87045 LIMOGES Cedex
Phone :+33 05 55 06 87 87 – Fax :+33 05 55 06 88 88

DPX³ 250 HP thermal magnetic with earth leakage circuit breakers
DPX³-I 250 HP switch disconnectors with earth leakage

Reference(s) :
from 4 230 45 to 4 230 57;
from 4 231 05 to 4 231 17;
4 231 83;

CONTENTS

1. USE

DPX³ HP platform has been developed to give a new solution of protection devices for a more precise approach in power installations in order to offer the correct answer for different project needs.
DPX³ HP platform provide a complete project approach in premium market segment, offering a range completely suitable for high power application with high performance breakers in compact dimensions and at a competitive costs.

2. RANGE

Circuit breakers

	DPX³ 250 HP + earth leakage	
	36 kA	50 kA
I_n (A)	4P	
16	423045	423105
20	423046	423106
25	423047	423107
32	423048	423108
40	423049	423109
50	423050	423110
63	423051	423111
80	423052	423112
100	423053	423113
125	423054	423114
160	423055	423115
200	423056	423116
250	423057	423117

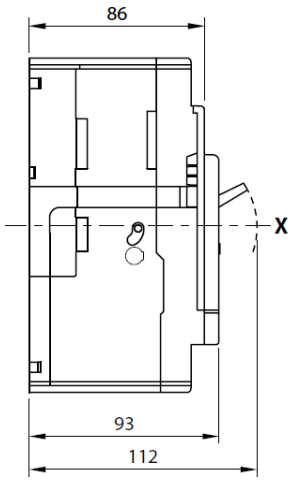
Switch disconnectors

DPX³-I 250 HP + earth leakage	
I_n (A)	4P
250	423183

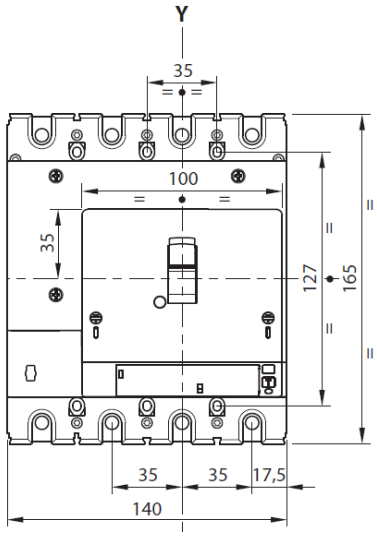
3. DIMENSIONS AND WEIGHTS

3.1 Dimensions

Lateral view



Frontal view



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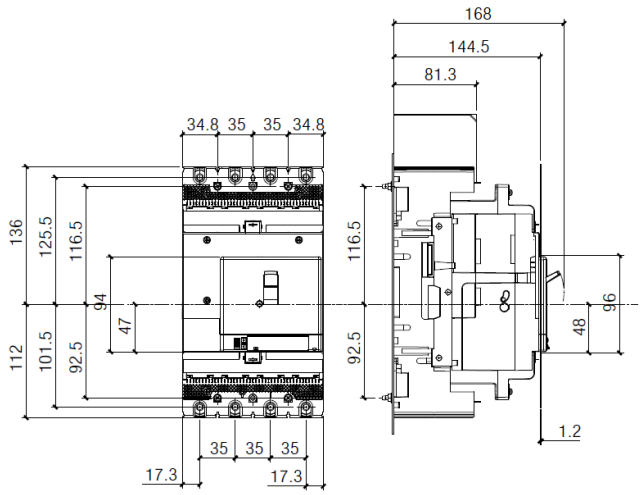
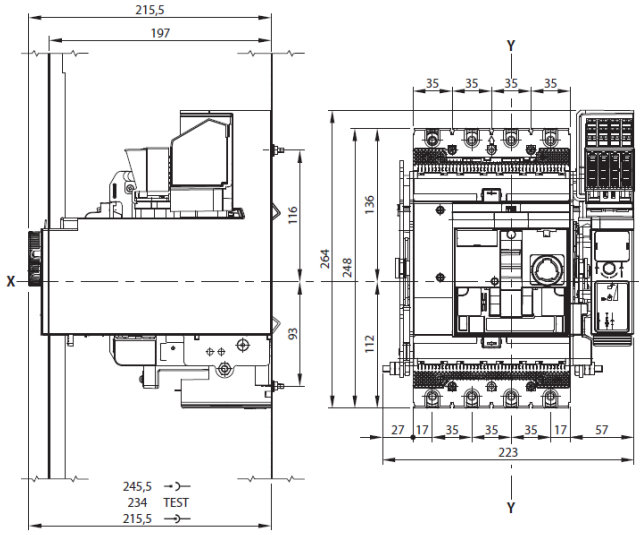
Plug-in version

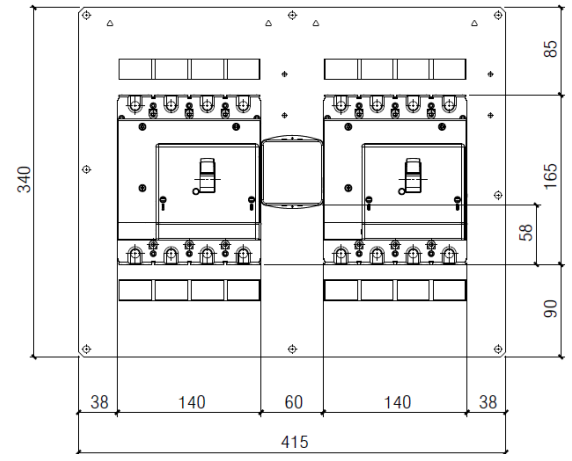


Draw-out version

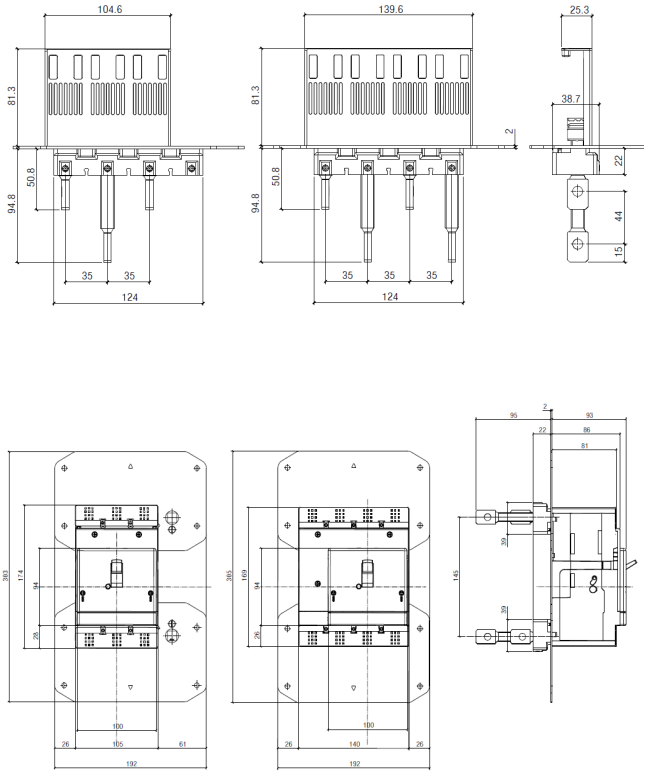


Interlock

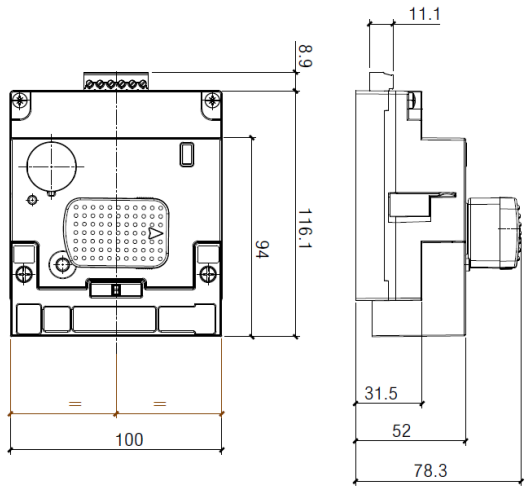
(for rear plate interlock dimension, see relative instruction sheet)



