

Low Voltage Circuit Breaker 1 to 1600A



Compact NS 800 to 1600



Compact NSX 400/630



Easypact CVS 400/630



Easypact CVS 160/250



Easypact EZC 100



Compact NSX 100 /160/250



Acti 9

> Safe

> Reliable

> Simple

Low Voltage Circuit Breakers 1 to 1600 A

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Selection table

-Acti 9

Selection guide

Circuit breakers

Type		iK60N	IC60N
			
Standard		IEC/EN 60898-1	IEC/EN 60947-2, 60898-1
Quality label		Country approval pictogram	Country approval pictogram
Number of poles		1P 2, 3P	1P 2, 3P
Add-on residual current devices (Vigi)		—	■
Auxiliaries for remote tripping and indication		—	■
Electrical characteristics			
Curves		C	C, D
Ratings (A)	In	6 to 32	1 to 63 (1 to 63 in DC)
Maximum operational voltage (V)	Ue	AC (50/60 Hz)	230/400
	max	DC	240/415, 440
Minimum operational voltage (V)	Ue	AC (50/60 Hz)	—
	min	DC	250
Insulation voltage (V AC)	Ui	—	12
			12
Rated impulse withstand voltage (kV)		400	500
Uimp		4	6
Limitation class 40 A (EN 60898)		3	3
Breaking capacity			
IEC/EN 60898 (A)	Icn	240/415 V - 230/400 V	6000 6000 6000 6000
AC-Breaking capacity		Ue (50/60 Hz)	1P 2, 3P 1P 2, 3P
Ratings (A)	In	6 to 32	1 to 4 A 6 to 63 A 1 to 4 A 6 to 63 A
IEC 60947-2 (kA)	Icu	12...60 V	— — 50 36 — —
		12...133 V	— — — — 50 36
		100...133 V	— — 50 20 — —
		220...240 V	— — 50 10 50 20
		380...415 V	— — — — 50 10
		440 V	— — — — 25 6
	Ics	—	100 % of Icu 75 % of Icu 100 % of Icu 75 % of Icu
DC-Breaking capacity		Ue DC	
IEC 60947-2 (kA)	Icu	12...60 V (1P)	— 15
		≤ 72 V (1P)	— 10
		≤ 125 V (2P)	— 10
		≤ 180 V (3P)	— 10
		≤ 250 V (4P)	— 10
	Ics	—	100 % of Icu
Other characteristics			
Suitable for industrial isolation according to IEC/EN 60947-2		—	■
Reference temperature IEC/EN 60947-2		—	50°C
Fault tripping indication		—	Visi-trip window
Positive contact indication		—	■
Fast closing		—	■
Degree of protection	IP	Device only	IP20
		Device in modular enclosure	IP40
Insulation class II		CA901006 and CA901007	CA901002
For more detail, see module			
Accessories		—	CA907000 and CA907001
Auxiliaries		—	CA907000 and CA907002
Add-on residual current devices (Vigi)		—	CA902005

Selection guide (cont.)

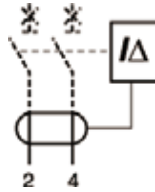
Circuit breakers

Type	C120N				
					
Standard	IEC/EN 60898-1				
Quality label	Country approval pictogram				
Number of poles					2, 3, 4P
Add-on residual current devices (Vigi)	■				
Auxiliaries for remote tripping and indication	■				
Electrical characteristics					
Curves					C
Ratings (A)	In				63 to 125
Maximum operational voltage (V)	Ue max	AC (50/60 Hz)	240/415, 440		
		DC	125 per pole		
Minimum operational voltage (V)	Ue min	AC (50/60 Hz)	12		
		DC	12		
Insulation voltage (V AC)	Ui				500
Rated impulse withstand voltage (kV)	Uimp				6
Breaking capacity					
IEC/EN 60898 (A)	Icn	230/400 V			10000
AC-Breaking capacity	Ue	(50/60 Hz)			2, 3, 4P
Ratings (A)	In				63 to 125
IEC 60947-2 (kA)	Icu	110...130 V			–
		12...130 V			–
		220...240 V			20
		380...415 V			10
		440 V			6
		500 V			–
	Ics				75 % of Icu
DC-Breaking capacity		Ue	DC		
IEC 60947-2 (kA)	Icu	12...125 V (1P)			15
		≤ 144 V (1P)			10
		≤ 250 V (2P)			10
		≤ 375 V (3P)			10
		≤ 500 V (4P)			10
	Ics				100 % of Icu
Other characteristics					
Suitable for industrial isolation according to IEC/EN 60947-2		■			
Reference temperature IEC/EN 60947-2		50°C			
Fault tripping indication		–			
Positive contact indication		■			
Fast closing		■			
Degree of protection	IP	Device only	IP20		
		Device in modular enclosure	IP40		
For more detail, see module		CA901015			
Accessories		CA907012 and CA907013			
Auxiliaries		CA907008 and CA907013			
Earth leakage module (Vigi)		CA902016			

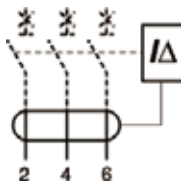
(1) Breaking capacity under 1 pole with IT isolated neutral system (case of double fault).

Vigi iC60 漏電保護模組

極數	額定電流 (A)	額定漏電動作電流 (mA)	使用電壓 (V)	產品編號
2P	25A	30mA	127/220V	A9V01225
		30mA	240/415V	A9V41225
	40A	30mA	240/415V	A9V41240
		300mA	240/415V	A9V44240
	63A	30mA	240/415V	A9V41263
		300mA	240/415V	A9V44263



3P	25A	30mA	240/415V	A9V41325
		30mA	240/415V	A9V41340
	40A	30mA	240/415V	A9V41340
		300mA	240/415V	A9V44340
	63A	30mA	240/415V	A9V41363
		300mA	240/415V	A9V44363



應用

保護線路漏電故障，並搭配 MCB 可達到過載及短路保護。

■ 30mA Vigi 模組可保護人員，防止直接接觸帶電體造成感電。

■ 300mA Vigi 模組可保護人員，防止間接接觸帶電體造成感電。

技術資料

■ Vigi iC60 漏電模組內含殘餘電流電磁機械動作方式，無須輔助電源。

□ Vigi iC60 漏電模組內含濾波裝置，可有效防止由於瞬間電壓變化。(照明或設備產生線路電壓波動...)和突波電流所引起的誤動作。

■ 額定電流：

□ Vigi iC60 漏電模組適用 63A 及 63A 以下的 iC60 系列斷路器

□ Vigi iC60 漏電模組(額定電流)選定可向下相容：
Ex. Vigi iC60 ≤ 40A 可直接搭配 Acti-9 iC60N MCB 40A 或 40A 以下。

■ 動作時間

□ 符合 IEC61008/61009

□ 跳脫時間 (Tripping time) 與漏電電流 (I_{Δn}) 關係如下：

I _{Δn}	Tripping Time
I _{Δn}	<300ms
2I _{Δn}	<150ms
5I _{Δn}	<40ms

■ 電擊防護等級 (Insulation Class) : 2 (雙重絕緣設計)

■ 重量 (g)

極數	2P	3P
	≤ 25A ≤ 63A	≤ 25A ≤ 63A
	145 165	184 210

■ 接線

□ 小於 25A：電纜最大可接至 25mm²

□ 小於 63A：電纜最大可接至 35mm²

組合示意圖

2P 斷路器

2P Vigi 模組

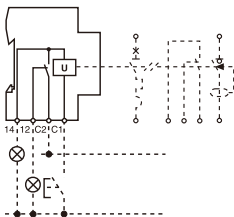
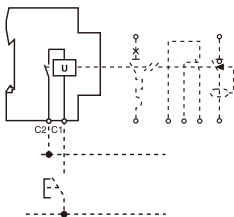
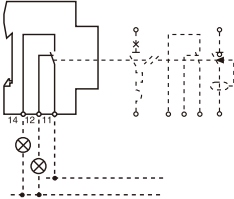
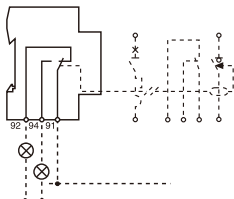


3P 斷路器

3P Vigi 模組



電氣輔助裝置

	寬度 (9mm 的倍數)	使用電壓 (V)	產品編號
 iMX+OF (分路跳脫)	2	110~415V AC	A9A26946
		110~130V DC	A9A26947
		48V AC/DC	A9A26947
		12/24V AC/DC	A9A26948
			
 iMN(欠壓跳脫)	2	瞬時跳脫	A9A26960
		220~240V AC	A9A26961
		48V AC/DC	A9A26961
		延時跳脫 	A9A26963
			
 iOF(輔助接點)	1	(NO-NC)	A9A26924
			
 iSD(警報接點)	1		A9A26927
			

遙控跳脫

一個 iMX+OF 分路跳脫或 iMN 欠壓跳脫裝置可以安裝於斷路器的左側。詳見 Page 5。

■ iMX+OF 分路跳脫：

當得到信號後斷路器立即跳脫。

☐ 符合 IEC60947-1 標準

☐ 具有一個跳脫線圈

☐ 安裝了一個輔助接點 (端子 12 和 14)，可以指示斷路器 " 開啟 " 或 " 閉合 " 的位置。

■ iMN 欠壓跳脫：

當電壓下降至額定電源 70% 和 35% 之間時斷路器跳脫，當電壓未恢復至 85% 之額定電源時，斷路器無法再閉合。

☐ 符合 IEC60947-1 標準。

☐ 應用：

- 緊急停止按鈕。
- 可防止線路上的機器馬達在沒有接到控制信號情況下再次啟動。

■ iMN 欠壓跳脫的延時跳脫

最小有效延遲斷開時間：200ms

■ 電氣輔助裝置技術資料

☐ 接點啟斷容量：

電壓 (Vac 或 Vdc)	容量 (A)
380/415 Vac	3
220/240 Vac	6
130 Vdc	1
48 Vdc	2
24 Vdc	6

☐ 跳脫機構消耗能量：

電壓 (Vac 或 Vdc)	消耗 (W/VA)
iMN/iMN 240 Vac	3.3/3.4
48 Vac	1.6
48 Vdc	1.1

- iOF 輔助接點安裝在斷路器左側，斷路器的開啟／閉合狀態可以直接經由 iOF 輔助接點引出。

☐ 符合 IEC60947-5-1

- iSD 警報接點安裝在斷路器左側，斷路器的跳脫狀態可以直接經由 iSD 警報接點引出。

☐ 符合 IEC60947-5-1

■ 接線：

電纜最大可接至 2.5 mm²X1 條

電纜最大可接至 1.5 mm²X2 條

■ 電氣輔助裝置搭配 Acti-9 iC60N：

完整適用搭配於 Acti-9 iC60N MCB 產品

Selection table

-Easypact EZC

CPB100000



EZC100-1P.

CPB100001



EZC100-2P.

CPB100002



EZC100-3P.

Easypact EZC circuit breakers

Fixed version

Plug-in version

Number of poles

Rated current (A)

In

at 40 °C

Rated insulation voltage (V)

Ui

Rated impulse withstand voltage (kV)

Uimp

Rated operational voltage (V)

Ue

AC 50/60 Hz

DC

Electrical characteristics as per IEC 60947-2, EN 60947-2, JIS C8201-2-1

Ultimate breaking capacity (kA rms)

Icu

AC 50/60 Hz 110/130 V

220/230/240 V

380 V

400/415 V

440 V

550 V

DC

125 V (1P)

250 V

(2P in series)

Rated service breaking capacity (kA rms)

Ics

% Icu

110-400 V

415-550 V

Suitability for isolation

Utilisation category

Pollution degree

Endurance (C-O cycles)

Mechanical

Electrical

In/415 V

Electrical characteristics as per NEMA-AB1

Breaking capacity (kA rms)

HIC

AC 50/60 Hz 240 V

277/480 V

Protection

Overload protection

Bimetal

Instantaneous protection

Magnetic

Fixed (±20 %)

Auxiliaries

Indication contacts

Auxiliary switch

AX

Alarm switch

AL

Combined AX + AL

AXAL

Voltage releases

Shunt trip release

SHT

Undervoltage release

UVR

Installation

Connection

Crimp lugs/bars

Accessories

Box lugs for bare cables

Rotary handles

Direct

Extended

Terminal extensions

Spreaders

Phase barriers

Terminal shields

Padlocking system

DIN rail adaptor

Dimension and weight

Dimensions (mm)

D x H

W

Weight (kg)

	EYC100B	EYC100F	EYC100N	EYC100H	
	■	■	■	■	■
	■	■	■ ⁽⁴⁾	-	■ ⁽⁴⁾
	3	3	3	1	2-3
	15, 16, 20, 25, 30, 32, 40, 45, 50, 60	15, 16, 20, 25, 30, 32, 40, 45, 50, 60, 63, 75, 80, 100	15, 16, 20, 25, 30, 32, 40, 45, 50, 60, 63, 75, 80, 100	15, 16, 20, 25, 30, 32, 40, 45, 50, 60, 63, 75, 80, 100	15, 16, 20, 25, 30, 32, 40, 45, 50, 60, 63, 75, 80, 100
	690	690	690	690	690
	6	6	6	6	6
	550	550	550	415	550
	-	250	250	125	250
	10	25	25	50	100
	10	25	25	25	100 ⁽¹⁾
	7.5	10	18	5	30
	7.5	10	15	5	30
	5	7.5	10	-	20
	2.5	5	5	-	10
	-	5	5	10	10
	-	5	5	-	10
	25 %	50 %	50 %	50 %	50 %
	25 %	50 %	50 %	50 %	25 %
	■	■	■	■	■
	A	A	A	A	A
	3	3	3	3	3
	8 500	8 500	8 500	8 500	8 500
	1 500	1 500	1 500	1 500	1 500
	-	-	25	18	100
	-	-	10	18 ⁽²⁾	18 ⁽³⁾
	fixed	fixed	fixed	fixed	fixed
	fixed	fixed	fixed	fixed	fixed
	■	■	-	■	-
	■	■	-	■	-
	■	■	-	■	-
	■	■	-	■	-
	■	■	-	■	-
	■	■	■	■	■
	■	■	■	■	■
	■	■	-	■	■ ⁽³⁾
	■	■	-	■	■ ⁽³⁾
	-	-	-	-	-
	■	■	-	■	-
	■	■	■	■	■
	■	■	-	■	■ ⁽³⁾
	■	■	■	■	■
	■	■	■	■	■
	60 x 130	60 x 130	60 x 130	60 x 130	60 x 130
	75	75	75 (3P)	25	50 (2P) 75 (3P)
	0.78	0.78	0.78 (3P)	0.28	0.6 (2P) 0.78 (3P)

(1) 50 kA for 2 poles.
(2) For 277 V only.
(3) For 3 and 4 poles only.
(4) For 3P only.

Selection table

-Easypact CVS

PS106447



Easyact CVS160/250

PS106448



Easyact 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
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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 ²

CVS160	CVS250	CVS400	CVS630
160	250	400	630
3, 4	3, 4	3, 4	3, 4
F	B F	F N	F N
70	40 70	40 70	40 70
36	25 36	36 50	36 50
36	20 36	30 42	30 42
70	40 70	40 70	40 70
36	25 36	36 50	36 50
18	15 18	23 32	23 32
25000	20000	15000	15000
25000	20000	12000	8000
12000	10000	6000	4000
■	■	■	■
■	■	■	■
-	-	■	■
-	-	■	■
■	■	■	■
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	185 x 255 x 110	185 x 255 x 110
1.8	2.0	4.7	5.2
2.3	2.6	6.3	7.1
35/45 mm	35/45 mm	45/52.5 mm	45/52.5 mm
		45/70 mm	45/70 mm
300	300	4 x 240	4 x 240

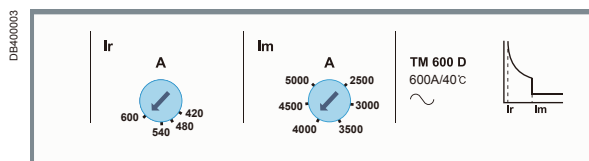
Protection of distribution systems

Easypact CVS

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 (I_r)

Thermal protection operates according to:

- I_r 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 (I_m)

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

- TM-D: fixed pick-up, I_m , for 16 to 250 A ratings and adjustable from 5 to 10 x I_n for 400 A ratings, 4.2 to 8.3 x I_n for 600 A rating.

Protection versions

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

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

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

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

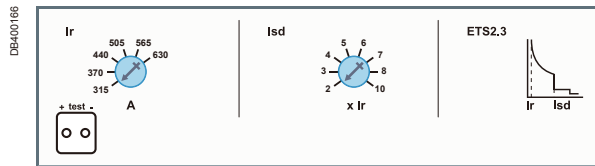
Protection of distribution systems

Easypact CVS

Easypact
CVS

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 _{sd} = Ir x ...	2...10 adj, 8 settings	
accuracy ± 15 %		fixed	
Time delay (ms)		≤ 40	
	max. resettable time	≤ 60	
	max. break time		
Short-circuit protection (instantaneous)			
Pick-up (A)	Ii = 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.

Selection table

-Compact NSX 100 to 250A



Compact NSX100/160/250.

Common characteristics

Rated voltages			
Insulation voltage (V)	Ui		800
Impulse withstand voltage (kV)	Uimp		8
Operational voltage (V)	Ue	AC 50/60 Hz	690
Suitability for isolation		IEC/EN 60947-2	yes
Utilisation category			A
Pollution degree		IEC 60664-1	3

Circuit breakers

Breaking capacity levels

Electrical characteristics as per IEC 60947-2

Rated current (A)	In	40 °C	
Number of poles			
Breaking capacity (kA rms)			
	Icu	AC 50/60 Hz	220/240 V 380/415 V 440 V 500 V 525 V 660/690 V
Service breaking capacity (kA rms)			
	Ics	AC 50/60 Hz	220/240 V 380/415 V 440 V 500 V 525 V 660/690 V
Durability (C-O cycles)			
		Mechanical	
		Electrical	440 V In/2 690 V In/2 In

Characteristics as per Nema AB1

Breaking capacity (kA rms)	AC 50/60 Hz	240 V 480 V 600 V
----------------------------	-------------	-------------------------

Characteristics as per UL 508

Breaking capacity (kA rms)	AC 50/60 Hz	240 V 480 V 600 V
----------------------------	-------------	-------------------------

Protection and measurements

Short-circuit protection	Magnetic only
Overload / short-circuit protection	Thermal magnetic Electronic
	with neutral protection (Off-0.5-1-OSN) ⁽¹⁾
	with ground-fault protection
	with zone selective interlocking (ZSI) ⁽²⁾
Display / I, U, f, P, E, THD measurements / interrupted-current measurement	
Options	Power Meter display on door Operating assistance Counters Histories and alarms Metering Com Device status/control Com
Earth-leakage protection	By Vigi module ⁽³⁾ By Vigirex relay

Installation / connections

Dimensions and weights

Dimensions (mm) W x H x D	Fixed, front connections	2/3P 4P
Weight (kg)	Fixed, front connections	2/3P 4P

Connections

Connection terminals	Pitch	With/without spreaders
Large Cu or Al cables	Cross-section	mm²

⁽¹⁾ OSN: Over Sized Neutral protection for neutrals carrying high currents (e.g. 3rd harmonics).

⁽²⁾ ZSI: Zone Selective Interlocking using pilot wires.

⁽³⁾ Vigi module is not available for breaking capacity levels HB1/HB2.

⁽⁴⁾ There is no 160 A frame, use 250 A frame with lower amperage trip units for R, HB1, HB2.

Common characteristics

Control

Manual	With toggle	■
	With direct or extended rotary handle	■
Electrical	With remote control	■

Versions

Fixed		■
Withdrawable	Plug-in base	■
	Chassis	■

NSX100

N H L

NSX160

N H L

NSX250

N H L

100

2⁽⁵⁾, 3, 4

90 100 150
50 70 150
50 65 130
36 50 70
35 35 50
10 10 20

90 100 150
50 70 150
50 65 130
36 50 70
35 35 50
10 10 20

50000

50000

30000

20000

10000

90 100 150
50 65 130
20 35 50

85 85 -
50 65 -
10 10 -

■

■

■

■

■

■

■

■

■

■

■

■

■

■

■

105 x 161 x 86

140 x 161 x 86

2.05

2.4

35/45 mm

300

160

2⁽⁵⁾, 3, 4

90 100 150
50 70 150
50 65 130
36 50 70
35 35 50
10 10 20

90 100 150
50 70 150
50 65 130
36 50 70
35 35 50
10 10 20

40000

40000

20000

15000

7500

90 100 150
50 65 130
20 35 50

85 85 -
50 65 -
10 10 -

■

■

■

■

■

■

■

■

■

■

■

■

■

■

■

105 x 161 x 86

140 x 161 x 86

2.2

2.6

35/45 mm

300

250

2⁽⁵⁾, 3, 4

90 100 150
50 70 150
50 65 130
36 50 70
35 35 50
10 10 20

90 100 150
50 70 150
50 65 130
36 50 70
35 35 50
10 10 20

20000

20000

10000

10000

5000

90 100 150
50 65 130
20 35 50

85 85 -
50 65 -
15 15 -

■

■

■

■

■

■

■

■

■

■

■

■

■

■

■

105 x 161 x 86

140 x 161 x 86

2.4

2.8

35/45 mm

300

Selection table

-Compact NSX 400 to 630A

PR108106.eps



Compact NSX400/630

Common characteristics

Rated voltages			
Insulation voltage (V)	Ui		800
Impulse withstand voltage (kV)	Uimp		8
Operational voltage (V)	Ue	AC 50/60 Hz	690
Suitability for isolation		IEC/EN 60947-2	yes
Utilisation category			A
Pollution degree		IEC 60664-1	3

Circuit breakers

Breaking capacity levels

Electrical characteristics as per IEC 60947-2

Rated current (A)	In	40 °C	
Number of poles			
Breaking capacity (kA rms)			
	Icu	AC 50/60 Hz	220/240 V 380/415 V 440 V 500 V 525 V 660/690 V
Service breaking capacity (kA rms)			
	Ics	AC 50/60 Hz	220/240 V 380/415 V 440 V 500 V 525 V 660/690 V
Durability (C-O cycles)		Mechanical	
		Electrical	440 V In/2 690 V In/2 In

Characteristics as per Nema AB1

Breaking capacity (kA rms)	AC 50/60 Hz	240 V 480 V 600 V
----------------------------	-------------	-------------------------

Characteristics as per UL 508

Breaking capacity (kA rms)	AC 50/60 Hz	240 V 480 V 600 V
----------------------------	-------------	-------------------------

Protection and measurements

Short-circuit protection	Magnetic only
Overload / short-circuit protection	Thermal magnetic
	Electronic
	with neutral protection (Off-0.5-1-OSN) ⁽¹⁾
	with ground-fault protection
	with zone selective interlocking (ZSI) ⁽²⁾
Display / I, U, f, P, E, THD measurements / interrupted-current measurement	
Options	Power Meter display on door
	Operating assistance
	Counters
	Histories and alarms
	Metering Com
	Device status/control Com
Earth-leakage protection	By Vigi module ⁽³⁾
	By Vigirex relay

Installation / connections

Dimensions and weights

Dimensions (mm)	Fixed, front connections	2/3P 4P
W x H x D		
Weight (kg)	Fixed, front connections	2/3P 4P

Connections

Connection terminals	Pitch	With/without spreaders
Large Cu or Al cables	Cross-section	mm ²

⁽¹⁾ OSN: Over Sized Neutral protection for neutrals carrying high currents (e.g. 3rd harmonics).

⁽²⁾ ZSI: Zone Selective Interlocking using pilot wires.

⁽³⁾ Vigi module is not available for breaking capacity levels HB1/HB2.

Common characteristics

Control

Manual	With toggle	■
	With direct or extended rotary handle	■
Electrical	With remote control	■

Versions

Fixed		■
Withdrawable	Plug-in base	■
	Chassis	■

NSX400			NSX630		
N	H	L	N	H	L
400			630		
3, 4			3, 4		
85	100	150	85	100	150
50	70	150	50	70	150
42	65	130	42	65	130
30	50	70	30	50	70
22	35	50	22	35	50
10	20	35	10	20	35
85	100	150	85	100	150
50	70	150	50	70	150
42	65	130	42	65	130
30	50	70	30	50	70
11	11	12	11	11	12
10	10	12	10	10	12
15000			15000		
12000			8000		
6000			4000		
6000			6000		
3000			2000		
85	100	150	85	100	150
42	65	130	42	65	130
20	35	50	20	35	50
85	85	-	85	85	-
50	65	-	50	65	-
10	20	-	20	20	-
■			■		
-			-		
■			■		
■			■		
■			■		
■			■		
■			■		
■			■		
■			■		
■			■		
■			■		
■			■		
■			■		
■			■		
140 x 255 x 110			140 x 255 x 110		
185 x 255 x 110			185 x 255 x 110		
6.05			6.2		
7.90			8.13		
45/52.5 mm			45/52.5 mm		
45/70 mm			45/70 mm		
4 x 240			4 x 240		

Protection of distribution systems

-Compact NSX

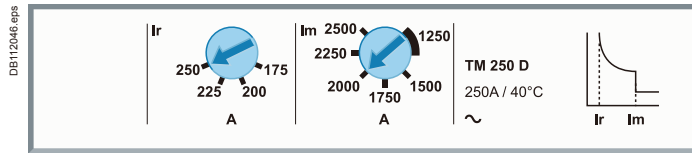
TM thermal-magnetic and MA magnetic trip units

TM thermal-magnetic and MA magnetic trip units can be used on Compact NSX100/160/250 circuit breakers with performance levels B/F/H/N/S/L.

TM trip units are available in 2 versions:

- TM-D, for the protection of distribution cables
 - TM-G, with a low threshold, for the protection of generators or long cable lengths.
- Vigi modules or Vigirex relays can be added to all the circuit breakers to provide external earth-leakage protection.

TM-D and TM-G thermal-magnetic trip units



Circuit breakers equipped with thermal-magnetic trip units are used mainly in industrial and commercial electrical distribution applications:

- TM-D, for protection of cables on distribution systems supplied by transformers
- TM-G, with a low pick-up for generators (lower short-circuit currents than with transformers) and distribution systems with long cable lengths (fault currents limited by the impedance of the cable).

Protection.....



Thermal protection (Ir)

Thermal overload protection based on a bimetal strip providing an inverse time curve I^2t , corresponding to a temperature rise limit. Above this limit, the deformation of the strip trips the circuit breaker operating mechanism.

This 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, defined to ensure protection of the cables.

Magnetic protection (Im)

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

- TM-D: fixed pick-up, I_m , for 16 to 160 A ratings and adjustable from 5 to 10 x I_n for 200 and 250 A ratings
- fixed pick-up for 16 to 63 A ratings.

Protection against insulation faults

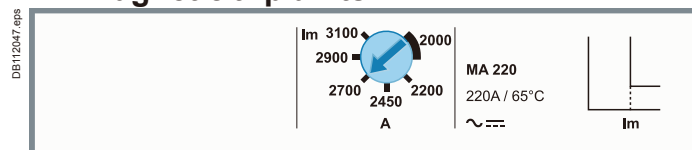
Two solutions are possible by adding:

- a Vigi module acting directly on the trip unit of the circuit breaker
- a Vigirex relay connected to an MN or MX voltage release.

Protection versions

- 3-pole:
 - 3P 3D: 3-pole frame (3P) with detection on all 3 poles (3D)
 - 3P 2D: 3-pole frame (3P) with detection on 2 poles (2D).
- 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).

MA magnetic trip units



In distribution applications, circuit breakers equipped with MA magnetic-only trip units are used for:

- short-circuit protection of secondary windings of LV/LV transformers with overload protection on the primary side.
- as an alternative to a switch-disconnector at the head of a switchboard in order to provide short-circuit protection.

Their main use is however for motor protection applications, in conjunction with a thermal relay and a contactor or motor starter (see "Motor protection", [page A-38](#)).

Protection.....



Magnetic protection (Im)

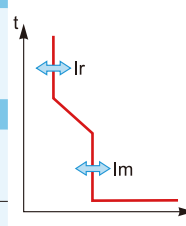
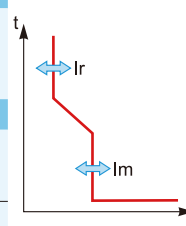
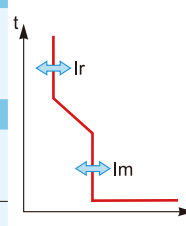
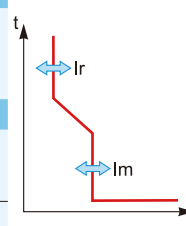
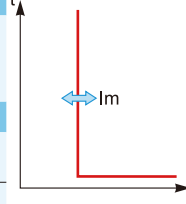
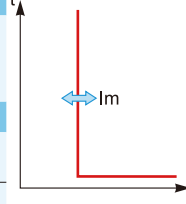
Short-circuit protection with an adjustable pick-up I_m that initiates instantaneous tripping if exceeded.

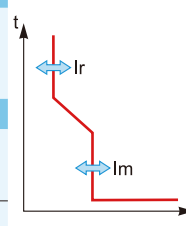
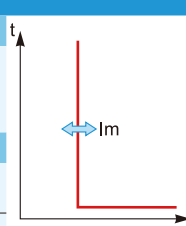
- **$I_m = I_n \times \dots$** set in amps on an adjustment dial  covering the range 6 to 14 x I_n for 2.5 to 100 A ratings or 9 to 14 I_n for 150 to 220 A ratings.

Protection versions

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

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

Thermal-magnetic trip units		TM16D to 250D													
Ratings (A)	In at 40 °C ⁽¹⁾	16	25	32	40	50	63	80	100	125	160	200	250		
Circuit breaker	Compact NSX100	■	■	■	■	■	■	■	■	-	-	-	-		
	Compact NSX160	-	-	■	■	■	■	■	■	■	■	-	-		
	Compact NSX250	-	-	-	-	-	■	■	■	■	■	■	■		
Thermal protection															
Pick-up (A) tripping between 1.05 and 1.20 Ir	$I_r = I_n \times \dots$	adjustable in amps from 0.7 to 1 x In													
Time delay (s)	t_r tr at 1.5 x In tr at 6 x Ir	non-adjustable 120 to 400 15													
Magnetic protection															
Pick-up (A) accuracy ±20 %	I_m	fixed										adjustable			
	Compact NSX100	190	300	400	500	500	500	640	800			5 to 10xIn			
	Compact NSX160/250	190	300	400	500	500	500	640	800	1250	1250				
Time delay	t_m	fixed													
Neutral protection															
Unprotected neutral	4P 3D	no detection													
Fully protected neutral	4P 4D	1 x Ir													
Magnetic trip units		MA 2.5 to 220													
Ratings (A)	In at 65 °C	2.5	6.3	12.5	25	50	100	150	220						
Circuit breaker	Compact NSX100	■	■	■	■	■	■	-	-						
	Compact NSX160	-	-	-	■	■	■	■	-						
	Compact NSX250	-	-	-	-	-	■	■	■						
Instantaneous magnetic protection															
Pick-up (A) accuracy ±20 %	$I_m = I_n \times \dots$	adjustable in amps from 6 to 14 x In (9 settings)													
Time delay (ms)	t_m	none													

Thermal-magnetic trip units		TM16G to 250G											
Ratings (A)	In at 40 °C ⁽¹⁾	16	25	40	63	80	100	125	160	200	250		
Circuit breaker	Compact NSX100	■	■	■	■	□	□						
	Compact NSX160	-	■	■	■	□	□	□	□				
	Compact NSX250	-	-	-	-				□	□	□		
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											
Time delay (s)	tr tr at 1.5 x In tr at 6 x Ir	non-adjustable 120 to 400 -											
Magnetic protection													
Pick-up (A) accuracy ±20 %	Im Compact NSX100 Compact NSX160 Compact NSX250	fixed 64 80 80 125 - 80 80 125 - - - -											
Time delay	tm	fixed											
Neutral protection													
Unprotected neutral	4P 3D	no 4P 3D version											
Fully protected neutral	4P 4D	1 x Ir											
Magnetic trip units		MA 2.5 to 220											
Ratings (A)	In at 65 °C	2.5	6.3	12.5	25	50	100	150	220				
Circuit breaker	Compact NSX100	■	■	■	■	■	■	-	-				
	Compact NSX160	-	-	-	■	■	■	■	-				
	Compact NSX250	-	-	-	-	-	■	■	■				
Instantaneous magnetic protection													
Pick-up (A) accuracy ±20 %	Im = In x ...	adjustable in amps from 9 to 14 x In											
Time delay (ms)	tm	none											

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

(□) New: available october 2013.

Protection of distribution systems

-Compact NSX

Micrologic 2 and 1.3 M trip units

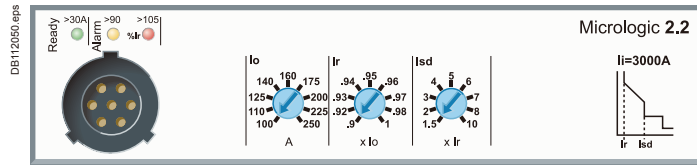
Micrologic 2 trip units can be used on Compact NSX100 to 630 circuit breakers with performance levels B/F/H/N/S/L.

They provide:

- standard protection of distribution cables
- indication of:
 - overloads (via LEDs)
 - overload tripping (via the SDx relay module).

Circuit breakers equipped with Micrologic 1.3 M trip units, without thermal protection, are used in certain applications to replace switch-disconnectors at the head of switchboards. Micrologic 1.3 M trip units are dedicated to Compact NSX400/630 A circuit breakers.

Micrologic 2



Circuit breakers equipped with Micrologic 2 trip units can be used to protect distribution systems supplied by transformers. For generators and long cables, Micrologic 2 G trip units offer better suited low pick-up solutions (see page A-52).

Protection

Settings are made using the adjustment dials with fine adjustment possibilities.

Overloads: Long time protection (I_r)

Inverse time protection against overloads with an adjustable current pick-up I_r set using a dial and a non-adjustable time delay t_r .

Short-circuits: Short-time protection with fixed time delay (I_{sd})

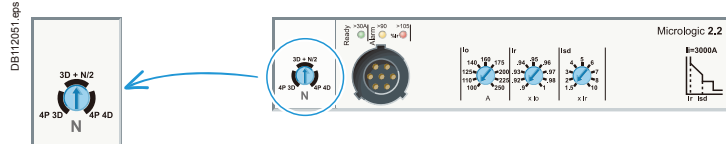
Protection with an adjustable pick-up I_{sd} . Tripping takes place after a very short delay used to allow discrimination with the downstream device.

Short-circuits: Non-adjustable instantaneous protection

Instantaneous short-circuit protection with a fixed pick-up.

Neutral protection

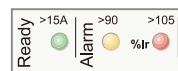
- On 3-pole circuit breakers, neutral protection is not possible.
- On four-pole circuit breakers, neutral protection may be set using a three-position switch:
 - 4P 3D: neutral unprotected
 - 4P 3D + N/2: neutral protection at half the value of the phase pick-up, i.e. $0.5 \times I_r$
 - 4P 4D: neutral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



Indications

Front indications

- Green "Ready" LED: flashes slowly when the circuit breaker is ready to trip in the event of a fault.
- Orange overload pre-alarm LED: steady on when $I > 90\% I_r$.
- Red overload LED: steady on when $I > 105\% I_r$.

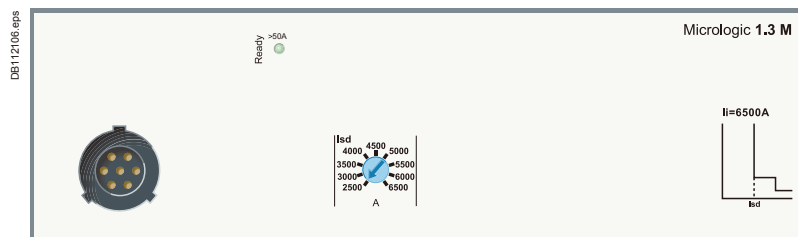


Remote indications

An overload trip signal can be remoted by installing an SDx relay module inside the circuit breaker.

This module receives the signal from the Micrologic electronic trip unit via an optical link and makes it available on the terminal block. The signal is cleared when the circuit breaker is reclosed. For description, see page A-83.

Micrologic 1.3 M for magnetic protection only



Micrologic 1.3 M trip units provide magnetic protection only, using electronic technology. They are dedicated to 400/630 A 3-pole (3P 3D) circuit breakers or 4-pole circuit breakers with detection on 3 poles (4P, 3D) and are used in certain applications to replace switch-disconnectors at the head of switchboards. They are especially used in 3-pole versions for motor protection, see page A-42.



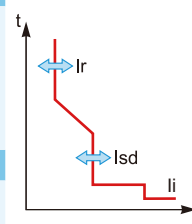
SDx remote indication relay module with its terminal block.

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

Micrologic 2

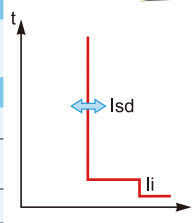
Ratings (A)	In at 40 °C ⁽¹⁾	40	100	160	250	400	630					
Circuit breaker	Compact NSX100	■	■	-	-	-	-					
	Compact NSX160	■	■	■	-	-	-					
	Compact NSX250	■	■	■	■	-	-					
	Compact NSX400	-	-	-	■	■	-					
	Compact NSX630	-	-	-	■	■	■					
L Long-time protection												
Pick-up (A)	lo	value depending on trip unit rating (In) and setting on dial										
tripping between 1.05 and 1.20 Ir	In = 40 A	lo =	18	18	20	23	25	28	32	36	40	
	In = 100 A	lo =	40	45	50	55	63	70	80	90	100	
	In = 160 A	lo =	63	70	80	90	100	110	125	150	160	
	In = 250 A (NSX250)	lo =	100	110	125	140	160	175	200	225	250	
	In = 250 A (NSX400)	lo =	70	100	125	140	160	175	200	225	250	
	In = 400 A	lo =	160	180	200	230	250	280	320	360	400	
	In = 630 A	lo =	250	280	320	350	400	450	500	570	630	
Ir = lo x ...		9 fine adjustment settings from 0.9 to 1 (0.9 - 0.92 - 0.93 - 0.94 - 0.95 - 0.96 - 0.97 - 0.98 - 1) for each value of lo										
Time delay (s) accuracy 0 to -20%	tr	non-adjustable										
		1.5 x Ir	400									
		6 x Ir	16									
		7.2 x Ir	11									
Thermal memory		20 minutes before and after tripping										
S ₀ Short-time protection with fixed time delay												
Pick-up (A) accuracy ±10 %	Isd = Ir x ...	1.5	2	3	4	5	6	7	8	10		
Time delay (ms)	tsd	non-adjustable										
	Non-tripping time	20										
	Maximum break time	80										
I Instantaneous protection												
Pick-up (A) accuracy ±15 %	li non-adjustable	600	1500	2400	3000	4800	6900					
	Non-tripping time	10 ms										
	Maximum break time	50 ms for I > 1.5 li										

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



Micrologic 1.3 M

Micrologic 2.0			
Ratings (A)	In at 65 °C	320	500
Circuit breaker	Compact NSX400	■	-
	Compact NSX630	■	■
S Short time protection			
Pick-up (A) accuracy ±15 %	Isd	adjustable directly in amps	
		9 settings: 1600, 1920, 2440, 2560, 2880, 3200, 3520, 3840, 4160 A	9 settings: 2500, 3000, 3500, 4000, 4500, 5000, 5500, 6000, 6500 A
Time delay (ms)	tsd	non-adjustable	
	Non-tripping time	10	
	Maximum break time	60	
I Instantaneous protection			
Pick-up (A) accuracy ±15 %	li non-adjustable	4800	6500
	Non-tripping time	0	
	Maximum break time	30 ms	

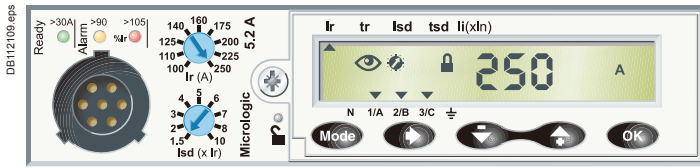


Protection of distribution systems

-Compact NSX

Micrologic 5 / 6 A or E trip units

Micrologic 5 / 6 A (Ammeter) or E (Energy) trip units can be used on Compact NSX100 to 630 circuit breakers with performance levels B/F/H/N/S/L. They all have a display unit. They offer basic LSI protection (Micrologic 5) or LSI and ground-fault protection G (Micrologic 6). They also offer measurement, alarm and communication functions.



Protection

Settings can be adjusted in two ways, using the dials and/or the keypad. The keypad can be used to make fine adjustments in 1 A steps below the maximum value defined by the setting on the dial. Access to setting modifications via the keypad is protected by a locking function displayed on the screen and controlled by a microswitch. The lock is activated automatically if the keypad is not used for 5 minutes. Access to the microswitch is protected by a transparent lead-sealable cover. With the cover closed, it is still possible to display the various settings and measurements using the keypad.

Overloads: Long time protection (Ir)

Inverse time protection against overloads with an adjustable current pick-up **Ir** set using a dial or the keypad for fine adjustments. The time delay **tr** is set using the keypad.

