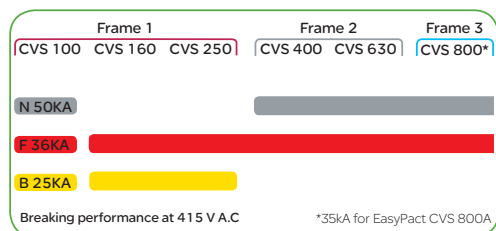


Standardised characteristics indicated on the rating plate:

- 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 Suitable for Isolation symbol.
- 9 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.

### Suitable for isolation with positive contact indication

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

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

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

The isolation function is certified by tests guaranteeing:

- The mechanical reliability of the position-indication system
- The absence of leakage currents
- Over voltage withstand capacity between upstream and downstream connections.

The tripped position does not ensure isolation with positive contact indication.

Only the OFF position guarantees isolation.

### Installation in class II switchboards

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

### Degree of protection

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

Bare circuit breaker:

- with toggle: IP40, IK07 front face
- with extended rotary handle: IP 55, IK08

Circuit breaker installed in a switchboard:

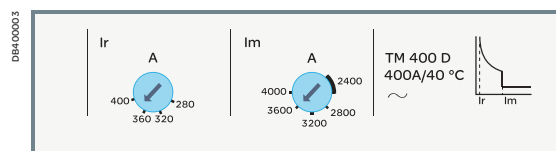
- with toggle: IP40, IK07 front face
- with extended rotary handle: IP 55, IK08

# Protection of distribution systems

## TM-D thermal-magnetic trip units

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

### TM-D thermal-magnetic trip units



### Protection

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

### Thermal protection (Ir)

Thermal protection operates according to:

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

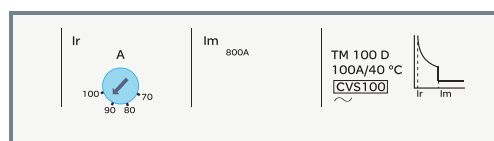
### Magnetic protection (Im)

Short-circuit protection with a fixed or adjustable pick-up Im that initiates instantaneous tripping if exceeded.

- TM-D: fixed pick-up, Im, for 16 to 250 A ratings and adjustable from 5 to 10 x In for 400 A ratings, 4 to 8 x In for 600 A rating.

### Protection versions

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

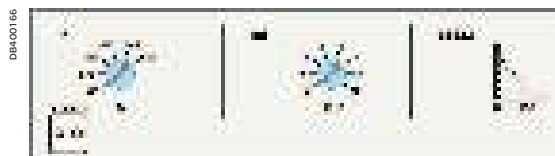


Thermal-magnetic trip units		TM16D to 250D											TM320D to 630D				
Ratings (A)	In at 40°C <sup>(1)</sup>	16	25	32	40	50	63	80	100	125	160	200	250	320	400	500	630*
Circuit breaker	CVS100	■	■	■	■	■	■	■	■	-	-	-	-				
	CVS160	-	-	-	-	-	-	-	■	■	■	-	-				
	CVS250	-	-	-	-	-	-	-	-	-	■	■	■				
	CVS400													■	■	-	-
	CVS630													-	-	■	■
<b>Magnetic protection</b>																	
Pick-up (A)	Im	fixed											adjustable				
accuracy ± 120 %	CVS100	190	300	400	500	500	500	640	800								
	CVS160/250								800	1250	1250	2000	2500				
	CVS400													5 to 10 x In			
	CVS630													4 to 8 x In			
<b>Thermal protection</b>																	
Pick-up (A)	Ir = In x ...	adjustable in amps from 0.7 to 1 x In															
tripping between 1.05 and 1.20 Ir																	
<b>Neutral protection</b>																	
Unprotected neutral	4P 3D	no detection															
Fully protected neutral	4P 4D	1 x Ir															

(1) For temperatures greater than 40°C, the thermal protection characteristics are modified. See the temperature derating table on page B-2.  
\* 630 A @ 30°C

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

### ETS 2.3 electronic trip unit



#### Protection

The protection functions can be set using the adjustment dials.

#### Overload protection

Long-time protection with an adjustable threshold and fixed tripping delay:

- Ir base setting (6-position dial from 0.5 to 1)

#### Short-circuit protection

**Short-time and instantaneous protection:**

- short-time protection with an adjustable pick-up and fixed tripping delay
- instantaneous protection with fixed pick-up.

#### Protection of the fourth pole

On 4-pole circuit breakers, neutral protection is set using a three-position switch to 4P 3D (neutral unprotected), 4P 3D + N/2 (neutral protection at 0.5 In) or 4P 4D (neutral protection at In).