Rear terminals



Direct rotary handle



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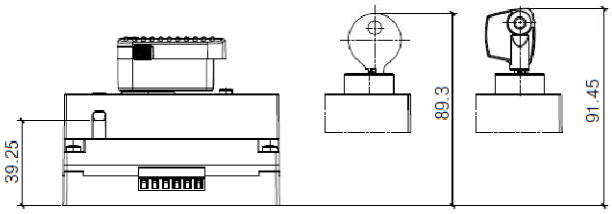
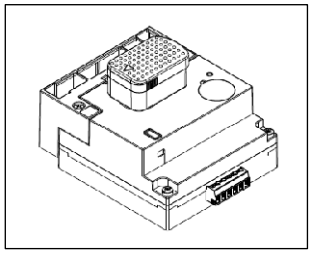
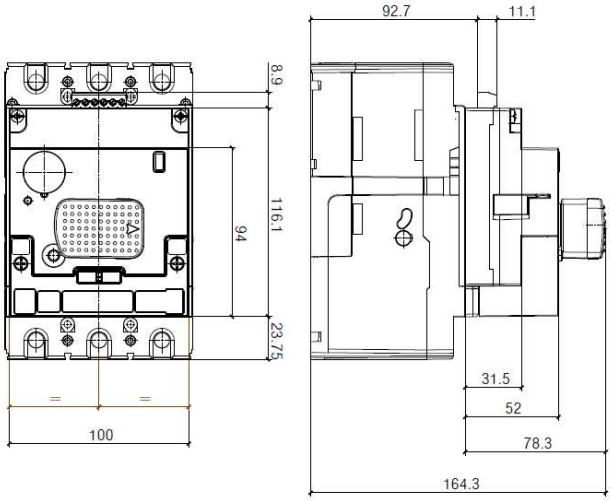
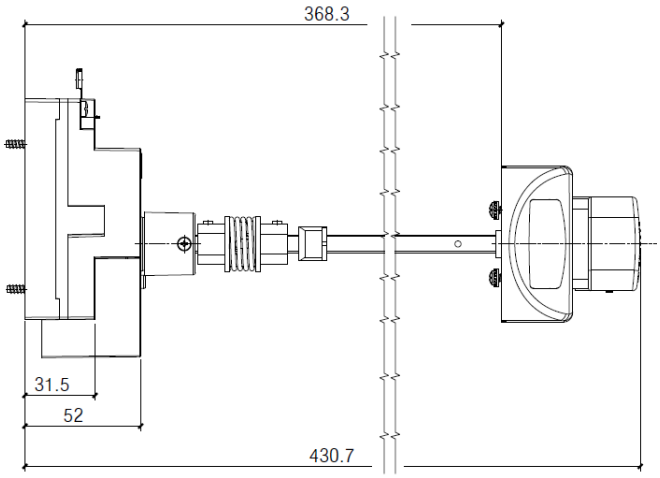
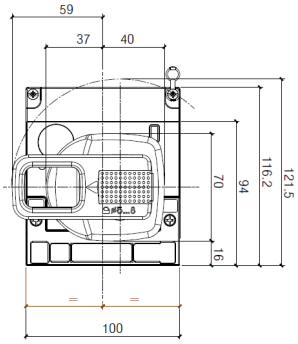


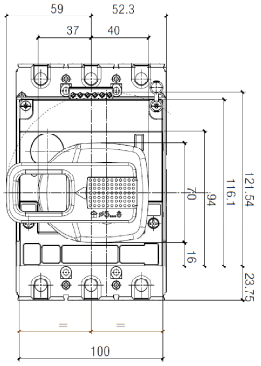


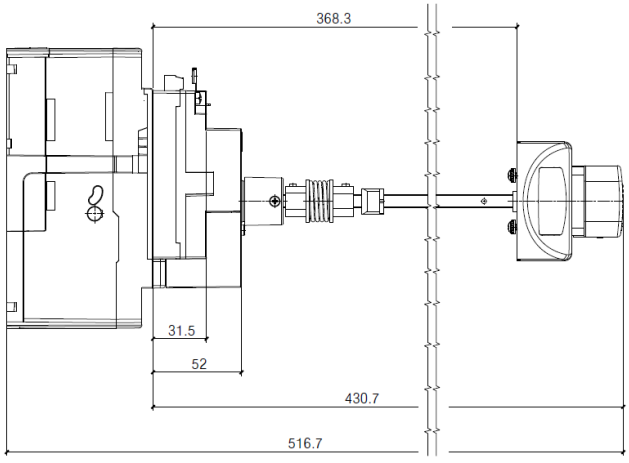


Vari-depth rotary handle









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DPX³-I 250 HP switch disconnectors with earth leakage

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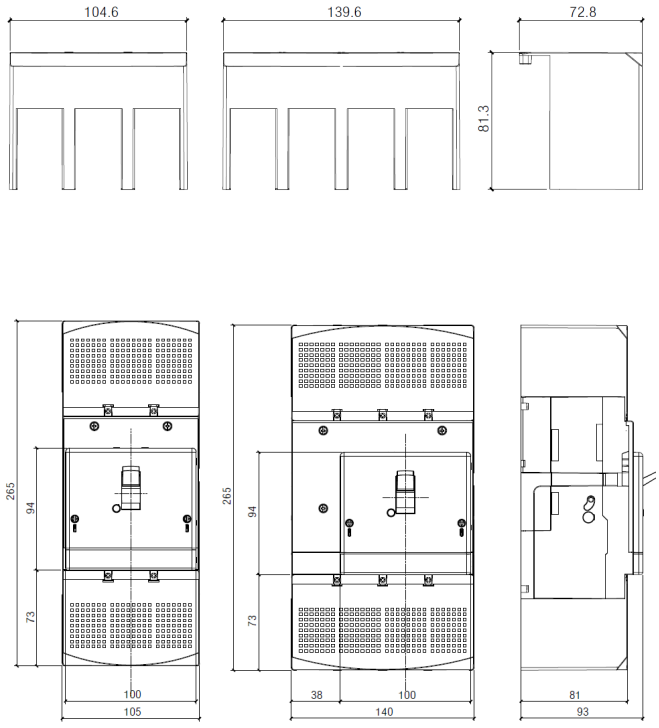
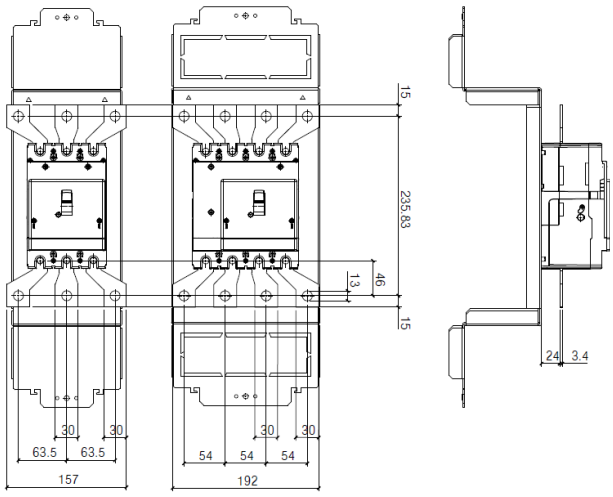
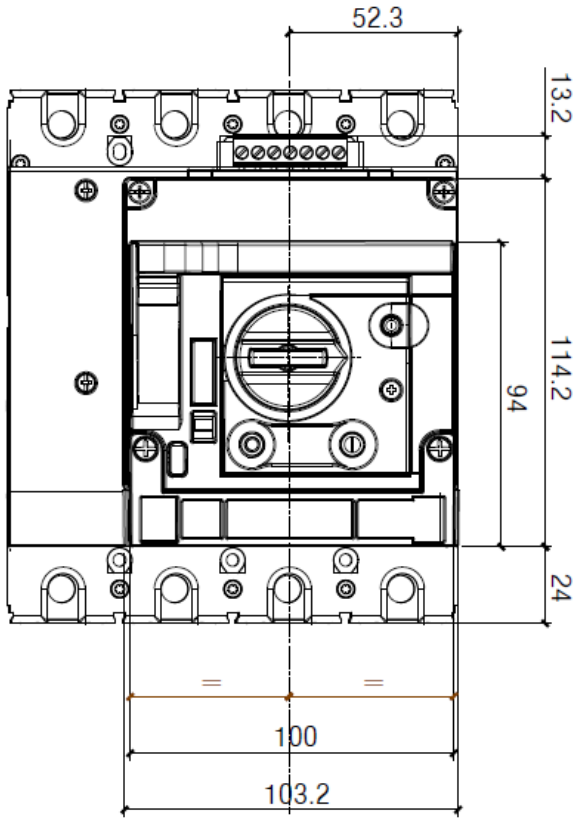
Sealable terminal shields