Short-circuits: Short-time protection (I_{sd})

Short-circuit protection with an adjustable pick-up **I_{sd}** and adjustable time delay **tsd**, with the possibility of including a portion of an inverse time curve (I²t On).

Short-circuits: Instantaneous protection (Ii)

Instantaneous protection with adjustable pick-up **Ii**.

Additional ground fault protection (Ig) on Micrologic 6

Residual type ground-fault protection with an adjustable pick-up **Ig** (with Off position) and adjustable time delay **tg**. Possibility of including a portion of an inverse time curve (I²t On).

Neutral protection

■ On 4-pole circuit breakers, this protection can be set via the keypad:

- Off: neutral unprotected
- 0.5: neutral protection at half the value of the phase pick-up, i.e. $0.5 \times I_r$
- 1.0: neutral fully protected at I_r
- OSN: Oversized neutral protection at 1.6 times the value of the phase pick-up.

Used when there is a high level of 3rd order harmonics (or orders that are multiples of 3) that accumulate in the neutral and create a high current. In this case, the device must be limited to $I_r = 0.63 \times I_n$ for the maximum neutral protection setting of $1.6 \times I_r$.

■ With 3-pole circuit breakers, the neutral can be protected by installing an external neutral sensor with the output (T1, T2) connected to the trip unit.

Zone selective interlocking (ZSI)

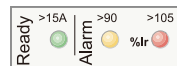
A ZSI terminal block may be used to interconnect a number of Micrologic control units to provide zone selective interlocking for short-time (I_{sd}) and ground-fault (I_g) protection, without a time delay. For Compact NSX 100 to 250, the ZSI function is available only in relation to the upstream circuit breaker (ZSI out).

Display of type of fault

On a fault trip, the type of fault (Ir, I_{sd}, Ii, Ig), the phase concerned and the interrupted current are displayed. An external power supply is required.

Indications

Front indications



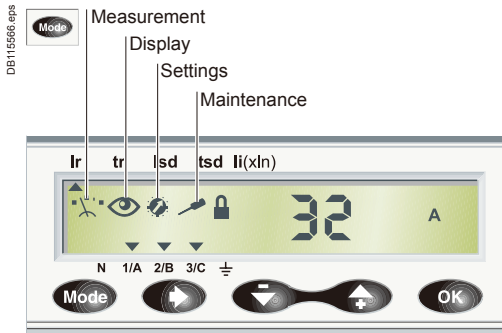
- Green "Ready" LED: flashes slowly when the circuit breaker is ready to trip in the event of a fault.
- Orange overload pre-alarm LED: steady on when $I > 90 \% I_r$.
- Red overload LED: steady on when $I > 105 \% I_r$.

Remote indications

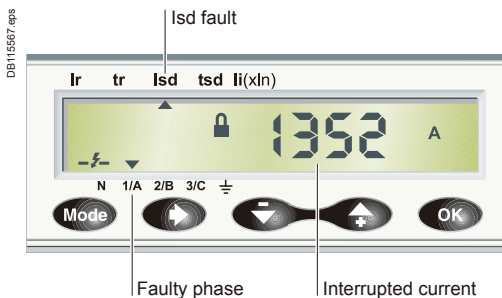
An SDx relay module installed inside the circuit breaker can be used to remote the following information:

- overload trip
 - overload prealarm (Micrologic 5) or ground fault trip (Micrologic 6).
- This module receives the signal from the Micrologic electronic trip unit via an optical link and makes it available on the terminal block. The signal is cleared when the circuit breaker is closed.

These outputs can be reprogrammed to be assigned to other types of tripping or alarm. The module is described in detail in the section dealing with accessories.



Trip unit menus.



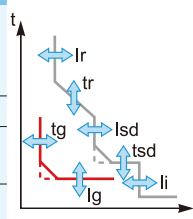
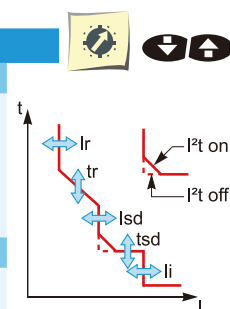
Display of interrupted current.



SDx remote indication relay module with its terminal block.

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

Protection		Micrologic 5 / 6 A or E trip units									
Ratings (A)	In at 40 °C ⁽¹⁾		40 ⁽²⁾	100	160	250	400	630			
Circuit breaker	Compact NSX100		■	■	-	-	-	-			
	Compact NSX160		■	■	■	-	-	-			
	Compact NSX250		■	■	■	■	-	-			
	Compact NSX400		-	-	-	-	■	-			
	Compact NSX630		-	-	-	-	■	■			
L Long-time protection											
Pick-up (A) tripping between 1.05 and 1.20 Ir	Ir = ...	dial setting	value depending on trip unit rating (In) and setting on dial								
		In = 40 A Io =	18	18	20	23	25	28	32	36	40
		In = 100 A Io =	40	45	50	55	63	70	80	90	100
		In = 160 A Io =	63	70	80	90	100	110	125	150	160
		In = 250 A Io =	100	110	125	140	160	175	200	225	250
		In = 400 A Io =	160	180	200	230	250	280	320	360	400
		In = 630 A Io =	250	280	320	350	400	450	500	570	630
		keypad setting	Fine adjustment in 1 A steps below maximum value set on dial								
Time delay (s) accuracy 0 to -20 %	tr = ...	keypad setting	0.5	1	2	4	8	16			
		1.5 x Ir	15	25	50	100	200	400			
		6 x Ir	0.5	1	2	4	8	16			
		7.2 x Ir	0.35	0.7	1.4	2.8	5.5	11			
Thermal memory	20 minutes before and after tripping										
S Short-time protection with adjustable time delay											
Pick-up (A) accuracy ±10 %	Isd = Ir x ...	dial setting for Micrologic 5	1.5	2	3	4	5	6	7	8	10
		keypad settings for micrologic 6	Adjustment in steps of 0.5 x In over the range 1.5 x In to: 15 x In (40 to 160 A), 12 x In (250 to 400 A) or 11 x In (630 A)								
Time delay (s)	tsd = ...	keypad setting	I ² Off	0	0.1	0.2	0.3	0.4			
			I ² On	-	0.1	0.2	0.3	0.4			
	Non-tripping time (ms)			20	80	140	230	350			
	Maximum break time (ms)			80	140	200	320	500			
I Instantaneous protection											
Pick-up (A) accuracy ±15 %	Ii = In x	keypad setting	Adjustment in steps of 0.5 x In over the range 1.5 x In to: 15 x In (40 to 160 A), 12 x In (250 to 400 A) or 11 x In (630 A)								
	Non-tripping time		10 ms								
	Maximum break time		50 ms for I > Ii								
G Ground-fault protection - for Micrologic 6 A or E											
Pick-up (A) accuracy ±10 %	Ig = In x	dial setting									
		In = 40 A	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1	Off
		In > 40 A	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1	Off
			Fine adjustment in 0.05 A steps using the keypad								
Time delay (s)	tg = ...	keypad setting	I ² Off	0	0.1	0.2	0.3	0.4			
			I ² On	-	0.1	0.2	0.3	0.4			
	Non-tripping time (ms)			20	80	140	230	350			
	Maximum break time (ms)			80	140	200	320	500			
Test	Iq function		built-in								



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

(2) For 40 A rating, the neutral N/2 adjustment is not possible.

Protection of distribution systems -Compact NSX

Micrologic 5 / 6 A or E trip units Power Meter functions

In addition to protection functions, Micrologic 5 / 6 trip units offer all the functions of Power Meter products as well as operating-assistance for the circuit breaker.

- display of settings
- measurement functions:
 - Ammeter (A)
 - Energy (E)
- alarms
- time-stamped histories and event tables
- maintenance indicator
- communication
- Refer to: user manual "ULP system" TRV99101.

PG10305 eps



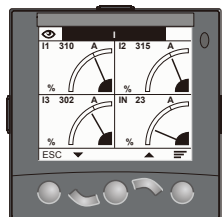
Micrologic built-in LCD display showing an energy measurement.

DB12591 eps



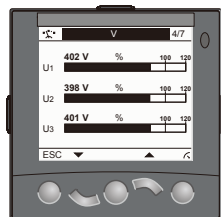
FDM121 display: navigation.

DB112131 eps



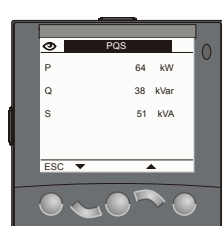
Current.

DB112132 eps



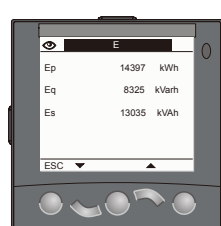
Voltage.

DB112133 eps



Power.

DB112134 eps



Consumption.

Examples of measurement screens on the FDM121 display unit.

Micrologic A and E measurement functions are made possible by Micrologic intelligence and the accuracy of the sensors. They are handled by a microprocessor that operates independent of protection functions.

Display



Micrologic LCD

The user can display all the protection settings and the main measurements on the LCD screen of the trip unit.

- Micrologic A: instantaneous rms current measurements.
- Micrologic E: voltage, frequency and power measurements and energy metering, in addition to the measurements offered by Micrologic A

To make the display available under all conditions and increase operating comfort, an external power supply is recommended for Micrologic A.

It is indispensable to:

- display faults and interrupted current measurements
- use all the functions of Micrologic E (e.g. metering of low power and energy values)
- ensure operation of the communication system.

The external power supply can be shared by several devices. For description, see page A-34.

FDM121 display unit

An FDM121 switchboard display unit can be connected to a Micrologic trip unit using a prefabricated cord to display all measurements on a screen. The result is a veritable 96 x 96 mm Power Meter.

In addition to the information displayed on the Micrologic LCD, the FDM121 screen shows demand, power quality and maximeter/minimeter values along with alarms, histories and maintenance indicators.

The FMD121 display unit requires a 24 V DC power supply. The Micrologic trip unit is supplied by the same power supply via the cord connecting it to the FDM121.

PC screen

When the Micrologic, with or without an FDM121 switchboard display unit, is connected to a communication network, all information can be accessed via a PC.

Measurements



Instantaneous rms measurements

The Micrologic A and E continuously display the RMS value of the highest current of the three phases and neutral (Imax). The navigation buttons  can be used to scroll through the main measurements.

In the event of a fault trip, the current interrupted is memorised.

The Micrologic A measures phase, neutral, ground fault currents.

The Micrologic E offers voltage, frequency and power measurements in addition to the measurements provided by Micrologic A.

Maximeters / minimeters

Every instantaneous measurement provided by Micrologic A or E can be associated with a maximeter/minimeter. The maximeters for the highest current of the 3 phases and neutral, the demand current and power can be reset via the trip unit keypad, the FDM121 display unit or the communication system.

Energy metering

The Micrologic E also measures the energy consumed since the last reset of the meter. The active energy meter can be reset via the keypad and the FDM121 display unit or the communication system.

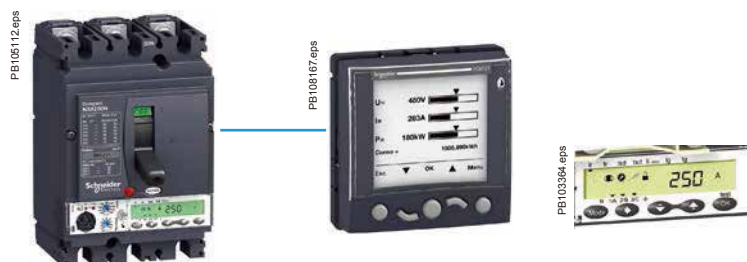
Demand and maximum demand values

Micrologic E also calculates demand current and power values. These calculations can be made using a block or sliding interval that can be set from 5 to 60 minutes in steps of 1 minute. The window can be synchronised with a signal sent via the communication system. Whatever the calculation method, the calculated values can be recovered on a PC via Modbus communication.

Ordinary spreadsheet software can be used to provide trend curves and forecasts based on this data. They will provide a basis for load shedding and reconnection operations used to adjust consumption to the subscribed power.

Power quality

Micrologic E calculates power quality indicators taking into account the presence of harmonics up to the 15th order, including the total harmonic distortion (THD) of current and voltage.



Micrologic 5 / 6 integrated Power Meter functions				Type		Display	
				A	E	Micrologic LCD	FDM121 display
Display of protection settings							
Pick-ups (A) and delays	All settings can be displayed	Ir, tr, lsd, tsd, li, lg, tg		■	■	■	-
Measurements							
Instantaneous rms measurements							
Currents (A)	Phases and neutral	I1, I2, I3, IN		■	■	■	■
	Average of phases	Iavg = (I1 + I2 + I3) / 3		■	■	-	■
	Highest current of the 3 phases and neutral	Imax of I1, I2, I3, IN		■	■	■	■
	Ground fault (Micrologic 6)	% Ig (pick-up setting)		■	■	■	■
	Current unbalance between phases	% Iavg		-	■	-	■
Voltages (V)	Phase-to-phase	U12, U23, U31		-	■	■	■
	Phase-to-neutral	V1N, V2N, V3N		-	■	■	■
	Average of phase-to-phase voltages	Uavg = (U12 + U21 + U23) / 3		-	■	-	■
	Average of phase-to-neutral voltages	Vavg = (V1N + V2N + V3N) / 3		-	■	-	■
	Ph-Ph and Ph-N voltage unbalance	% Uavg and % Vavg		-	■	-	■
	Phase sequence	1-2-3, 1-3-2		-	■	■	■
Frequency (Hz)	Power system	f		-	■	-	■
Power	Active (kW)	P, total / per phase		- / -	■ / ■	■ / -	■ / ■
	Reactive (kVAR)	Q, total / per phase		- / -	■ / ■	■ / -	■ / ■
	Apparent (kVA)	S, total / per phase		- / -	■ / ■	■ / -	■ / ■
	Power factor and cos φ (fundamental)	PF and cos φ, total and per phase		-	■	-	■
Maximeters / minimizers							
	Associated with instantaneous rms measurements	Reset via Micrologic or FDM121 display unit		■	■	-	■
Energy metering							
Energy	Active (kW), reactive (kVARh), apparent (kVAh)	Total since last reset Absolute or signed mode ⁽¹⁾		-	■	■	■
Demand and maximum demand values							
Demand current (A)	Phases and neutral	Present value on the selected window		-	■	-	■
		Maximum demand since last reset		-	■	-	■
Demand power	Active (kWh), reactive (kVAR), apparent (kVA)	Present value on the selected window		-	■	-	■
		Maximum demand since last reset		-	■	-	■
Calculation window	Sliding, fixed or com-synchronised	Adjustable from 5 to 60 minutes in 1 minute steps ⁽²⁾		-	■	-	-
Power quality							
Total harmonic distortion (%)	Of voltage with respect to rms value	THDU, THDV of the Ph-Ph and Ph-N voltage		-	■	-	■
	Of current with respect to rms value	THDI of the phase current		-	■	-	■

⁽¹⁾ Absolute mode: $E_{absolute} = E_{out} + E_{in}$; Signed mode: $E_{signed} = E_{out} - E_{in}$.

⁽²⁾ Available via the communication system only.

Additional technical characteristics

Measurement accuracy

Accuracies are those of the entire measurement system, including the sensors:

- current: Class 1 as per IEC 61557-12
- voltage: 0.5 %
- power and energy: Class 2 as per IEC 61557-12
- frequency: 0.1 %.

Protection of distribution systems -Compact NSX

Micrologic 5 / 6 A or E trip units

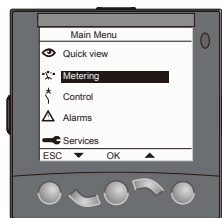
Operating-assistance functions

PB 103365.eps



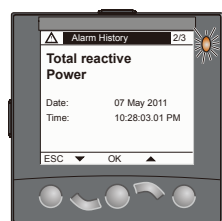
Micrologic built-in LCD display.

DB129111.eps



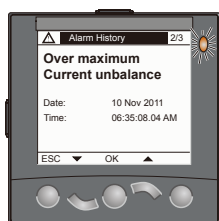
FDM121 display: navigation.

DB413152.eps



Overpower alarm.

DB413153.eps



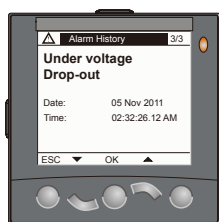
Phase unbalance alarm.

DB413154.eps



Alarm pick-up and drop-out.

DB413155.eps



Examples of operating-assistance screens on the FDM121 display unit.

Personalised alarms with time-stamping



Alarm types

The user can assign an alarm to all Micrologic A or E measurements or events:

- up to 12 alarms can be used together:
- two alarms are predefined and activated automatically:
 - Micrologic 5: overload (Ir)
 - Micrologic 6: overload (Ir) and ground fault (Ig)
- thresholds, priorities and time delays can be set for ten other alarms.
- the same measurement can be used for different alarms to precisely monitor certain values, e.g. the frequency or the voltage
- alarms can also be assigned to various states: phase lead/lag, four quadrants, phase sequence
- selection of display priorities, with pop-up possibility
- alarm time-stamping.

Alarm settings

Alarms cannot be set via the keypad or the FDM121 display unit. They are set via communication with the PC. Set-up includes the threshold, priority, activation delay before display and deactivation delay. It is also possible to reprogram the standard assignment for the two SDx relay outputs to user-selected alarms.

Alarm reading

Remote alarm indications.

- Reading on FDM121 display unit or on PC via the communication system.
- Remote indications via SDx relay with two output contacts for alarms.

Histories and event tables



Micrologic A and E have histories and event tables that are always active.

Three types of time-stamped histories

- Tripping due to overruns of Ir, Isd, li, Ig: last 17 trips
- Alarms: last 10 alarms
- Operating events: last 10 events

Each history record is stored with:

- indications in clear text in a number of user-selectable languages
- time-stamping: date and time of event
- status: pick-up / drop-out

Two types of time-stamped event tables

- Protection settings.
- Minimizers / maximizers.

Display of alarms and tables

The time-stamped histories and event tables may be displayed on a PC via the communication system.

Embedded memory

Micrologic A and E have a non-volatile memory that saves all data on alarms, histories, event tables, counters and maintenance indicators even if power is lost.

Maintenance indicators



Micrologic A and E have indicators for, among others, the number of operating cycles, contact wear and operating times (operating hours counter) of the Compact NSX circuit breaker.

It is possible to assign an alarm to the operating cycle counter to plan maintenance. The various indicators can be used together with the trip histories to analyse the level of stresses the device has been subjected to.

The information provided by the indicators cannot be displayed on the Micrologic LCD. It is displayed on the PC via the communication system.

Management of installed devices

Each circuit breaker equipped with a Micrologic 5 or 6 trip unit can be identified via the communication system:

- serial number
- firmware version
- hardware version
- device name assigned by the user.

This information together with the previously described indications provides a clear view of the installed devices.



Micrologic 5 / 6 operating assistance functions				Type		Display	
				A	E	Micrologic LCD	FDM121 display
Operating assistance							
Personalised alarms							
Settings	Up to 10 alarms assigned to all A and E measurements ⁽²⁾			■	■	-	-
	Phase lead/lag, four quadrants, phase sequence, display priority selection ⁽²⁾			-	■	-	-
Display	Alarms / tripping			■	■	- / ■	■ / ■
Remote indications	Activation of two dedicated contacts on SDx module			■	■	-	-
Time-stamped histories (ms)							
Trips (last 17)	Cause of tripping	Ir, lsd, li (Micrologic 5, 6)		■	■	-	■
		Ig (Micrologic 6)		■	■	-	■
		Phase fault		■	■	-	■
		Interrupted current value		■	■	-	■
Alarms (last 10)				■	■	-	■
Operating events (last 10)	Event types	Modification of protection setting by dial		-	■	-	■
		Opening of keypad lock		-	■	-	■
		Test via keypad		-	■	-	■
		Test via external tool		-	■	-	■
		Time setting (date and time)		-	■	-	■
		Reset for maximeter/minimeter and energy meter		■	■	-	■
Time stamping (date and time, text, status)				■	■	-	■
Time-stamped event tables							
Protection settings	Setting modified (value displayed)	Ir tr lsd tsd li Ig tg ⁽²⁾		■	■	-	-
	Time-stamping	Date and time of modification ⁽²⁾		■	■	-	-
	Previous value	Value before modification ⁽²⁾		■	■	-	-
Min/Max	Values monitored	I1 I2 I3 IN		■	■	-	■
		U12 U23 U31 f		-	■	-	■
	Time-stamping of each value	Date and time of min/max record		■	■	-	■
	Current min/max value	Min/max value		■	■	-	■
Maintenance indicators							
Counter	Mechanical cycles ⁽¹⁾	Assignable to an alarm		■	■	-	■
	Electrical cycles ⁽¹⁾	Assignable to an alarm		■	■	-	■
	Trips	One per type of trip ⁽²⁾		■	■	-	-
	Alarms	One for each type of alarm ⁽²⁾		■	■	-	-
	Hours	Total operating time (hours) ⁽²⁾		■	■	-	-
Indicator	Contact wear	%		■	■	-	■
Load profile	Hours at different load levels	% of hours in four current ranges: 0-49 % In, 50-79 % In, 80-89 % In and ≥ 90 % In		■	■	-	■

⁽¹⁾ The BSCM module (page A-29) is required for these functions.

⁽²⁾ Also available via the communication system.

Additional technical characteristics

Contact wear

Each time Compact NSX opens, the Micrologic 5 / 6 trip unit measures the interrupted current and increments the contact-wear indicator as a function of the interrupted current, according to test results stored in memory. Breaking under normal load conditions results in a very slight increment. The indicator value may be read on the FDM121 display. It provides an estimation of contact wear calculated on the basis of the cumulative forces affecting the circuit breaker. When the indicator reaches 80 %, it is advised to replace the circuit breaker to ensure the availability of the protected equipment.

Circuit breaker load profile

Micrologic 5 / 6 calculates the load profile of the circuit breaker protecting a load circuit. The profile indicates the percentage of the total operating time at four current levels (% of breaker In):

- 0 to 49 % In
- 50 to 79 % In
- 80 to 89 % In
- ≥ 90 % In.

This information can be used to optimise use of the protected equipment or to plan ahead for extensions.

Selection table

-Compact NS

PS104942.eps



Compact NS800L.

Compact circuit breakers

Number of poles

Control	manual	toggle
		direct or extended rotary handle
	electric	

Type of circuit breaker

Connections	fixed	front connection
		rear connection
		front connection with bare cables
	withdrawable (on chassis)	front connection
		rear connection

Electrical characteristics as per Nema AB1

Breaking capacity at 60 Hz (kA)	240 V
	480 V
	600 V

Electrical characteristics as per IEC 60947-2 and EN 60947-2

Rated current (A)	I_n	50 °C
		65 °C ⁽¹⁾

Rated insulation voltage (V) **U_i**

Rated impulse withstand voltage (kV) **U_{imp}**

Rated operational voltage (V) **U_e** AC 50/60 Hz

Type of circuit breaker

Ultimate breaking capacity (kA rms)	Manual	I_{cu}	AC 50/60 Hz	220/240 V
				380/415 V
				440 V
				500/525 V
				660/690 V
		I_{cs}	AC 50/60 Hz	220/240 V
				380/415 V
				440 V
	Electrical	I_{cu}	AC 50/60 Hz	500/525 V
				660/690 V
				220/240 V
		I_{cs}	AC 50/60 Hz	380/415 V
				440 V
				500/525 V

Short-time withstand current (kA rms) **I_{cw}** AC 50/60 Hz 1 s

Integrated instantaneous protection kA peak ±10 %

Suitability for isolation

Utilisation category

Durability (C-O cycles) mechanical electrical 440 V In/2 In 690 V In/2 In

Pollution degree

⁽¹⁾ 65 °C with vertical connections. See the temperature derating tables for other types of connections.

⁽²⁾ I_{cs}: 100 % I_{cu} for breaking capacity 440V/500V/660V
I_{cs}: 75 % I_{cu} for breaking capacity 220V/380V.

	NS800			NS1000			NS1250		NS1600		NS1600b
	3, 4			3, 4			3, 4		3, 4		3, 4
	■			■			■		■		■
	■			■			■		■		-
	■			■			■		■		-
	N	H	L	N	H	L	N		N		N
	■	■	■	■	■	■	■	■	■	■	■
	■	■	■	■	■	■	■	■	■	■	-
	■	■	-	■	■	-	■	■	-	-	-
	■	■	■	■	■	■	■	■	■	■	-
	■	■	■	■	■	■	■	■	■	■	-
	N	H	L	N	H	L	N		N		N
	50	65	125	50	65	125	50	65	50	65	85
	35	50	100	35	50	100	35	50	35	50	65
	25	50	-	25	50	-	25	50	25	50	50
	800			1000			1250		1600		1600
	800			1000			1250		1510		1550
				800			800		800		800
				8			8		8		8
				690			690		690		690
	L			N	H	L	N		N		N
	150			85	85	150	85	85	85	85	85
	150			50	70	150	50	70	50	70	70
	130			50	65	130	50	65	50	65	65
	100			40	50	100	40	50	40	50	65
	-			30	42	-	30	42	30	42	65
	150			50	52	150	50	52	37	35	65
	150			50	52	150	50	52	37	35	52
	130			50	48	130	50	48	37	32	65
	100			40	37	100	40	37	30	25	65
	-			30	31	-	30	31	22	21	65
	150			50	70	150	50	70	50	70	-
	150			50	70	150	50	70	50	70	-
	130			50	65	130	50	65	50	65	-
	100			40	50	100	40	50	40	50	-
	-			30	42	-	30	42	30	42	-
	150			37	35	150	37	35	37	35	-
	150			37	35	150	37	35	37	35	-
	130			37	32	130	37	32	37	32	-
	100			30	25	100	30	25	30	25	-
	-			22	21	-	22	21	22	21	-
	-			19.2	19.2	-	19.2	19.2	19.2	19.2	-
	-			-	-	-	-	-	-	-	32
	-			40	40	-	40	40	40	40	130
				■			■		■		■
	A			B	B	A	B		B		B
				10000			10000		10000		5000
	4000			6000	6000	4000	5000		5000		3000
	3000			5000	5000	3000	4000		2000		2000
	3000			4000	4000	3000	3000		2000		2000
	2000			2000	2000	2000	2000		1000		1000
				3			3		3		3

Protection of distribution systems -Compact NS

Micrologic 5 / 6 A or E trip units

Operating-assistance functions

All Compact circuit breakers are equipped with a Micrologic control unit that can be changed on site. Control units are designed to protect Power circuits and loads. Alarms may be programmed for remote indications.

Measurements of current, voltage, frequency, power and power quality optimise continuity of service and energy management.

Dependability

Integration of protection functions in an ASIC electronic component used in all Micrologic control units guarantees a high degree of reliability and immunity to conducted or radiated disturbances.

On Micrologic A, E and P control units, advanced functions are managed by an independent microprocessor.

Accessories

Certain functions require the addition of Micrologic control unit accessories, described on [page A-27](#).

The rules governing the various possible combinations can be found in the documentation accessible via the Products and services menu of the www.schneider-electric.com web site.

Micrologic name codes

2.0 E

X Y Z

X: type of protection

- 2 for basic protection
- 5 for selective protection
- 6 for selective + earth-fault protection
- 7 for selective + earth-leakage protection.

Y: control-unit generation

Identification of the control-unit generation.
"0" signifies the first generation.

Z: type of measurement

- A for "ammeter"
- E for "energy"
- P for "power meter"

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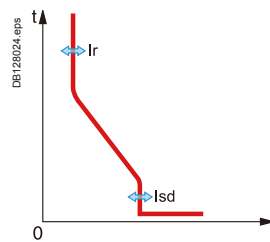


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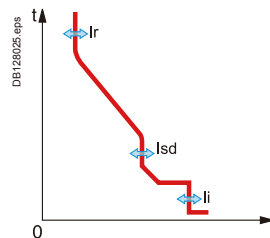
Current protection

Micrologic 2: basic protection



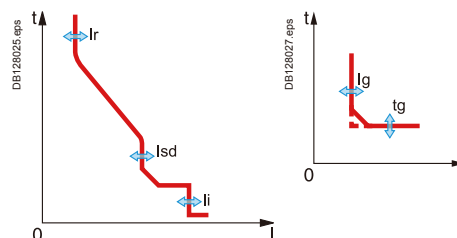
Protection:
long time
+ instantaneous

Micrologic 5: selective protection



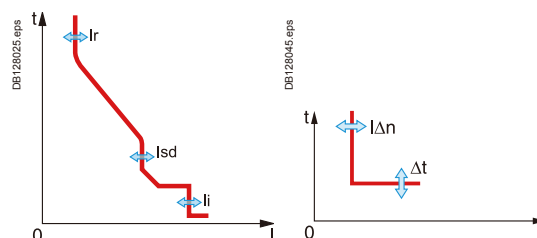
Protection:
long time
+ short time
+ instantaneous

Micrologic 6: selective + earth-fault protection



Protection:
long time
+ short time
+ instantaneous
+ earth fault

Micrologic 7: selective + earth-leakage



Protection:
long time
+ short time
+ instantaneous
+ earth leakage up to 3200A

Micrologic without measurement	Measurements and programmable protection		
	A: ammeter ■ I_1, I_2, I_3, I_N, $I_{\text{earth-fault}}$, $I_{\text{earth-leakage}}$ and maximeter for these measurements ■ fault indications ■ settings in amperes and in seconds. E: Energy ■ incorporates all the rms measurements of Micrologic A, plus voltage, power factor, power and energy metering measurements. □ calculates the current demand value □ "Quickview" function for the automatic cyclical display of the most useful values (as standard or by selection). P: A + power meter + programmable protection ■ measurements of V, A, W, VAR, VA, Wh, VARh, VAh, Hz, V_{peak}, A_{peak}, power factor and maximeters and minimeters ■ IDMTL long-time protection, minimum and maximum voltage and frequency, voltage and current imbalance, phase sequence, reverse power ■ load shedding and reconnection depending on power or current ■ measurements of interrupted currents, differentiated fault indications, maintenance indications, event histories and time-stamping, etc.		
2.0	2.0 A	2.0 E	
5.0	5.0 A	5.0 E	5.0 P
	6.0 A	6.0 E	6.0 P
	7.0 A		7.0 P

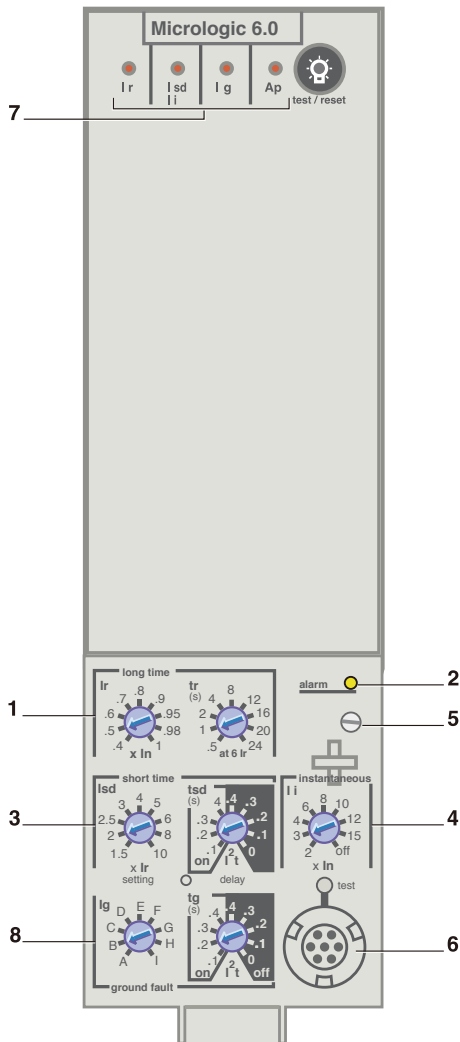
Protection of distribution systems -Compact NS

Micrologic trip units

Without measurement

Micrologic 2.0, 5.0 and 6.0 control units protect power circuits. Micrologic 5.0 and 6.0 offers time discrimination for short-circuits as well.

DB414487 eps



- 1 long-time threshold and tripping delay
- 2 overload alarm (LED)
- 3 short-time pick-up and tripping delay
- 4 instantaneous pick-up
- 5 fixing screw for long-time rating plug
- 6 test connector
- 7 indication of tripping cause
- 8 earth-leakage or earth-fault pick-up and tripping delay

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 different 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.

Earth-fault protection

Residual or source ground return earth fault protection.

Selection of I^2t type (ON or OFF) for 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 I_r (4P 3d + N/2) or neutral protection at I_r (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.

Fault indications (only for micrologic 6.0)

LEDs indicate the type of fault:

- overload (long-time protection I_r)
- short-circuit (short-time I_{sd} or instantaneous I_i protection)
- earth fault or earth leakage (I_g)
- internal fault (A_p).

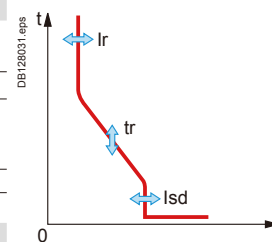
Battery power

The fault indication LEDs remain on until the test/reset button is pressed. Under normal operating conditions, the battery supplying the LEDs has a service life of approximately 10 years.

Note: Micrologic control units are equipped with a transparent lead-seal cover as standard.



Protection		Micrologic 2.0									
Long time											
Current setting (A)	$I_r = I_n \times \dots$	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 I_r		other ranges or disable by changing long-time rating plug									
Time setting		t_r (s)	0.5	1	2	4	8	12	16	20	24
Time delay (s)	accuracy: 0 to -30 %	1.5 x I_r	12.5	25	50	100	200	300	400	500	600
	accuracy: 0 to -20 %	6 x I_r	0.7 ⁽¹⁾	1	2	4	8	12	16	20	24
	accuracy: 0 to -20 %	7.2 x I_r	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									
⁽¹⁾ 0 to -40 % - ⁽²⁾ 0 to -60 %											
Instantaneous											
Pick-up (A)	$I_{sd} = I_r \times \dots$	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									



Protection			Micrologic 5.0 / 6.0										
Long time													
Current setting (A)	$I_r = I_n \times \dots$		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 I_r			Other ranges or disable by changing long-time rating plug										
Time setting		t_r (s)	0.5	1	2	4	8	12	16	20	24		
Time delay (s)	Accuracy: 0 to -30 %	1.5 x I_r	12.5	25	50	100	200	300	400	500	600		
	Accuracy: 0 to -20 %	6 x I_r	0.7 ⁽¹⁾	1	2	4	8	12	16	20	24		
	Accuracy: 0 to -20 %	7.2 x I_r	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										
(1) 0 to -40 % - (2) 0 to -60 %													
Short time													
Pick-up (A)	$I_{sd} = I_r \times \dots$		1.5	2	2.5	3	4	5	6	8	10		
Accuracy: ± 10 %													
Time setting t_{sd} (s)	Settings	I^2t Off	0	0.1	0.2	0.3	0.4						
		I^2t On	-	0.1	0.2	0.3	0.4						
Time delay (ms) at 10 x I_r (I^2t Off or I^2t On)	t_{sd} (max resettable time)		20	80	140	230	350						
	t_{sd} (max break time)		80	140	200	320	500						
Instantaneous													
Pick-up (A)	$I_i = I_n \times \dots$		2	3	4	6	8	10	12	15	off		
Accuracy: ± 10 %													
Time delay			Max resettable time: 20 ms Max break time: 50 ms										
Earth fault													
Pick-up (A)	$I_g = I_n \times \dots$		A	B	C	D	E	F	G	H	J		
	$I_n \leq 400$ A		0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1		
	$400 \text{ A} < I_n < 1250$ A		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1		
	$I_n \geq 1250$ A		500	640	720	800	880	960	1040	1120	1200		
Time setting t_g (s)	Settings	I^2t Off	0	0.1	0.2	0.3	0.4						
		I^2t On	-	0.1	0.2	0.3	0.4						
Time delay (ms)		t_g (max resettable time)	20	80	140	230	350						
		at I_n or 1200 A (I^2t Off or I^2t On)	t_g (max break time)	80	140	200	320	500					

DB I28032 eps

0

I^2t on

I^2t off

lr

tr

Isd

tsd

li

Micrologic 6.0													
Pick-up (A)	$I_g = I_n \times \dots$		A	B	C	D	E	F	G	H	J		
	$I_n \leq 400$ A		0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1		
	$400 \text{ A} < I_n < 1250$ A		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1		
	$I_n \geq 1250$ A		500	640	720	800	880	960	1040	1120	1200		
Time setting t_g (s)	Settings	I^2t Off	0	0.1	0.2	0.3	0.4						
		I^2t On	-	0.1	0.2	0.3	0.4						
Time delay (ms)		t_g (max resettable time)	20	80	140	230	350						
		at I_n or 1200 A (I^2t Off or I^2t On)	t_g (max break time)	80	140	200	320	500					

DB I28036 eps

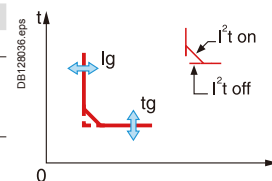
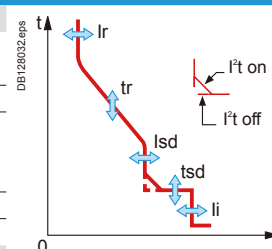
0

I^2t on

I^2t off

lg

tg



Note: all current-based protection functions require no auxiliary source.
The test / reset button resets maximeters, clears the tripping indication and tests the battery.

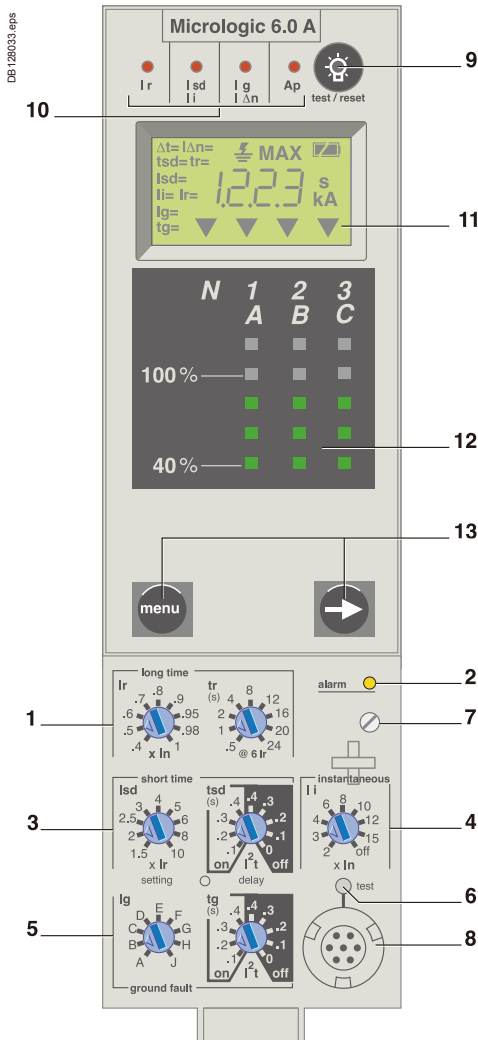
Protection of distribution systems -Compact NS

Micrologic trip units

Micrologic A "ammeter"

Micrologic A control units protect power circuits.

They also offer measurements, display, communication and current maximeters. Version 6 provides earth-fault protection, version 7 provides earth-leakage protection.



- 1 long-time threshold and tripping delay
- 2 overload alarm (LED) at 1.125 I_r
- 3 short-time pick-up and tripping delay
- 4 instantaneous pick-up
- 5 earth-leakage or earth-fault pick-up and tripping delay
- 6 earth-leakage or earth-fault test button
- 7 long-time rating plug screw
- 8 test connector
- 9 lamp test, reset and battery test
- 10 indication of tripping cause
- 11 digital display
- 12 three-phase bargraph and ammeter
- 13 navigation buttons

"Ammeter" measurements

Micrologic A control units measure the true (rms) value of currents.

They provide continuous current measurements from 0.2 to 1.2 I_n and are accurate to within 1.5 % (including the sensors).

A digital LCD screen continuously displays the most heavily loaded phase (I_{max}) or displays the I_1 , I_2 , I_3 , I_N , I_g , $I_{\Delta n}$, stored-current (maximeter) and setting values by successively pressing the navigation button.

The optional external power supply makes it possible to display currents $< 20 \% I_n$. Below 0.1 I_n , measurements are not significant. Between 0.1 and 0.2 I_n , accuracy changes linearly from 4 % to 1.5 %.

Communication option

In conjunction with the COM communication option, the control unit transmits the following:

- settings
- all "ammeter" measurements
- tripping causes
- maximeter readings.

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 different 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.

Earth-fault protection

Residual or source ground return earth fault protection.

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

Residual earth-leakage protection (Vigi).

Operation without an external power supply.

Δ Protected against nuisance tripping.

⋈ DC-component withstand class A up to 10 A.

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 I_r (4P 3d + N/2), neutral protection at I_r (4P 4d).

Zone selective interlocking (ZSI)

A ZSI terminal block may be used to interconnect a number of control units to provide total discrimination for short-time and earth-fault protection, without a delay before tripping.

Overload alarm

A yellow alarm LED goes on when the current exceeds the long-time trip threshold.

Fault indications

LEDs indicate the type of fault:

- overload (long-time protection I_r)
- short-circuit (short-time I_{sd} or instantaneous I_i protection)
- earth fault or earth leakage (I_g or $I_{\Delta n}$)
- internal fault (A_p).

