

Low Voltage

# EasyPact CVS

Moulded-case circuit breakers and switch-disconnectors  
from 100 to 630 A

Catalogue  
2011



**Schneider**  
Electric



EasyPact CVS100/160/250



EasyPact CVS400/630

### Common characteristics

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

### Circuit breakers

#### Performance

##### Electrical characteristics as per IEC 60947-2

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

#### Protection

Short-circuit protection	Magnetic only
Overload/short-circuit protection	Thermal magnetic
	Electronic
	with neutral protection (Off-0.5-1)
Earth-leakage protection	By Vigi module

#### Installation/connections

##### Dimensions and weights

Dimensions (mm)	Fixed, front connections	3P 4P
W x H x D		
Weight (kg)	Fixed, front connections	3P 4P

#### Connections

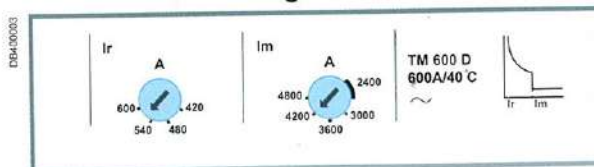
Connection terminals	Pitch	Without/With spreaders
Large Cu or Al cables	Cross-section	mm <sup>2</sup>

CVS100	CVS160	CVS250	CVS400	CVS630
100	160	250	400	630
3, 4	3, 4	3, 4	3, 4	3, 4
B F	B F	B F	F N	F N
40 70	40 70	40 70	40 70	40 70
25 36	25 36	25 36	36 50	36 50
20 36	20 36	20 36	30 42	30 42
40 70	40 70	40 70	40 70	40 70
25 36	25 36	25 36	36 50	36 50
15 18	15 18	15 18	23 32	23 32
30000	25000	20000	15000	15000
30000	25000	20000	12000	8000
12000	12000	10000	6000	4000
■	■	■	■	■
■	■	■	■	■
-	-	-	■	■
-	-	-	■	■
■	■	■	■	■
105 x 161 x 86	105 x 161 x 86	105 x 161 x 86	140 x 255 x 110	140 x 255 x 110
140 x 161 x 86	140 x 161 x 86	140 x 161 x 86	185 x 255 x 110	185 x 255 x 110
2.05	2.2	2.4	6.05	6.2
2.4	2.6	2.8	7.90	8.13
35/45 mm	35/45 mm	35/45 mm	45/52.5 mm	45/52.5 mm
			45/70 mm	45/70 mm
300	300	300	4 x 240	4 x 240



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 600D			
Ratings (A)	In at 40 °C <sup>(1)</sup>	16	25	32	40	50	63	80	100	125	160	200	250	320	400	500	600
Circuit breaker	CVS100	■	■	■	■	■	■	■	■	-	-	-	-				
	CVS160	-	-	-	-	-	-	-	■	■	■	-	-				
	CVS250	-	-	-	-	-	-	-	-	-	■	■	■	■	■	-	-
	CVS400															■	■
	CVS630																
Magnetic protection																	
Pick-up (A)	Im	fixed												adjustable			
accuracy ±20 %	CVS100	190 300 400 500 500 500 640 800															
	CVS160/250	800 1250 1250 2000 2500															
	CVS400													5 to 10 x In			
	CVS630													4 to 8 x In			
Thermal protection																	
Pick-up (A) tripping between 1.05 and 1.20 Ir	Ir = In x ...	adjustable in amps from 0.7 to 1 x In															
Neutral protection																	
Unprotected neutral	4P 3D	no detection															
Fully protected neutral	4P 4D	1 x Ir															

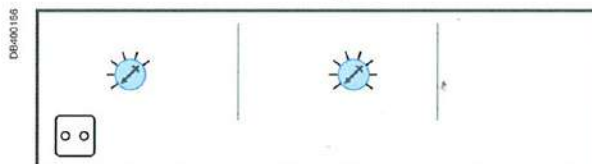
(1) For temperatures greater than 40°C, the thermal protection characteristics are modified. See the temperature derating table on page B-2.

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

# Protection of distribution systems

## ETS 2.3 electronic trip unit and accessories

### 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:

- $I_r$  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  $I_n$ ) or 4P 4D (neutral protection at  $I_n$ ).

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	-	■
Overload protection (Long time)			
Current setting	Ir = In x ...	0.5...1 adj., 6 settings	
Time delay (s)		fixed	
(min....max.)	at 1.5 x Ir	90...180	
	at 6 x Ir	5...7.5	
	at 7.2 Ir	3.2...5.0	
Short-circuit protection (Short time)			
Pick-up (A)	I <sub>sd</sub> = Ir x ...	2...10 adj, 8 settings	
accuracy ± 15 %			
Time delay (ms)		fixed	
	max. resettable time	≤ 40	
	max. break time	≤ 60	
Short-circuit protection (instantaneous)			
Pick-up (A)	I <sub>li</sub> = In x ...	11	
Protection of the fourth pole			
Neutral unprotected	4P 3D	no protection	
Neutral protection at 0.5 In	4P 3D + N/2	0.5 x Ir	
Neutral protection at In	4P 4D	1 x Ir	
Thermal memory			
	CVS400 F/N	Yes	
	CVS630 F/N	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.