Spreaders



Motor operator



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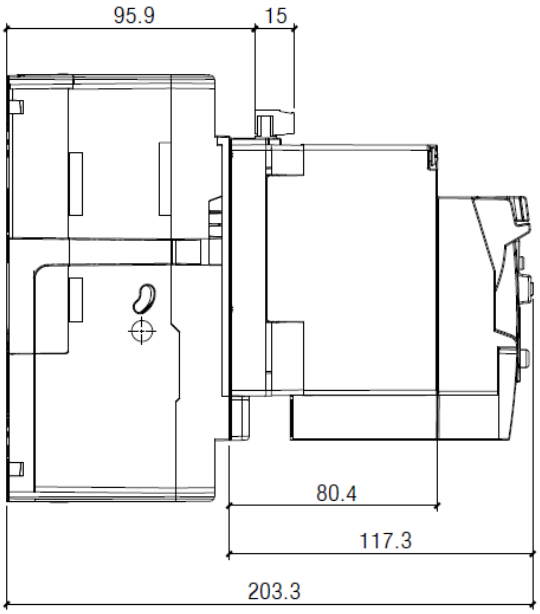

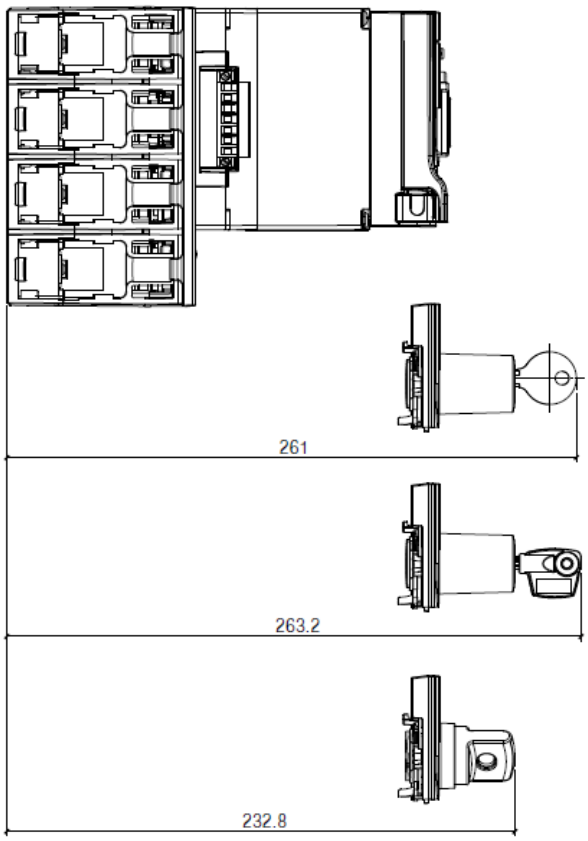

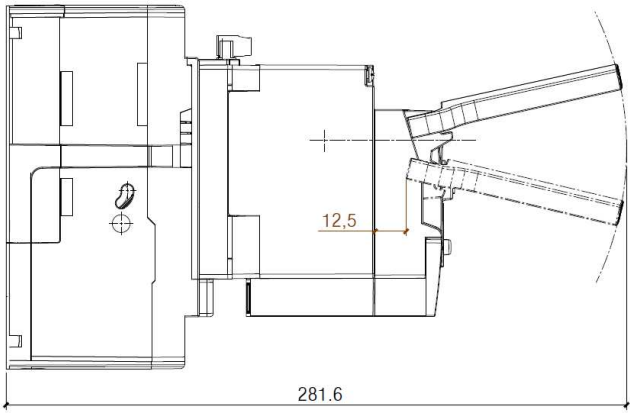

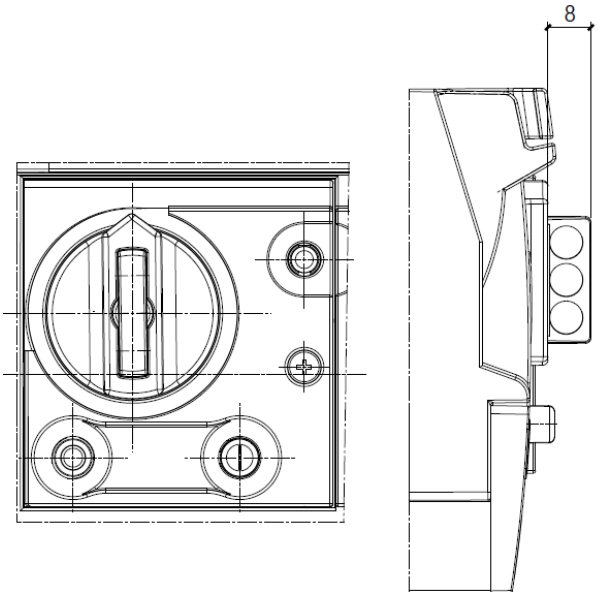

3.2 Weights

	Weights (Kg)
Configuration	**4P**
Circuit breaker/switch disconnector	2.6
Plug-in*	3.5
Draw-out**	2.5
Interlock*	0.35
Rear interlock (for plug-in/draw-out version)*	5
Motor operator*	1
** to add to device weight*	
** to add to device and plug-in weights*	

4. OVERVIEW

4.1 Supplied with:

- 4 fixing screws
- 8 screws for connections
- 3 phase insulators

5. ELECTRICAL CONNECTIONS

5.1 Mounting possibilities

On plate:

- Vertical
- Horizontal
- Supply invertor type

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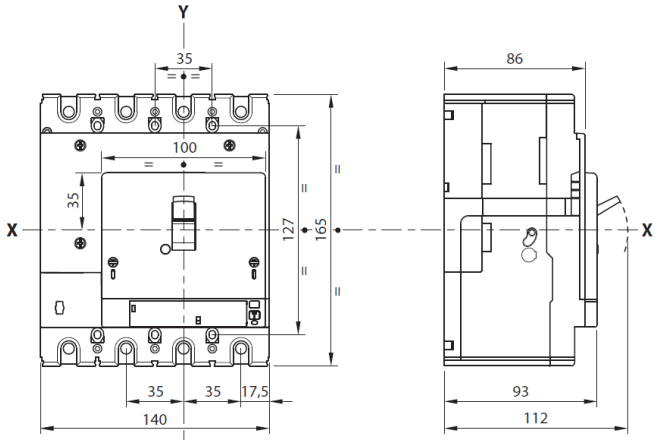
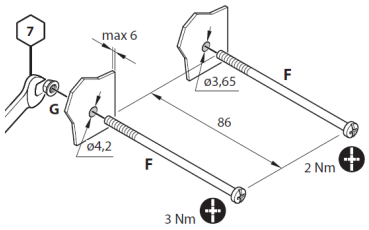
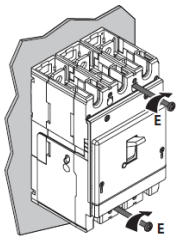
4 231 83;

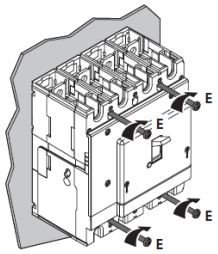
5.2 Mounting

(see instruction sheet for detailed mounting procedures)