Trip units		ETS 2.3	
Ratings (A) of circuit breaker	In 20 to 70 °C	400	630
Circuit breaker	CVS400 F/N CVS630 F/N	■	-
		-	■
<b>Overload protection (Long time)</b>			
Current setting	$I_r = I_n \times \dots$	0.5...1 adj., 6 settings	
Time delay (s) (min...max.)	at 1.5 x Ir at 6 x Ir at 7.2 Ir	fixed 90...180 5...7.5 3.2...5.0	
<b>Short-circuit protection (Short time)</b>			
Pick-up (A) accuracy ± 15 %	$I_{sd} = I_r \times \dots$	2... 10 adj, 8 settings	
Time delay (ms)	max. resettable time max. break time	fixed ≤ 40 ≤ 60	
<b>Short-circuit protection (instantaneous)</b>			
Pick-up (A)	$I_i = I_n \times \dots$	11	
<b>Protection of the fourth pole</b>			
Neutral unprotected	4P 3D	no protection	
Neutral protection at 0.5 In	4P3D + N/2	0.5 x Ir	
Neutral protection at In	4P 4D	1 x Ir	
<b>Thermal memory</b>			
	CVS400 F/N CVS630 F/N	Yes Yes	

### Test equipment for ETS electronic trip unit

#### Mini test kit

The mini test kit is a portable unit requiring no external power supply, used to check operation of the electronic trip unit and circuit breaker tripping. It connects to the test connector on the front of the circuit breaker. Required power source: five 9 V alkaline batteries (not supplied).

#### Portable test kit

The portable test kit is used to check all aspects of the protection functions:

- long time protection
- short time protection
- instantaneous protection
- earth-fault protection.

Required power source: 110 or 220 V AC, 50/60 Hz.

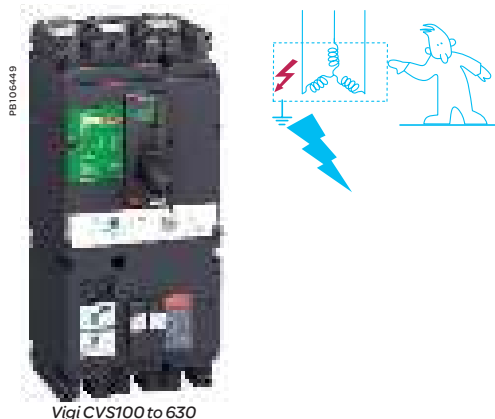
#### Spare test plug and wiring kit

A spare test plug and wiring kit are available for this offer.

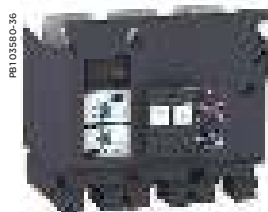
# Earth-leakage protection

Add-on protection against insulation faults using a Vigi module

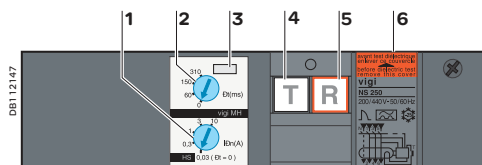
A Vigi module can be added to any three or four-pole CVS100 to 630 circuit breaker to form a Vigi CVS.



Vigi CVS100 to 630



PB1 03580-36



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

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

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

## Vigi CVS100 to 630 circuit breakers with earth-leakage protection

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

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

Dimensions and weights		Vigi CVS100/160/250	Vigi CVS400/630
Dimensions	3-pole	105 x 236 x 86	135 x 355 x 110
W x H x D (mm)	4-pole	140 x 236 x 86	180 x 355 x 110
Weight (kg)	3-pole	2.5	8.8
	4-pole	3.2	10.8

## Vigi earth-leakage protection modules

### Compliance with standards

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

## Vigi module selection

Type	Vigi ME	Vigi MH	Vigi MB
Number of poles	3, 4 <sup>(1)</sup>	3, 4 <sup>(1)</sup>	3, 4 <sup>(1)</sup>
CVS100	■	■	-
CVS160	■	■	-
CVS250	-	■	-
CVS400	-	-	■
CVS630	-	-	■

### Protection characteristics

Sensitivity I $\Delta$ n (A)	fixed	adjustable 0.3 0.03 - 0.3 - 1 - 3 - 10	adjustable 0.3 - 1 - 3 - 10 - 30
Time delay	fixed	adjustable	adjustable
Intentional delay (ms)	< 40	0 - 60 <sup>(2)</sup> - 150 <sup>(2)</sup> - 310 <sup>(2)</sup>	0 - 60 - 150 - 310
Max. break time (ms)	< 40	< 40 < 140 < 300 < 800	< 40 < 140 < 300 < 800
Rated voltage V AC 50/60 Hz	200...440	200... 440 - 440...550	200...440 - 440...550

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

## Operating safety

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