Battery power

The fault indication LEDs remain on until the test/reset button is pressed. Under normal operating conditions, the battery supplying the LEDs has a service life of approximately 10 years.

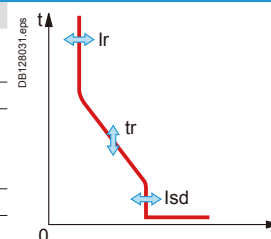
Test

A mini test kit or a portable test kit may be connected to the test connector on the front to check circuit-breaker operation. For Micrologic 6.0 A and 7.0 A control units, the operation of earth-fault or earth-leakage protection can be checked by pressing the test button located above the test connector.

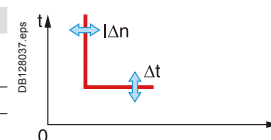
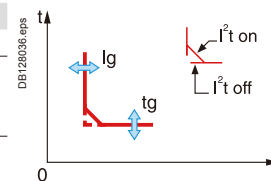
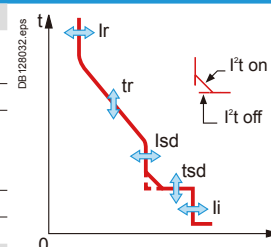
Note: Micrologic A control units come with a transparent lead-seal cover as standard.



Protection		Micrologic 2.0 A									
Long time											
Current setting (A)		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	tr (s)	0.5	1	2	4	8	12	16	20	24	
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	0.7 ⁽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									
(1) 0 to -40 % - (2) 0 to -60 %											
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									



Protection		Micrologic 5.0 / 6.0 / 7.0 A									
Long time		Micrologic 5.0 / 6.0 / 7.0 A									
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	tr (s)	0.5	1	2	4	8	12	16	20	24	
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	0.7 ⁽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									
(1) 0 to -40 % - (2) 0 to -60 %											
Short time											
Pick-up (A)	Isd = Ir x ...	1.5	2	2.5	3	4	5	6	8	10	
Accuracy: ±10 %											
Time setting tsd (s)	Settings	I ² t Off	0	0.1	0.2	0.3	0.4				
		I ² t On	-	0.1	0.2	0.3	0.4				
Time delay (ms) at 10 x Ir (I ² t Off or I ² t On)	tsd (max resettable time)		20	80	140	230	350				
	tsd (max break time)		80	140	200	320	500				
Instantaneous											
Pick-up (A)	Ii = In x ...	2	3	4	6	8	10	12	15	off	
Accuracy: ±10 %											
Time delay		Max resettable time: 20 ms Max break time: 50 ms									
Earth fault		Micrologic 6.0 A									
Pick-up (A)	Ig = In x ...	A	B	C	D	E	F	G	H	J	
Accuracy: ±10 %	In ≤ 400 A	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
	400 A < In < 1250 A	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
	In ≥ 1250 A	500	640	720	800	880	960	1040	1120	1200	
Time setting tg (s)	Settings	I ² t Off	0	0.1	0.2	0.3	0.4				
		I ² t On	-	0.1	0.2	0.3	0.4				
Time delay (ms) at In or 1200 A (I ² t Off or I ² t On)	tg (max resettable time)		20	80	140	230	350				
	tg (max break time)		80	140	200	320	500				
Residual earth leakage (Vigi)		Micrologic 7.0 A									
Sensitivity (A)	IΔn	0.5	1	2	3	5	7	10	20	30	
Accuracy: 0 to -20 %											
Time delay Δt (ms)	Settings	60	140	230	350	800					
	Δt (max resettable time)	60	140	230	350	800					
	Δt (max break time)	140	200	320	500	1000					

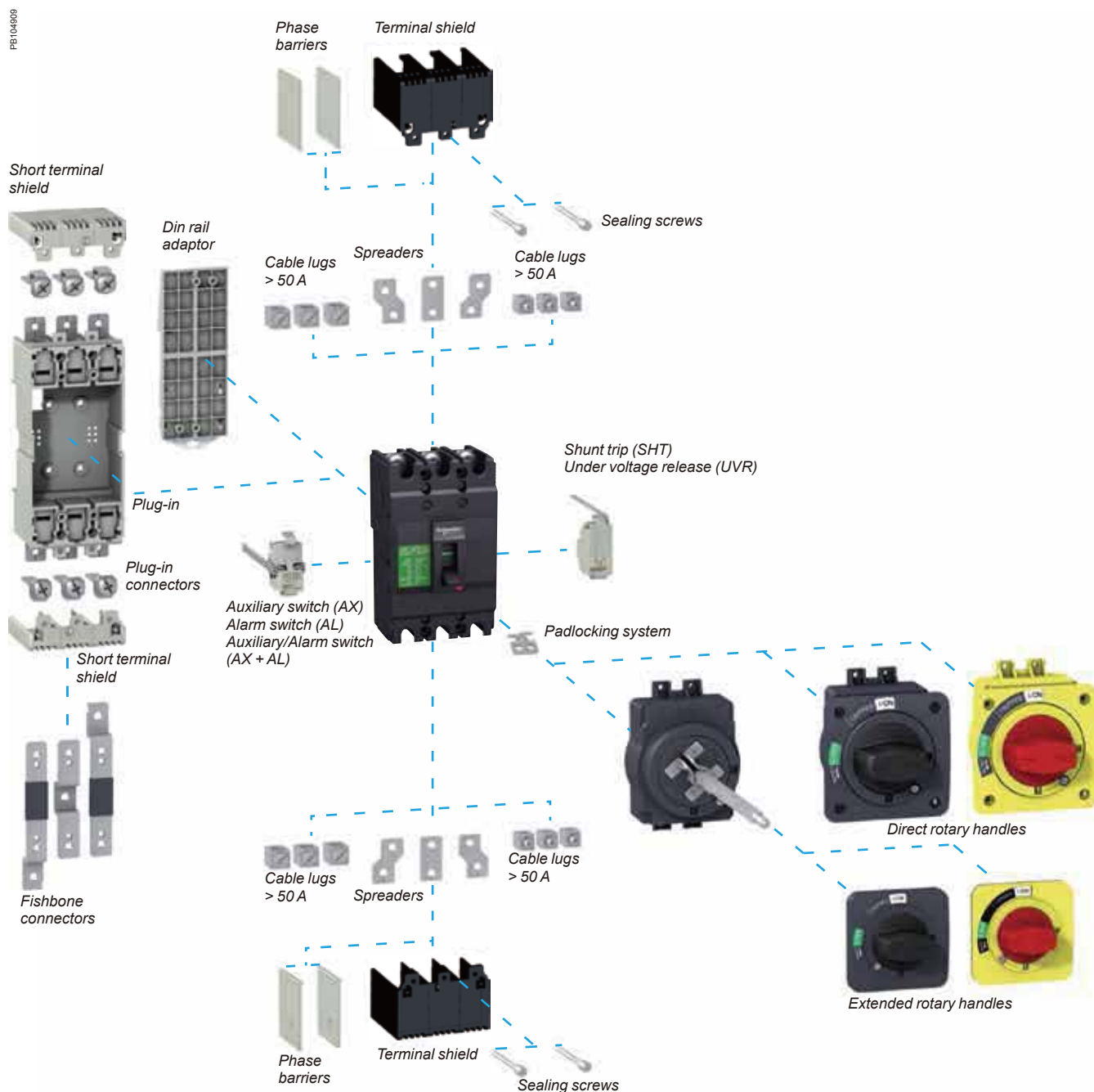


Ammeter		Micrologic 2.0 / 5.0 / 6.0 / 7.0 A									
Type of measurements		Range					Accuracy				
Instantaneous currents	I1, I2, I3, IN	0.2 x In to 1.2 x In					± 1.5 %				
	Ig (6.0 A)	0.2 x In to In					± 10 %				
	IΔn (7.0 A)	0 to 30 A					± 1.5 %				
Current maximeters of	I1, I2, I3, IN	0.2 x In to 1.2 x In					± 1.5 %				

Note: all current-based protection functions require no auxiliary source.
The test / reset button resets maximeters, clears the tripping indication and tests the battery.

Accessories and auxiliaries -Easypact E2C 100

Easypact E2C circuit breaker E2C100 comes with a full range of accessories to fulfill different application requirements and make it easy for the end-user.

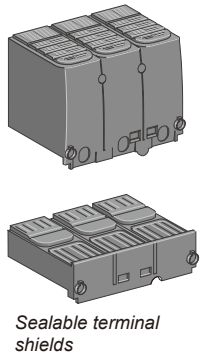


Accessories and auxiliaries -Easypact CVS

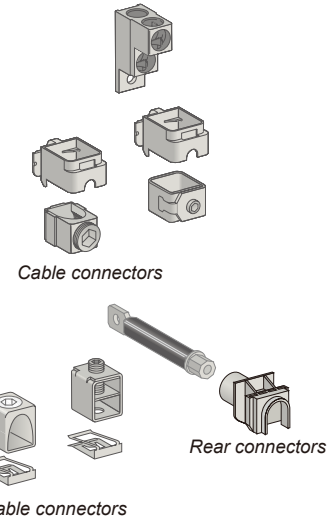
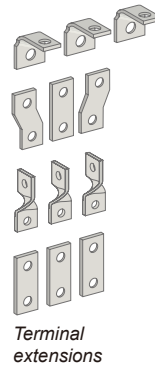
Easypact
CVS

Insulation accessories

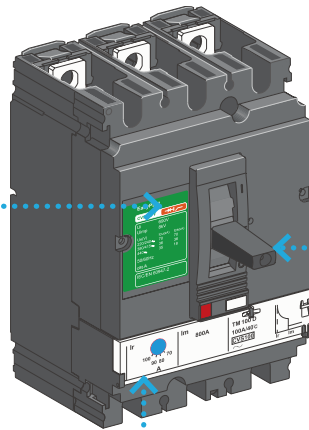
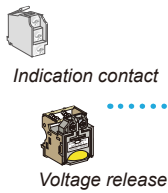
DB400001



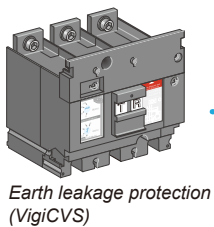
Connection



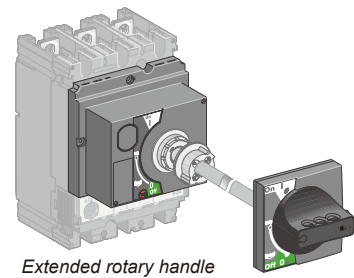
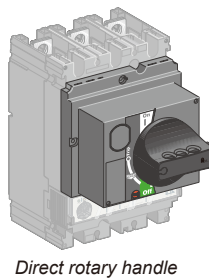
Electrical auxiliaries



Monitoring



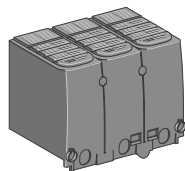
Control accessories



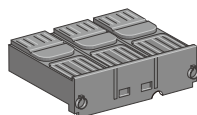
Accessories and auxiliaries -Compact NSX

Insulation accessories

DE115801.eps



Sealable terminal shields



Interphase barriers

Electrical auxiliaries



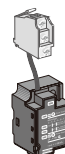
Indication contact



Voltage release



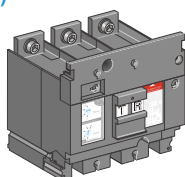
SDTAM module



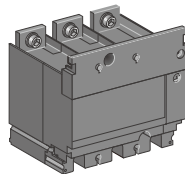
SDx module

Protection and measurements

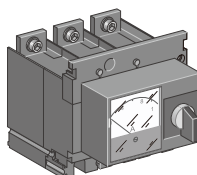
(1)



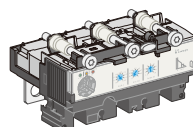
Vigi module



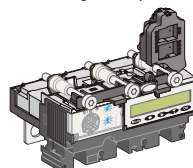
Current-transformer module



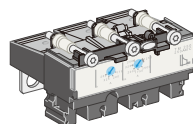
Ammeter module



Micrologic 2 trip unit



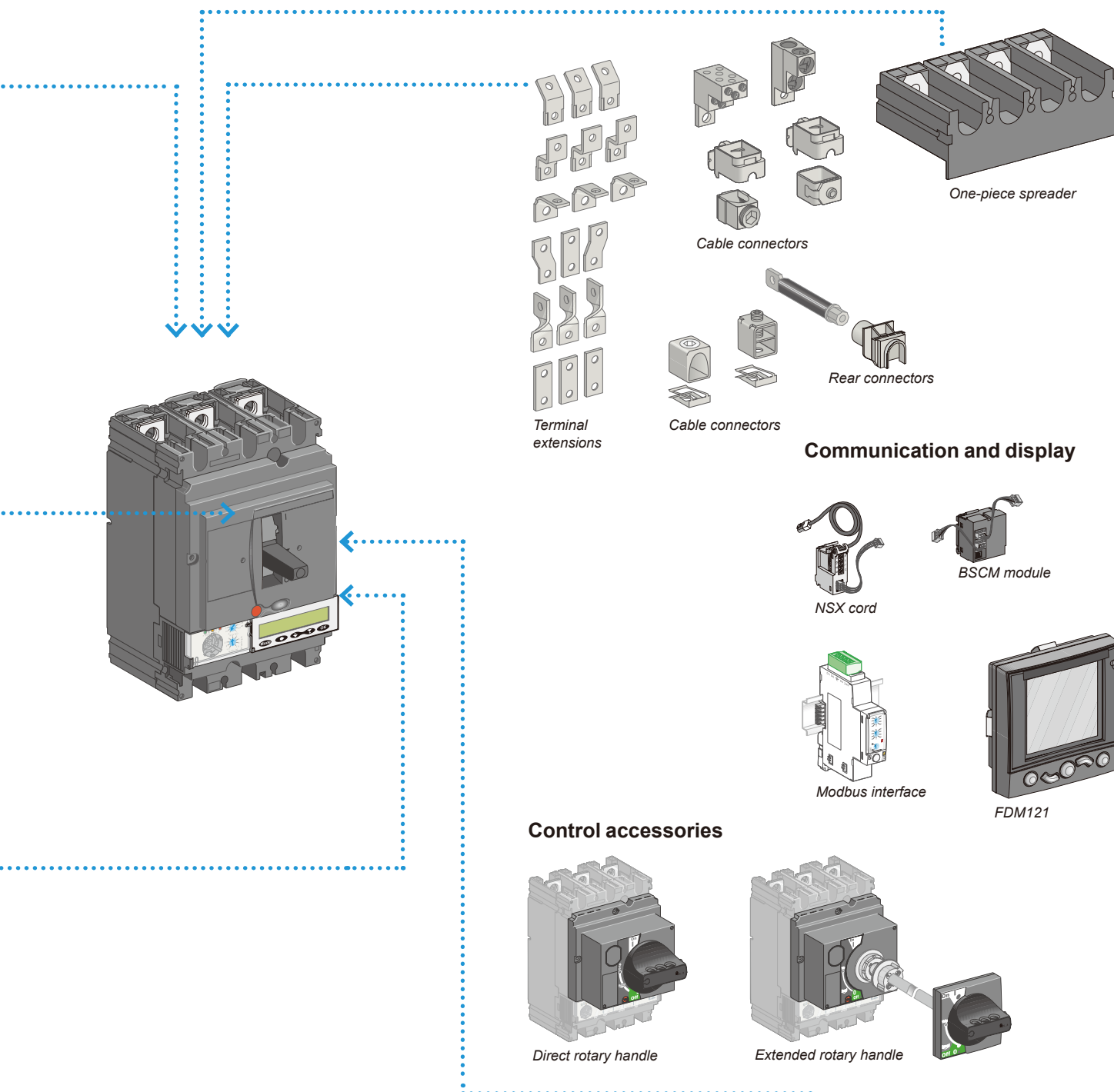
Micrologic 5 / 6 trip unit



TM-D, TM-G trip unit

(1) Up to 525 V.

Connection



Accessories and auxiliaries

-Compact NSX

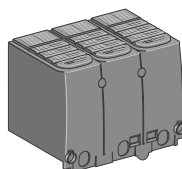
plug-in and withdrawable versions

Insulation accessories

DB115888 eps

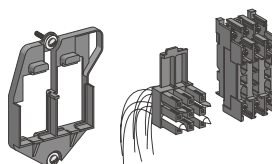


Interphase barriers

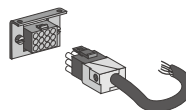


Sealable long terminal shields for plug-in base

Electrical accessories

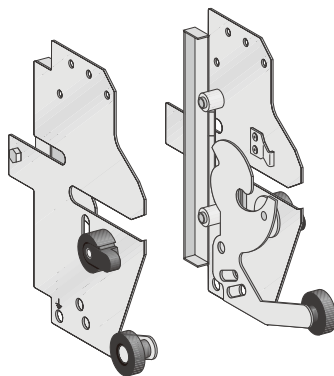


Automatic withdrawable auxiliary connector

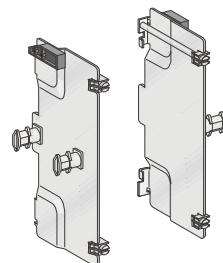


Manual auxiliary connector

Mechanical accessories

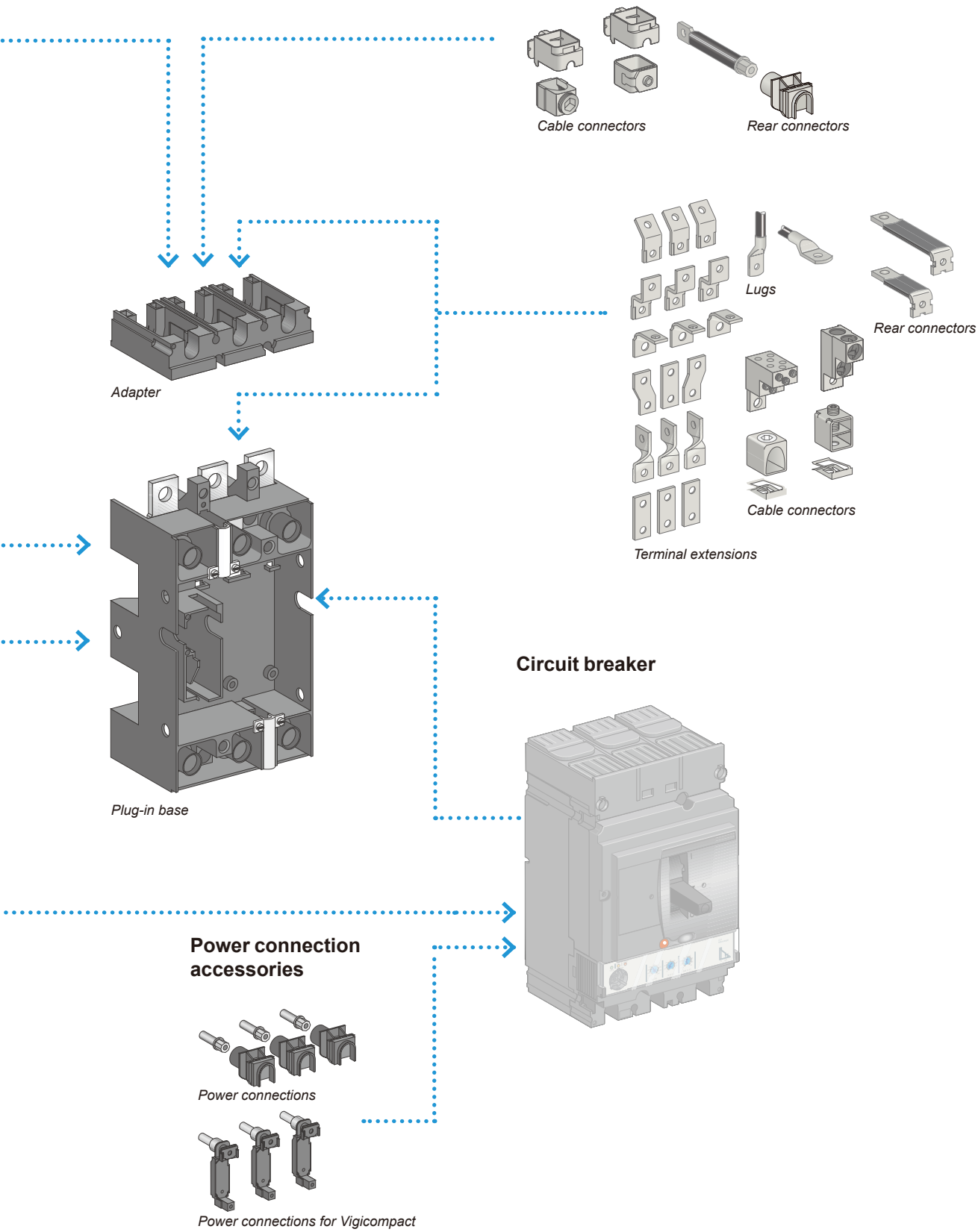


Chassis side plate

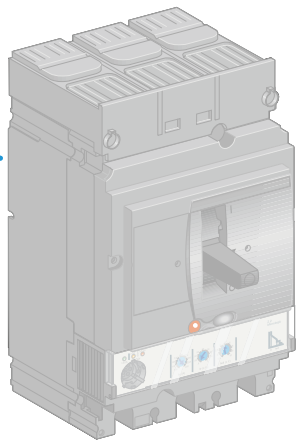


Circuit-breaker side plate

Connection



Circuit breaker

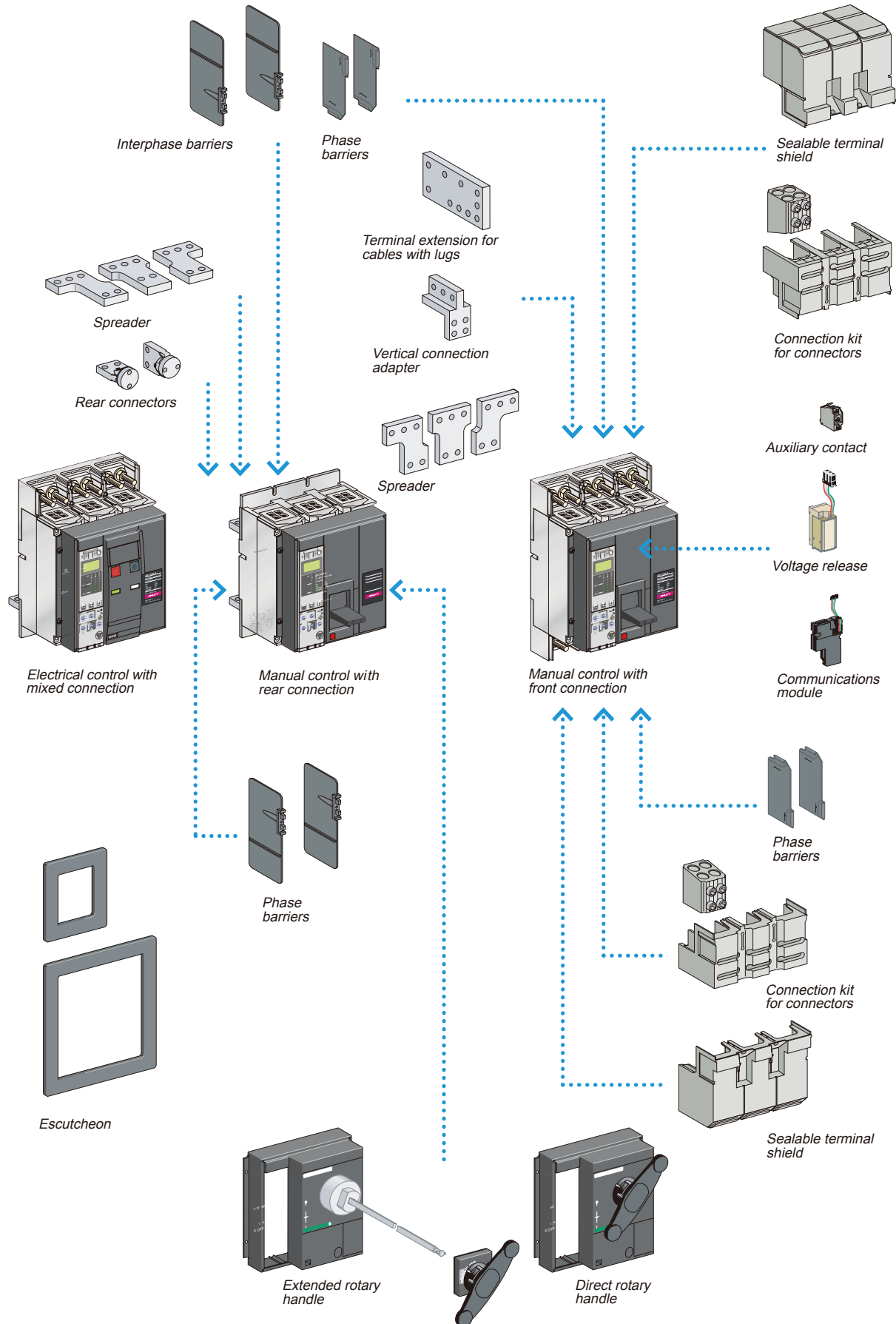


Accessories and auxiliaries

-ComPact NS

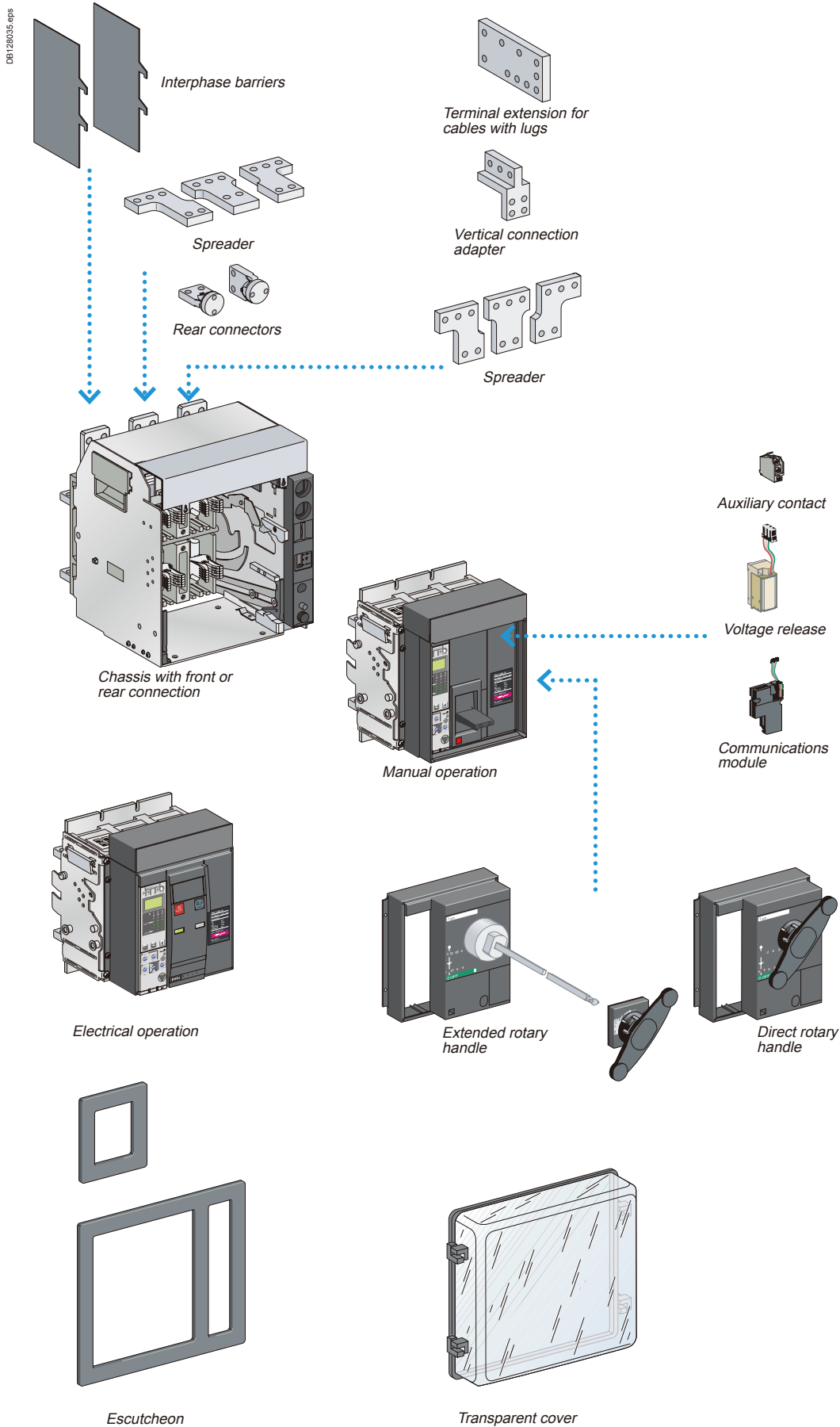
fixed version

DB1280612.eps



Accessories and auxiliaries -ComPact NS withdrawable version

ComPact
NS

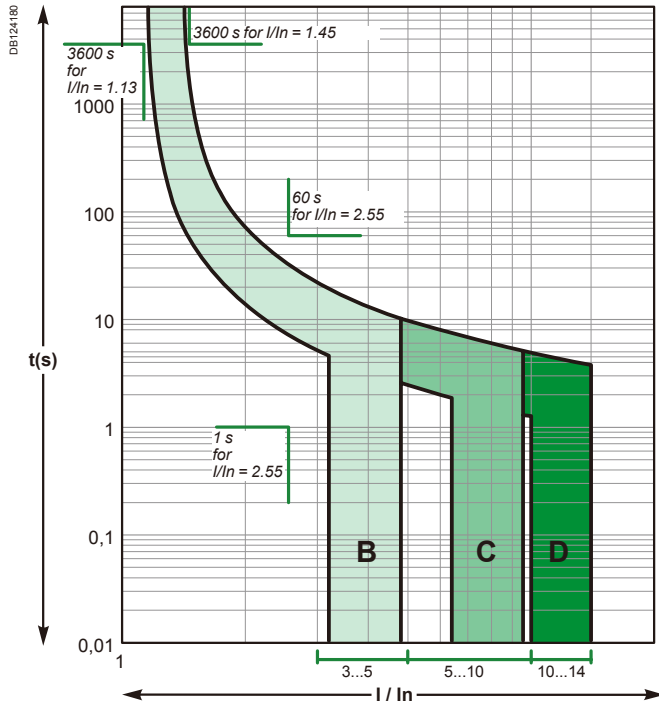


Alternative current 50/60 Hz

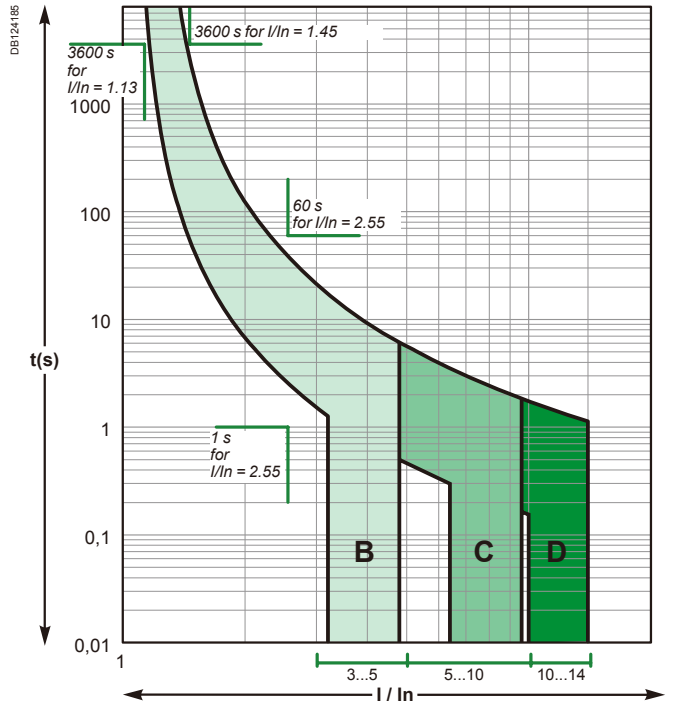
iC60a/N/H/L

According to IEC/EN 60898-1 (reference temperature 30°C)

Curves B, C, D rating up to 4 A



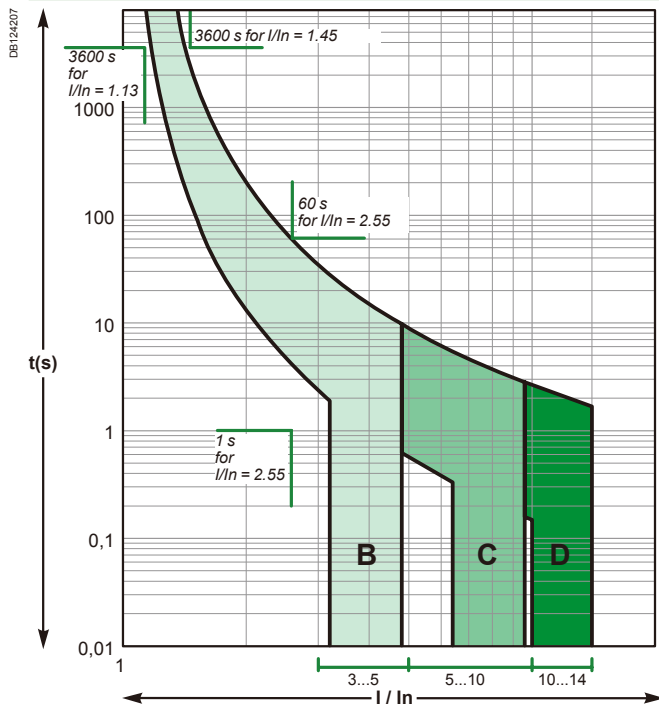
Curves B, C, D rating 6 A to 63 A



C120N/H

According to IEC/EN 60898-1 (reference temperature 30°C)

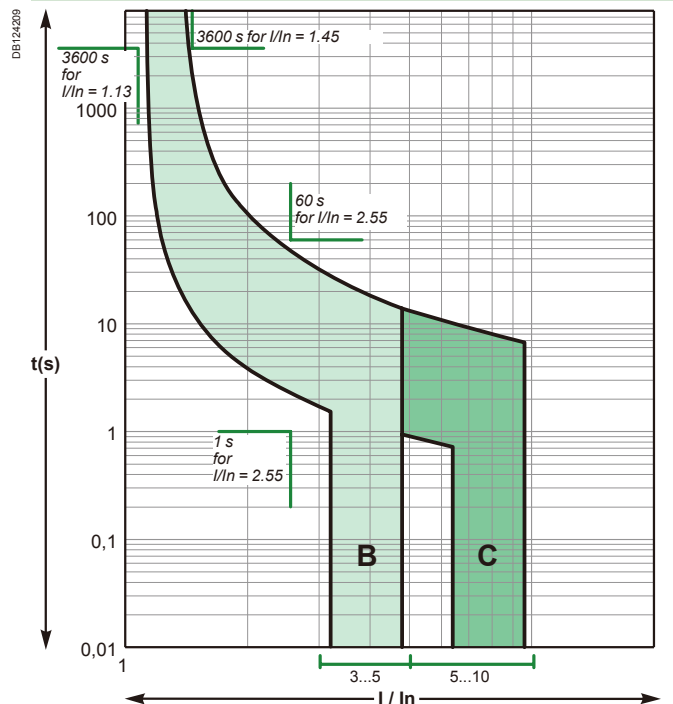
Curves B, C, D



iK60

According to IEC/EN 60898-1 (reference temperature 30°C)

Curves B, C

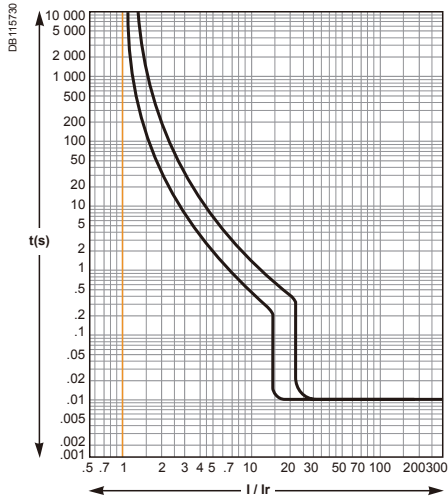


Tripping curves -EasyPact EZC 100 TM

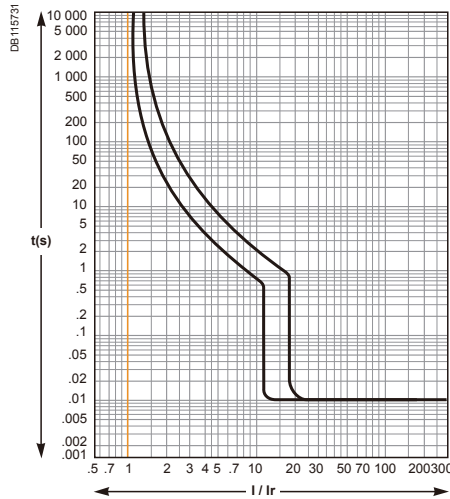
EasyPact
EZC

EasyPact EZC100 TM trip units

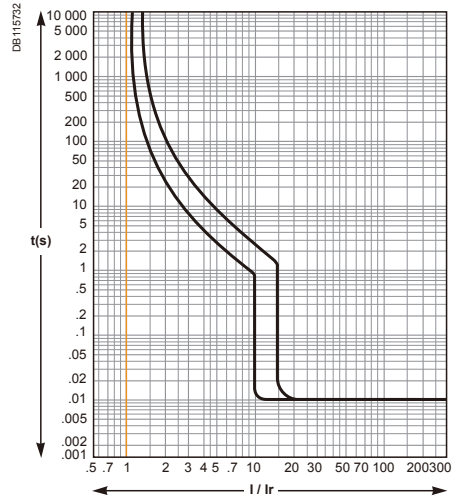
15-16 A



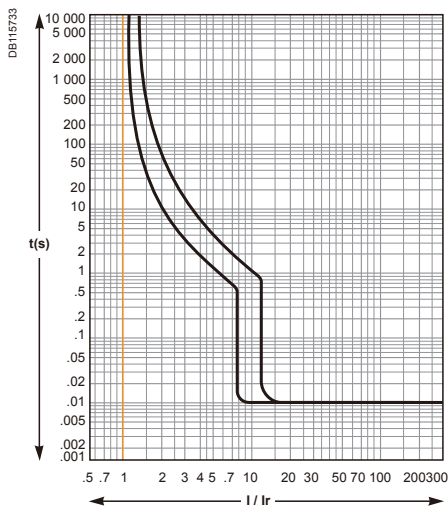
20 A



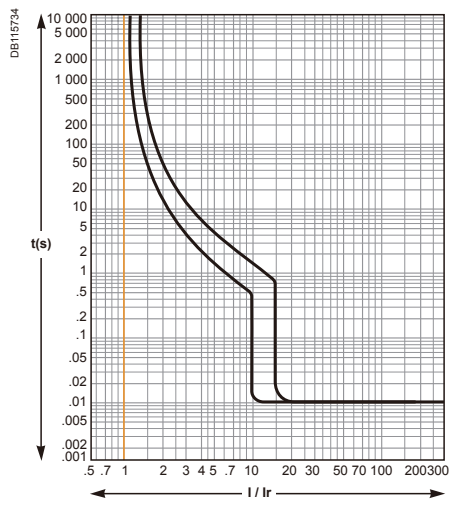
25 A



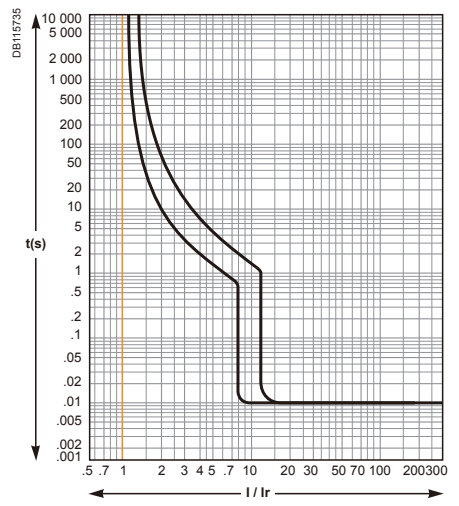
30-32 A



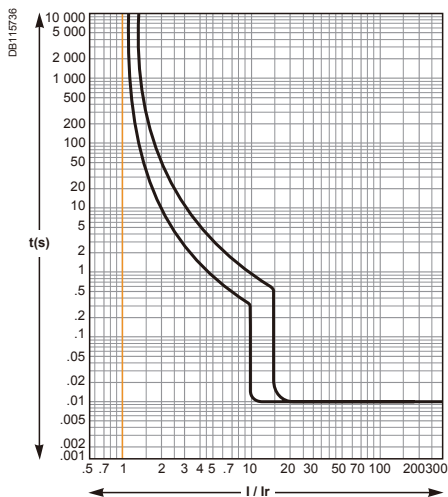
40 A



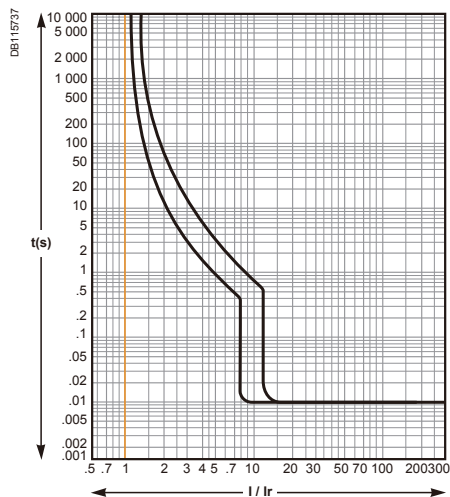
45-50 A



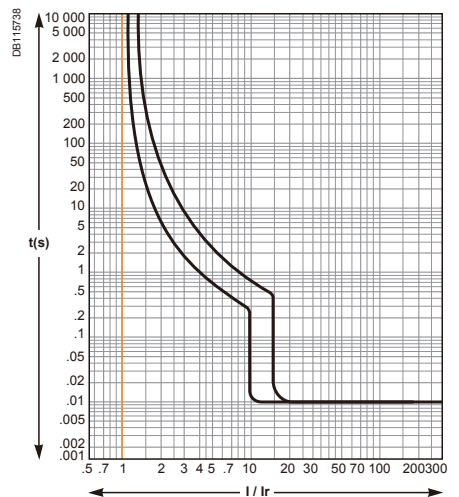
60-63 A



75 A

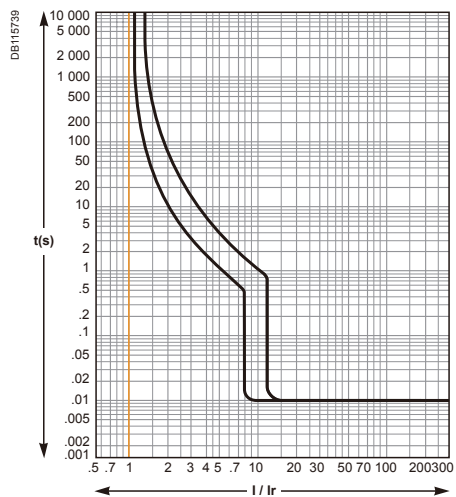


80 A



Easypact EZC100 TM trip units (cont.)