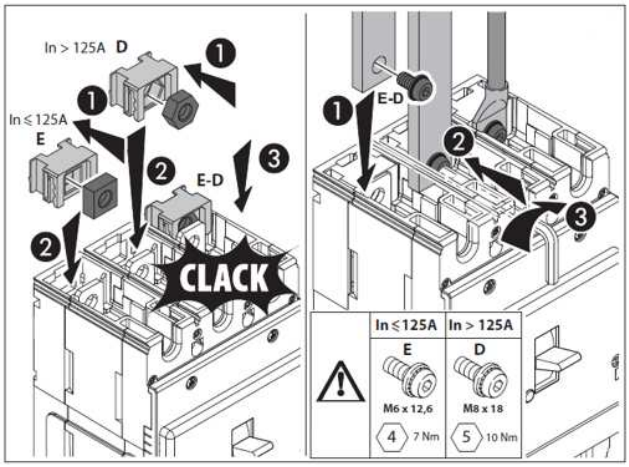


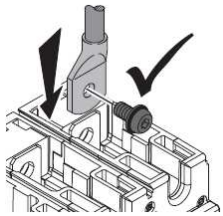


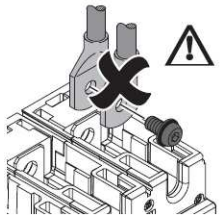




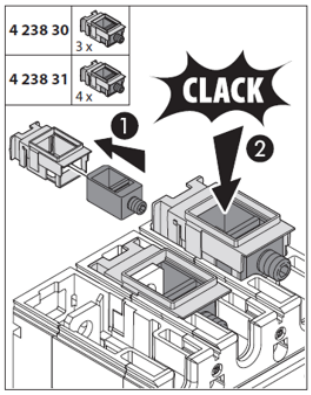
Busbars/cable lugs:

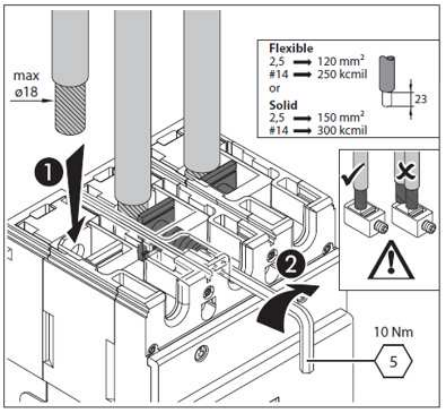






Cables:





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6. ELECTRICAL AND MECHANICAL CHARACTERISTICS

Circuit breaker

Circuit Breaker	DPX³ 250 HP + RCD F/N (36kA, 50kA)
Rated current (A)	16-20-25-32-40-50-63-80-100-125-160-200-250
Poles	4
Pole pitch (mm)	35
Rated insulation voltage (50/60Hz) U_i (V)	500
Rated operating voltage (50/60Hz) U_e (V)	500
Rated impulse withstand current U_{imp} (kV)	6
Rated frequency (Hz)	50 - 60
Reference ambient temperature(°C)	40 - 50
Operating temperature (°C)	-25 ÷ 70
Mechanical endurance (cycles)	12000
Mechanical endurance with motor control (cycles)	12000
Electrical endurance at I_n (cycles)	6000
Electrical endurance at 0.5 I_n (cycles)	6000
Utilization category	A
Suitable for isolation	Yes
Type of protection	Thermal-magnetic
Thermal adjustment I_r	0,8 - 0,9 - 1 x I_n
Magnetic adjustment I_i (A)	400 A up to In=40A (not adjustable); 6,5-10-13 x I_n for In=50A; 5-7,5-10 x I_n up to =250A;
Neutral protection for 4P (%I_{th} of phase pole)	100
Earth leakage type	A - Integrated
Adjustable sensitivity (A)	0.03- 0.3 - 1 -3
Adjustable tripping (s)	0 - 0.3 - 1 - 3 (with 0.03 possible only 0s)
Dimensions (W x H x D) (mm)	140 x 165 x 86 (4P)

Switch disconnectors

Switch	DPX³-I 250 HP
Uninterrupted nominal current I_e (A)	250
Short-time resistive current I_{cw}(kA) for 1s	3
Rated short-circuit making capacity I_{cm} (kA)	4.3
Rated insulation voltage U_i (V AC)	500
Maximum rated operating voltage U_e (V AC)	500 (@ AC22A) - 415 (@ AC23A)
Rated impulse withstand voltage U_{imp} (kV)	8
Utilisation category	AC22A (I_n=250A)
Suitable for isolation	Yes
Nominal frequency (Hz)	50-60
Operating temperature (°C)	-25 ÷ 70
Mechanical endurance (cycles)	12000
Mechanical endurance with motor control (cycles)	12000
Electrical endurance at I_n (cycles)	6000
Electrical endurance at 0.5 I_n (cycles)	6000
Dimensions (W x H x D) (mm)	140 x 165 x 86 (4P)

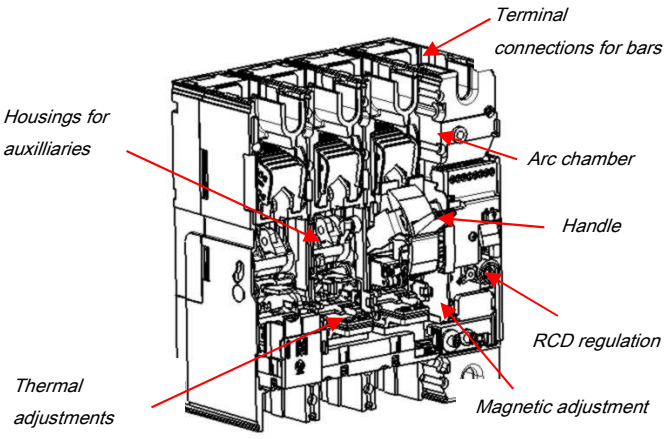
The maximum admissible (absolute) temperature is 125°C (for detail, see IEC 60947-1 and 60947-2).

DPX³ product line has the possibility to supply both in "direct" and "reverse" feed.

If "direct", the word "LINE" needs to be marked on supply terminals (normally the top ones), as well as "LOAD" has to be written on the output terminals to be connected to the load (normally the bottom ones).

If "reverse", any indications about LINE / LOAD are NOT expected on the product.

6.1 Main parts constituting the circuit breaker



6.2 Breaking capacity (kA)

		Breaking capacity (kA) & I_{cs}	
		4P	
IEC 60947-2	U_e/I_{cu} (I_{cu} letter)	36kA (F)	50kA (N)
	220/240 V AC	70	90
	380/415 V AC	36	50
	440/460 V AC	25	30
	480/500 V AC	16	18
	I_{cs}(% I_{cu})	100	100
	Rated making capacity under short circuit I_{cm}		
	I_{cm} (kA) at 415V	76.5	105
NEMA AB-1	220/240 V AC	70	90
	480/500 V AC	16	18

6.3 Rated current (I_n) at 40°C / 50°C

	Phases limit trip current			
	thermal (I_r)		magnetic (I_i)	
I_n (A)	0.8 x I_n	1 x I_n	min	max
16	13	16	400	400
20	16	20	400	400
25	20	25	400	400
32	26	32	400	400
40	32	40	400	400
50	40	50	325	650
63	51	63	315	630
80	64	80	400	800
100	80	100	500	1000
125	100	125	625	1250
160	128	160	800	1600
200	160	200	1000	2000
250	200	250	1250	2500

6.3 Load operations

Force on handle	N
Opening operation	63,5
Closing operation	66
Restore operation	86,5

6.4 Electrodynamic forces

The table below shows an indication of suggested distances to keep between the breaker and the first fixing point of the conductor and bars in order to reduce the effects of the electrodynamic stresses that may be created during a short circuit. In the realization of anchorage system it is recommend the use of isolators suitable for the type of conductor used and the operating voltage.

I_{cc} (kA)	Maximum Distance (mm)
36	350
50	300

According to conductor type and bar system (except Legrand bar kits), the choice of the distance to keep is to be calibrated by the installer. Also installer must take into account the weight of the conductors so that this does not affect the electrical junction between the conductor itself and the connection point.

6.5 Power losses per pole under I_n

Circuit breaker

	Power losses per pole (W)												
In (A)	16	20	25	32	40	50	63	80	100	125	160	200	250
Cage terminals	3.29	4.91	5.87	5.49	8.44	6.33	10.39	7.94	8.55	14,00	12.98	16.38	23.33
Lugs	3.01	4.49	7.01	5.02	7.71	5.78	9.49	7.25	7.81	12.79	11.86	14.96	21.31
Spreaders	2.53	3.78	4.52	4.22	6.49	4.87	7.99	6.11	6.58	10.77	9.98	12.6	17.95
Rear terminals	3.1	4.63	5.54	5.17	7.95	5.97	9.79	7.48	8.06	13.19	12.23	15.43	21.99

Note: power losses in the table above are referred and measured as described in the standard IEC 60947-2 (Annex G) for circuit-breakers. Values in the table are referred to a single phase.