## Functions and characteristics

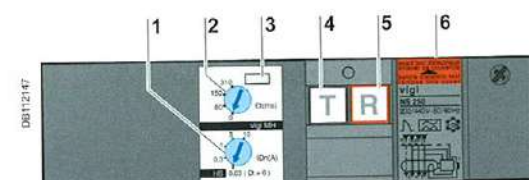
# Earth-leakage protection

## 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



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

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

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

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

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

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

Dimensions and weights		CVS100/160/250	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 MH	Vigi MB
Number of poles	3, 4 <sup>(1)</sup>	3, 4 <sup>(1)</sup>
CVS100	■	-
CVS160	■	-
CVS250	■	-
CVS400	-	■
CVS630	-	■
Protection characteristics		
Sensitivity	adjustable	adjustable
$I_{\Delta n}$ (A)	0.03 - 0.3 - 1 - 3 - 10	0.3 - 1 - 3 - 10 - 30
Time delay	adjustable	adjustable
Intentional delay (ms)	0 - 60 <sup>(2)</sup> - 150 <sup>(2)</sup> - 310 <sup>(2)</sup>	0 - 60 - 150 - 310
Max. break time (ms)	< 40 < 140 < 300 < 800	< 40 < 140 < 300 < 800
Rated voltage	200... 440	200... 440
VAC 50/60 Hz		

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

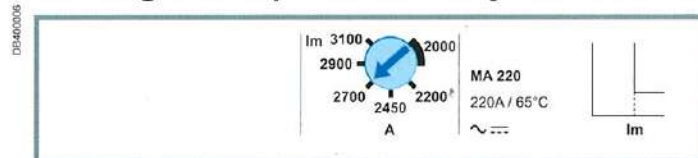
## Operating safety

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

# Motor protection

## MA instantaneous trip units

### MA magnetic trip units for EasyPact CVS100-630A



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

### Protection

#### Magnetic protection (Im)

Short-circuit protection with an adjustable pick-up  $I_m$  that initiates instantaneous tripping if exceeded.

■  $I_m = I_n \times \dots$  is set on an adjustment dial in multiples of the rating:

- 6 to 14 x  $I_n$  (2.5 to 100 A ratings)
- 9 to 14 x  $I_n$  (150 to 220 A ratings)
- 6 to 13 x  $I_n$  (320 to 500 A ratings)

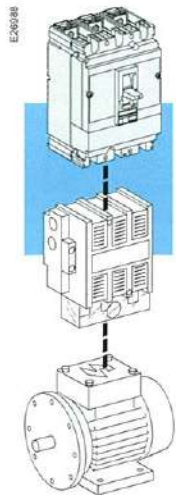
#### Protection version

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

### Motor protection up to 250 kW

#### Motor protection rating (kW)

CVS 100/160/250		1.1...110		
CVS 400/630		18.5...250		
Breaking	B	25	25	-
capacity (kA rms)	F	36	36	36
380/415 V	N	-	-	50



CVS100 to 630 circuit breakers, equipped with an MA magnetic trip unit with adjustable thresholds, offer:

- short-circuit protection
- suitability for isolation.

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

### MA trip units

Ratings (A)		In at 65 °C									
		2.5	6.3	12.5	25	50	100	150	220	320	500
Circuit breaker	CVS100	■	■	■	■	■	■	-	-	-	-
	CVS160	-	-	-	-	-	■	■	-	-	-
	CVS250	-	-	-	-	-	-	■	■	-	-
	CVS400	-	-	-	-	-	-	-	-	■	-
	CVS630	-	-	-	-	-	-	-	-	-	■
Short-circuit protection (magnetic)											
Pick-up (A)	$I_m = I_n \times \dots$	setting						setting		setting	
CVS100		6...14 x $I_n$						9...14 x $I_n$		-	
CVS160/250		-						-		-	
CVS400/630		-						-		6...13 x $I_n$	



## Functions and characteristics

## Switch-disconnectors Characteristics and performance

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

PB100451



EasyPact CVS100 to 250 NA

PB100452



EasyPact CVS400 to 630 NA

### Common characteristics

Rated voltages			
Insulation voltage (V)	<b>Ui</b>		690
Impulse withstand voltage (kV)	<b>Uimp</b>		8
Operational voltage (V)	<b>Ue</b>	AC 50/60 Hz	440
Suitability for isolation		IEC/EN 60947-3	yes
Utilisation category		AC 22 A/AC 23 A	
Pollution degree		IEC 60664-1	3

### Switch-disconnectors

#### Electrical characteristics as per IEC 60947-3 and EN 60947-3

Conventional thermal current (A)	<b>Ith</b>	50 °C	
Number of poles			
Operational current (A) depending on the utilisation category	<b>Ie</b>	AC 50/60 Hz	
		220/240 V	
		380/415 V	
Short-circuit making capacity (kA peak)	<b>Icm</b>	min. (switch-disconnector alone)	
		max. (protection by upstream circuit breaker)	
Rated short-time withstand current (A rms)	<b>Icw</b>	for	1 s
			3 s
			20 s
Durability (C-O cycles)		mechanical	
		electrical	AC
			415 V In

#### Protection

Add-on earth-leakage protection	By Vigi module
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#### Additional indication and control auxiliaries

Indication contacts	
Voltage releases	MX shunt release
	MN undervoltage release

#### Installation/connections

Dimensions (mm)	fixed, front connections	3P
W x H x D		4P
Weight (kg)	fixed, front connections	3P
		4P



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