100 A

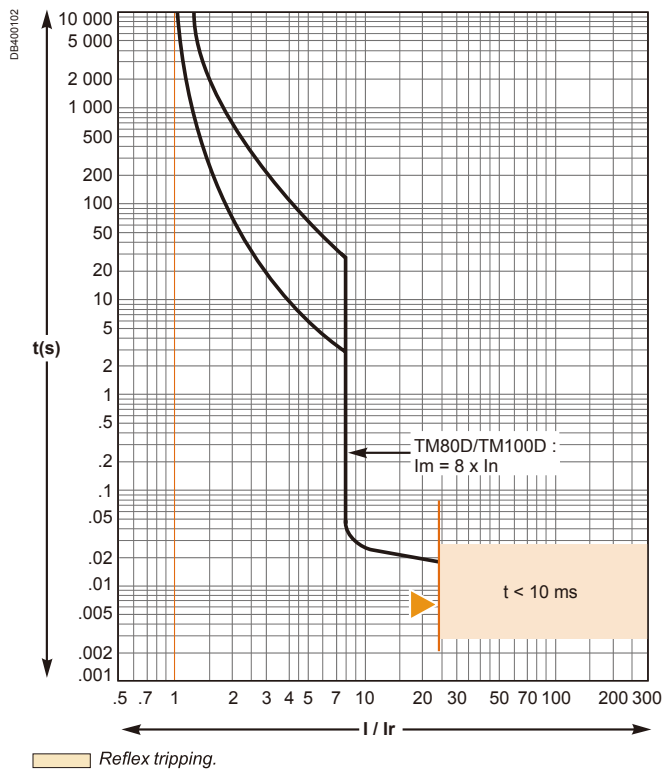


Tripping curves -Easypact CVS TM

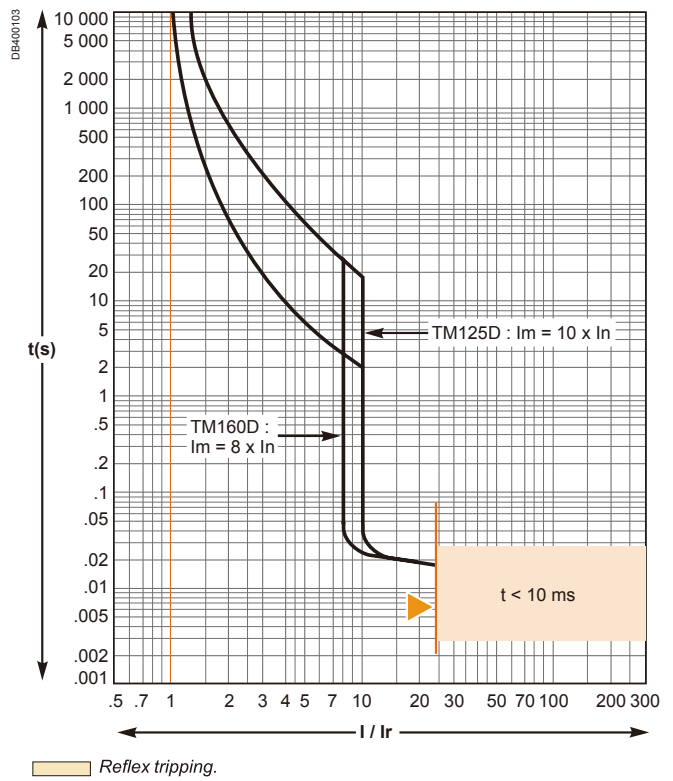
Easypact
CVS

TM magnetic trip units (cont.)

TM100D

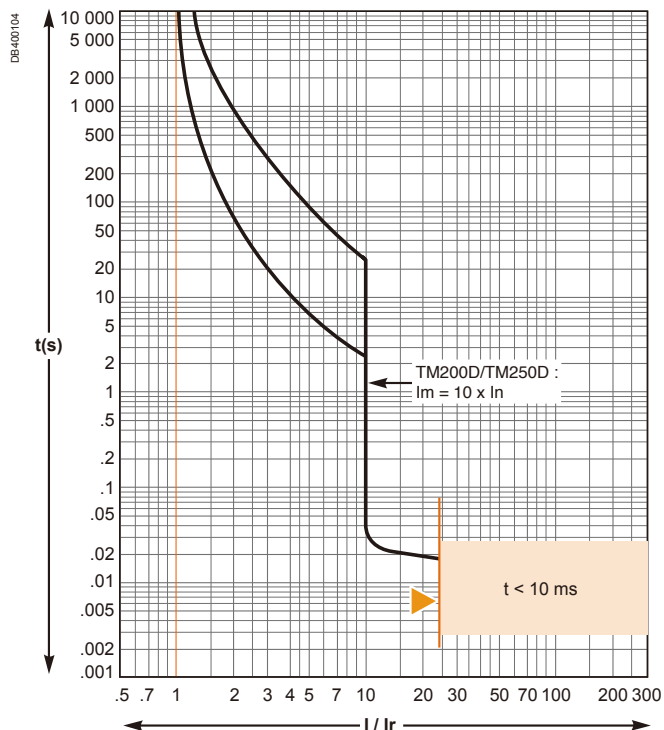


TM125D/160D

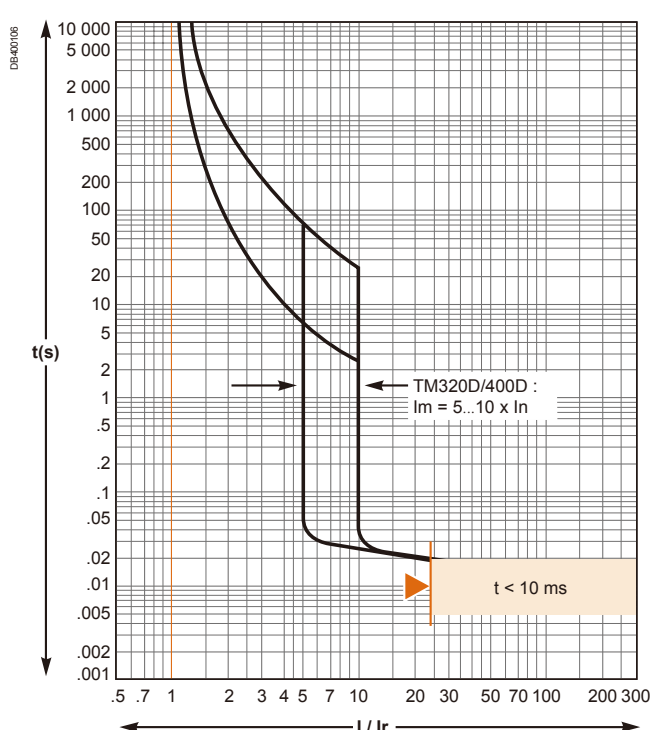


TM magnetic trip units (cont.)

TM200D/250D

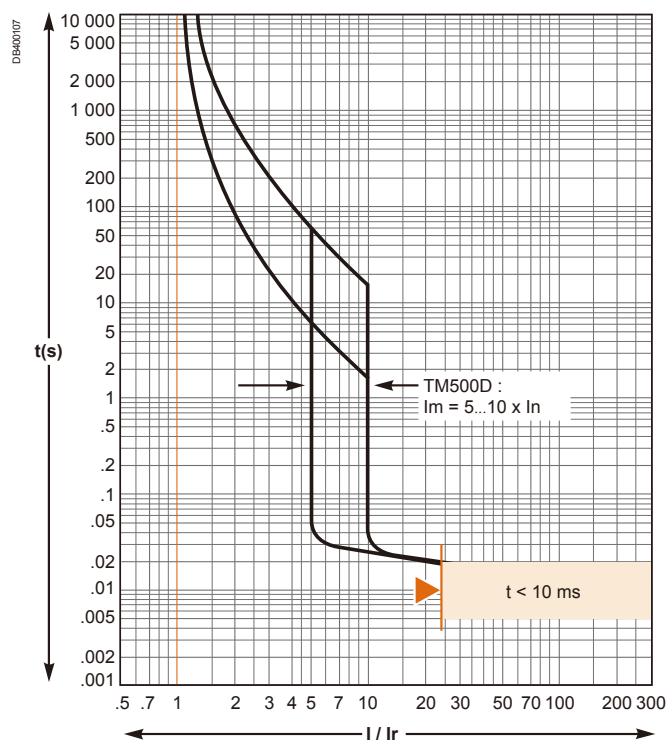


TM320D/400D



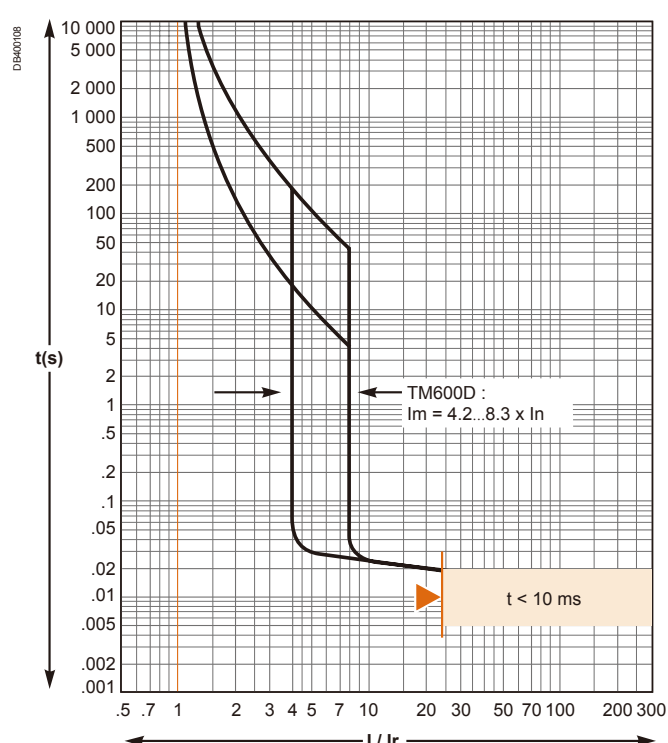
Reflex tripping.

TM500D



Reflex tripping.

TM600D



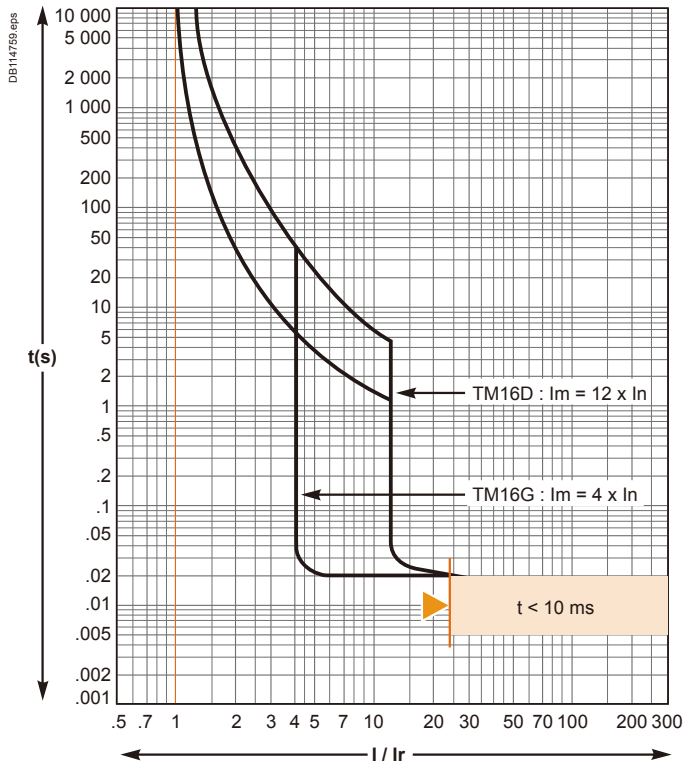
Reflex tripping.

Tripping curves -Compact NSX TM

Compact
NSX

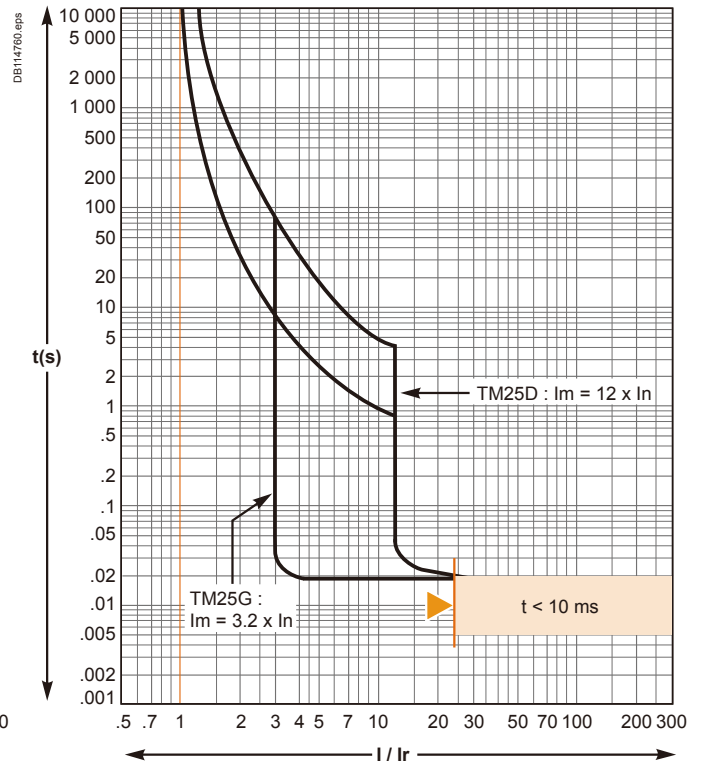
TM magnetic trip units

TM16D / TM16G

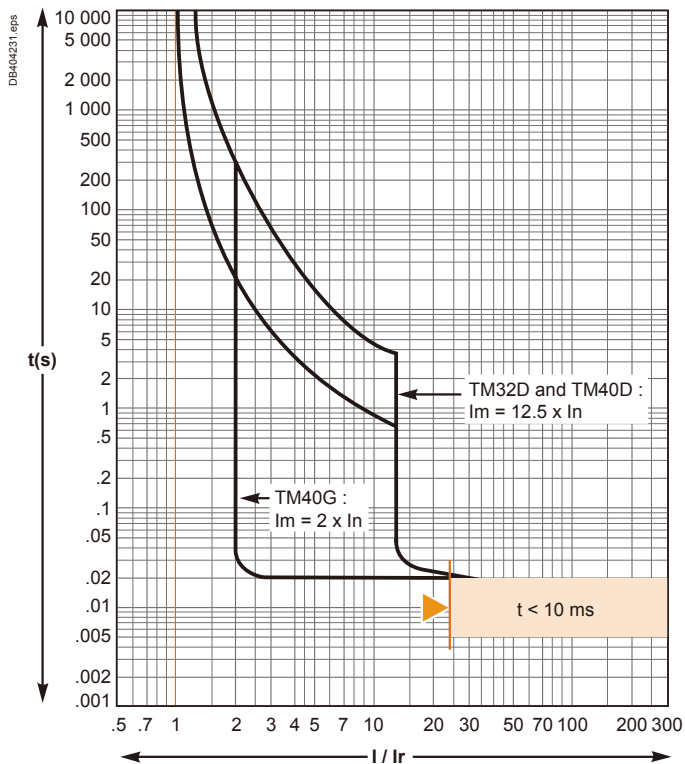


Reflex tripping.

TM25D / TM25G

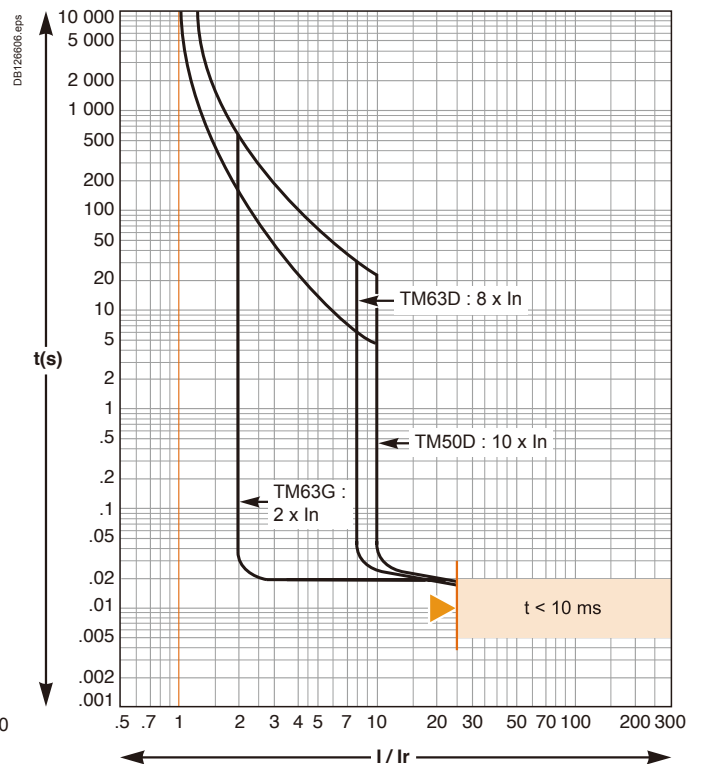


TM32D / TM40D / TM40G



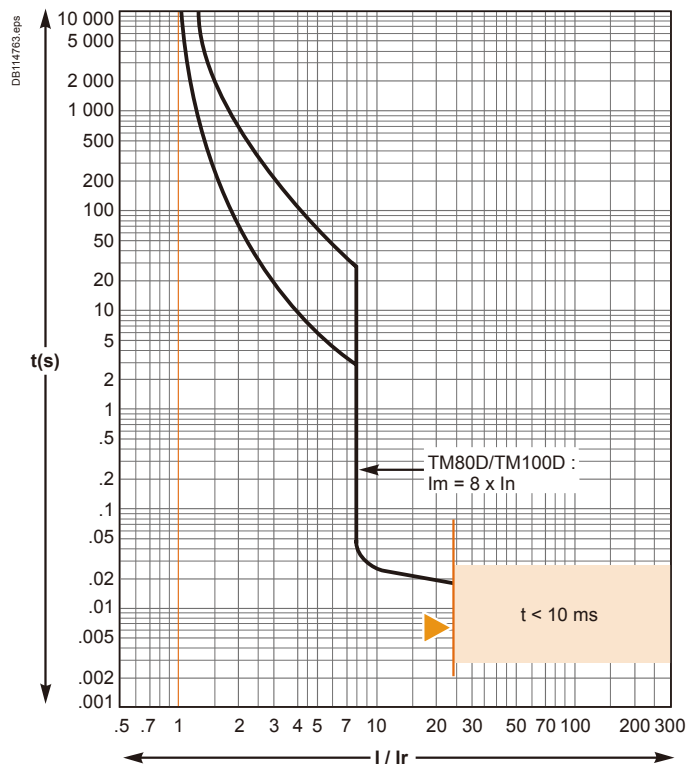
Reflex tripping.

TM50D / TM63D / TM63G



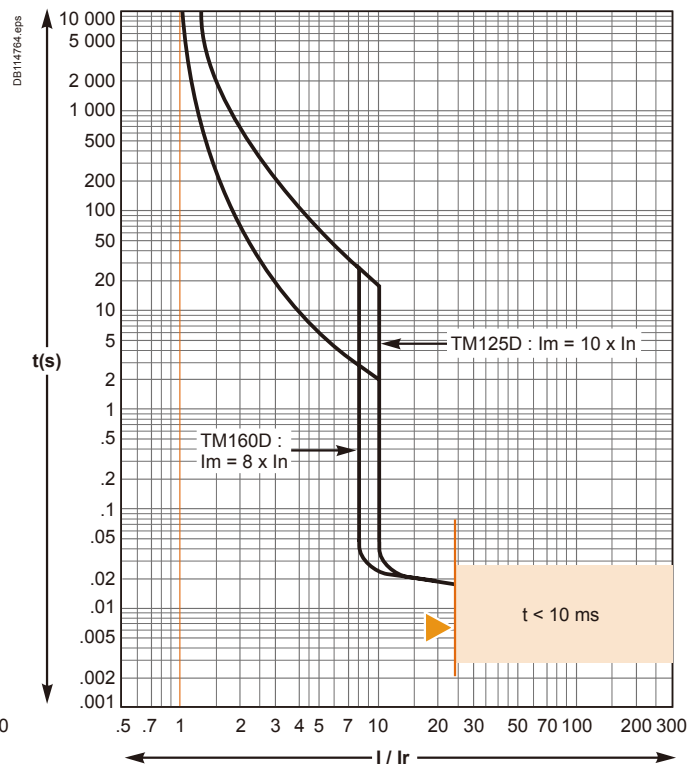
TM magnetic trip units (cont.)

TM80D / TM100D

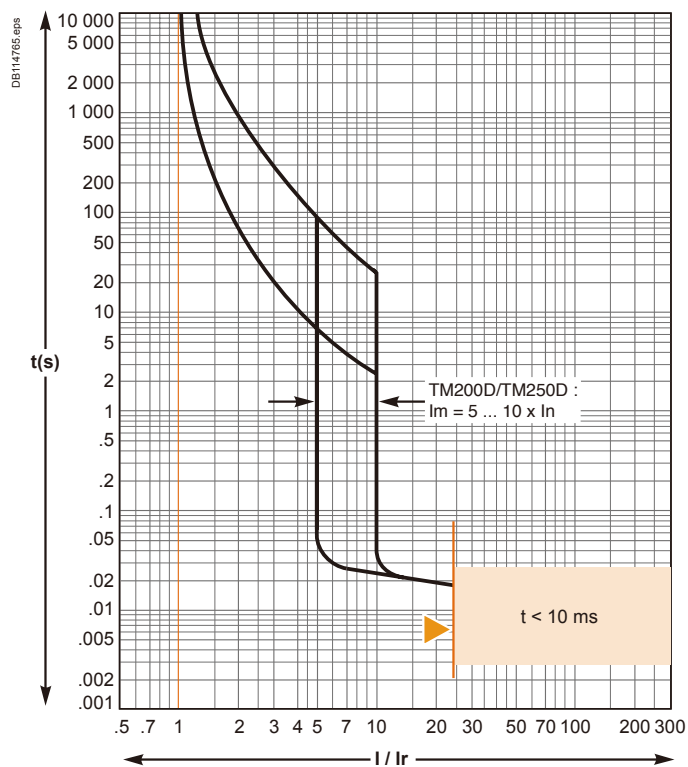


Reflex tripping.

TM125D / TM160D



TM200D / TM250D



Reflex tripping.

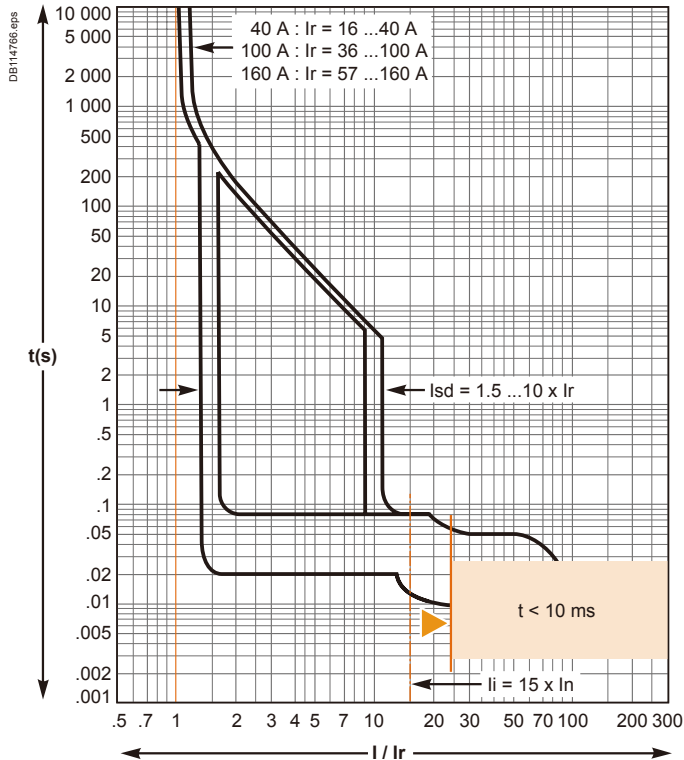
Tripping curves

-Compact NSX 100 to 250 Micrologic

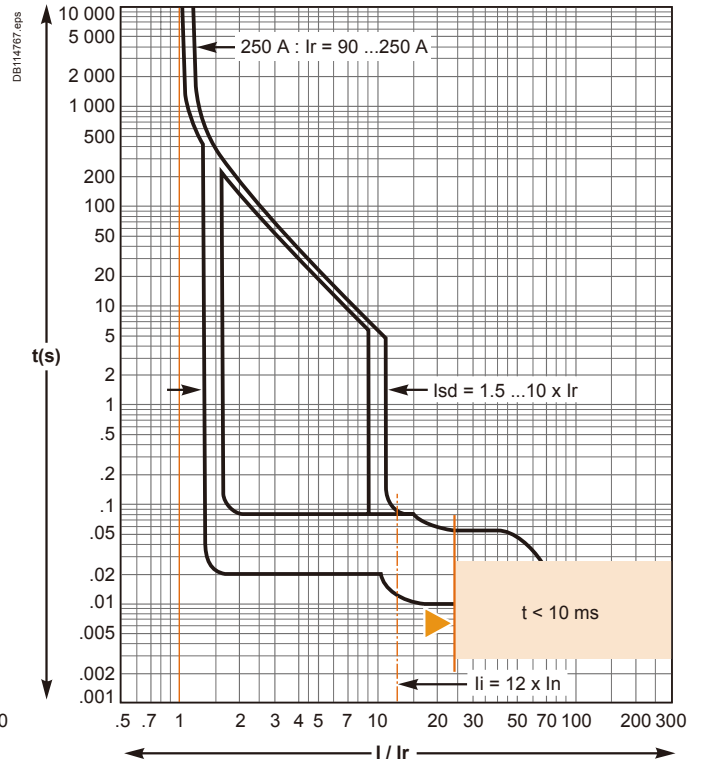
Compact
NSX

Micrologic 2.2 and 2.2 G electronic trip units

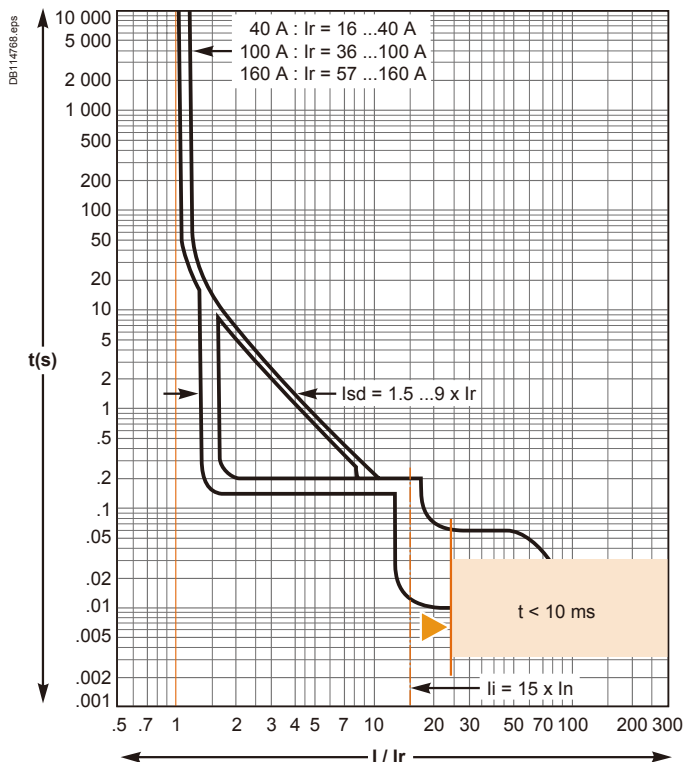
Micrologic 2.2 - 40... 160 A



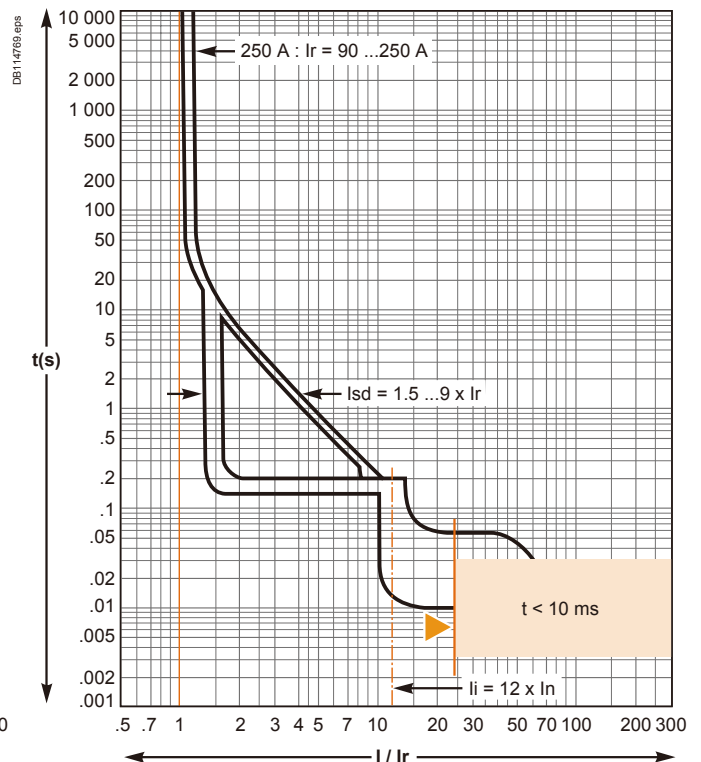
Micrologic 2.2 - 250 A



Micrologic 2.2 G - 40... 160 A

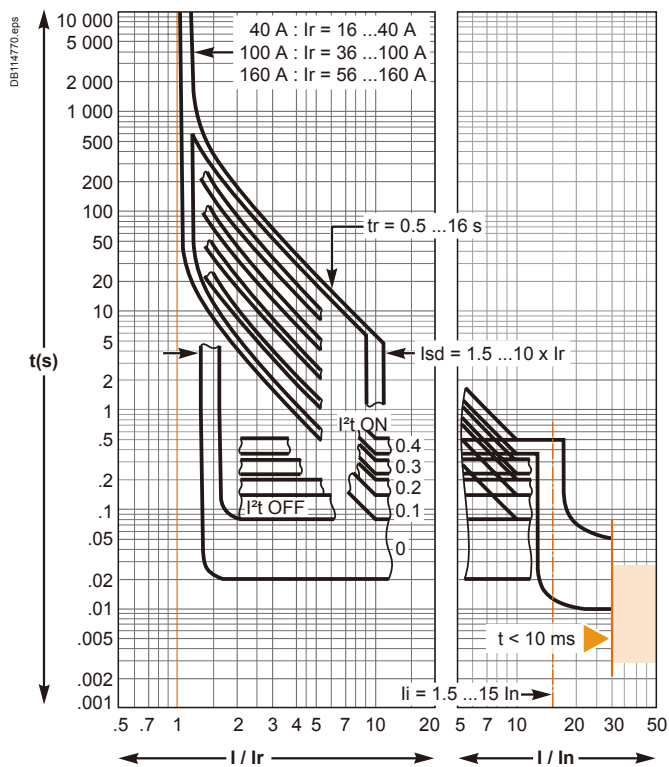


Micrologic 2.2 G - 250 A



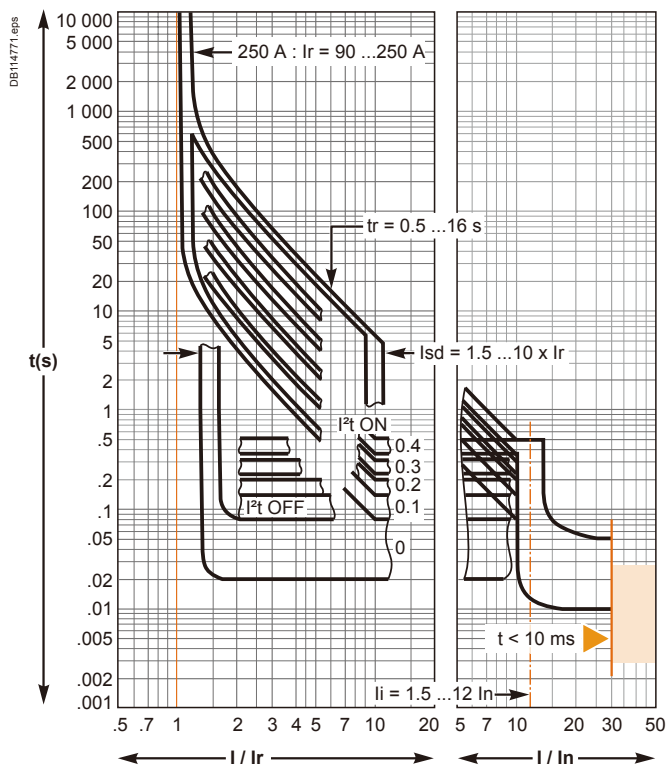
Micrologic 5.2 and 6.2 A or E electronic trip units

Micrologic 5.2 and 6.2 A or E - 40... 160 A

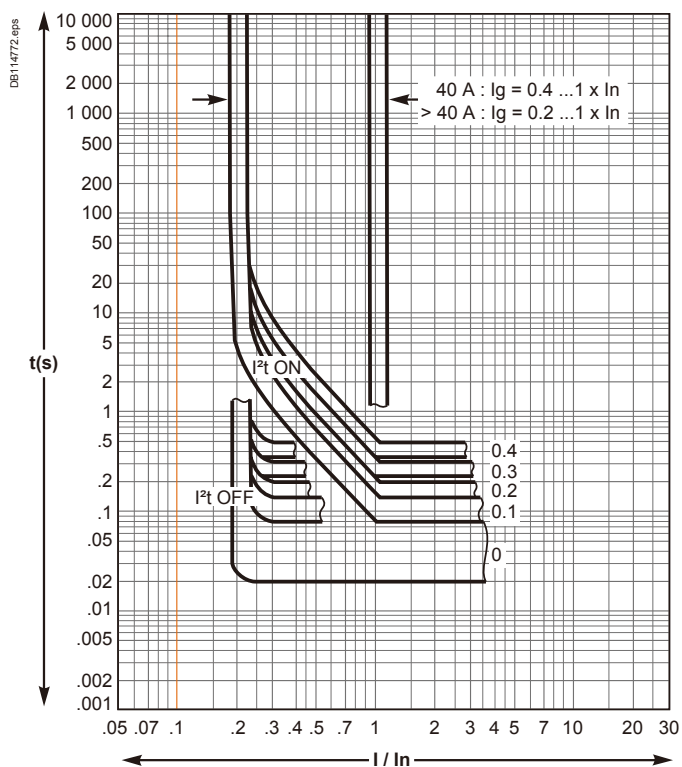


Reflex tripping.

Micrologic 5.2 and 6.2 A or E - 250 A



Micrologic 6.2 A or E (ground-fault protection)



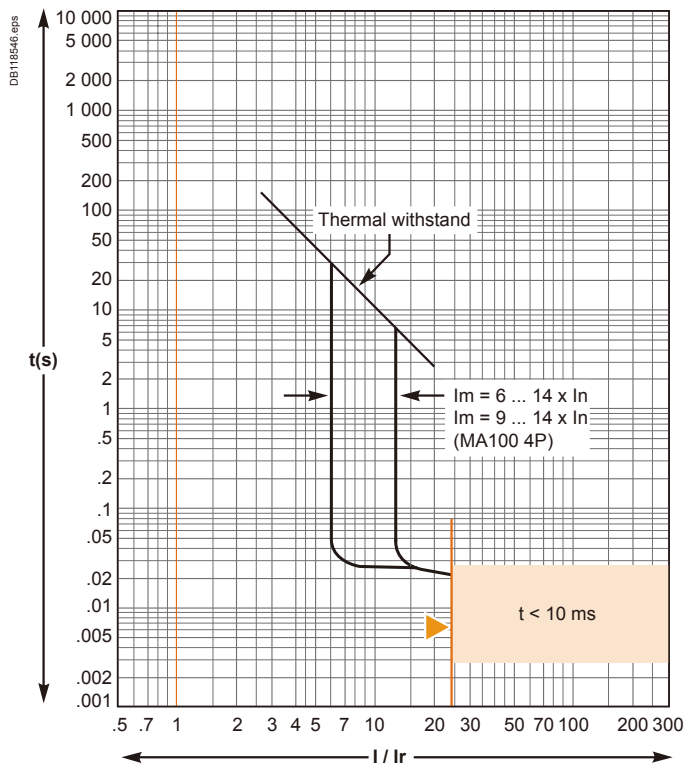
Tripping curves

-Compact NSX 100 to 250 MA

Compact
NSX

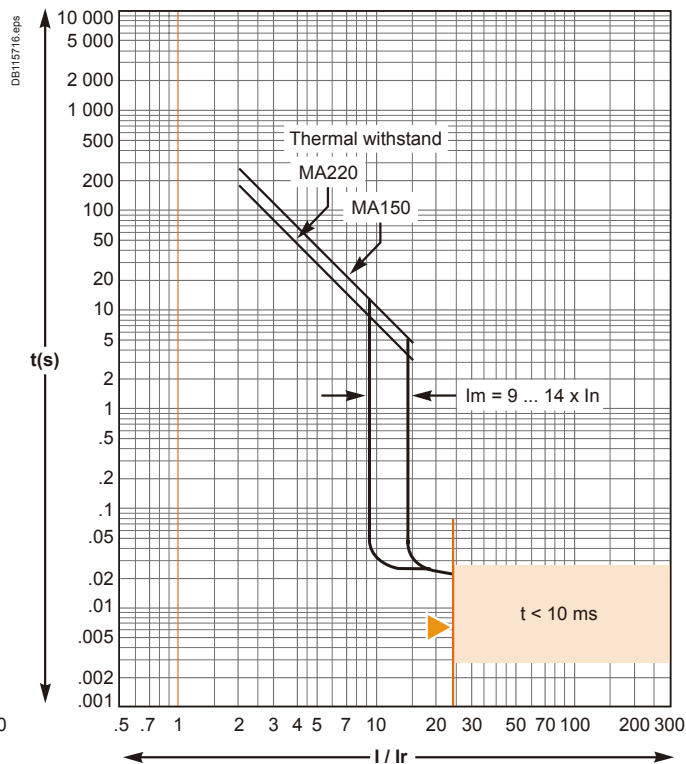
MA magnetic trip units

MA2.5... MA100



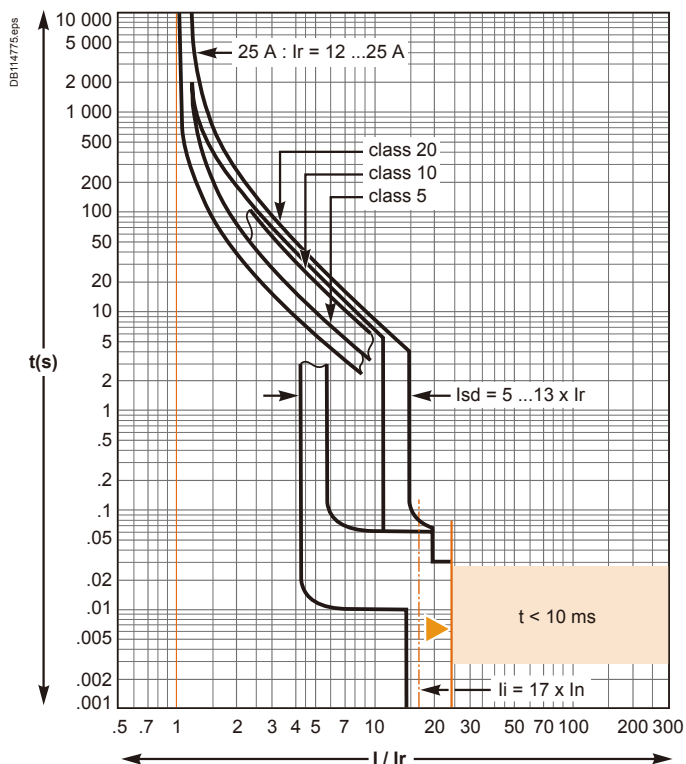
Reflex tripping.