Switch disconnectors

	Power losses per pole (W)
	I_n(A)
	250
Cage terminals	14.84
Lugs	13.55
Spreaders	11.41
Rear terminals	13.98

Note: power losses in the table above are referred and measured as described in the standard IEC 60947-3 for switches. Values in the table are referred to a single phase.

6.6 DERATINGS

according to IEC/EN 60947-1

6.6.1 Temperature

Rated current and his adjustment has to be considered relating to a rise or fall of ambient temperature and to a different version or installation conditions. The table below indicates the maximum long-time (LT) protection setting depending on the ambient temperature.

I_n (A)	0	10	20	30	40	50	60	70
16	18	17	17	16	16	16	15	14
20	22	22	21	20	20	20	19	17
25	28	27	26	26	25	25	23	21
32	35	35	35	33	32	32	30	27
40	44	43	42	41	40	40	37	34
50	55	54	53	51	50	50	47	43
63	69	68	67	64	63	63	59	54
80	88	86	86	82	80	80	74	68
100	110	108	105	102	100	100	93	85
125	138	135	131	128	125	125	116	106
160	176	173	168	163	160	160	149	136
200	258	244	230	215	200	200	180	170
250	322	305	287	269	250	250	225	213

For derating temperature with other configurations, see table A.

6.6.2 Specific condition use

Climatic conditions

according to IEC/EN 60947-1 Annex Q, Cat. F subject to temperature, humidity, vibration, shock and salt mist.

Pollution degree

for DPX³ 250 HP circuit breakers, degree 3, according to IEC/EN 60947-2

6.6.3 Altitude

Altitude derating for DPX³ and DPX³–I with RCD

Altitude (m)	2000	3000	4000	5000
U_e (V)	500	430	380	330
I_n (A) (T_a = 40°C/50°C)	1 x I_n	0.98 x I_n	0.93 x I_n	0.9 x I_n

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7. CONFORMITY

DPX³ HP range of product concerning circuit-breakers and switch-disconnectors exceed compliance with the IEC/EN standard 60947-2 and 60947-3 respectively. Certification available by IECEE CB-scheme or LOVAG Compliance scheme.

DPX³ HP respect the European Directives REACh, RoHS, RAEE.

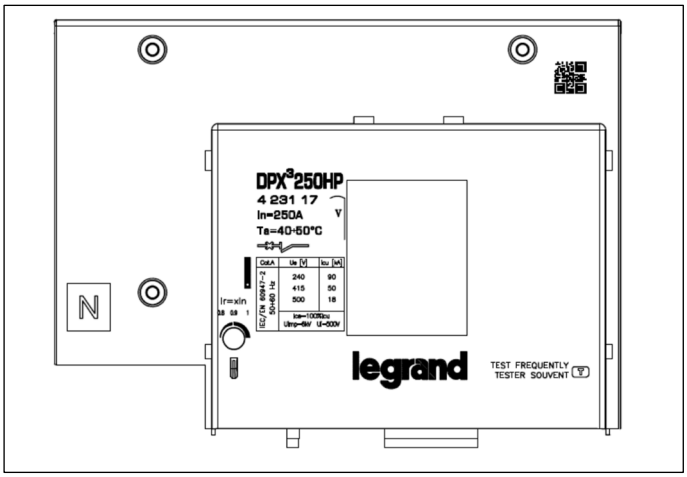
For specific information, please contact Legrand support.

7.1 Marking

Product (both circuit breakers and switch disconnectors) are provided with labelling in full conformity to the referred standard and directives requirements by laser or sticker labels (for illustrative purposes only) as:

Product laser label on front

- -Manufacturer responsible
- -Denomination, type product, code
- -Standard conformity
- -Standard characteristics declared
- -Coloured identification of I_{cu} at 415V

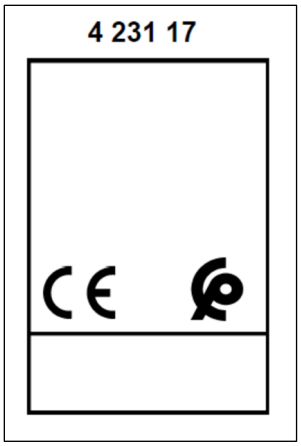


Product sticker label on side

- -Manufacturer responsible
- -Denomination and type product
- -Standard conformity
- -Mark/Licence (if any)
- -Directive requirements
- -Bar code identification product
- -Manufacturing Country

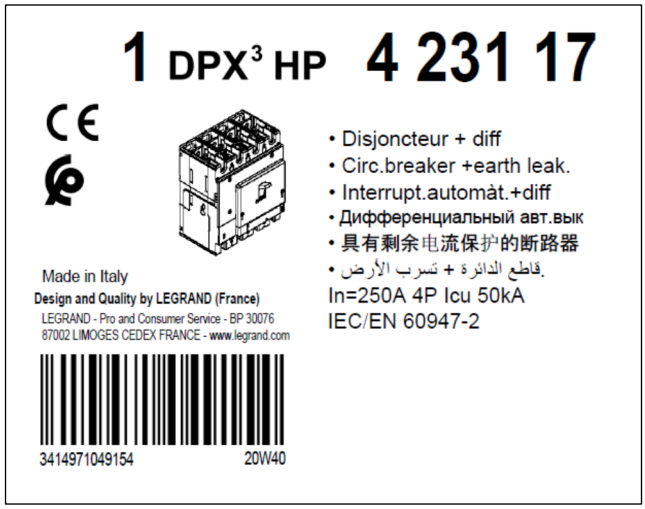
Mark sticker label on side

- -Product code
- -Mark/Licence (if any)
- -Country deviation, if any



Packaging sticker label

- -Manufacturer responsible
- -Denomination and type product
- -Mark/Licence (if any)
- -Directive requirements
- -Bar code identification product



DPX³ 250 HP thermal magnetic with earth leakage circuit breakers
DPX³-I 250 HP switch disconnectors with earth leakage

Reference(s) :
from 4 230 45 to 4 230 57;
from 4 231 05 to 4 231 17;
4 231 83;

8. EQUIPMENTS AND ACCESSORIES

8.1 Releases (for DPX³ 125/250 HP and DPX³ 160/250)

- shunt releases with voltage:

12 Vac and dc	*ref. 4 210 12*
24 Vac and dc	*ref. 4 210 13*
48 Vac and dc	*ref. 4 210 14*
110÷130 Vac	*ref. 4 210 15*
220÷277 Vac	*ref. 4 210 16*
380÷480 Vac	*ref. 4 210 17*

Maximum power = 400 VA / W

- undervoltage releases with voltage:

12 Vac and dc	*ref. 4 210 18*
24 Vac and dc	*ref. 4 210 19*
48 Vac and dc	*ref. 4 210 20*
110÷130 Vac and dc	*ref. 4 210 21*
220÷240 Vac	*ref. 4 210 22*
277 Vac	*ref. 4 210 23*
380÷415 Vac	*ref. 4 210 24*
440÷480 Vac	*ref. 4 210 25*

Maximum power = 4 VA
Circuit breaker opening time < 50 ms

UVR releases can be used on DPX3 125/250 HP starting from batch 19W15

- time-lag undervoltage releases (800 ms)

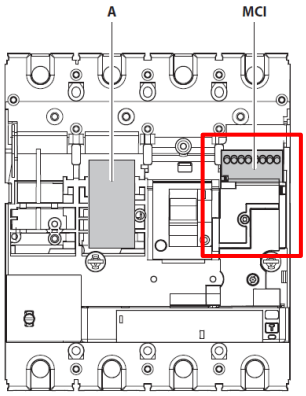
Time-lag modules with voltage:

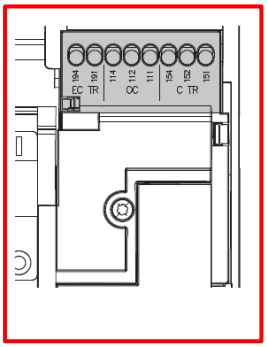
230 V ac	*ref. 0 261 90*
400 V ac	*ref. 0 261 91*

Release *ref. 4 210 98*
(to be equipped with a time-lag module 0 261 90/91)

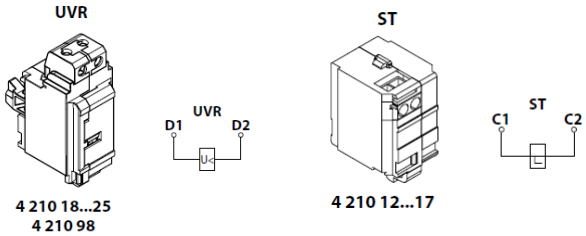
8.2 Auxiliary contacts

For version of DPX³ 250 HP thermal magnetic, with earth leakage module, auxiliary contacts are integrated inside module M.C.I (see instruction sheet for details).
Here a connection scheme to get auxiliary functionality:





TRIP STATUS	151 Common contact 152 Normal close contact 154 Normal open contact	154 152 151	I O
OPEN/CLOSE STATUS	111 Common contact 112 Normal close contact 114 Normal open contact	114 112 111	I O
TRIP RCD	191 Common contact 194 Normal open contact	194 191	



	A
UVR	✓
ST	✓

To get more information on auxiliary mounting procedures, please refer to product instruction sheet.

