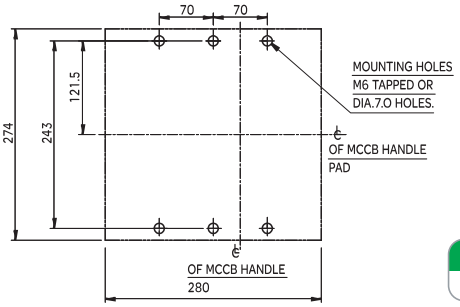




### CVS 800 F/N

**3 P**




**4 P**




| Rating | Dimn. 't' |
|---|---|
| 800 A | 8.0 mm |

# Compact CVS - **Glossary**

**Breaking capacity**

Value of prospective current that a switching device is capable of breaking at a stated voltage under prescribed conditions of use and behaviour. Reference is generally made to the ultimate breaking capacity (Icu) and the service breaking capacity (Ics).

**Prospective short-circuit current**

Current that would flow through the poles if they remained fully closed during the short-circuit.

**Ultimate breaking capacity (Icu)**

Expressed in KA, it indicates the maximum breaking capacity of the circuit breaker. It is confirmed by a test with one opening and one closing/opening at Icu, followed by a check that the circuit is properly isolated. This test ensures user safety.

**Service breaking capacity (Ics)**

Expressed as a percentage of Icu, it provides an indication on the robustness of the device under severe conditions. It is confirmed by a test with one opening and one closing/opening at Ics, followed by a check that the device operates correctly at its rated current, i.e. 50 cycles at In, where temperature rise remains within tolerances and the protection system suffers no damage.

**Suitability for isolation**

This capability means the circuit breaker meets the conditions below.

- In the open position, it must withstand, without flashover between the upstream and downstream contacts, the impulse voltage specified by the standard as a function of the Uimp indicated on the device.
- It must indicate contact position by one or more of the following systems:
  - position of the operating handle
  - separate mechanical indicator
  - visible break of the moving contacts
- Leakage current between each pole, with the contacts open, at a test voltage of 1.1 x the rated operating voltage, must not exceed:
  - 0.5 mA per pole for new devices
  - 2 mA per pole for devices already subjected to normal switching operations
  - 6 mA, the maximum value that must never be exceeded.
- It must not be possible to install padlocks unless the contacts are open. Locking in the closed position is permissible for special applications. Compact CVS complies with this requirement by positive contact indication.

**Suitable for isolation with positive contact indication**

Suitability for isolation is defined here by the mechanical reliability of the position indicator of the operating mechanism, where:

- the isolation position corresponds to the O (OFF) position
- the operating handle cannot indicate the “OFF” position unless the contacts are effectively open.

The other conditions for isolation must all be fulfilled:

- locking in the open position is possible only if the contacts are effectively open
- leakage currents are below the standardised limits
- over voltage impulse withstand between upstream and downstream connections.

**Insulation class**

Defines the type of device insulation in terms of earthing and the corresponding safety for user, in one of three classes.

- Class I. The device is earthed. Any electrical faults, internal or external, or caused by the load, are cleared via the earthing circuit, thus ensuring user safety.
- Class II. The device is not connected to a protective conductor. User safety is ensured by reinforced insulation around the live parts (an insulating case and no contact with live parts, i.e. plastic buttons, moulded connections, etc.) or double insulation.

**Rated current (In)**

This is the current that the device can carry continuously with the contacts closed and without abnormal temperature rise.

**Rated operational current (Ie)**

“A rated operational current of an equipment is stated by the manufacturer and takes into account the rated operational voltage, the rated frequency, the rate duty, the utilization category and the type of protective enclosure, if appropriate.”

**Rated operational voltage (Ue)**

“A value of voltage which, combined with a rated operational current, determines the application of the equipment and to which the relevant tests and the utilisation categories are referred. For multiple equipment, it is generally stated as the voltage between phases”.

This is the maximum continuous voltage at which the equipment may be used.

**Rated insulation voltage (Ui)**

“The rated insulation voltage of an equipment is the value of voltage to which dielectric tests and creepage distances are referred. In no case shall the maximum value of the rated operational voltage exceed that of the rated insulation voltage.”

**Rated Impulse withstand voltage (Uimp)**

“The peak value of an impulse voltage of prescribed form and polarity which the equipment is capable of withstanding without failure under specified conditions of test and to which the values of the clearances are referred. The rated impulse withstand voltage of an equipment shall be equal to or higher that the values stated for the transient over voltages occurring in the circuit in which the equipment is fitted.”

# Compact CVS - **Glossary**

| | |
|---|---|
| **RoHS directive**<br>(Restriction of Hazardous substances) | European directive 2002/95/EC dated 27 January 2003 aimed at reducing or eliminating the use of hazardous substances. The manufacturer must attest to compliance, without third-party certification. Circuit breakers are not included in the list of concerned products, which are essentially consumer products.<br>That not withstanding, Schneider Electric decided to comply with the RoHS directive. Compact CVS products are designed in compliance with RoHS and do not contain (above the authorised levels) lead, mercury, cadmium, hexavalent chromium or flame retardants (polybrominated biphenyls PBB and polybrominated diphenyl ether PBDE). |
| **WEEE directive**<br>(Waste of Electrical and Electronic Equipment) | European directive on managing the waste of electrical and electronic equipment. Circuit breakers are not included in the list of concerned products.<br>However, Compact CVS products respect the WEEE directive. |

# Compact CVS range of MCCBs are complimented by Masterpact MVS Range of ACBs

Masterpact MVS 800-3200A

## Masterpact MVS is packed with world class features and designed especially to meet your technical & commercial needs

- Conforms to IS/IEC 60947-2/3 tested at CPRI/ERDA
- 800A -3200A in 3/4Pole Versions in Manual & Electrical operated versions
- No deration up to 50°C
- Single frame size for the complete range of circuit breakers & switch disconnectors resulting in size optimisation and connection simplicity
- Icu=Ics=Icw(1sec)=50kA with complete discrimination with downstream breakers
- <40ms fault clearing time
- Microprocessor based ET trip systems with true RMS sensing & in-built thermal memory ensures reliability and accurate protections
  - > ET2I – basic protections
  - > ET5S – selective protections
  - > ET6G – selective + ground fault protections
- Overload run alarm & individual LED indications enable fault identification & analysis
- Immune to electromagnetic interference
- 100% neutral with adjustable protections at OFF-50%-100%
- High electrical & mechanical endurances without maintenance assures long service life with Zero downtime.
- Wide range of Simple & easy front fittable accessories & auxiliaries common to NT/NW reduces inventory & saving on maintenance costs
- Promise to provide complete safety with Safety shutter locking, ON/OFF PB locking, door interlock, Ready to close contact, Key locks, positive locking in with drawable positions, etc.,
- Offers complete flexibility in terminating Copper/Aluminium busbars with single pole pitch of 115mm
- Terminal orientation can be changed at site depending upon the termination requirements
- Single bolt fixing motor mechanism helps to convert Manual operated breaker in to Electrical one with practically lesser down time.
- Masterpact MVS respects the environment throughout their life cycle & conforms to ROHS/WEEE norms

**Kindly contact your nearest sales office to get your copy of Masterpact MVS Catalogue**

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Phone: +91 11 4168 2434/35

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