MA150 and MA220



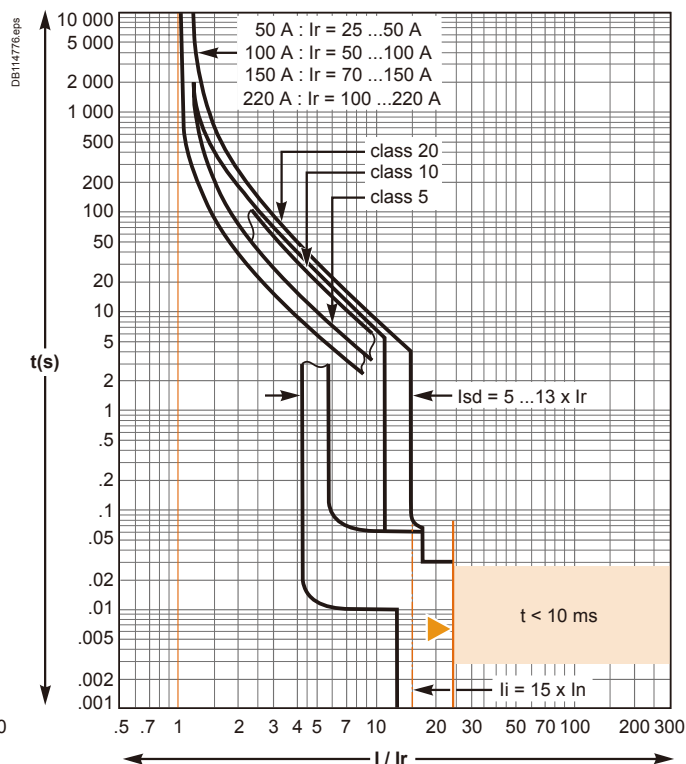
Micrologic 2.2 M electronic trip units

Micrologic 2.2 M - 25 A



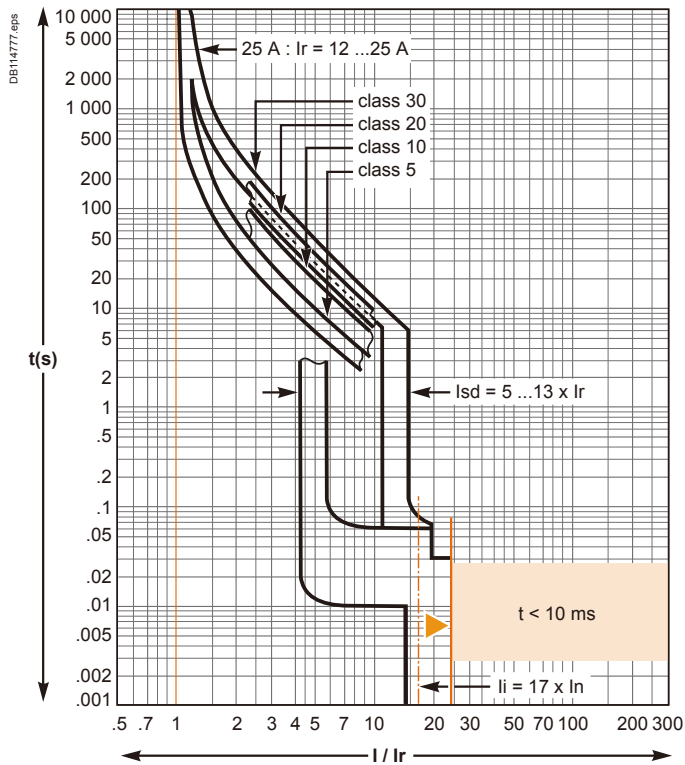
Reflex tripping.

Micrologic 2.2 M - 50... 220 A



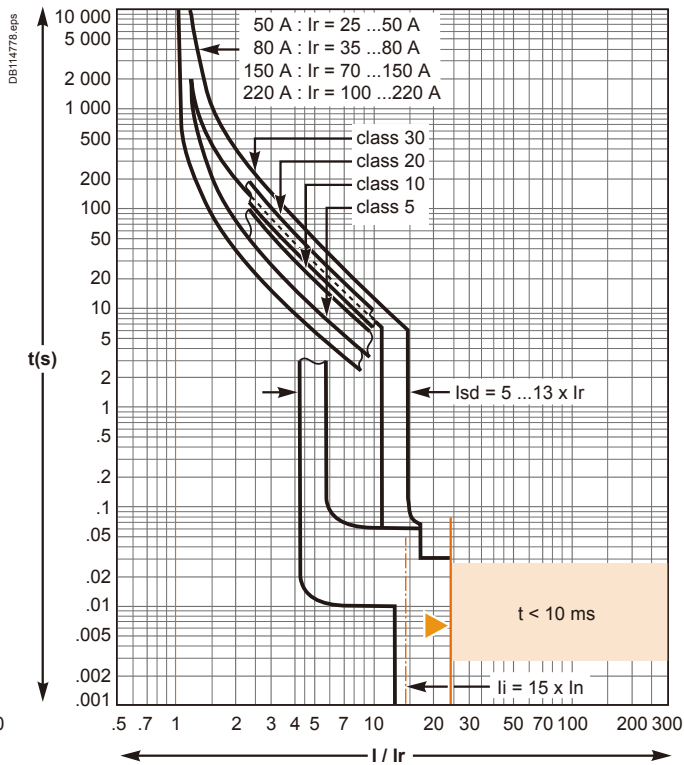
Micrologic 6.2 E-M electronic trip units

Micrologic 6.2 E-M - 25 A

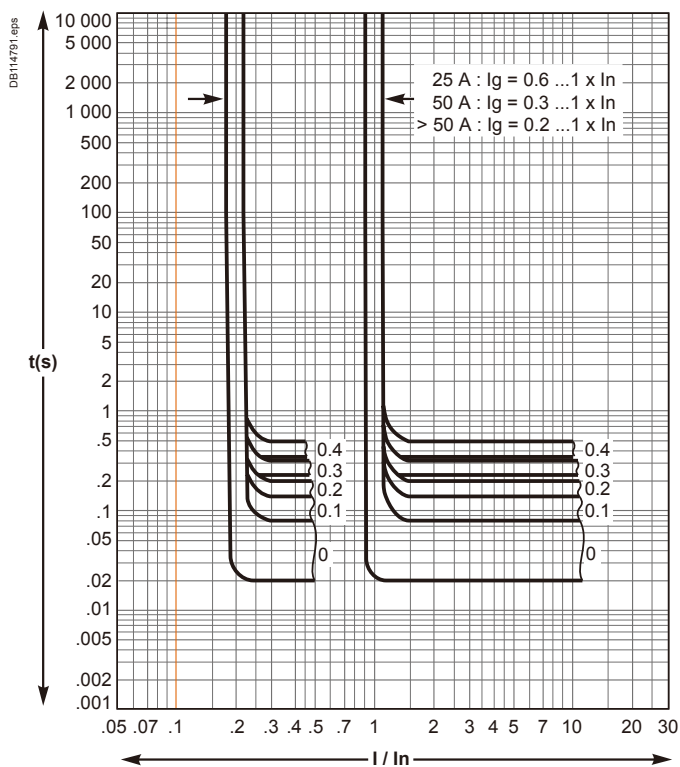


Reflex tripping.

Micrologic 6.2 E-M - 50... 220 A



Micrologic 6.2 E-M (ground-fault protection)

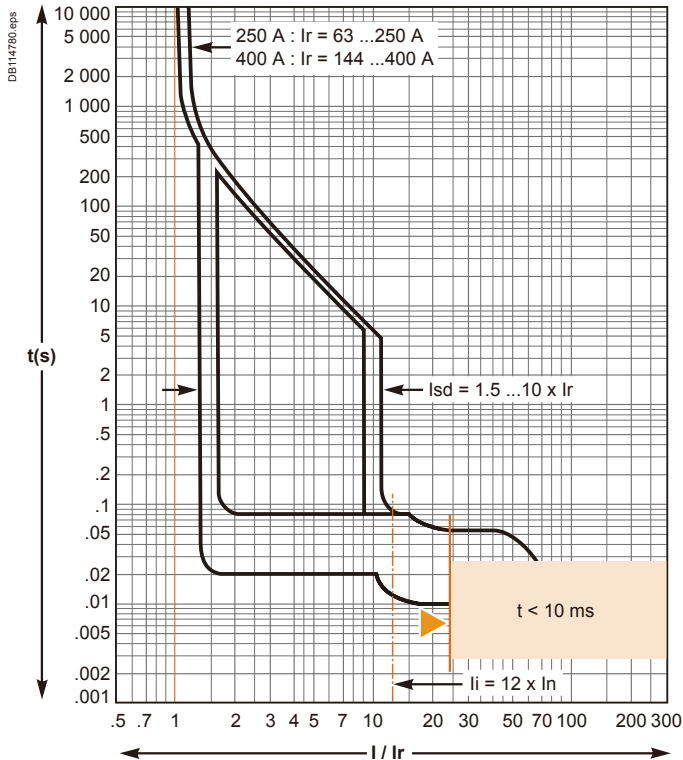


Tripping curves

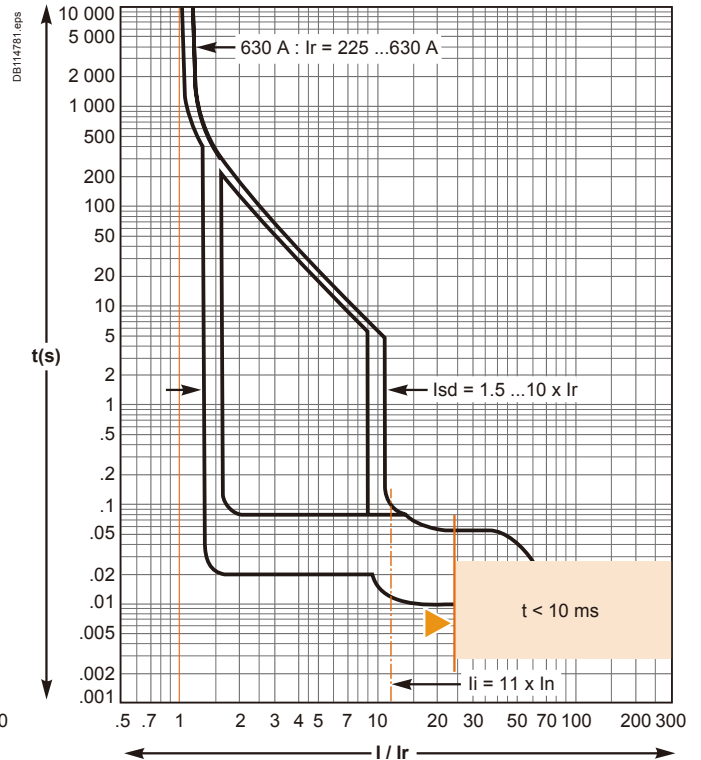
-Compact NSX 400 to 630 Micrologic

Micrologic 2.3, 5.3 and 6.3 A or E electronic trip units

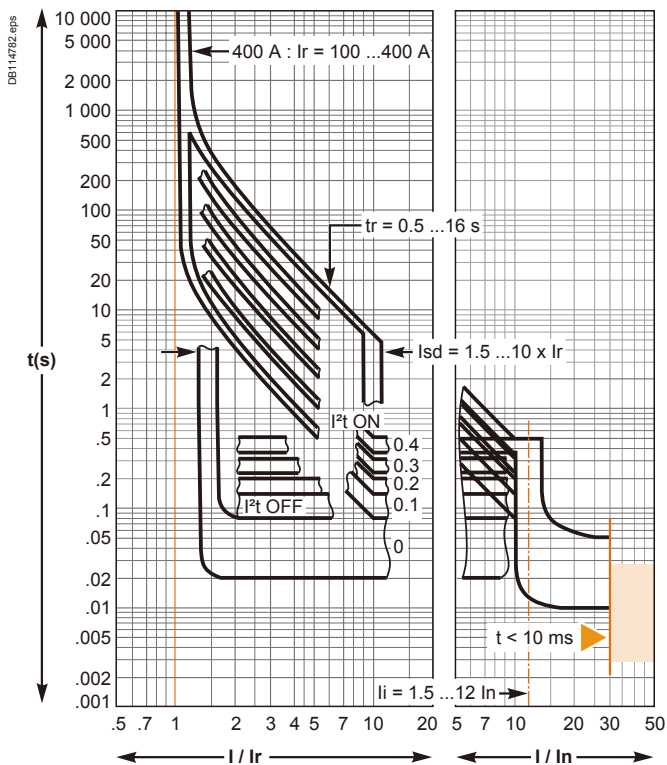
Micrologic 2.3 - 250... 400 A



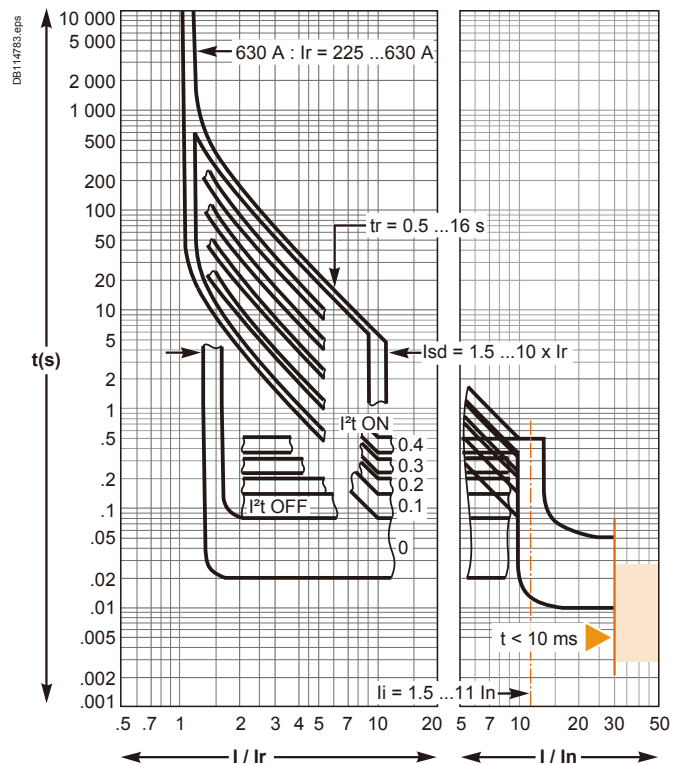
Micrologic 2.3 - 630 A



Micrologic 5.3 and 6.3 A or E - 400 A

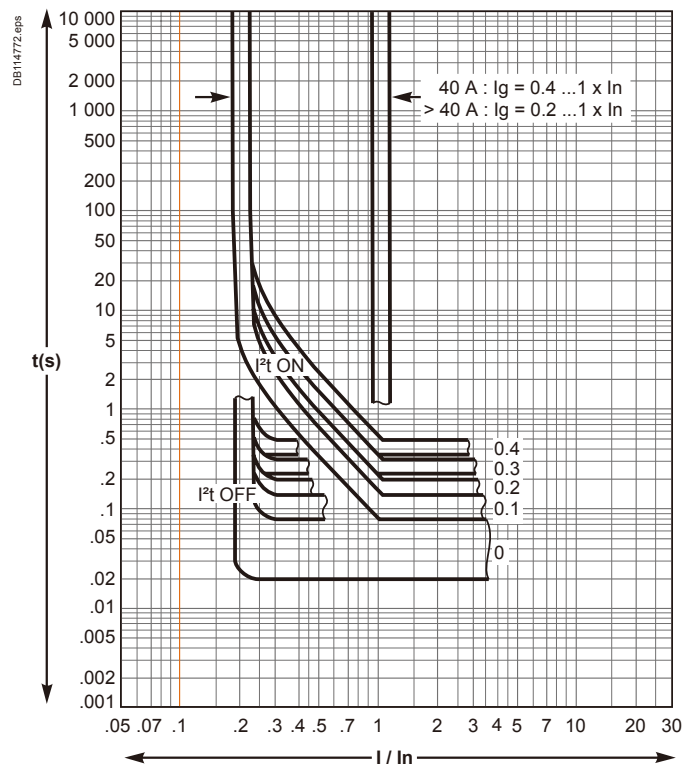


Micrologic 5.3 and 6.3 A or E - 630 A



Micrologic 6.3 A or E electronic trip units (cont.)

Micrologic 6.3 A or E (ground-fault protection)

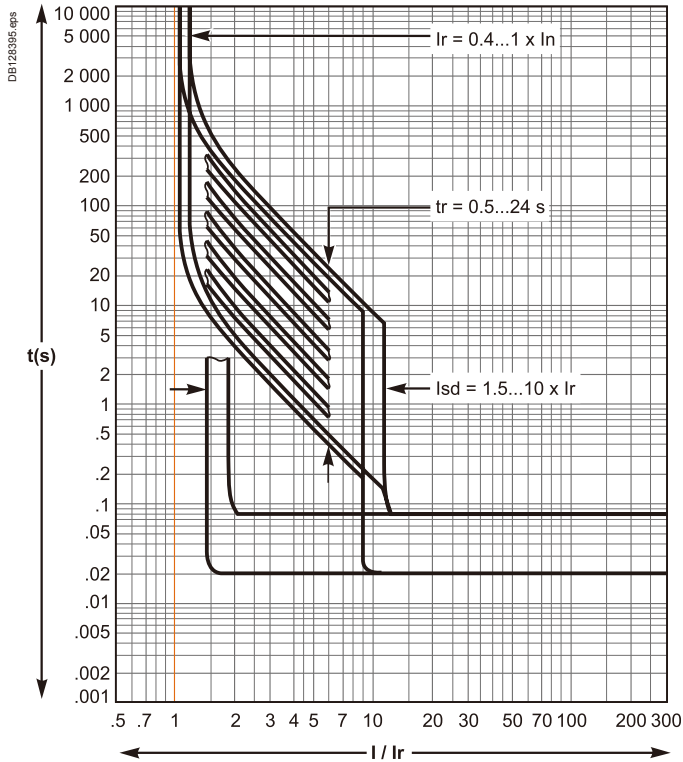


Tripping curves -Compact NS Micrologic

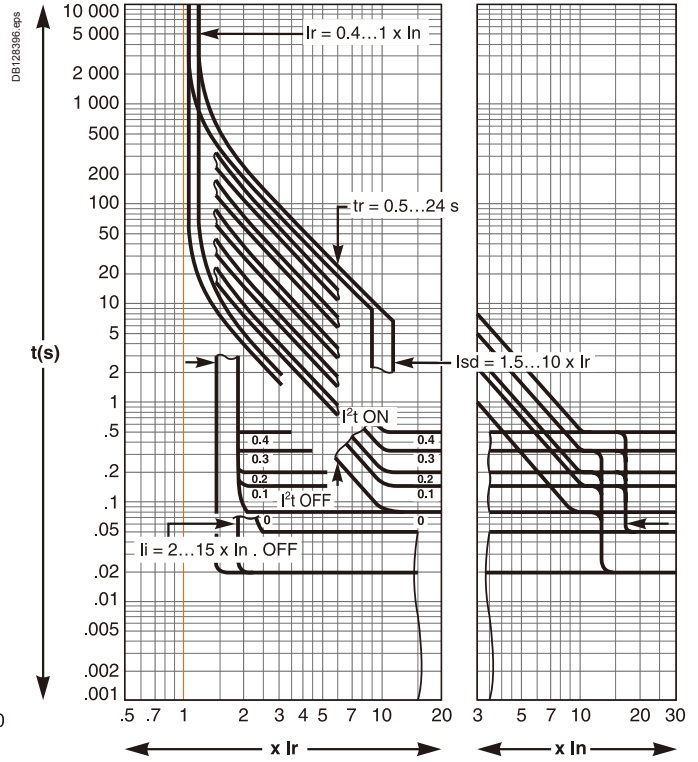
Compact
NS

Micrologic electronic control units

Micrologic 2.0

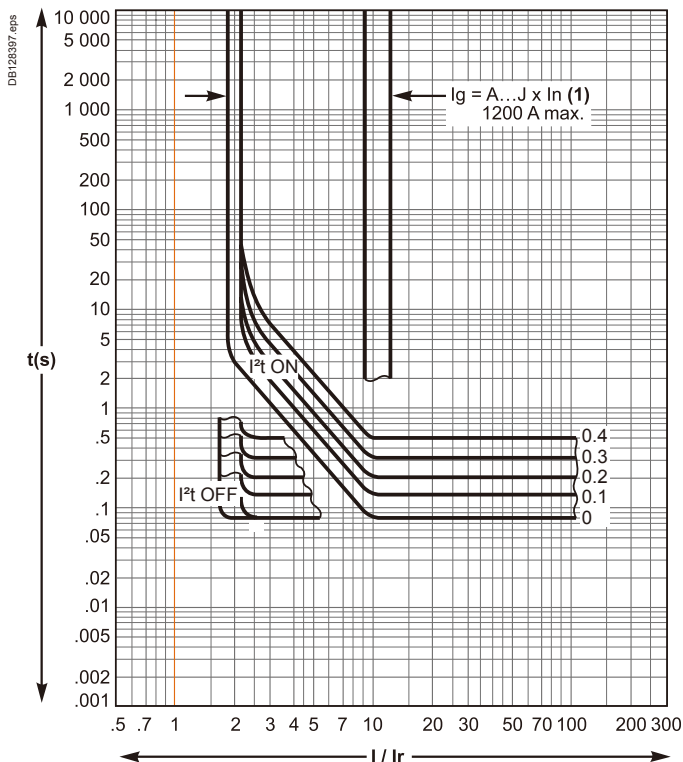


Micrologic 5.0, 6.0, 7.0



Options for Micrologic electronic control units

Earth-fault protection (Micrologic 6.0)

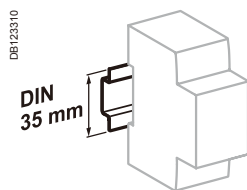


(1)

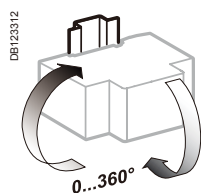
$I_g = I_n \times \dots$	A	B	C	D	E	F	G	H	J
$I_n < 400 A$	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
$400 A \leq I_n \leq 1200 A$	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
$I_n > 1200 A$	500	640	720	800	880	960	1040	1120	1200

Dimension and Mounting

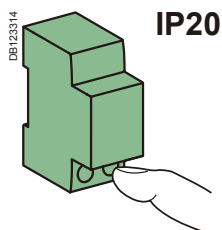
Acti 9 iK60N



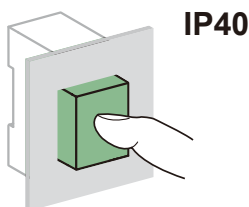
Clip on DIN rail 35 mm.



Position d'installation indifférente.



IP20



IP40

Technical data

Main characteristics

According to IEC/EN 60898-1

Insulation voltage (Ui)		440 V AC
Pollution degree		2
Rated impulse withstand voltage (Uimp)		4 kV
Thermal tripping	Reference temperature	30°C
	Temperature derating	See module CA908007
Magnetic tripping	C curve	5 to 10 In
Limitation class		3
Rated making and breaking capacity of an individual pole (Icn1)		Icn1 = Icn

Additional characteristics

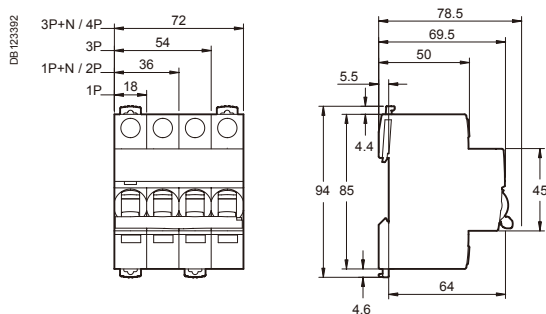
Degree of protection (IEC 60529)	Device only	IP20
	Device in modular enclosure	IP40 Classe d'isolement II
Endurance (O-C)	Electrical	10,000 cycles
	Mechanical	20,000 cycles
Overvoltage category (IEC 60364)		III
Operating temperature		-25°C to +60°C
Storage temperature		-40°C to +85°C

Weight (g)

Circuit-breaker

Type	iK60N
1P	100
2P	200
3P	300

Dimensions (mm)

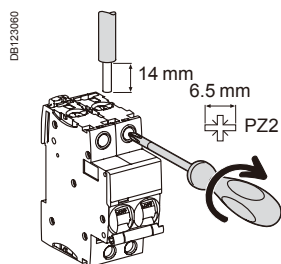


Dimension and Mounting

Acti 9 iC60N

Acti9

Connection



		Without accessory		With accessories			
Rating	Tightening torque	Copper cables		50 mm ² Al terminal	Screw-on connection for ring terminal	Multi-cables terminal	
		Rigid	Flexible or ferrule			Rigid cables	Flexible cables
		DB122945 	DB122946 	DB122935  Al	DB118789 	DB118787 	
0.5 to 25 A	2 N.m	1 to 25 mm ²	1 to 16 mm ²	-	Ø 5 mm	-	-
32 to 63 A	3.5 N.m	1 to 35 mm ²	1 to 25 mm ²	50 mm ²		3 x 16 mm ²	3 x 10 mm ²

Technical data

Main characteristics

According to IEC/EN 60947-2

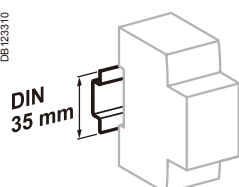
Insulation voltage (Ui)	500 V AC
Pollution degree	3
Rated impulse withstand voltage (Uimp)	6 kV
Thermal tripping	Reference temperature
	Temperature derating
Magnetic tripping	B curve
	C curve
	D curve
Utilization category	A

According to IEC/EN 60898-1

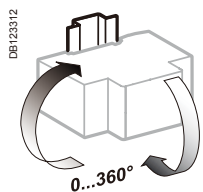
Limitation class	3
Rated making and breaking capacity of an individual pole (Icn1)	Icn1 = Icn

Additional characteristics

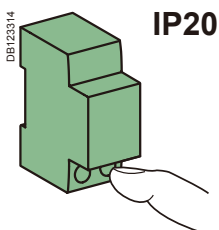
Breaking capacity under 1 pole with IT 380-415 V isolated neutral system (case of double fault)	40 A	4 kA
	50/63 A	3 kA
Degree of protection (IEC 60529)	Device only	IP20
	Device in modular enclosure	IP40
Endurance (O-C)	Electrical	10,000 cycles
	Mechanical	20,000 cycles
Overvoltage category (IEC 60364)		IV
Operating temperature		-35°C to +70°C
Storage temperature		-40°C to +85°C
Tropicalization (IEC 60068-1)		Treatment 2 (relative humidity 95 % to 55°C)



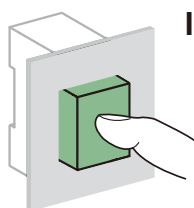
Clip on DIN rail 35 mm.



Indifferent position of installation.



IP20

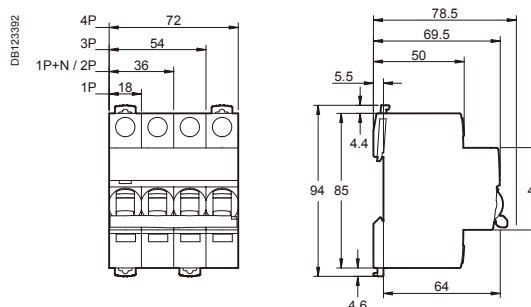


IP40

Weight (g)

Circuit-breaker	
Type	iC60N
1P	125
2P	250
3P	375

Dimensions (mm)

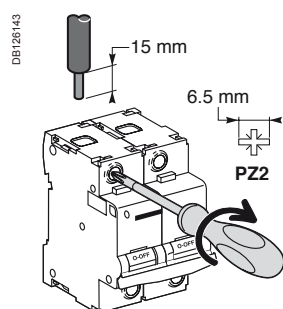


Dimension and Mounting-Acti 9

C120N circuit breakers

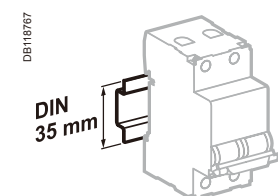
(curves C)

Connection

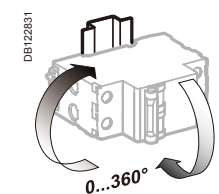


		Without access.		With accessories			
Rating	Tightening torque	Copper cables		50 mm² Al Terminal	Screw-on connection for ring terminal ⁽¹⁾	Multi-cable terminal	
		Rigid/ semi-rigid	Flexible or with ferrule			Rigid cables	Flexible cables
		DB122845 	DB122846 	DB122835  Al	DB118789 	DB118787 	
63 to 125 A	3.5 N.m	1 to 50 mm²	1.5 to 35 mm²	16 to 50 mm²	Ø 5 mm	3 x 16 mm²	3 x 10 mm²

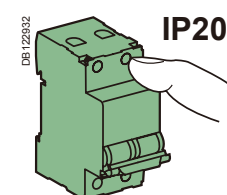
(1) For lugs up to 63 A, front or rear access.



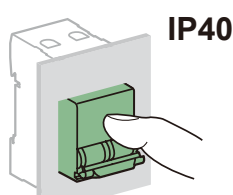
Clips onto 35 mm DIN rail.



Any installation position.



IP20



IP40

Technical data

Main characteristics

To IEC/EN 60947-2

Insulation voltage (Ui)	500 V AC
Degree of pollution	3
Rated impulse withstand voltage (Uimp)	6 kV
Thermal tripping	Reference temperature
	50°C

To IEC/EN 60898-1

Magnetic tripping	Curve B	3 and 5 In
	Curve C	5 and 10 In
	Curve D	10 and 14 In
Limitation class		3

Additional characteristics

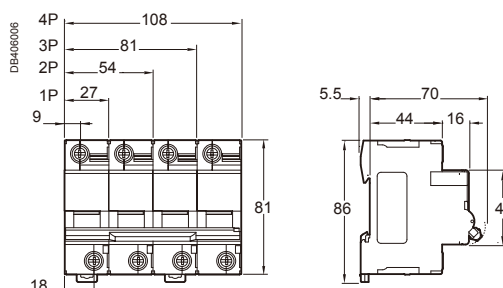
Degree of protection (IEC 60529)	Device only		IP20
	Device in a modular enclosure		IP40
Endurance (O-C)	Electrical	63 A	10000 cycles (O-C)
		80...125 A	5000 cycles (O-C)
	Mechanical		20000 cycles
Operating temperature			-30°C to +70°C
Storage temperature			-40°C to +80°C
Tropicalisation (IEC 60068-1)			Treatment 2 (relative humidity 95 % at 55°C)

Weight (g)

Circuit breaker

Type	C120N
2P	410
3P	615

Dimensions (mm)



Dimension and Mounting

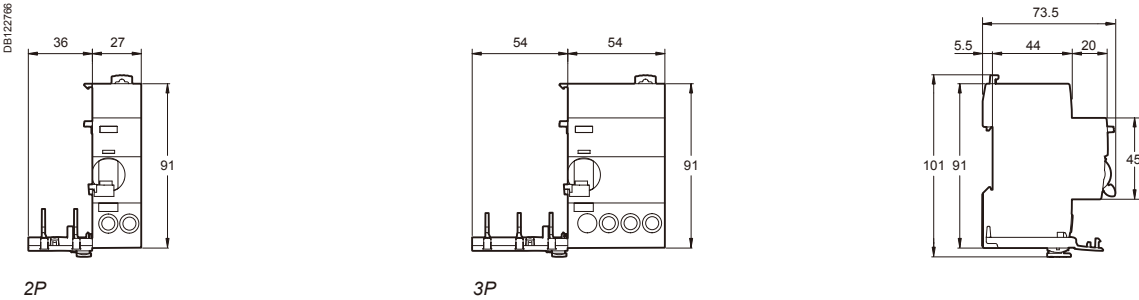
Acti9 VigiiC60 add-on residual current devices (AC types)

Weight (g)

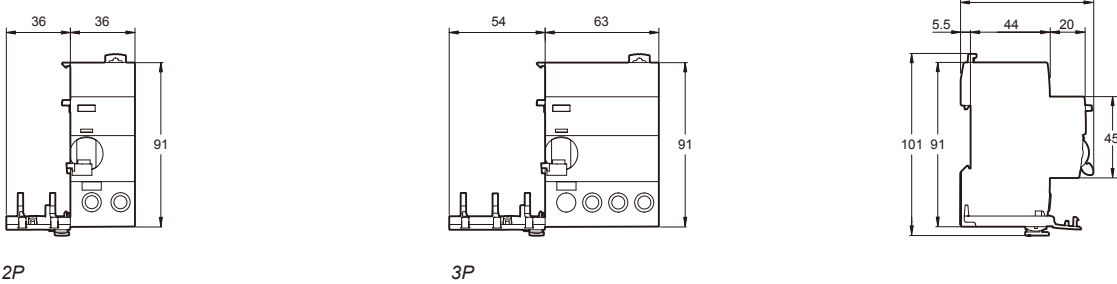
Add-on residual current devices	
Type	Vigi iC60
2P	165
3P	210

Dimensions (mm)

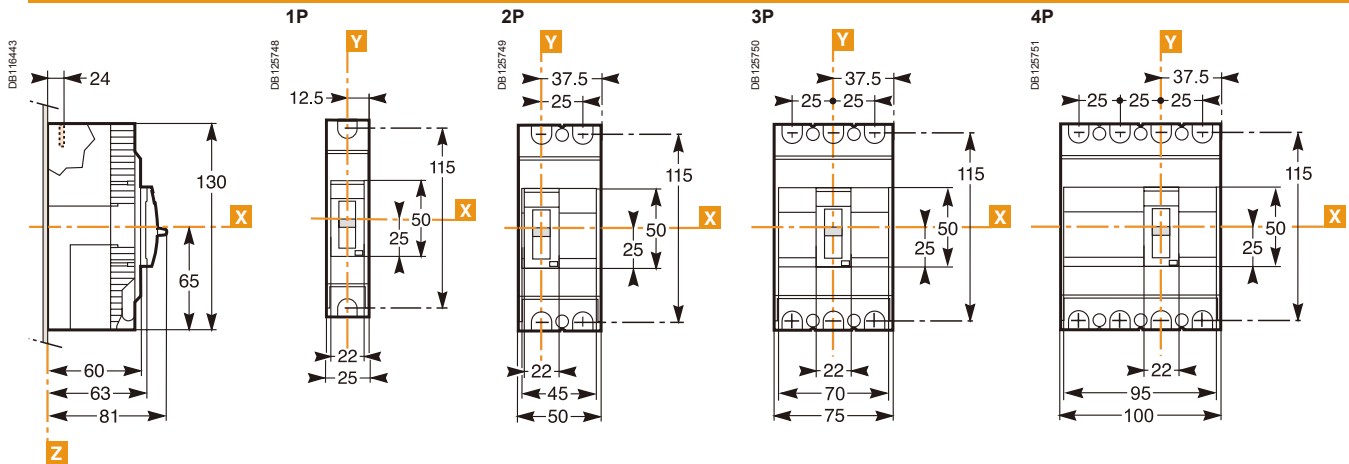
Vigi iC60 25 A



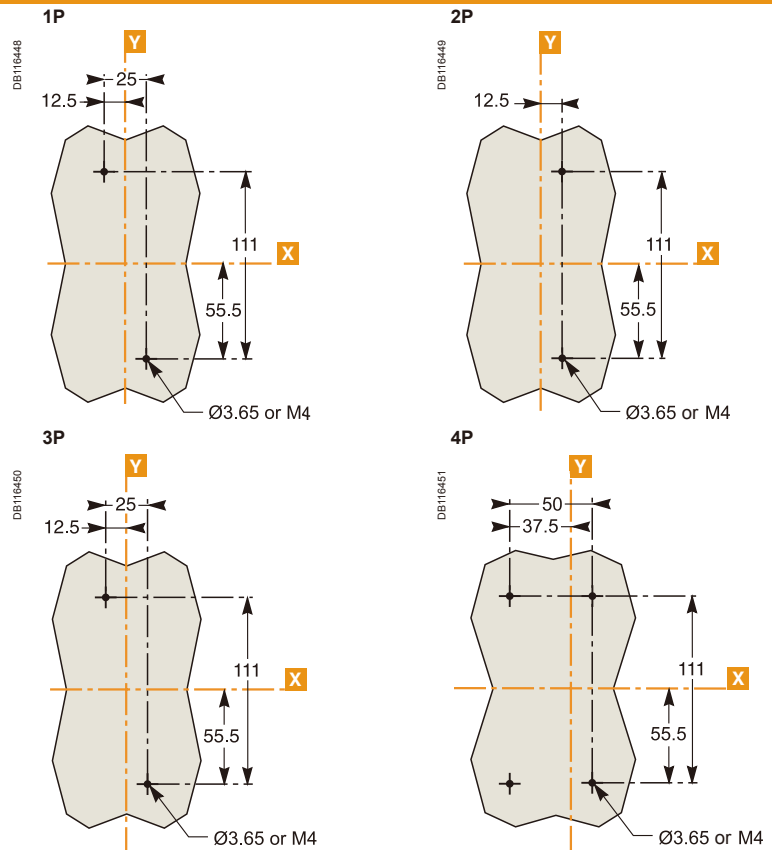
Vigi iC60 40 and 63 A



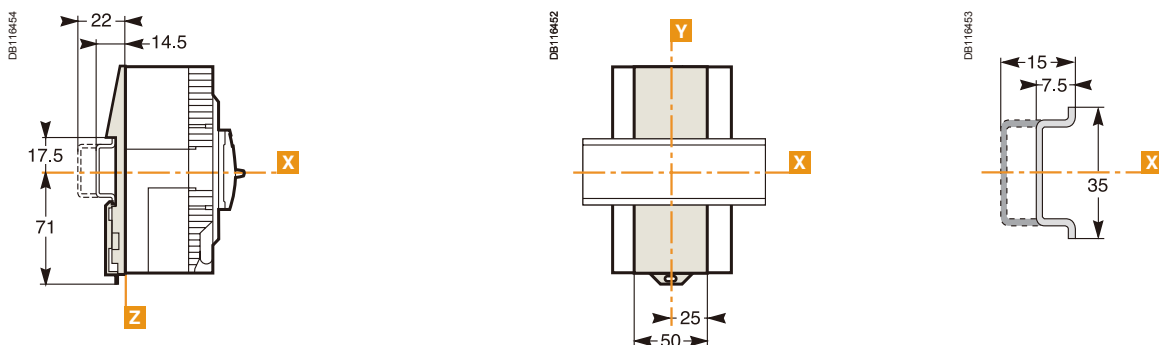
Dimensions



Mounting on plate



Mounting on DIN rail

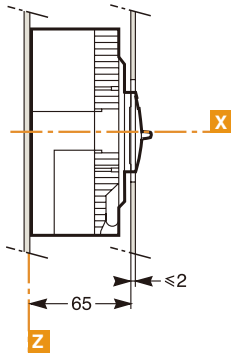


Dimensions and Mounting

Easypact EZC 100

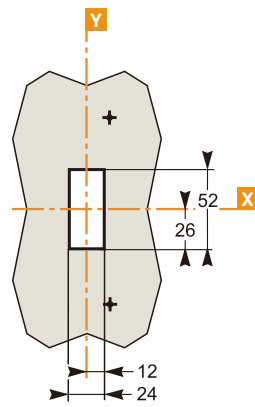
Door cut-out (small)

DB116455



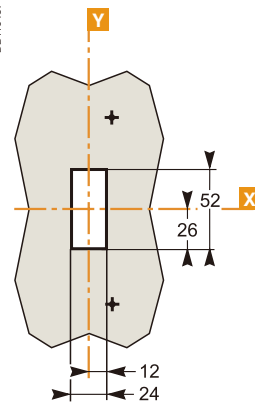
1P, 3P

DB116457



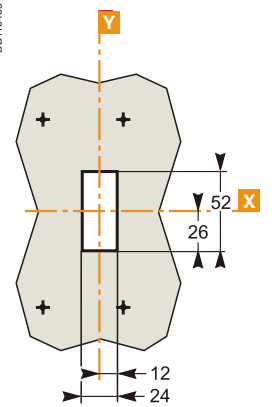
2P

DB116457



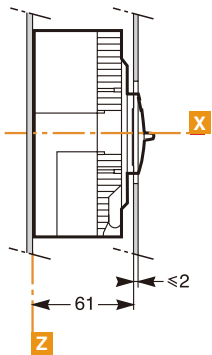
4P

DB116459



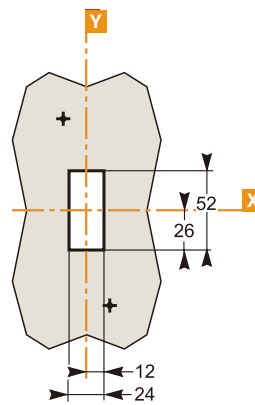
Door cut-out (large)