8.3 Universal keylocks

These keylocks must be used for all the accessories that can be locked:

- rotary handle
- motor operator
- plug-in mechanism
- draw-out mechanism

For each of these, a specific accessory (indicated in the specific section of this datasheet) must be added in order to get the complete locking kits for the specific application.

- 1 lock + 1 flat key with random mapping *ref. 4 238 80*
- 1 lock + 1 flat key with fixed mapping (EL43525) *ref. 4 238 81*
- 1 lock + 1 flat key with fixed mapping (EL43363) *ref. 4 238 82*
- 1 lock + 1 star key with random mapping *ref. 4 238 83*

8.3 Rotary handles

Direct on DPX³ (with auxiliary option)
- Standard (black) *ref. 4 238 00*
- For emergency use (red / yellow) *ref. 4 238 01*

Vari-depth handle IP55 (with auxiliary option)
- Standard (black) *ref. 4 238 02*
- For emergency use (red / yellow) *ref. 4 238 03*

Locking accessories (for rotary handle with auxiliary option)
- Key lock accessory for direct rotary handle *ref. 4 238 04*
- Key lock accessory for vari-depth rotary handle *ref. 4 238 05*
  (ref. 4 238 05 is compatible with DPX³ 125 HP also)

Ref. 4 238 04 and 4 238 05 must be used with universal keylocks to get the complete locking kit for rotary handle

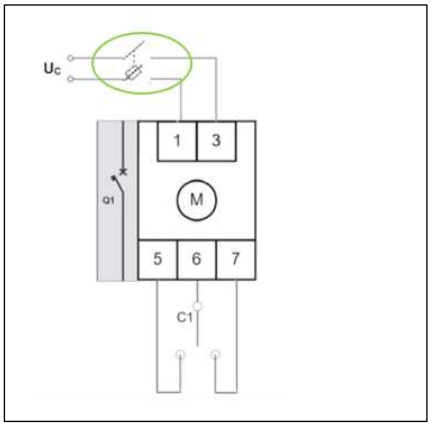
8.4 Motor operators

For synchronized operations (energy storage type):
- 24 Vac and dc *ref. 4 238 40*
- 48 Vac and dc *ref. 4 238 41*
- 110 Vac *ref. 4 238 42*
- 230 Vac *ref. 4 238 43*

Technical parameters:

Voltage	Property	AC		DC	
		Opening	Closing	Opening	Closing
24V ac/dc	Maximum inrush power (VA)	75	430	55	320
	Rated power (VA)	45	-	20	-
	Absorption time (s)	2.8	0.01	3.3	0.01
	Operating current time (s)	1.1	0.03	1.2	0.03
48V ac/dc	Maximum inrush power (VA)	85	1000	70	690
	Rated power (VA)	65	-	15	-
	Absorption time (s)	3.3	0.006	3.8	0.006
	Operating current time (s)	1.1	0.02	1.3	0.02
110V ac	Maximum inrush power (VA)	95	600	-	-
	Rated power (VA)	60	-	-	-
	Absorption time (s)	3	0.02	-	-
	Operating current time (s)	1.0	0.03	-	-
230V ac	Maximum inrush power (VA)	125	460	-	-
	Rated power (VA)	70	-	-	-
	Absorption time (s)	2.5	0.08	-	-
	Operating current time (s)	0.9	0.03	-	-

It is necessary to foresee a protection device (e.g. fuse) along the motor operator power line. The correct size of the fuse depends on the motor version and on the number of users.
Here a schematic example:



Locking accessory (for motor operator)
- Padlock (for motor operator locking) *ref. 4 238 46*
- Key lock accessory for motor operator *ref. 4 238 45*

Ref. 4 238 45 must be used with universal keylocks to get the complete locking kit for motor operator

8.6 Mechanical accessories

- Padlock (for locking in "OPEN" position) *ref. 4 210 49*

(ref. 4 210 49 is compatible with DPX³ 125 HP and DPX³ 160/250)

- Sealable terminal shields:
  - Set of 3 (for 4P) *ref. 4 238 24*
- Insulated shields:
  - Set of 3 (for 4P) *ref. 4 238 35*

(ref. 4 238 34/35 are compatible with DPX³ 125 HP also)

8.7 Connection accessories

Cage terminals
- Set of 4 terminals for cables 150 mm² max (rigid) *ref. 4 238 31*
  or 120 mm² max (flexible) Cu/Al

Spreaders *(incoming or outcoming):*
- Set of 4 (for 4P) *ref. 6 250 18*

Rear terminals *(incoming or outcoming):*
- Set of 4 (for 4P) *ref. 4 238 22*

Cage terminal use specifications

DPX³ 250HP							
Type of cage terminal	*Cable standard suggested cross section (mm²)**			*Dimensions limits of cable for cage terminals*			
	In (A)	Cu	Al	MIN cross section (mm²)		MAX cross section (mm²)	
				Flexible	Rigid	Flexible	Rigid
Standard	16	2,5	4	2,5	2,5	120	150
	20	2,5	4				
	25	4	6				
	32	6	10				
	40	10	16				
	50	10	16				
	63	16	25				
	80	25	35				
	100	35	50				
	125	50	70				
	160	70	\				
	200	95	\				
	250	120	\				

* The suggested cross section are in compliance with standard IEC60947-1 (ed.6 2020/04) and IEC60947-2 (ed.5.1 2019/07)

8.8 Plug-in version

(A plug-in is a DPX³ 250 HP fitted with special terminals and mounted on a plug-in base)

Bases
(for plug-in and draw-out versions for DPX³ 250 HP and DPX³-I 250 HP)

- Plug-in/draw-out base for 3P *ref. 4 238 50*
- Plug-in/draw-out base for 4P *ref. 4 238 51*
- Plug-in/draw-out mobile part kit for 3P *ref. 4 238 52*
- Plug-in/draw-out mobile part kit for 4P *ref. 4 238 53*

Plug-in accessories

Locking accessory (for plug-in)
- Key lock accessory for plug-in *ref. 4 238 63*

Ref. 4 238 63 must be used with universal keylocks to get the complete locking kit for plug-in version

8.9 Draw-out version

(A DPX³ 250 HP draw-out version is a plug-in DPX³ 250 HP fitted with a "Debro-lift" mechanism which can be used to withdraw the breaker while keeping it on its base)

"Debro-lift" mechanism
(supplied with a rigid slide and handle for drawing-out)

- transformation kit for 4P *ref. 4 238 61*

Fontal masks for draw-out version
(to provide in addition to debro-lift mechanism according to accessory mounted)

- Frontal module, with frontal mask (3P and 4P) *ref. 4 238 55*
  (if neither motor operator nor rotary handle are mounted)
- Frontal mask for motor operator (3P and 4P) *ref. 4 238 56*

Locking accessory (for draw-out)

- Padlock for draw-out position *ref. 4 238 64*
- Key lock accessory for draw-out *ref. 4 238 62*

Ref. 4 238 62 must be used with universal keylocks to get the complete locking kit for draw-out version

Auxiliary contacts
- Automatic auxiliary contacts for draw-out version *ref. 4 222 30*
- 6 contact connector (under sliding contacts) *ref. 0 098 19*

(Ref. *0 098 19 can be used with both plug-in and draw-out version)*

8.10 Interlock mechanism

(for interlocking 2 DPX³ 125 HP or 2 DPX³ 250 HP breakers)

No frame mixing in interlock mechanism

- Interlock mechanism – standard version *ref. 4 238 27*
  (for fixed version DPX³ 125 HP and DPX³ 250 HP)
- Interlock mechanism – for electronic module *ref. 4 238 28*
  (for fixed version DPX³ 125 HP and DPX³ 250 HP)

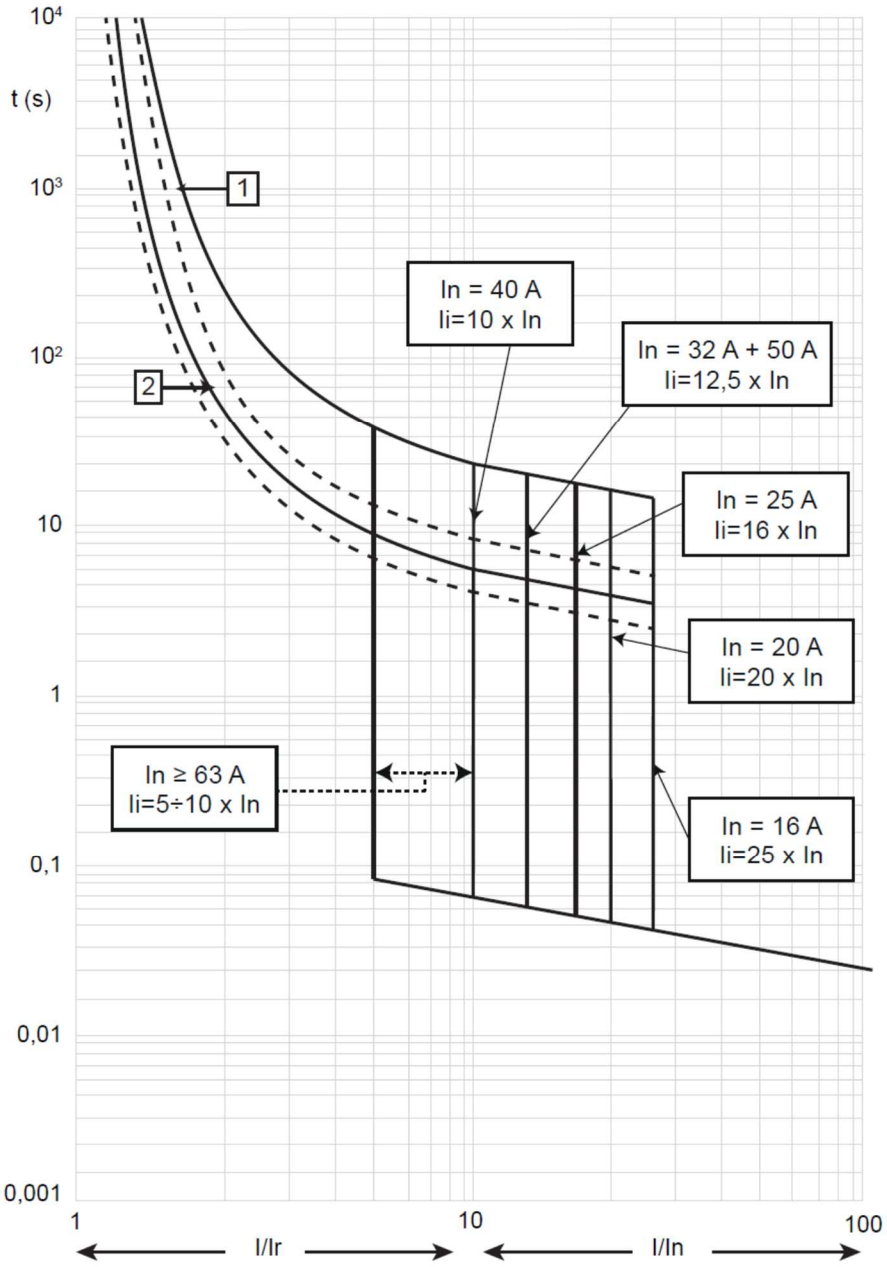
- Interlock plate for DPX³ 250 HP *ref. 4 238 26*

- Rear interlock mechanism *ref. 4 238 29*
  (for DPX³ 250 HP plug-in and/or draw-out version)
  If used ref. 0 098 19, maximum 1 set

9. CURVES

9.1 Thermal magnetic tripping curve

Update: 11/06/2019

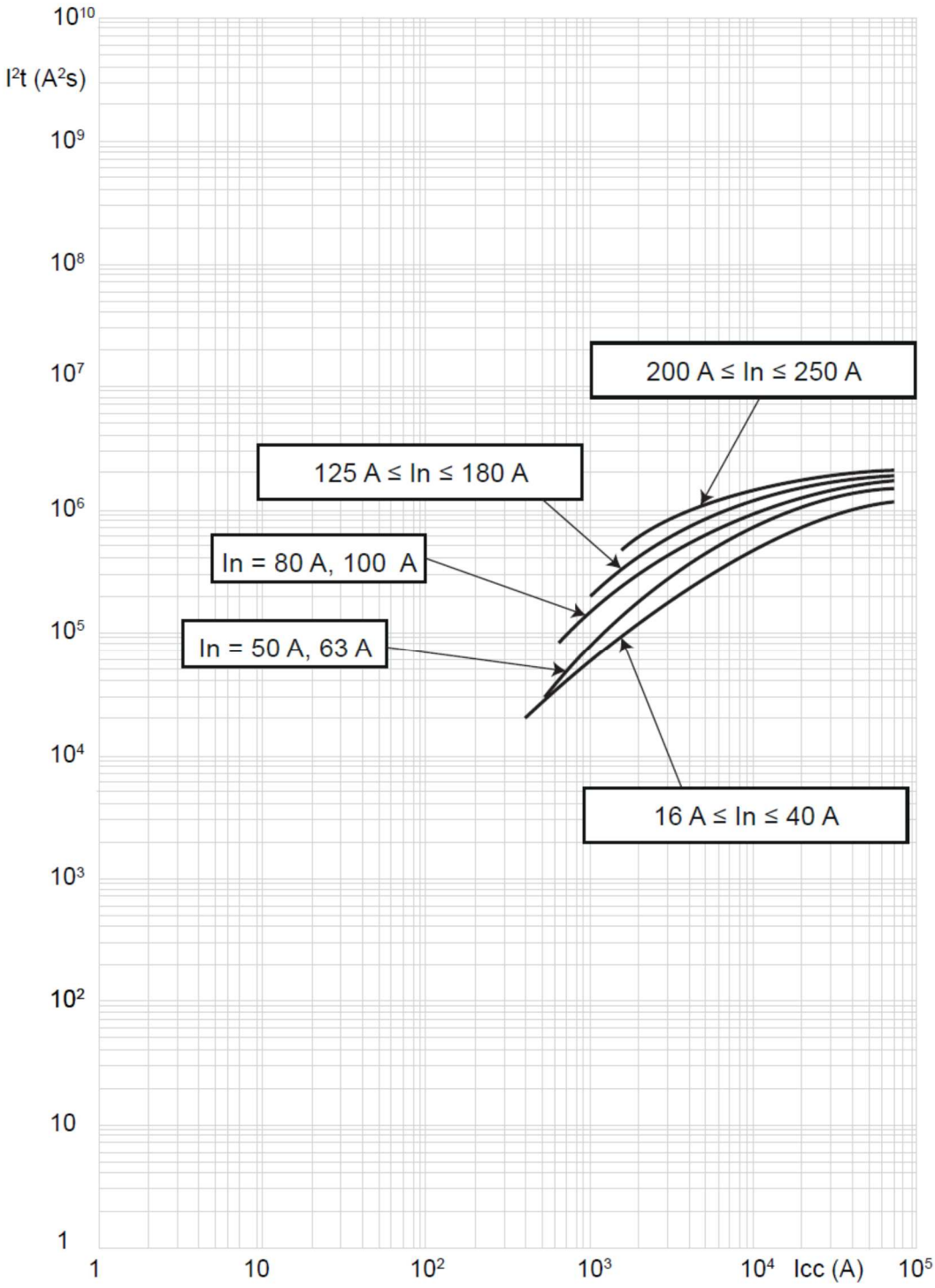


I_{cu} = 36-50 kA I_{max} = 250A 4 P U_e = 415Vac *(IEC/EN 60947-2)*

Value	Description
t	time
I	current
I_n	rated current
I_r	long time setting current
curve 1	characteristic with cold start
curve 2	characteristic with hot start