DB116459



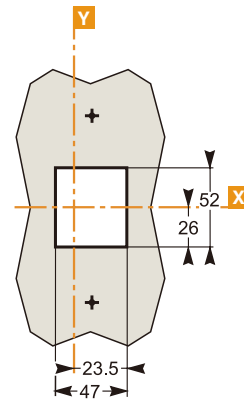
1P

DB116460



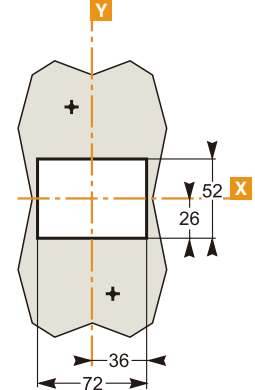
2P

DB116461



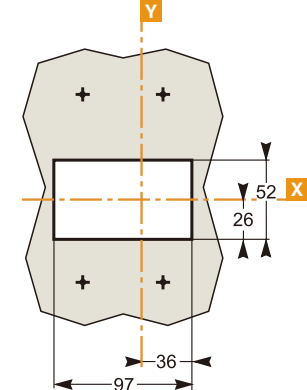
3P

DB116462



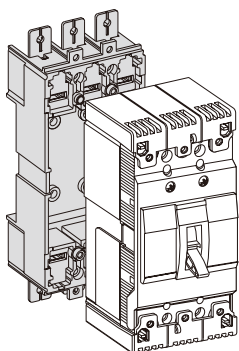
4P

DB116463

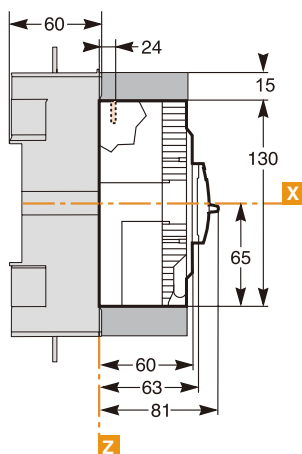


Dimensions

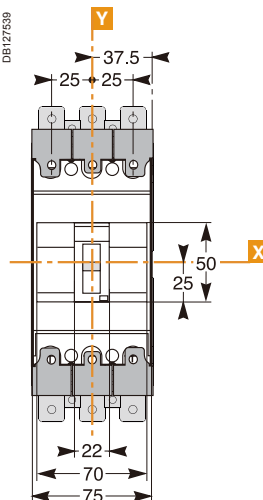
DB127536



DB127538



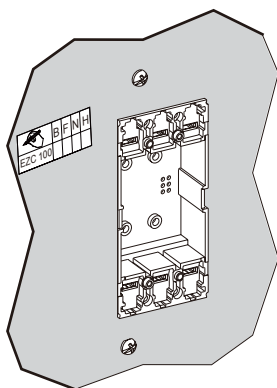
DB127539



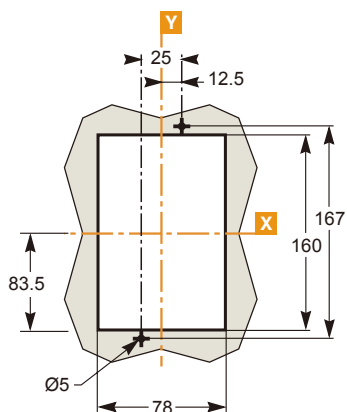
Mounting

Through front panel

DB127541

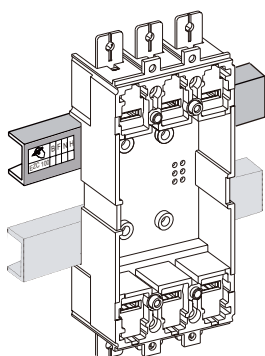


DB127537

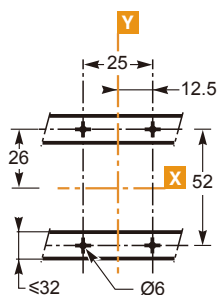


On rail

DB127542



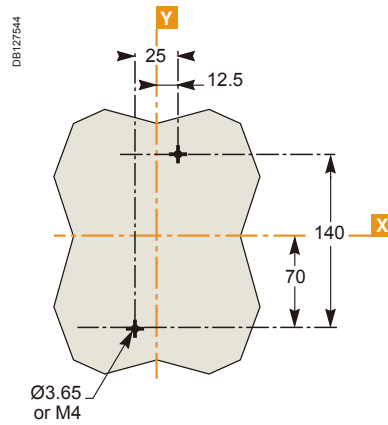
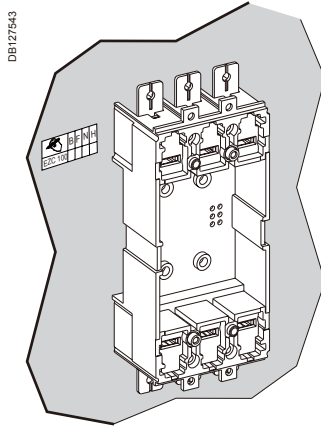
DB127540



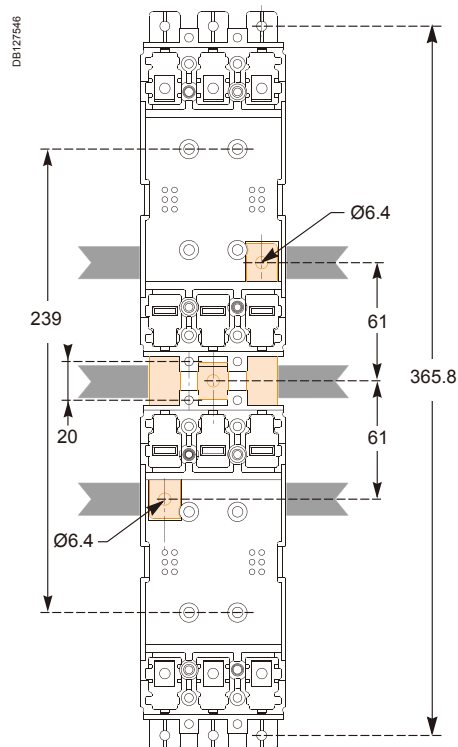
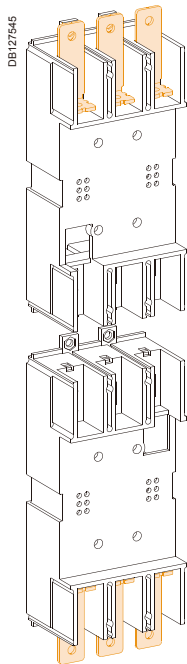
Dimensions and Mounting

Easypact EZC 100 A with plug-in

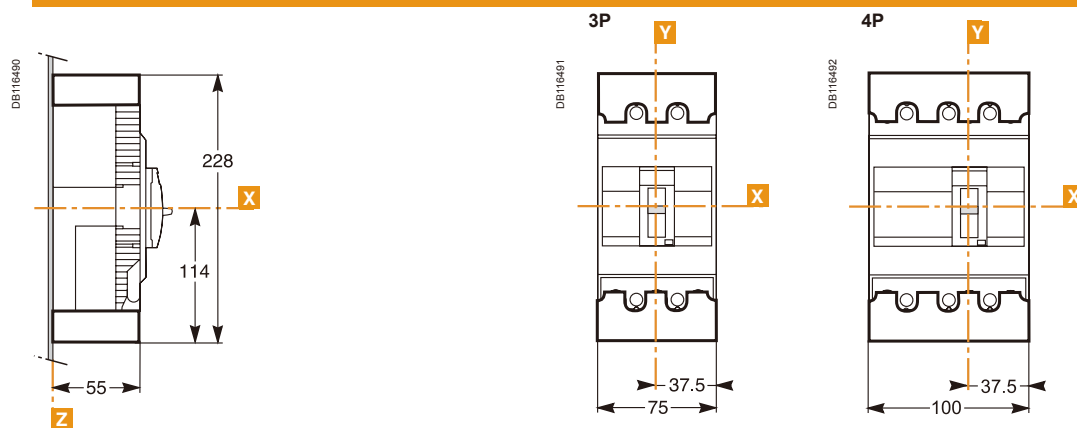
On backplate



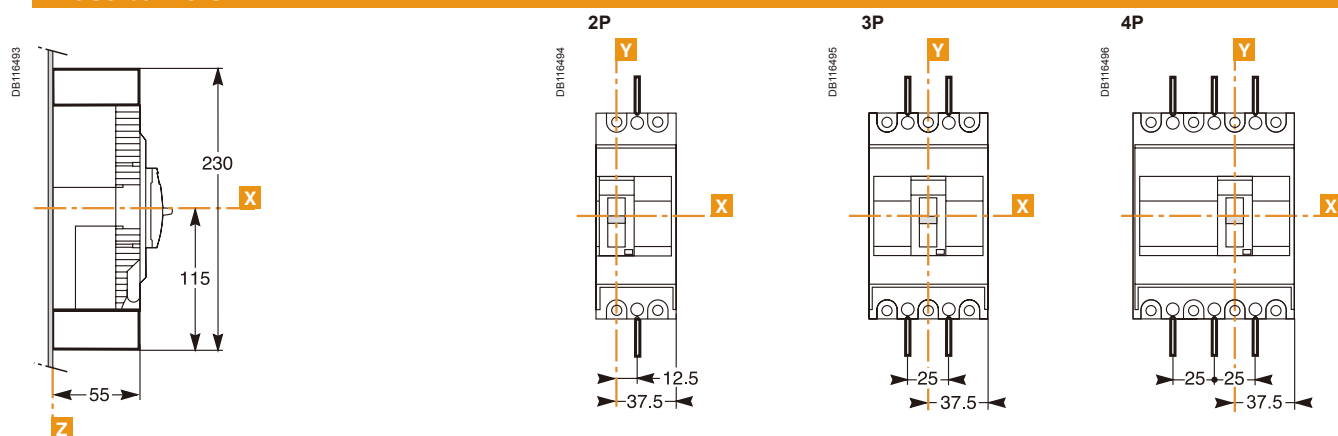
Dimensions - combination



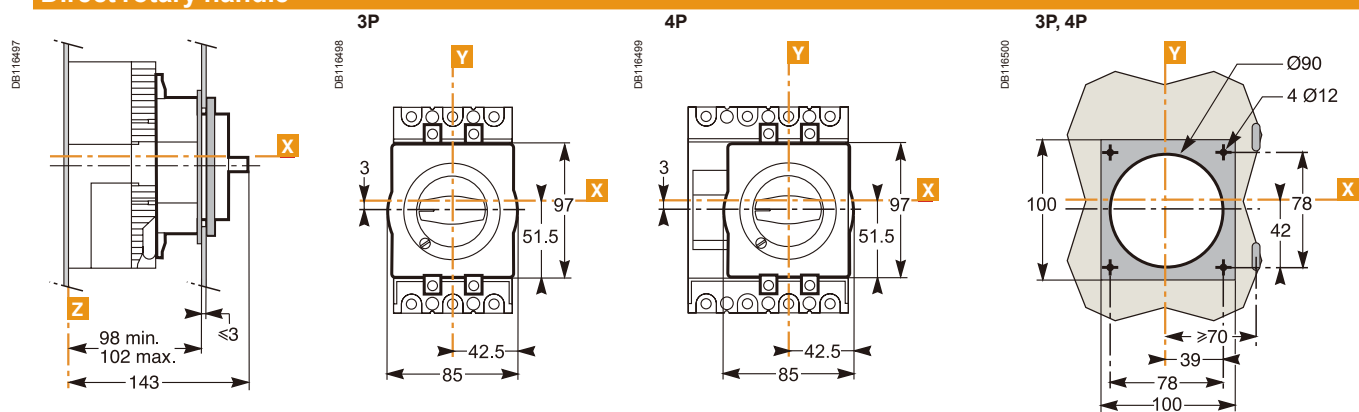
Terminal shields



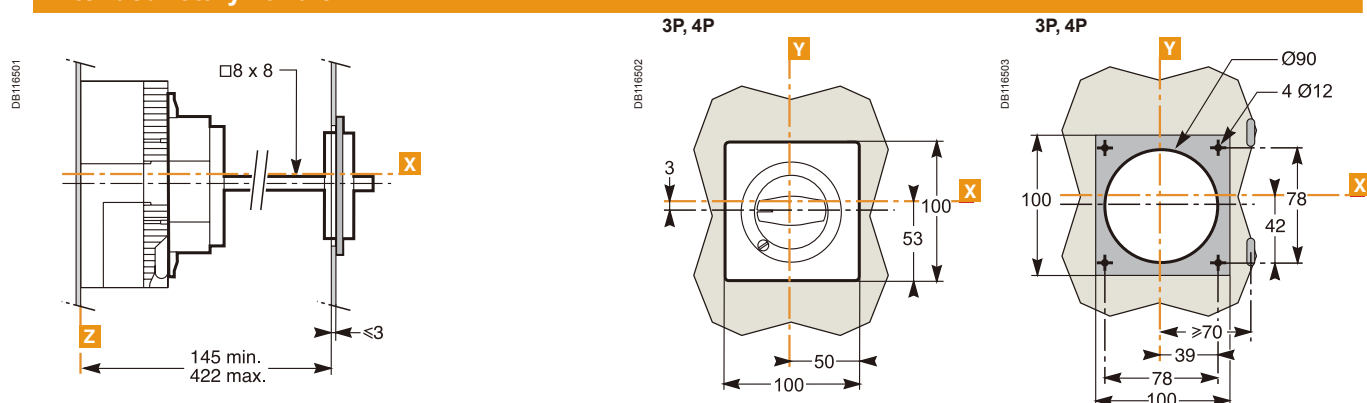
Phase barriers



Direct rotary handle



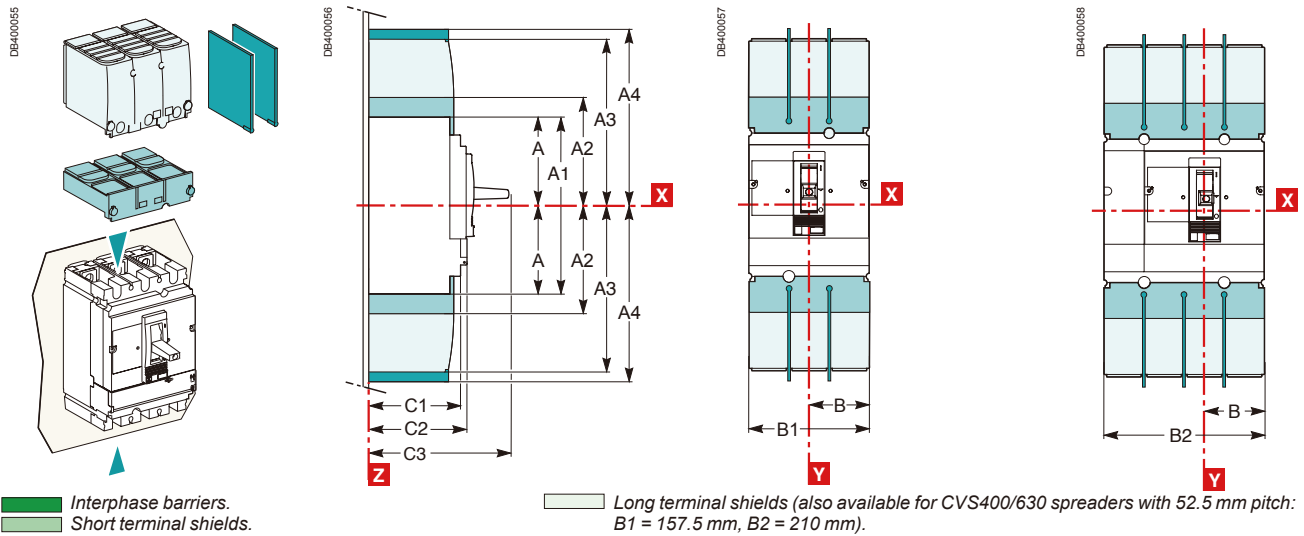
Extended rotary handle



Dimensions and Mounting

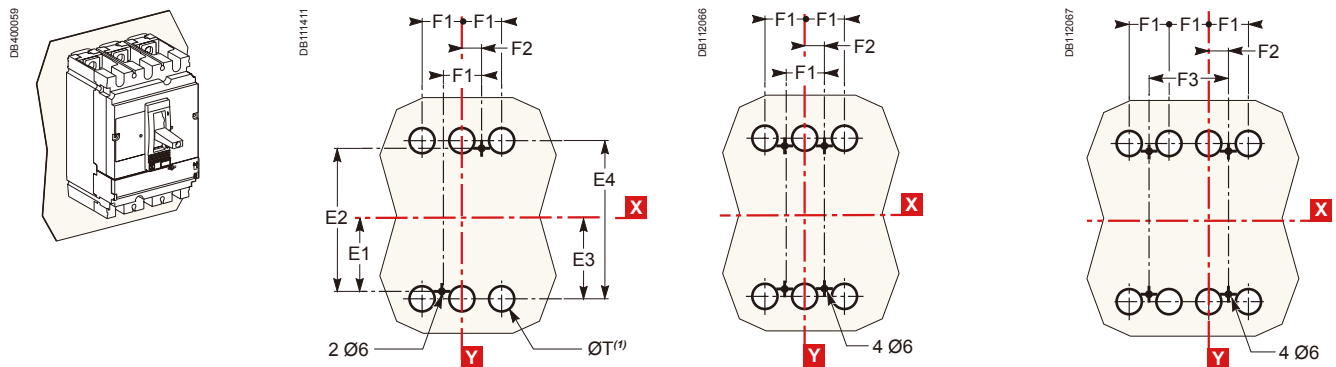
Easypact CVS160 to 630

Dimensions

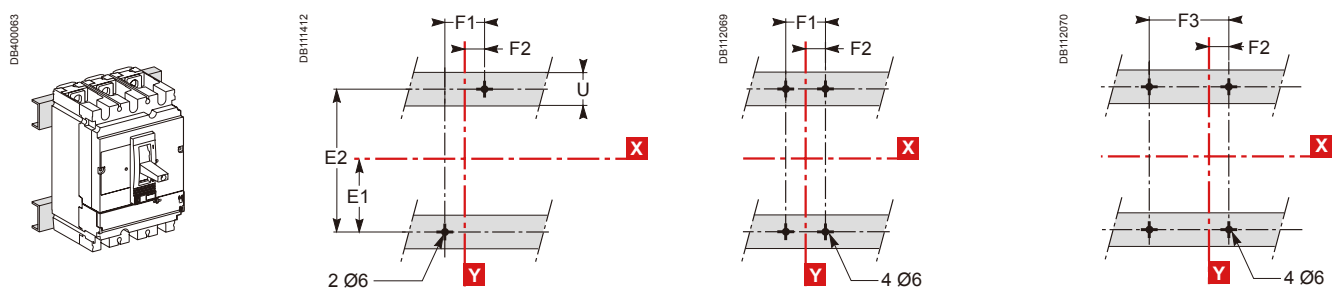


Mounting

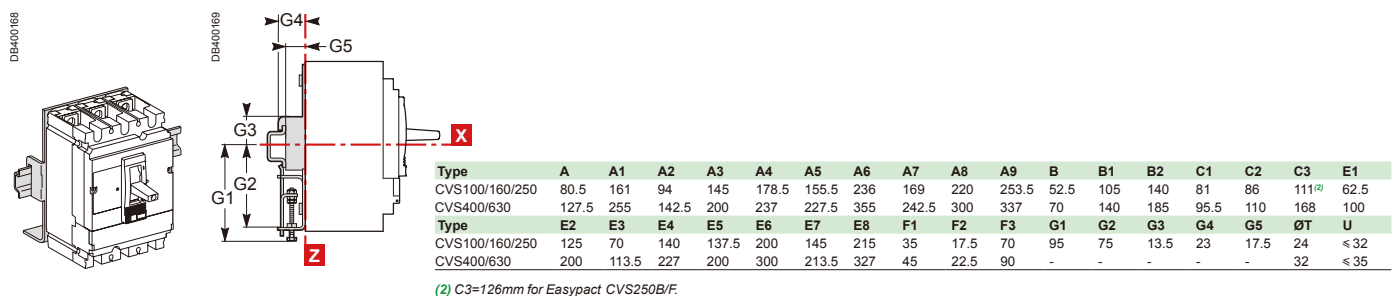
On backplate



On rails



On DIN rail with adaptor plate (CVS100 to 250)



Dimensions and Mounting

Easycompact CVS 160 to 630

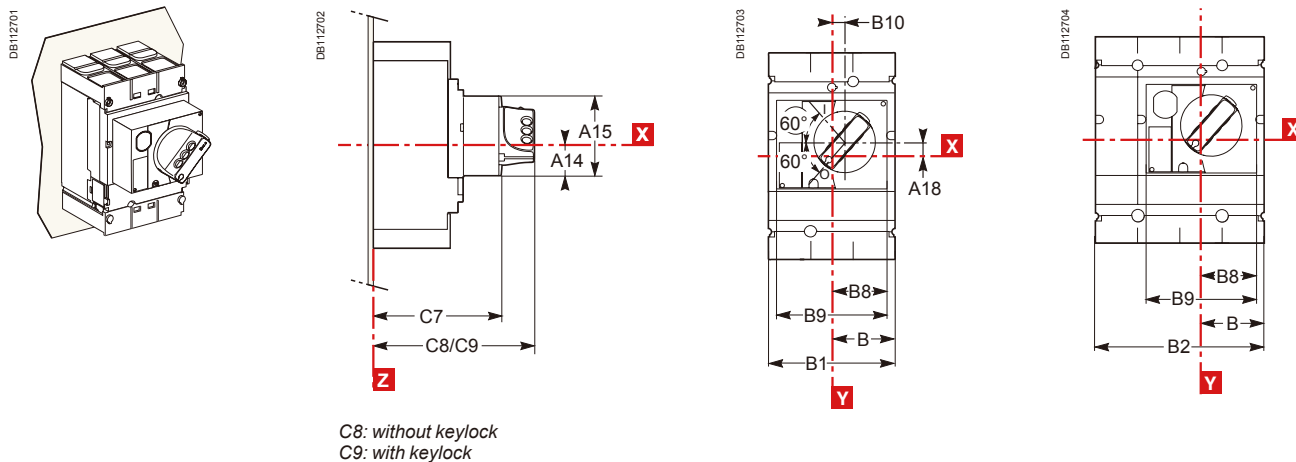
Direct rotary handle

Dimensions

3P

4P

Fixed circuit breaker



Type	A14	A15	A18	B8	B9	B10	C7	C8	C9
CVS160/250	27.5	73	9	45.5	91	9.25	121	155	164
CVS400/630	40	123	24.6	61.5	123	5	145	179	188

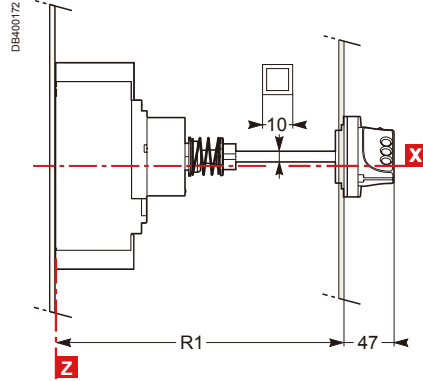
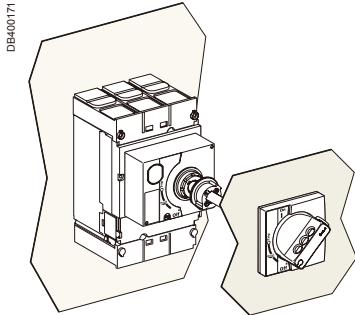
Dimensions and Mounting

Easypact CVS 160 to 630

Extended rotary handle

Dimensions

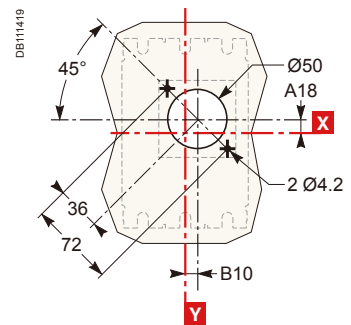
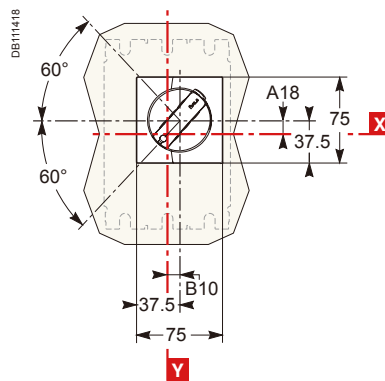
Fixed circuit breakers



Cutout for shaft (mm)

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

Dimensions and front-panel cutout



Type	A18	B10
CVS100/160/250	9	9.25
CVS400/630	24.6	5

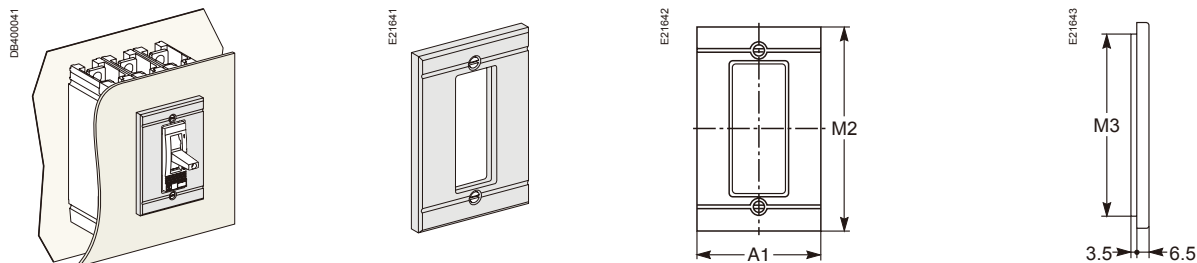
Dimensions and Mounting

Easycompact CVS 160 to 630

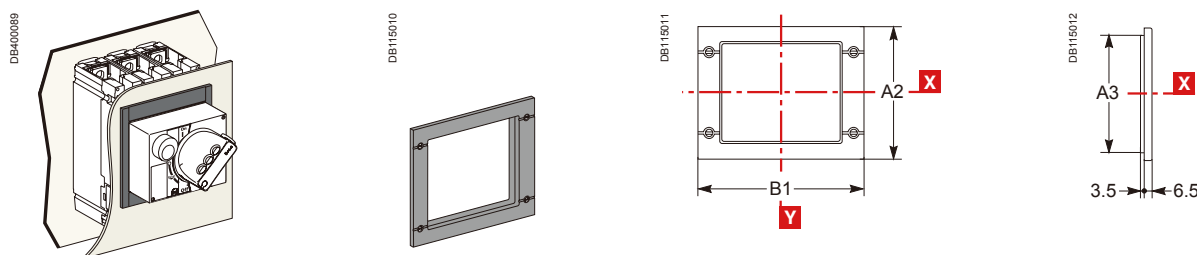
Front-panel

IP40 front-panel escutcheons

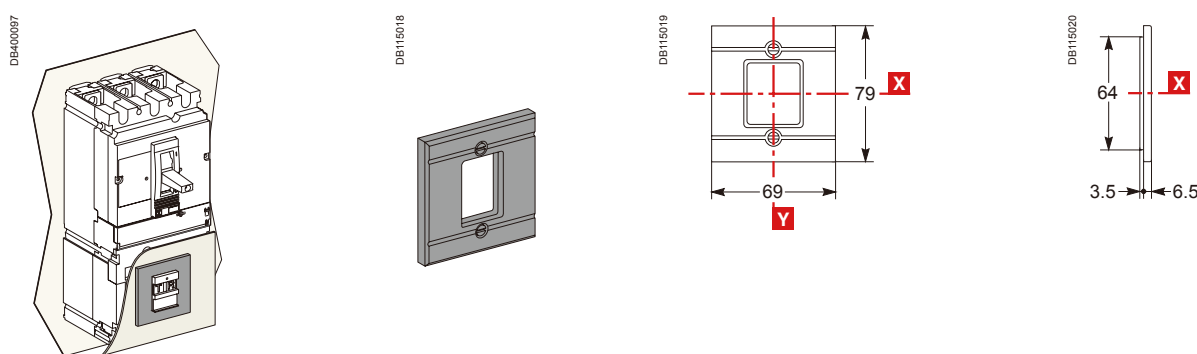
For toggle



For rotary handle or module and protection collar



For Vigi



Type	A1	A2	A3	B1	M2	M3
CVS100/160/250	91	114	101	157	115	102
CVS400/630	123	164	151	189	155	142

Dimensions and Mounting

Easypact CVS 160 to 630

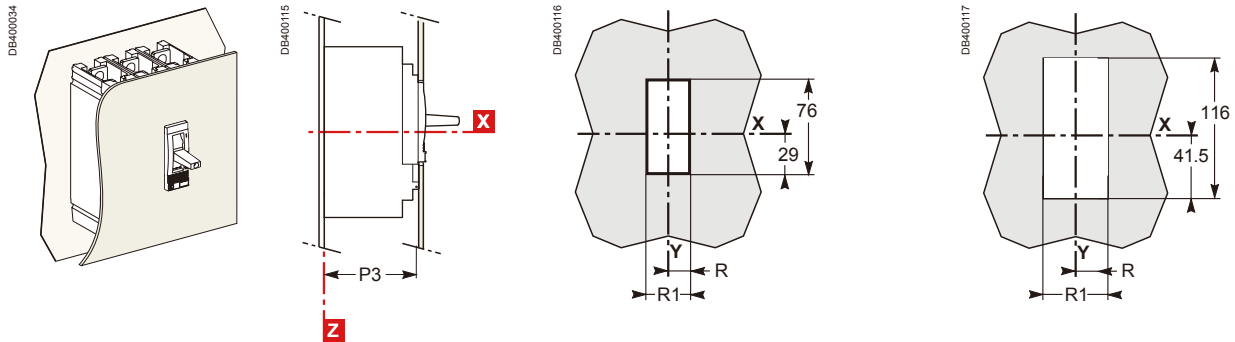
Front-panel

Bare sheet metal

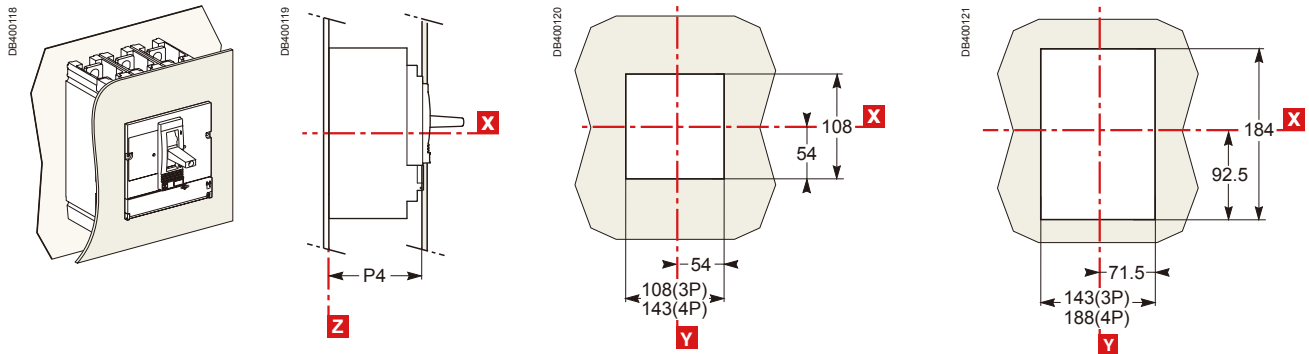
CVS100 to 250

CVS400/630

For toggle



For toggle with access to trip unit



Type	P3	P4	R	R1
CVS100/160/250	88	83	14.5	29
CVS400/630	112	107	31.5	63

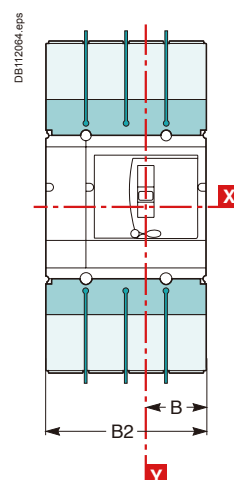
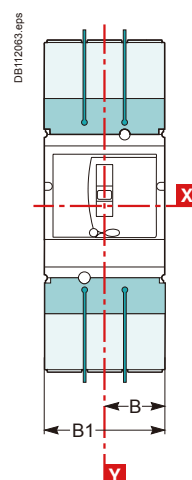
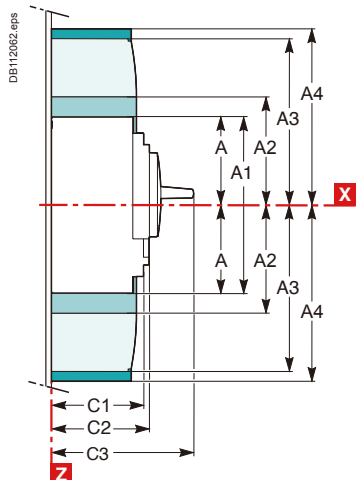
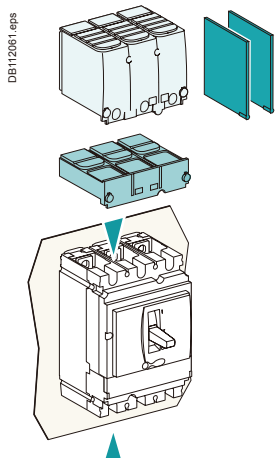
Dimensions and Mounting

Compact NSX100 to 630 fixed version

Dimensions

2/3P

4P



Interphase barriers.
Short terminal shields.

Long terminal shields (also available for NSX400/630 spreaders with 52.5 mm pitch:
B1 = 157.5 mm, B2 = 210 mm).

Mounting

NSX100 to 250

NSX400/630

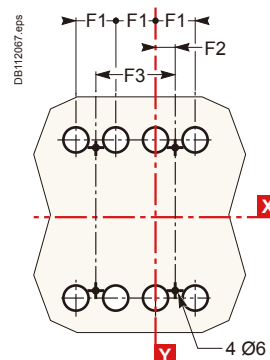
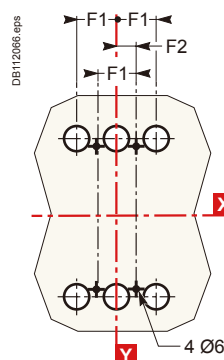
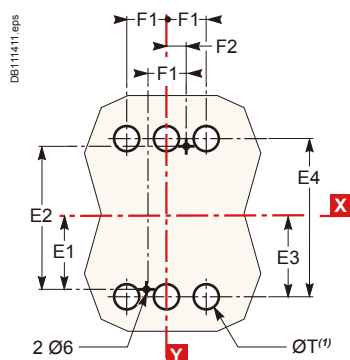
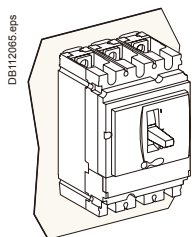
NSX100 to 630

On backplate

2/3P

3P

4P



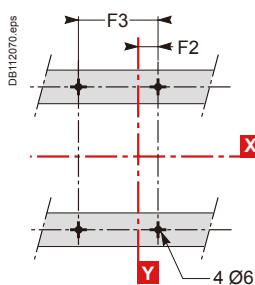
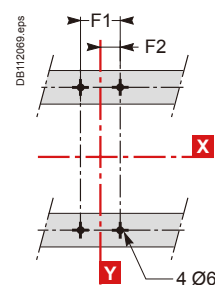
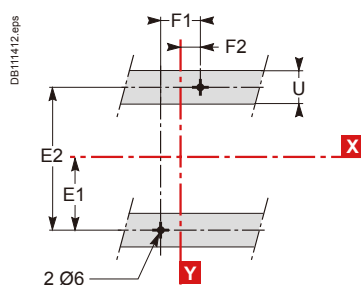
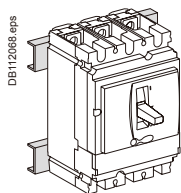
(1) The ØT holes are required for rear connection only.
For two-pole circuit breakers, the middle holes are not required.

On rails

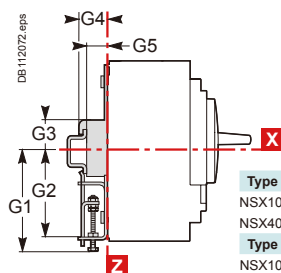
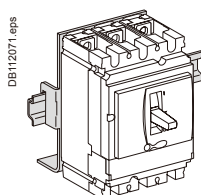
2/3P

3P

4P



On DIN rail with adapter plate (NSX100 to 250)



Type	A	A1	A2	A3	A4	A5	A6	A7	A8	A9	B	B1	B2	C1	C2	C3	E1
NSX100/160/250	80.5	161	94	145	178.5	155.5	236	169	220	253.5	52.5	105	140	81	86	126	62.5
NSX400/630	127.5	255	142.5	200	237	227.5	355	242.5	300	337	70	140	185	95.5	110	168	100
Type	E2	E3	E4	E5	E6	E7	E8	F1	F2	F3	G1	G2	G3	G4	G5	ØT	U
NSX100/160/250	125	70	140	137.5	200	145	215	35	17.5	70	95	75	13.5	23	17.5	24	≤ 32
NSX400/630	200	113.5	227	200	300	213.5	327	45	22.5	90	-	-	-	-	-	32	≤ 35

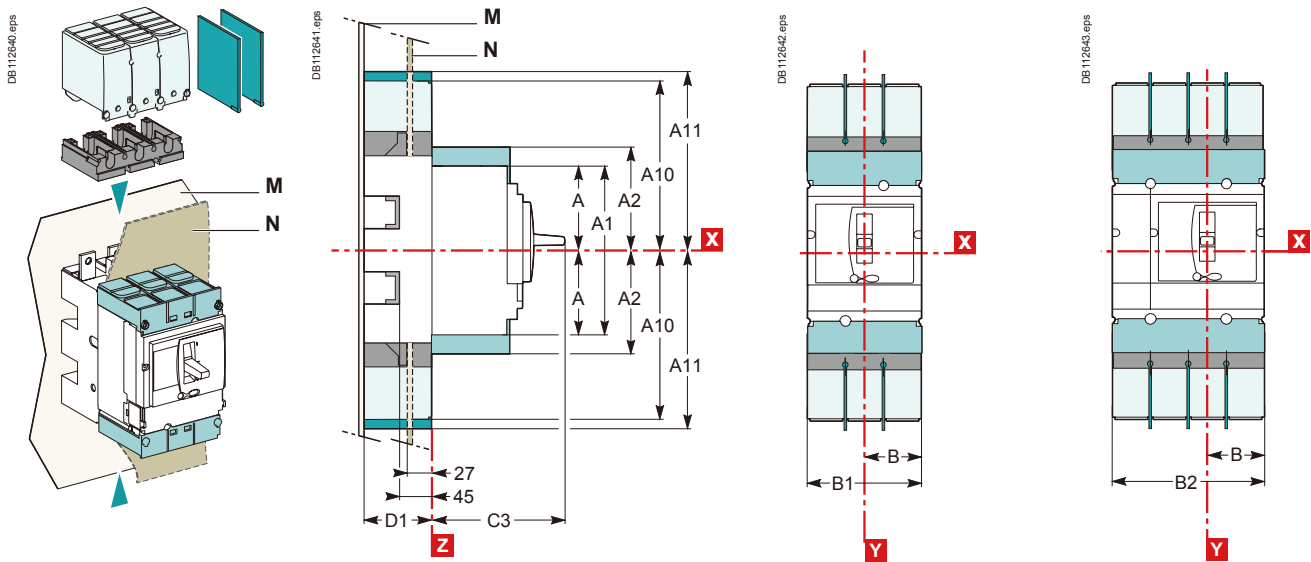
Dimensions and Mounting

Compact NSX100 to 630 plug-in version

Dimensions

2/3P

4P



Interphase barriers for base.
Short terminal shields on circuit breaker.

Long terminal shields (also available for NSX400/630 spreaders with 52.5 mm pitch:
B1 = 157.5 mm, B2 = 210 mm).
Adapter for base, required to mount long terminal shields or interphase barriers.

Mounting

Through front panel (N)

2/3P

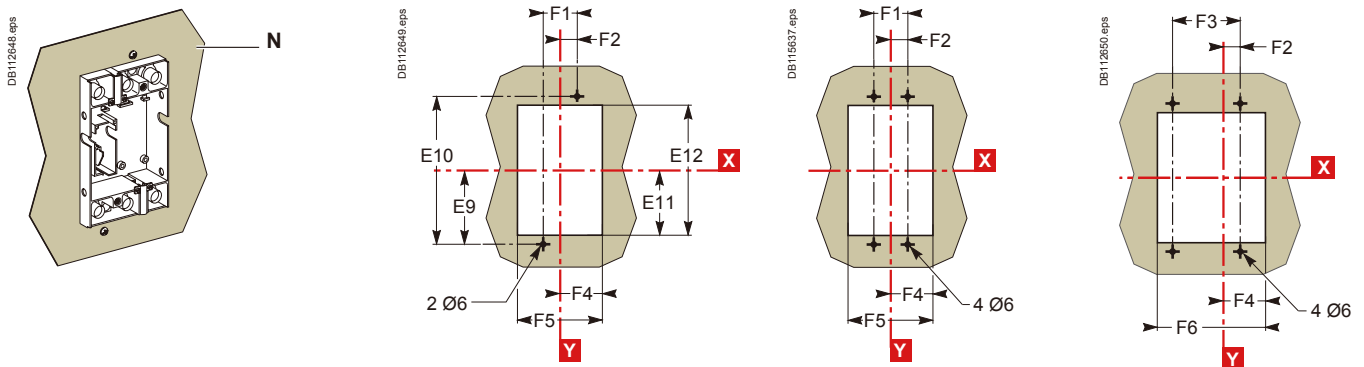
3P

4P

NSX100 to 250

NSX400/630

NSX100 to 630

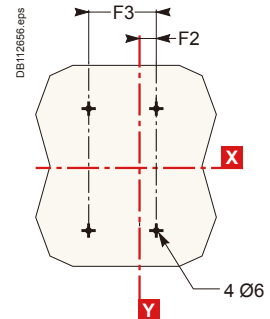
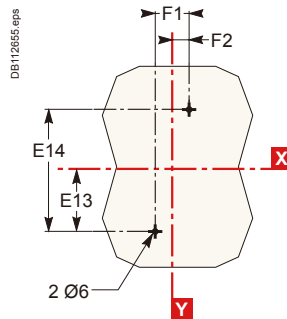
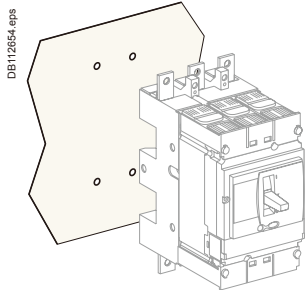


On backplate (M)

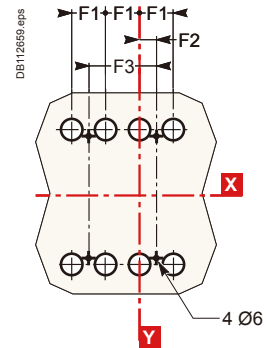
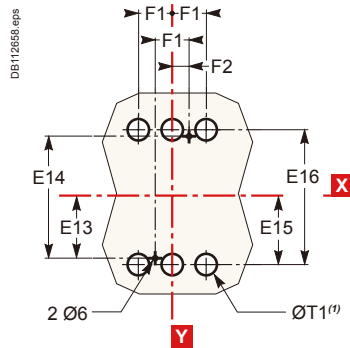
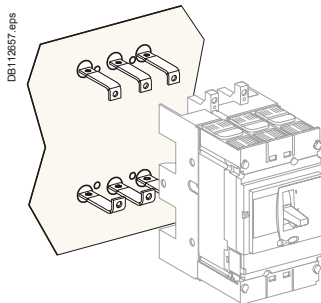
2/3P

4P

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

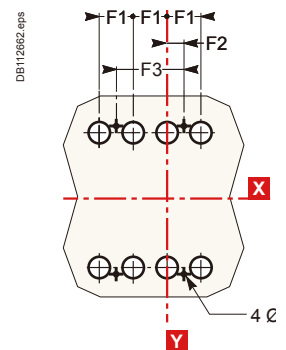
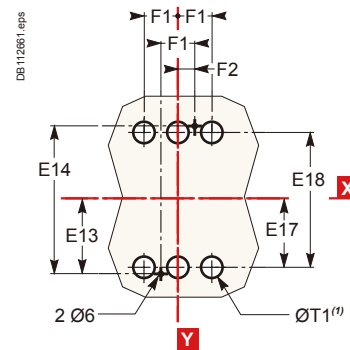
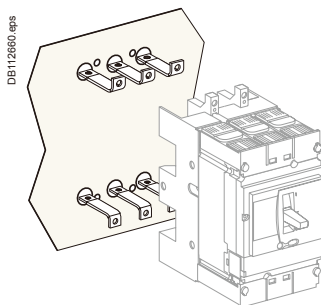


Connection by exterior-mounted rear connectors



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

Connection by interior-mounted rear connectors

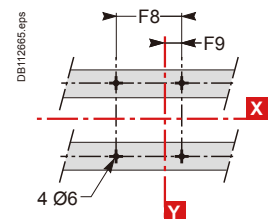
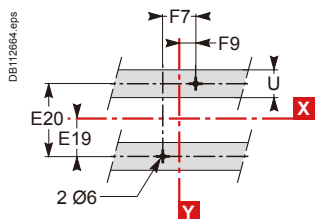
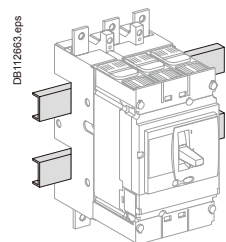


(1) The ØT1 holes are required for rear connection only (for two-pole circuit breakers, the middle holes are not required).

On rails

2/3P

4P



Type	A	A1	A2	A10	A11	B	B1	B2	C3	D1	E9	E10	E11	E12	E13	E14	E15
NSX100/160/250	80.5	161	94	175	210	52.5	105	140	126	75	95	190	87	174	77.5	155	79
NSX400/630	127.5	255	142.5	244	281	70	140	185	168	100	150	300	137	274	125	250	126
Type	E16	E17	E18	E19	E20	F1	F2	F3	F4	F5	F6	F7	F8	F9	ØT1	U	
NSX100/160/250	158	61	122	37.5	75	35	17.5	70	54.5	109	144	70	105	35	24	≤ 32	
NSX400/630	252	101	202	75	150	45	22.5	90	71.5	143	188	100	145	50	33	≤ 35	

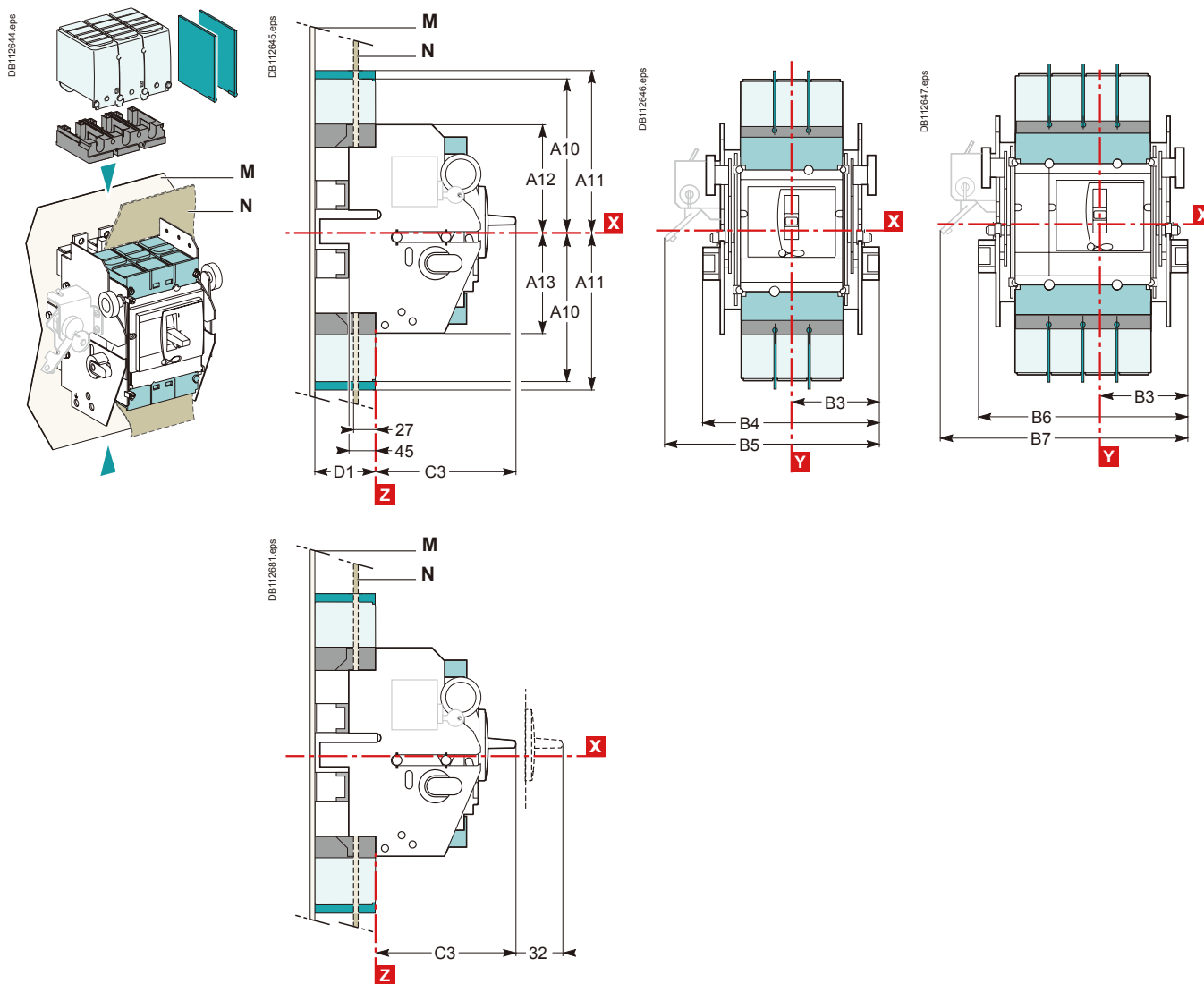
Dimensions and Mounting

Compact NSX100 to 630 withdrawable version

Dimensions

2/3P

4P



Interphase barriers for base.
Short terminal shields on circuit breaker.

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

Mounting

Through front panel (N)

2/3P

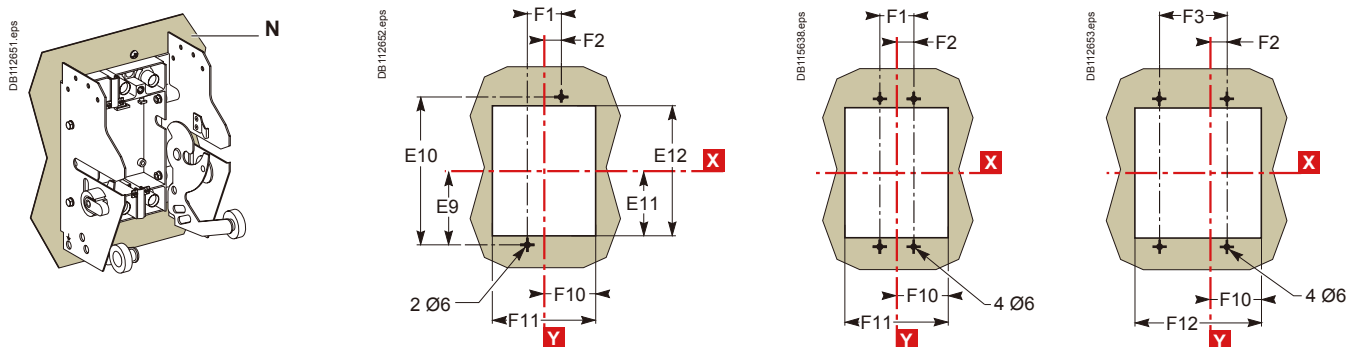
3P

4P

NSX100 to 250

NSX400/630

NSX100 to 630

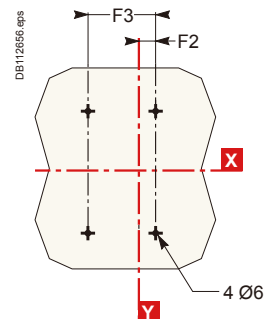
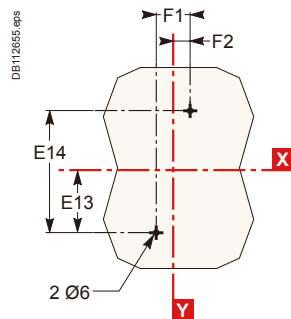
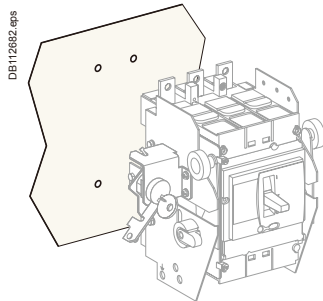


On backplate (M)

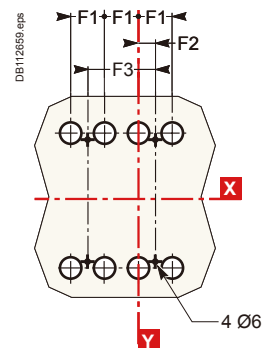
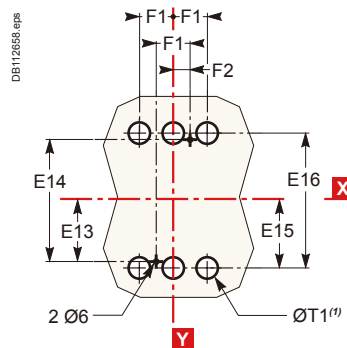
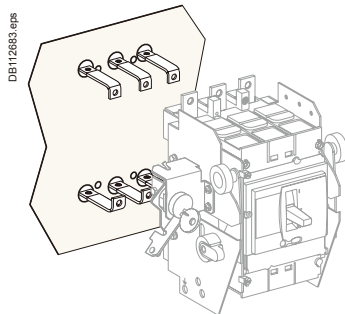
2/3P

4P

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

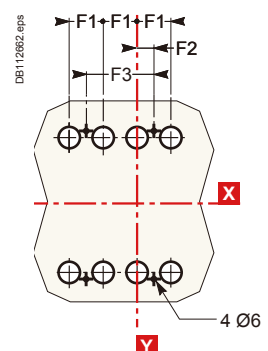
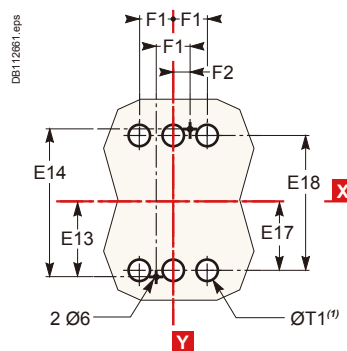
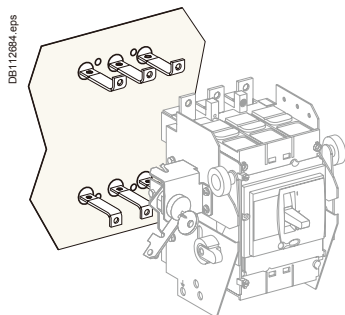


Connection by exterior-mounted rear connectors



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

Connection by interior-mounted rear connectors

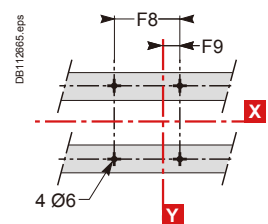
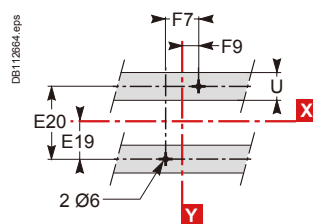
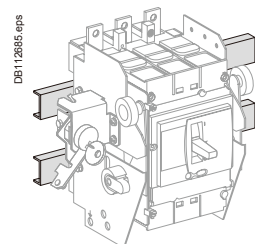


(1) The ØT1 holes are required for rear connection only (for two-pole circuit breakers, the middle holes are not required).

On rails

2/3P

4P



Type	A10	A11	A12	A13	B3	B4	B5	B6	B7	C3	D1	E9	E10	E11	E12	E13	E14
NSX100/160/250	175	210	106.5	103.5	92.5	185	216	220	251	126	75	95	190	87	174	77.5	155
NSX400/630	244	281	140	140	110	220	250	265	295	168	100	150	300	137	274	125	250
Type	E15	E16	E17	E18	E19	E20	F1	F2	F3	F7	F8	F9	F10	F11	F12	ØT1	U
NSX100/160/250	79	158	61	122	37.5	75	35	17.5	70	70	105	35	74	148	183	24	≤ 32
NSX400/630	126	252	101	202	75	150	45	22.5	90	100	145	50	91.5	183	228	33	≤ 35

Dimensions and Mounting

Compact NSX100 to 630

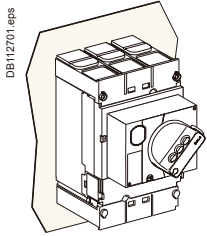
Direct rotary handle

Dimensions

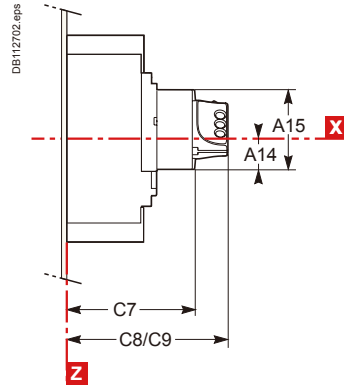
3P

4P

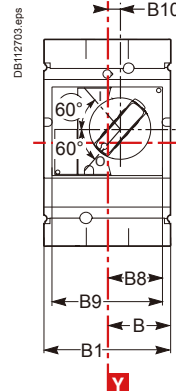
Fixed circuit breaker



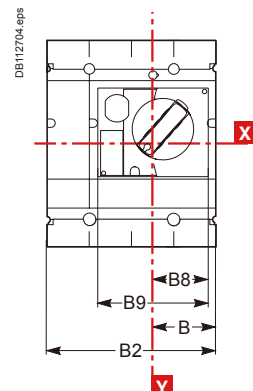
DB112701 eps



C8: without keylock
C9: with keylock

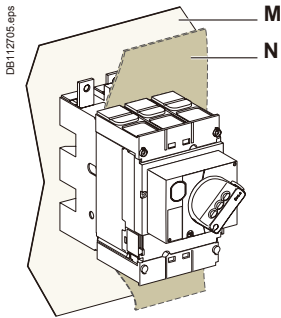


DB112703 eps

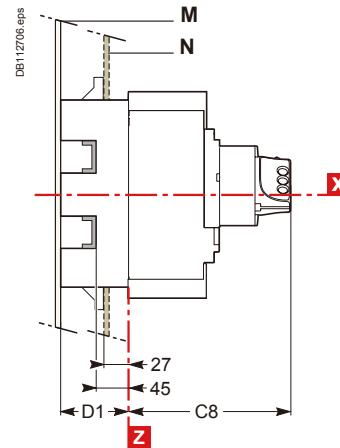


DB112704 eps

Plug-in circuit breaker

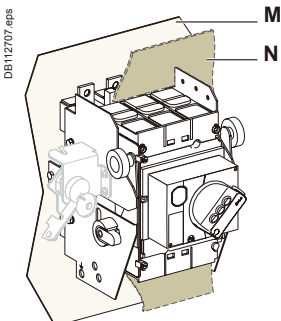


DB112705 eps

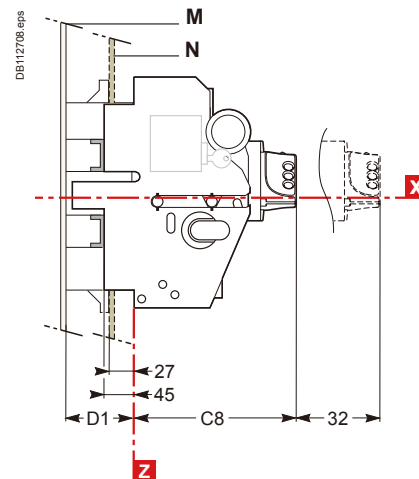


DB112706 eps

Withdrawable circuit breaker



DB112707 eps



DB112708 eps

Type	A14	A15	A18	B	B1	B2	B8	B9	B10	C7	C8	C9	D1
NSX100/160/250	27.5	73	9	52.5	105	140	45.5	91	9.25	121	155	164	75
NSX400/630	40	123	24.6	70	140	185	61.5	123	5	145	179	188	100

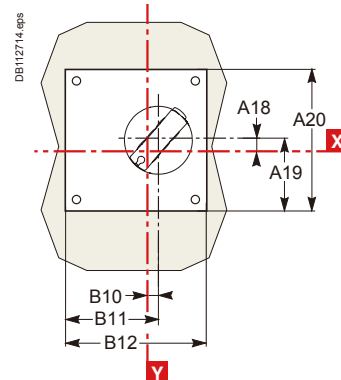
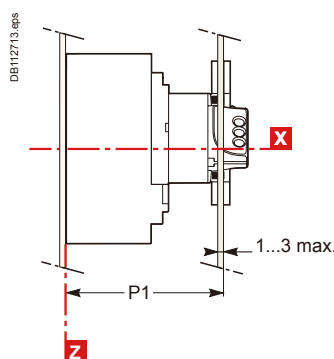
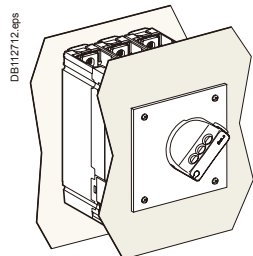
Dimensions and Mounting

Compact NSX100 to 630

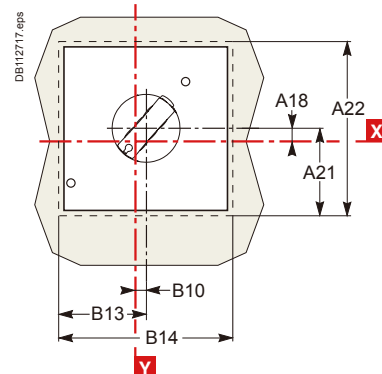
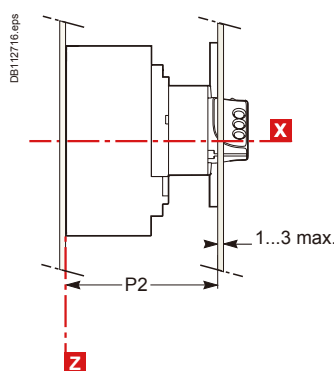
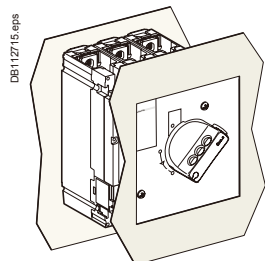
MCC and CNOMO type direct rotary handles

Dimensions

MCC type direct rotary handle



CNOMO type direct rotary handle

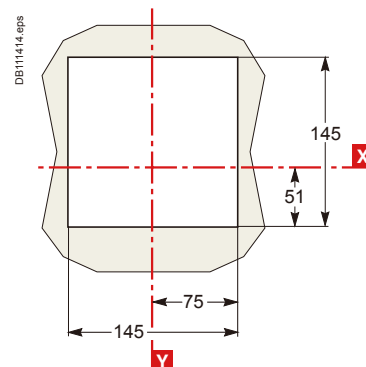
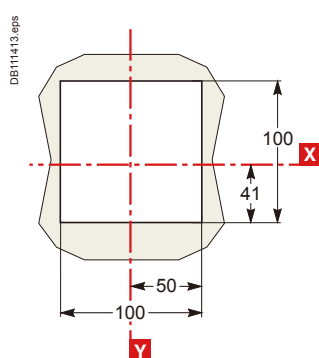
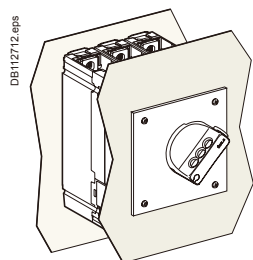


Front-panel cutout

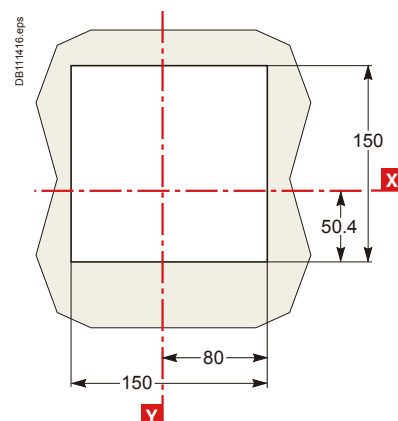
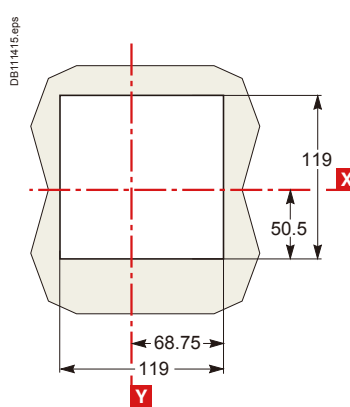
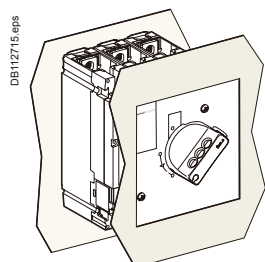
NSX100 to 250

NSX400/630

MCC type direct rotary handle



CNOMO type direct rotary handle



Type	A18	A19	A20	A21	A22	B10
NSX100/160/250	9	60	120	65	130	9.25
NSX400/630	24.6	83	160	82	164	5
Type	B11	B12	B13	B14	P1	P2
NSX100/160/250	69	120	65	130	125	135
NSX400/630	85	160	82	164	149	158

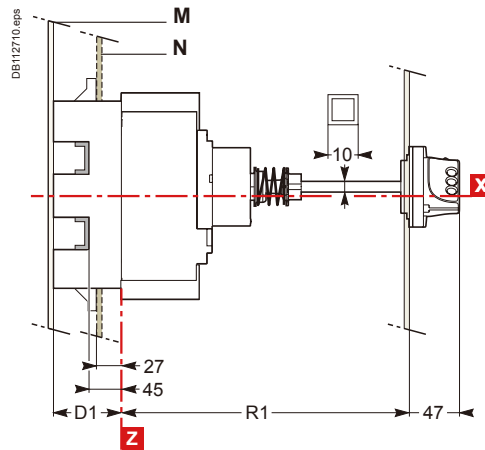
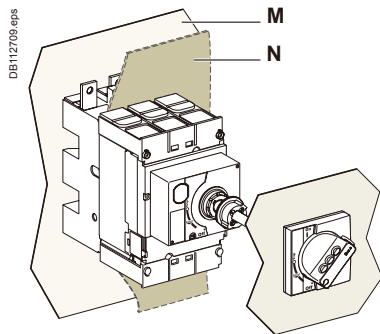
Dimensions and Mounting

Compact NSX100 to 630

Extended rotary handles

Dimensions

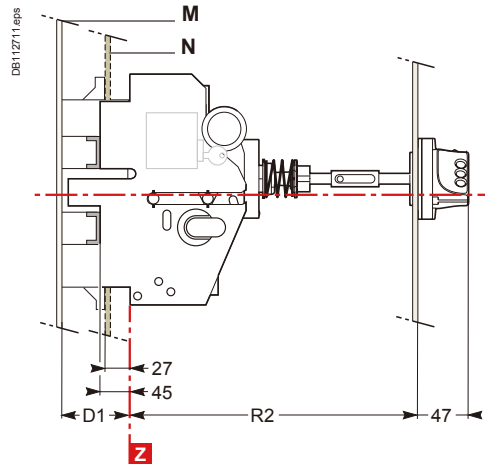
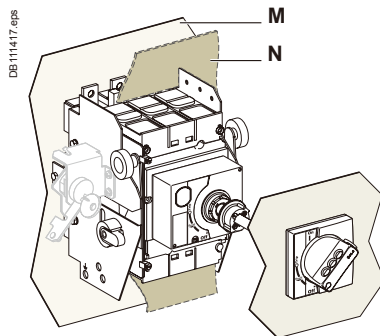
Fixed and plug-in circuit breakers



Cutout for shaft (mm)

Type	R1
NSX100/160/250	min. 171 max. 600
NSX400/630	min. 195 max. 600

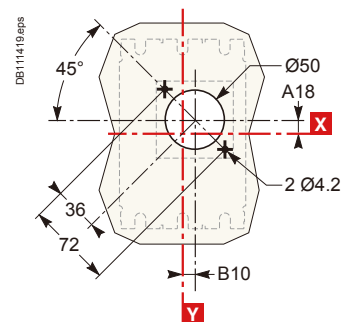
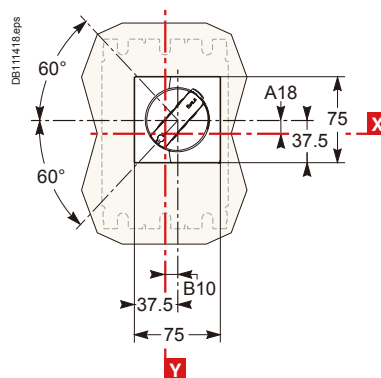
Withdrawable circuit breaker



Cutout for shaft (mm)

Type	R2
NSX100/160/250	min. 248 max. 600
NSX400/630	min. 272 max. 600

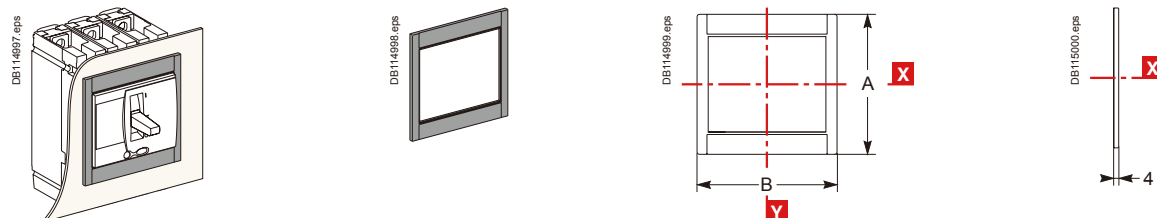
Dimensions and front-panel cutout



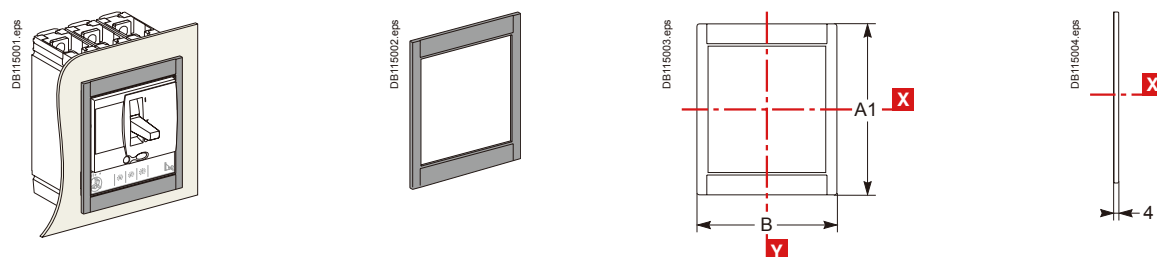
Type	A18	B10	D1
NSX100/160/250	9	9.25	75
NSX400/630	24.6	5	100

IP30 front-panel escutcheons

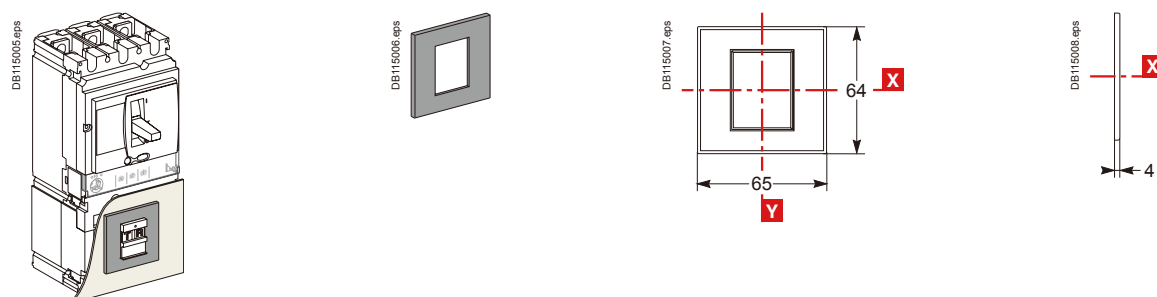
For toggle, rotary handle or motor mechanism module



For toggle or rotary handle with access to trip unit

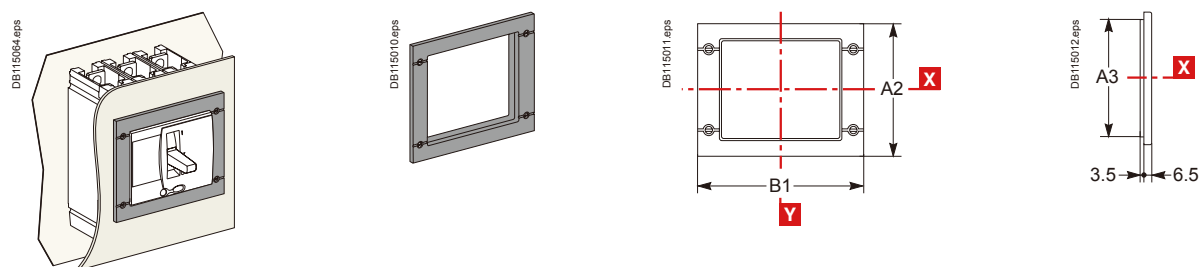


For Vigicompact

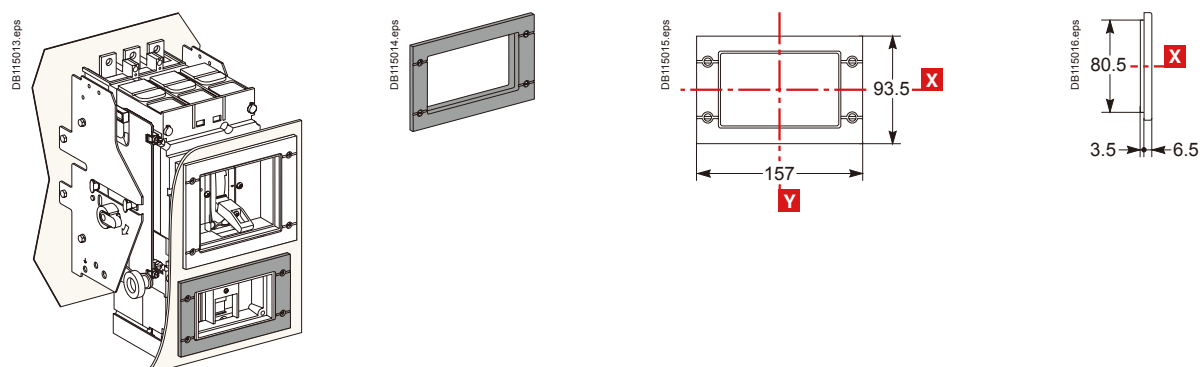


IP40 front-panel escutcheons

For toggle, rotary handle or motor mechanism module and protection collar



For Vigicompact with protection collar or ammeter module



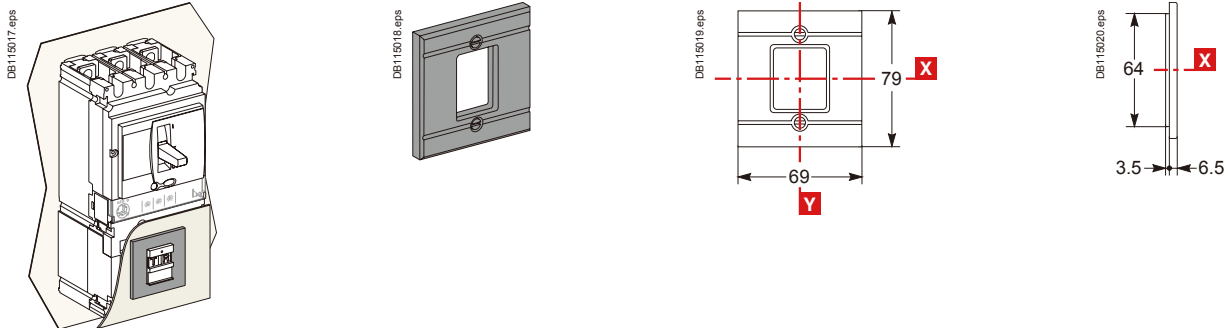
Dimensions and Mounting

Compact NSX100 to 630

Front-panel

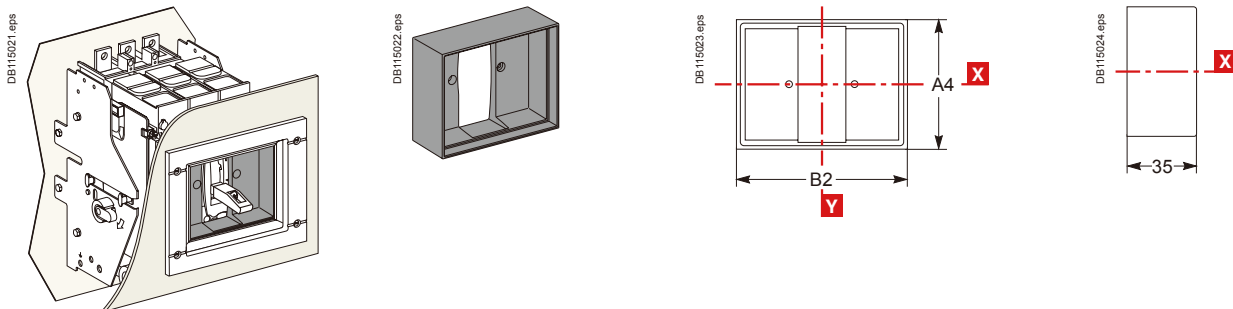
IP40 front-panel escutcheons (cont.)

For Vigicompact

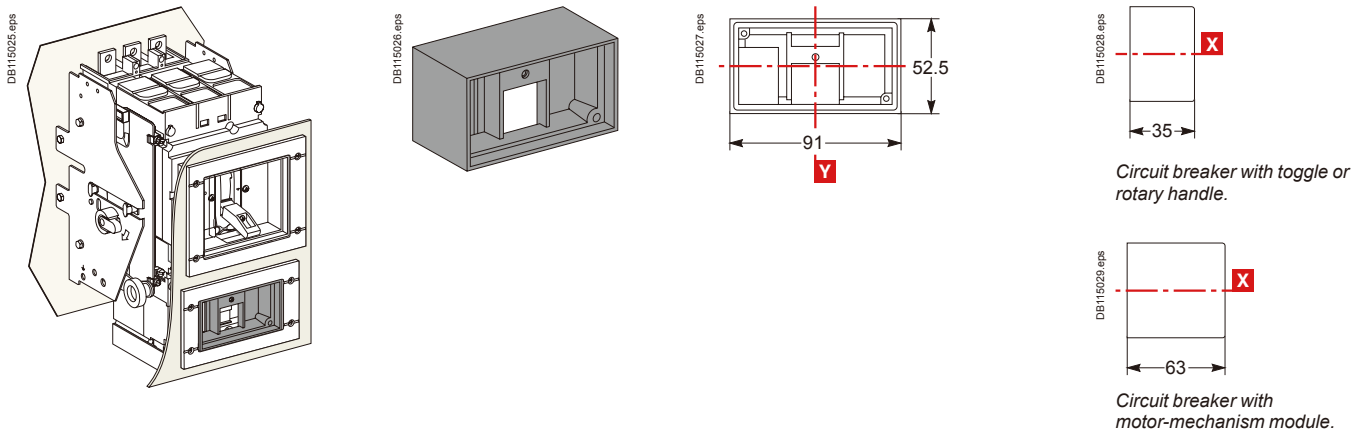


Protection collars for IP40 front-panel escutcheons

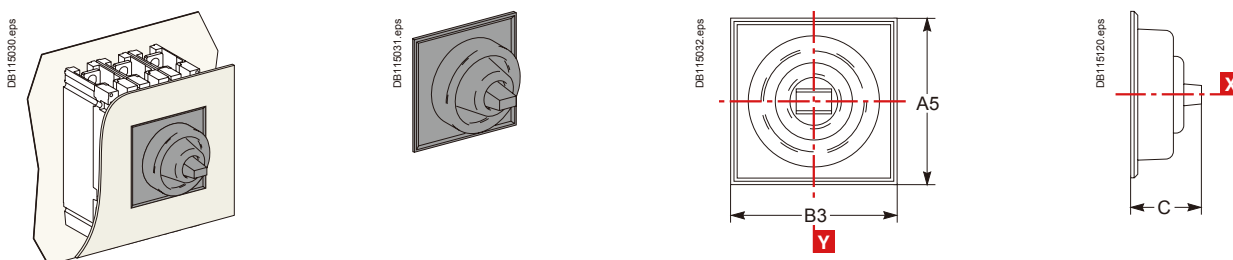
For toggle



For Vigicompact



IP43 toggle cover



Type	A	A1	A2	A3	A4	A5	B	B1	B2	B3	C
NSX100/160/250	113	138	114	101	73	85	113	157	91	103	40
NSX400/630	163	211	164	151	122.5	138	163	189	122.5	138	60

Dimensions and Mounting

Compact NSX100 to 630

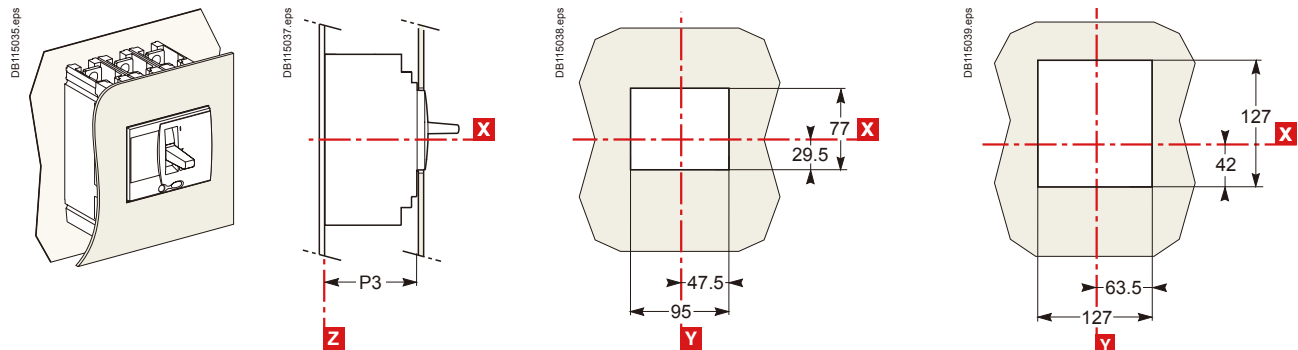
Front-panel cutouts

Bare sheet metal

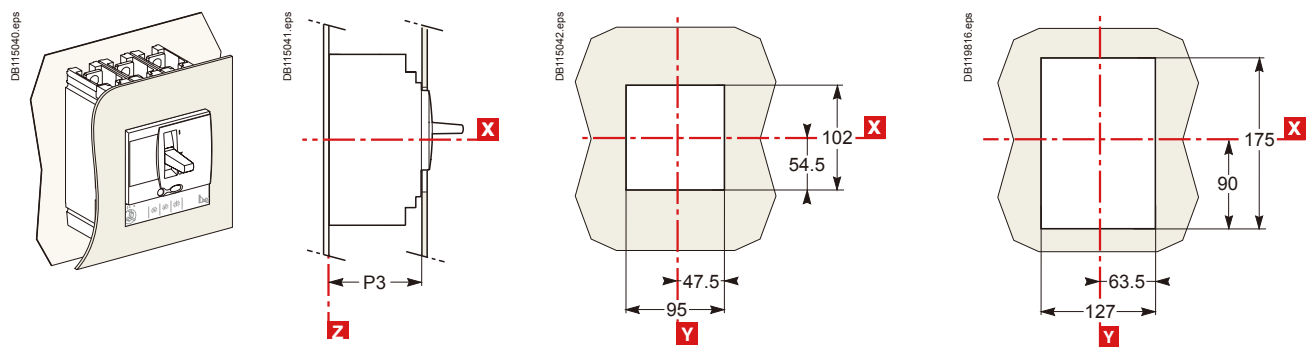
NSX100 to 250

NSX400/630

For toggle



For toggle with access to trip unit

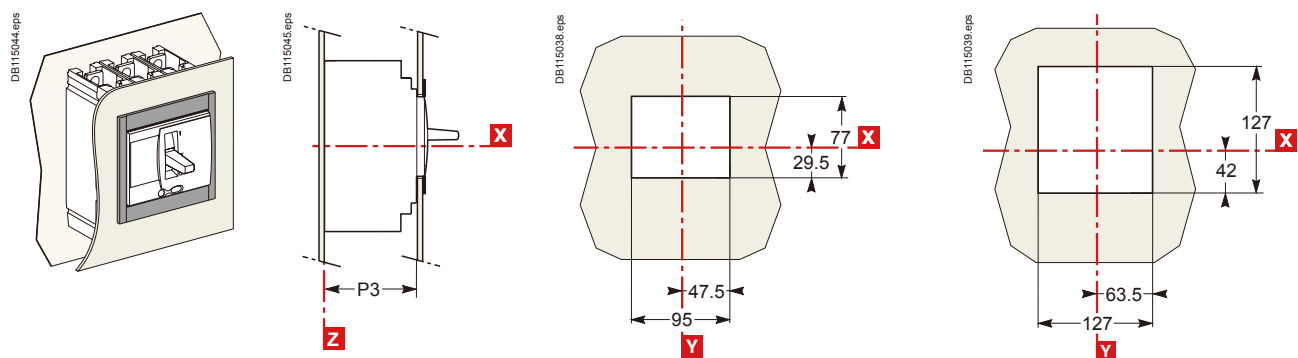


With IP30 front-panel escutcheon

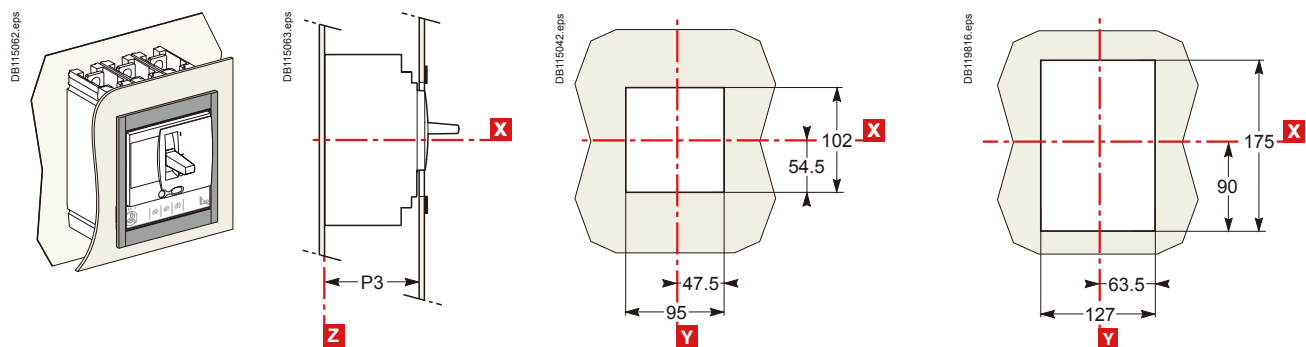
NSX100 to 250

NSX400/630

For toggle



For toggle with access to trip unit

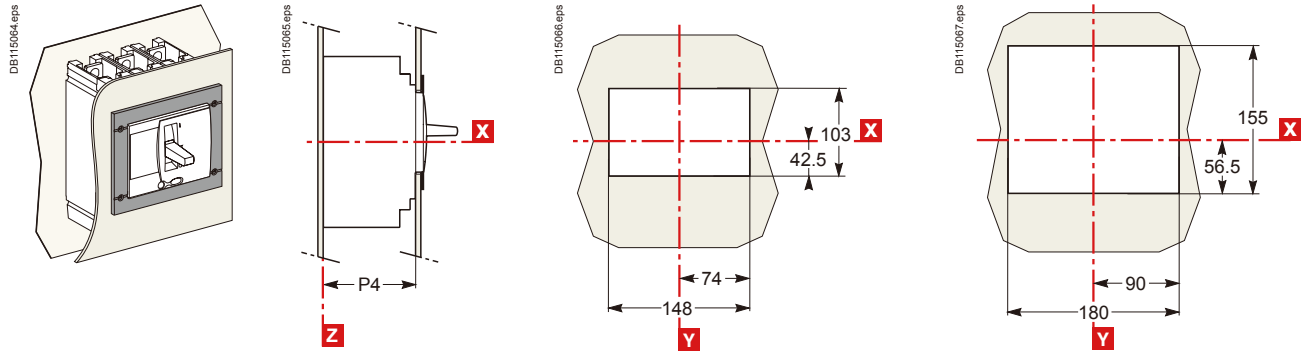


With IP40 front-panel escutcheon

NSX100 to 250

NSX400/630

For toggle

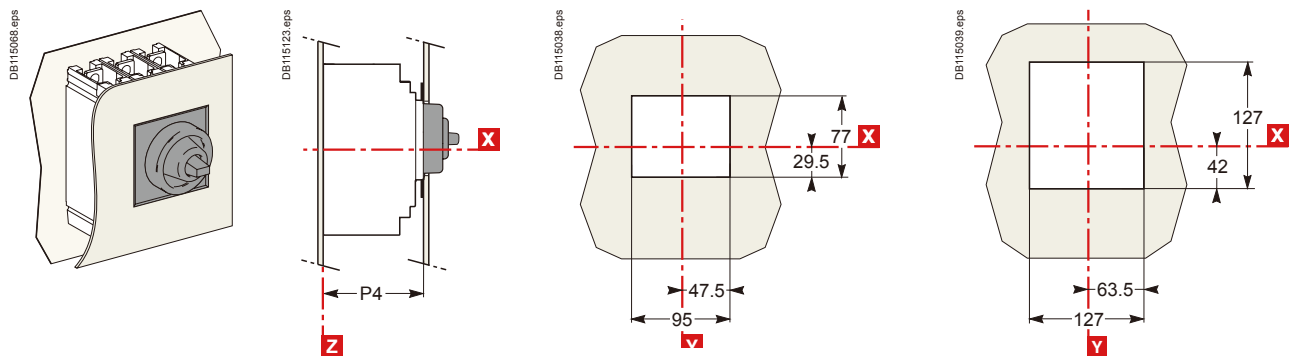


With IP43 toggle cover

NSX100 to 250

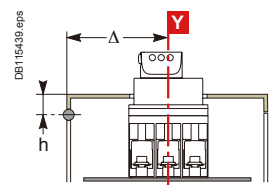
NSX400/630

For toggle



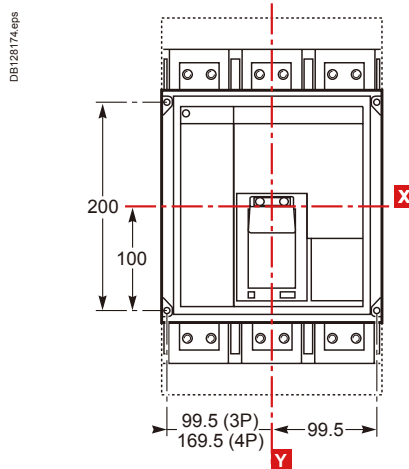
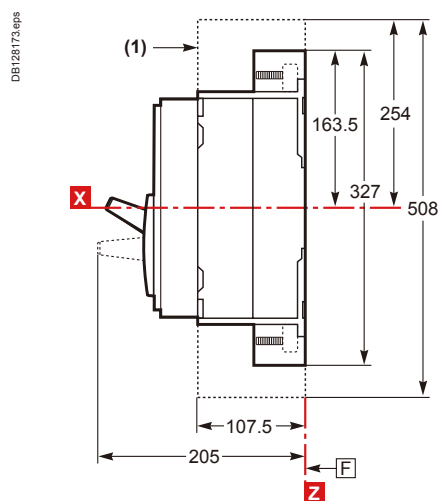
Type	P3	P4
NSX100/160/250	88	89
NSX400/630	112	113

Note: door cutout dimensions are given for a device position in the enclosure where $\Delta \geq 100 + (h \times 5)$ with respect to the door hinge.



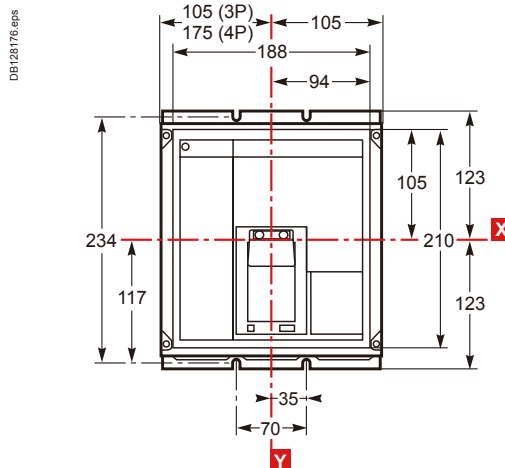
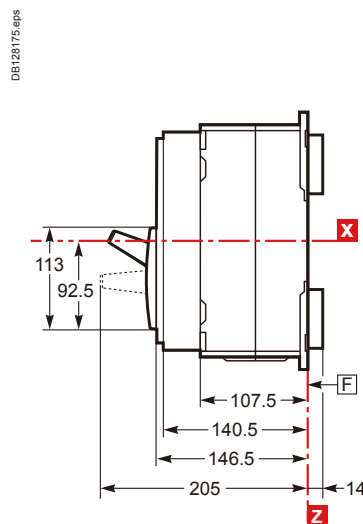
Manual control

Front connection (N, L)



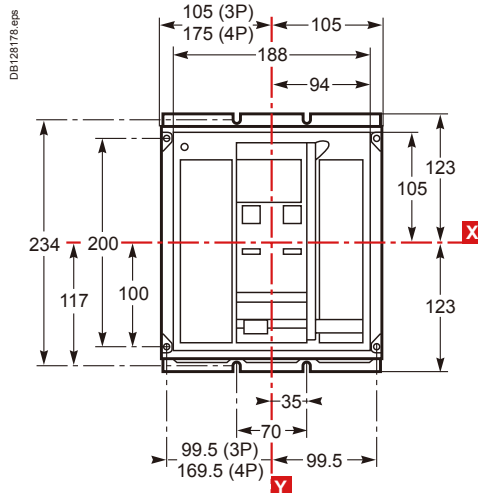
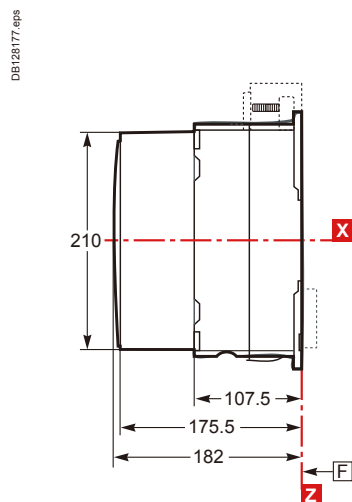
(1) terminal shields are optional.

Rear connection (N, L, LB)



Electrical control

Front and rear connection (N, L, LB)



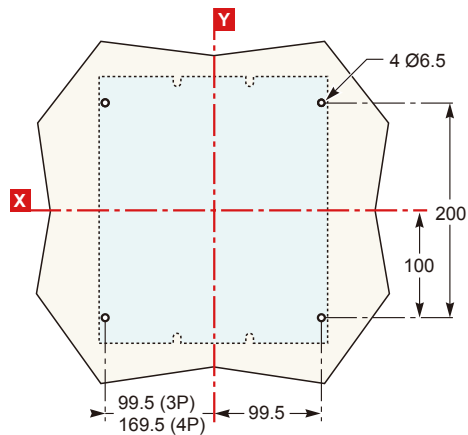
F : Datum.

Note: Dimensions for front and rear connection on electrically operated devices are identical to those for manually operated devices.

Front connection

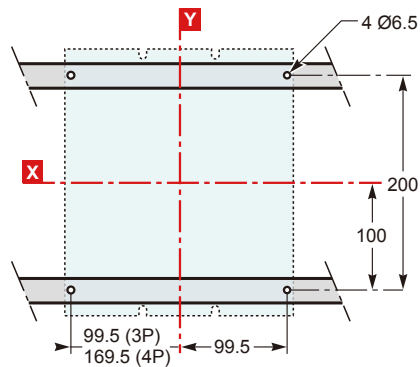
On backplate

DB128179.eps



On rails

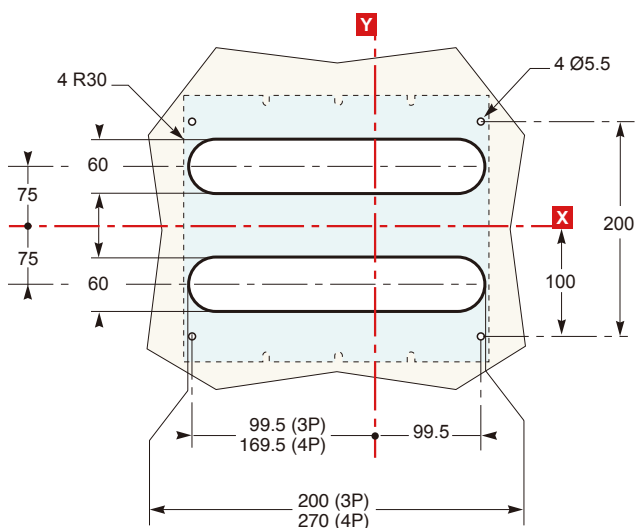
DB128180.eps



Rear connection

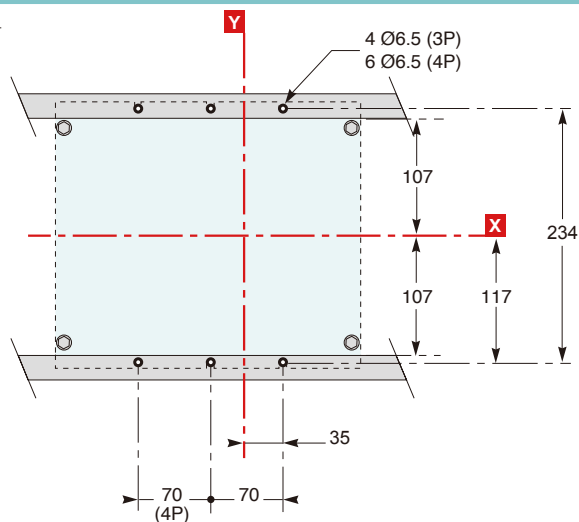
On backplate

DB444750.eps



On rails

DB444751.eps



Note: Mounting parameters for electrically operated devices are identical to those for manually operated devices.

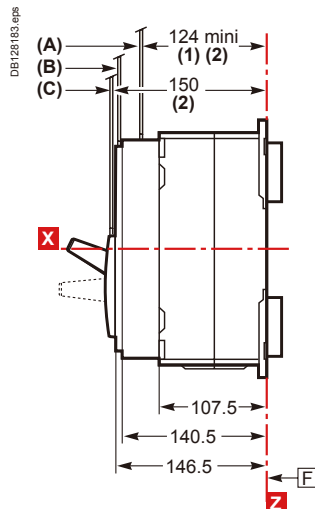
X and Y are the symmetry planes for a 3-pole device
Z is the back plane of the device.

Dimensions and Mounting

Compact NSX100 to 630

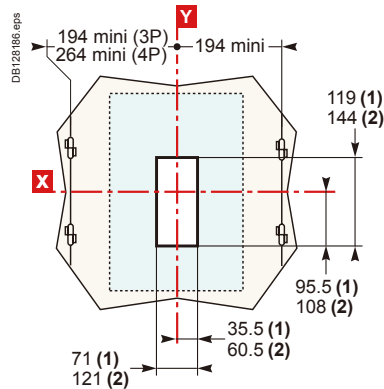
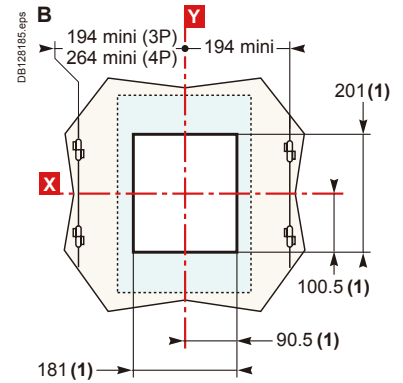
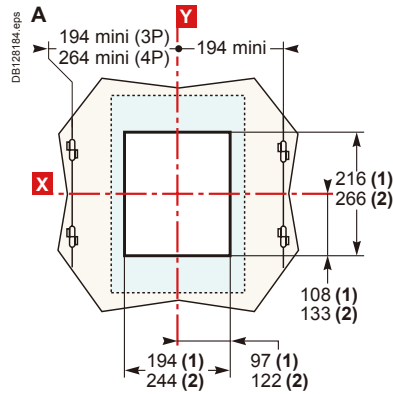
Front-panel cutouts

Toggle control

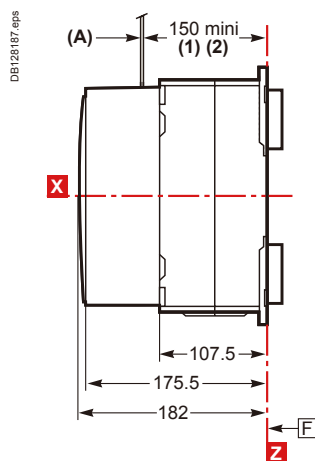


F : Datum.
(1) Without escutcheon.
(2) With escutcheon.

Door cutout

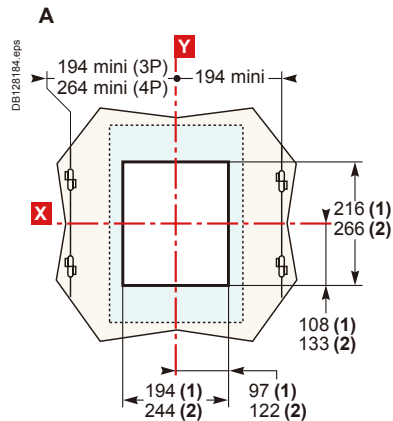


Electrical control



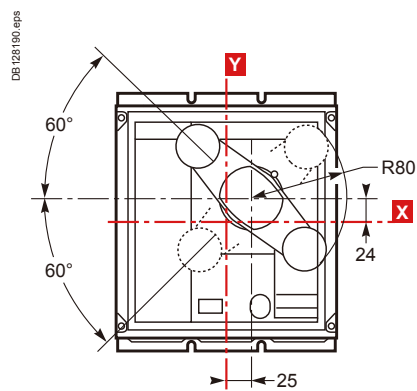
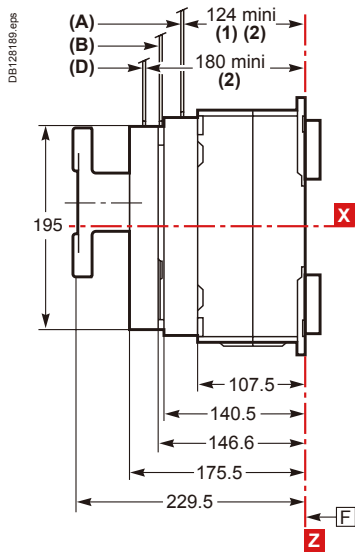
F : Datum.
(1) Without escutcheon.
(2) With escutcheon.

Door cutout

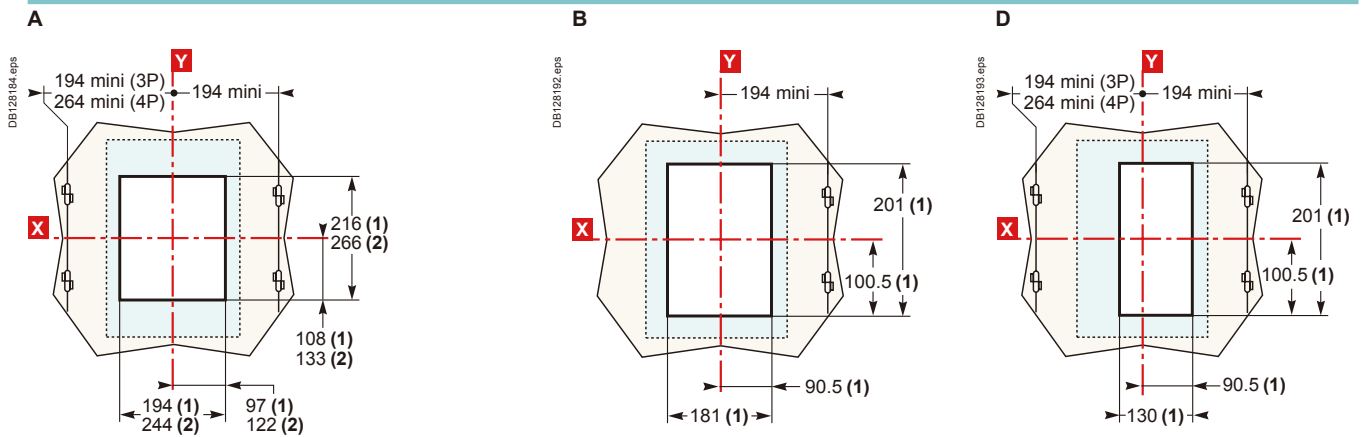


Direct rotary handle

Dimensions



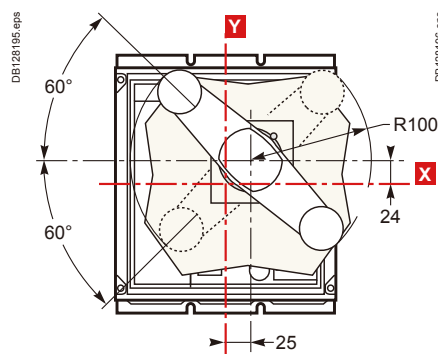
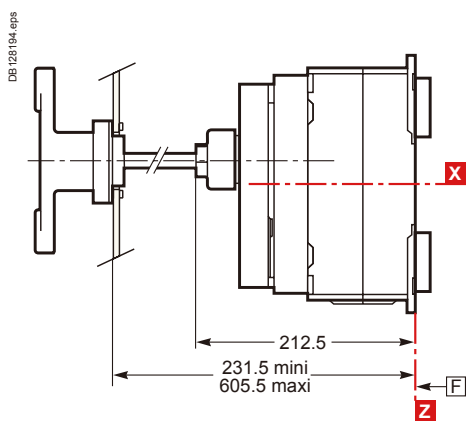
Door cutout



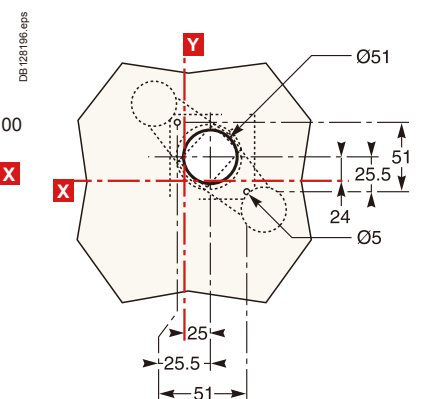
(1) Without escutcheon.
(2) With escutcheon.

Extended rotary handle

Dimensions



Door cutout

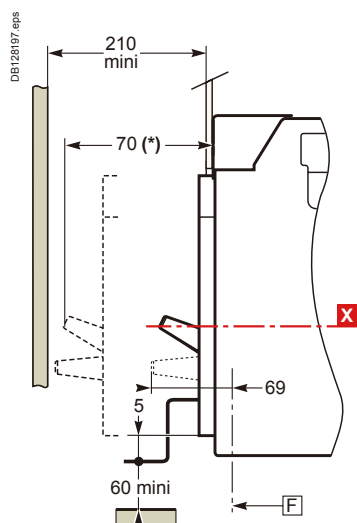


F : Datum.

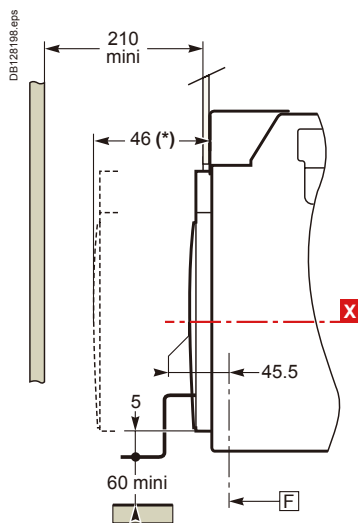
Note: X and Y are the symmetry planes for a 3-pole device Z is the back plane of the device.

Dimensions

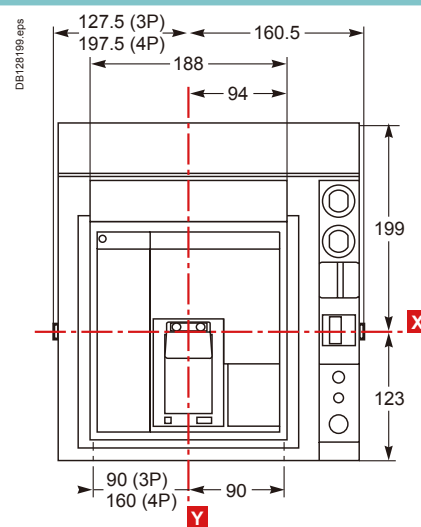
Manual control



Electrical control

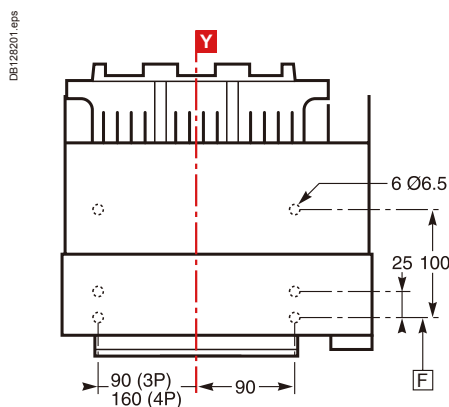
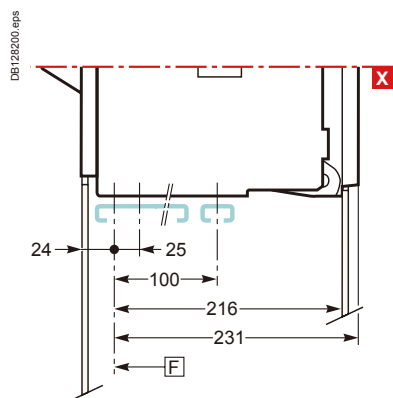


(*) Withdrawable position

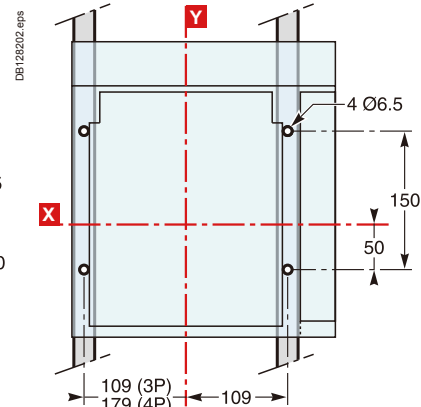


Mounting

Bottom mounting on base plate or rails

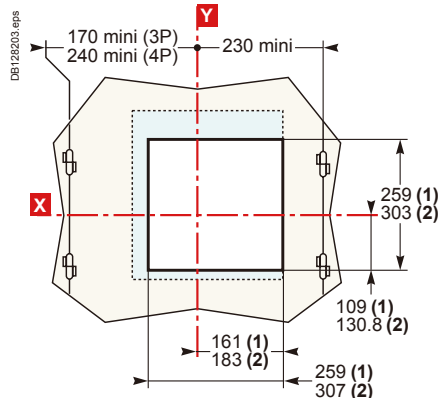


Vertical on uprights or backplate

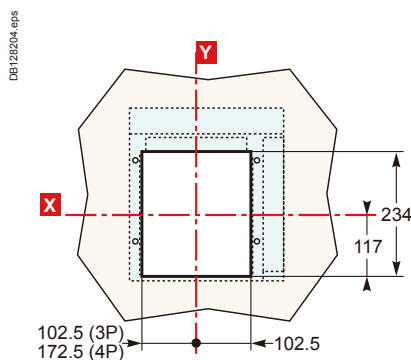


Cutouts

Door cutout



Rear panel cutout



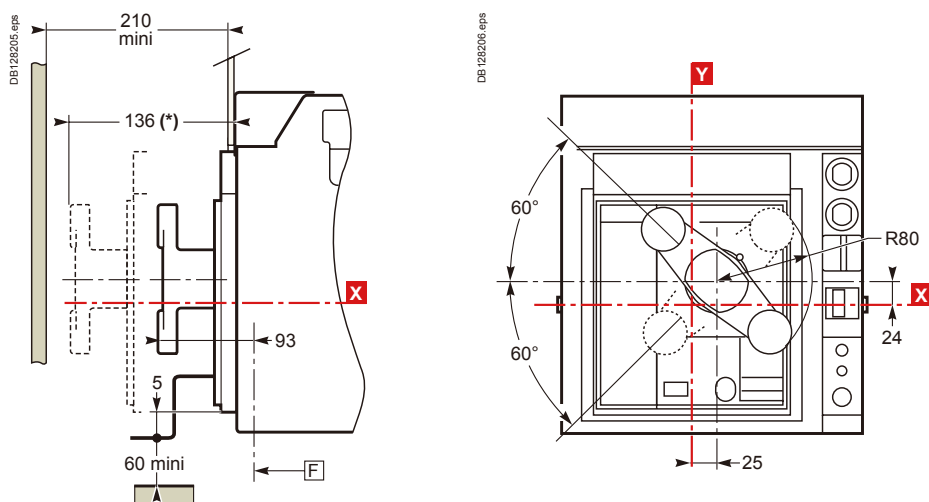
(1) Without escutcheon.
(2) With escutcheon.

F : Datum.

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

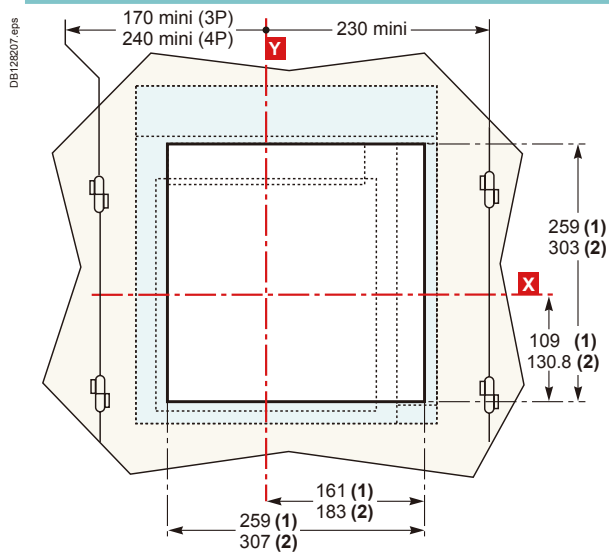
Direct rotary handle

Dimensions



(*) Withdrawable position.

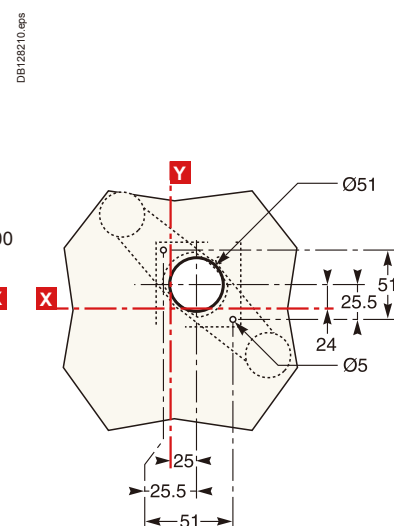
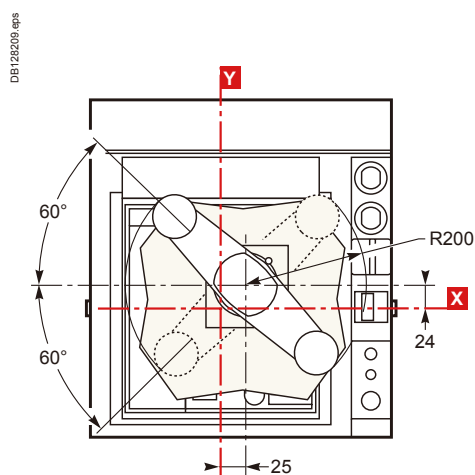
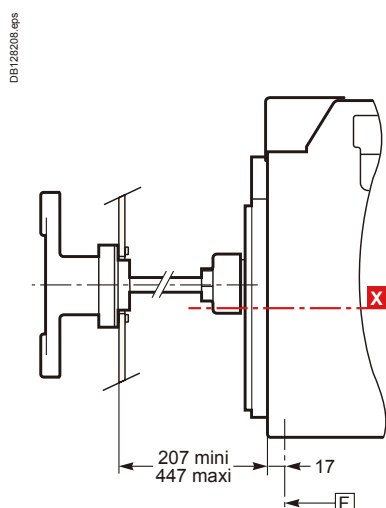
Door cutout



(1) Without escutcheon.
(2) With escutcheon.

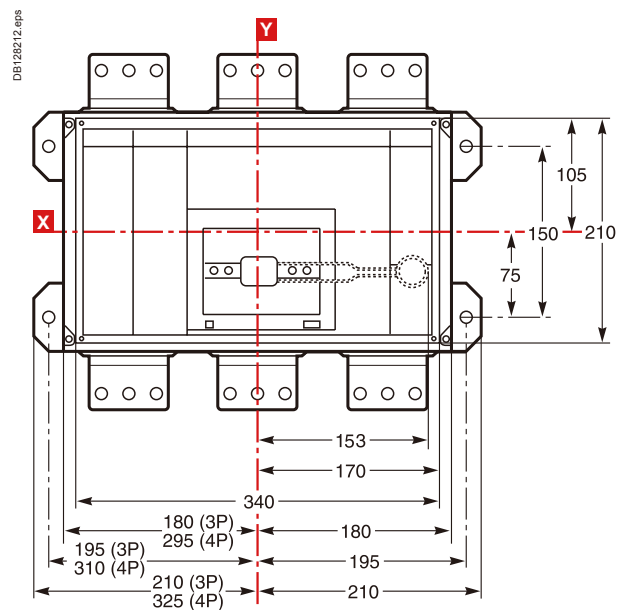
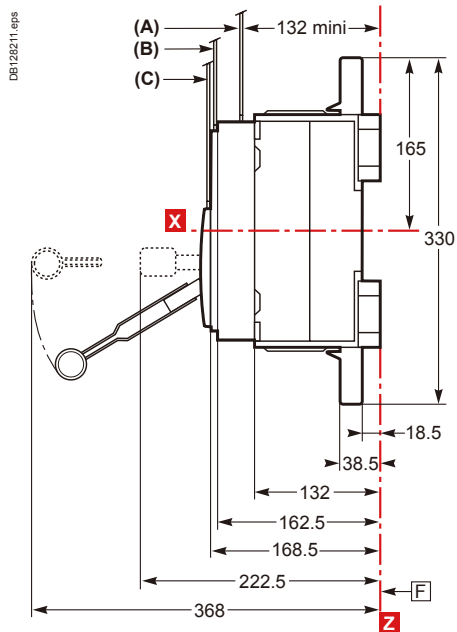
Extended rotary handle

Dimensions



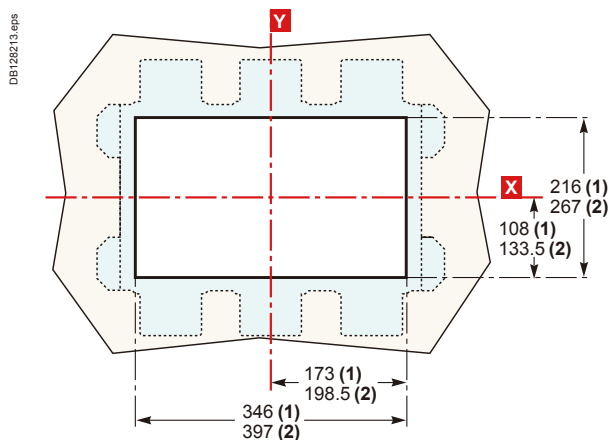
Note: X and Y are the symmetry planes for a 3-pole device.

Dimensions

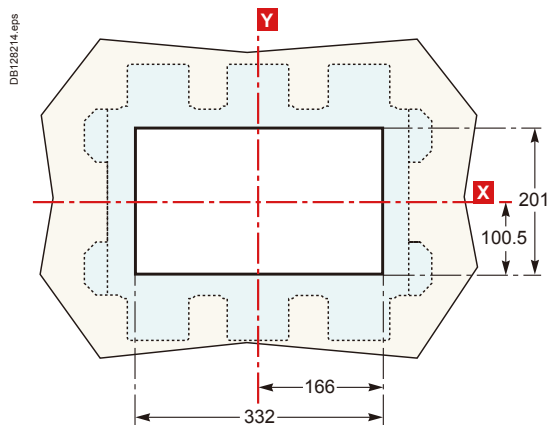


Door cutout (A, B, C)

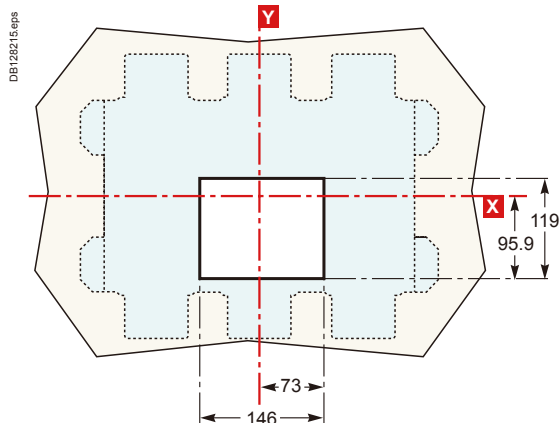
A



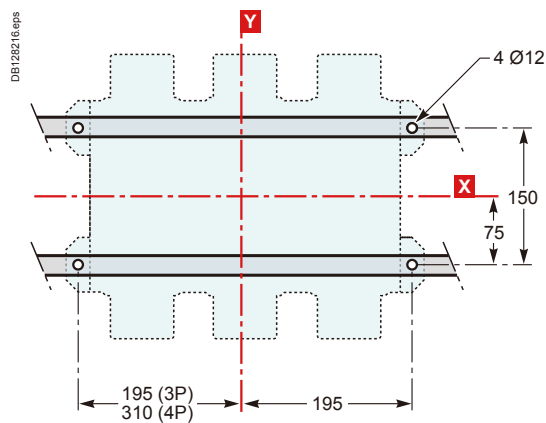
B



C



Mounting on rails



F : Datum.

(1) Without escutcheon.
(2) With escutcheon.

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

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