9.2 Pass-through specific energy characteristic curve

Update: 11/06/2019

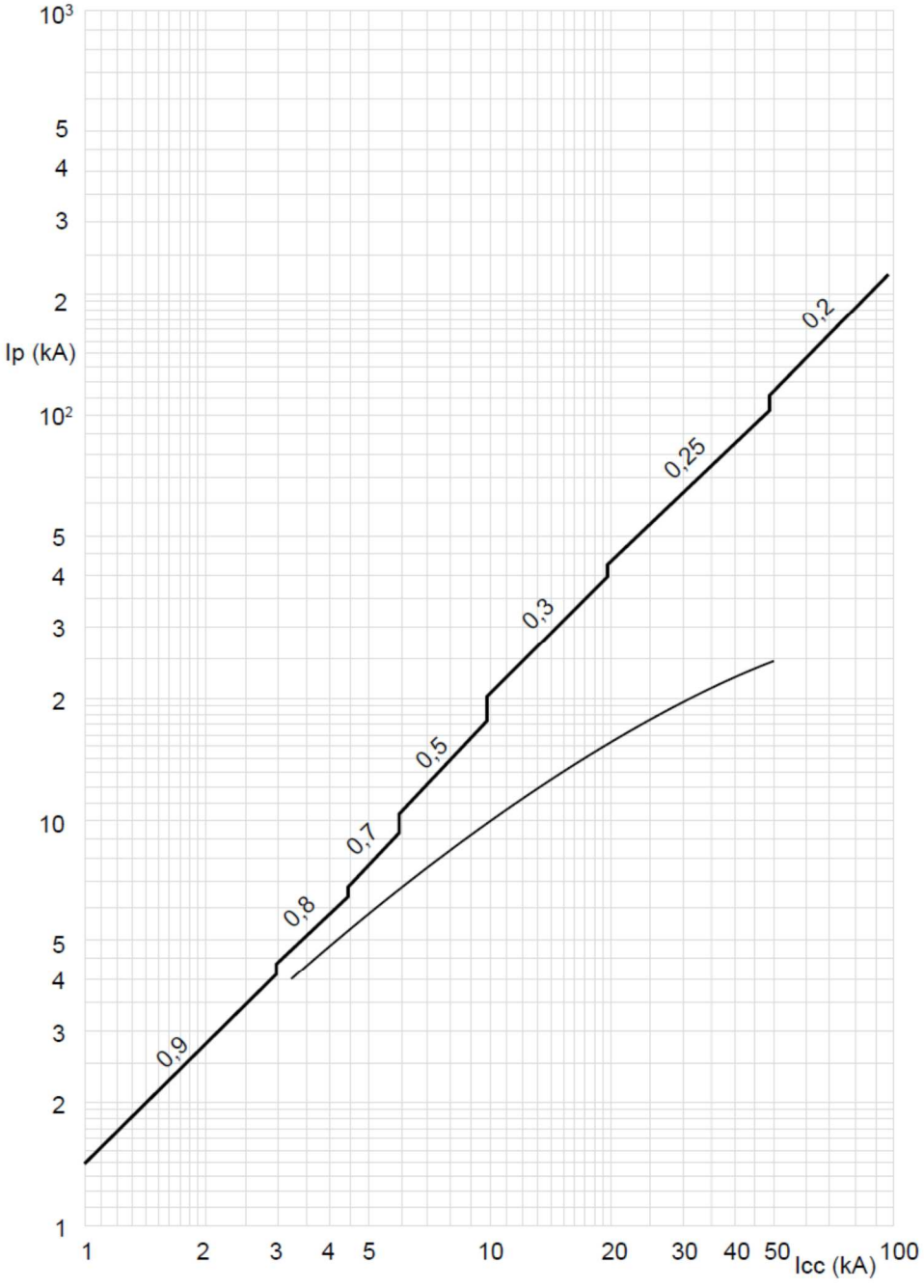


I_{cu} = 36-50 kA I_{max} = 250A 4 P U_e = 415Vac *(IEC/EN 60947-2)*

Value	Description
I_{cc}	short circuit current
I^2t (A^2s)	pass-through specific energy

9.3 Cut-off peak current characteristic curve (kA)

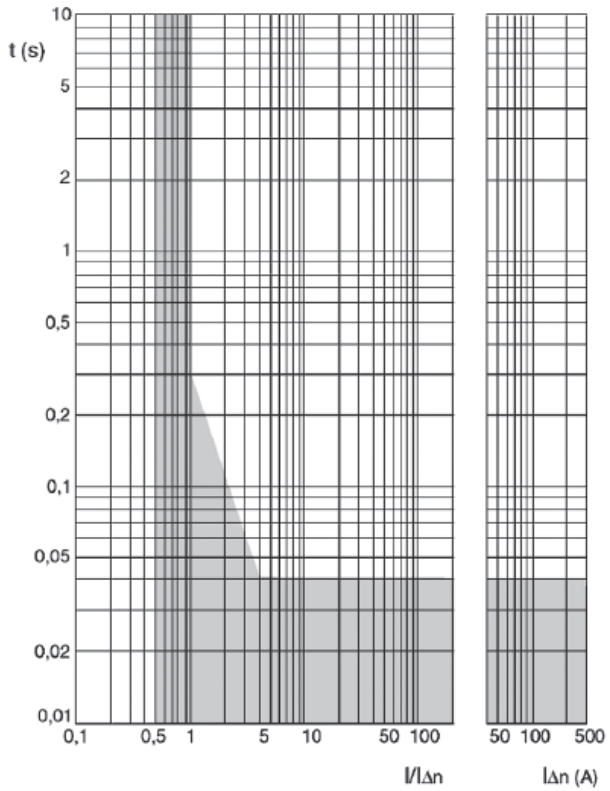
Update: 30/08/2019



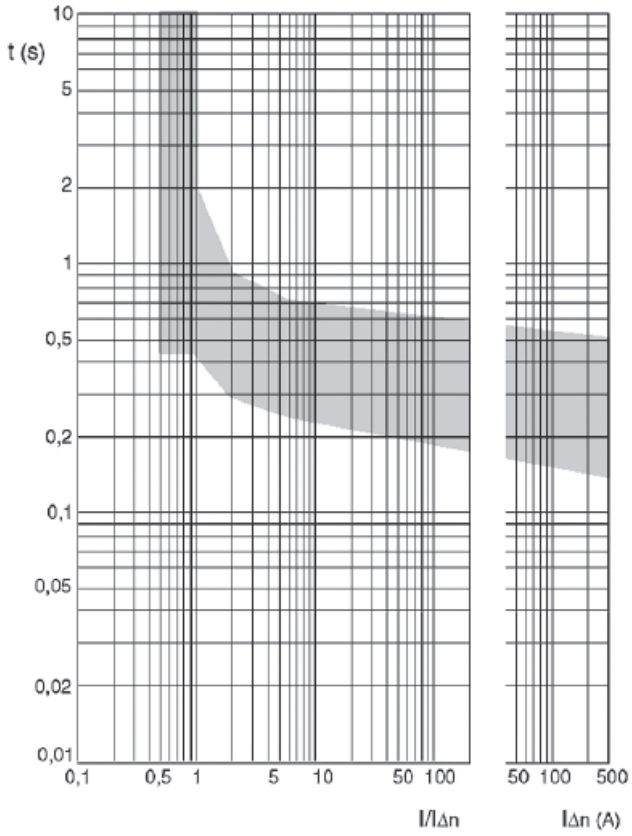
I_{cu} = 36-50 kA I_{max} = 250A 4 P U_e = 415Vac *(IEC/EN 60947-2)*

Value	Description
I_{cc}	estimated short circuit symmetrical current (RMS value)
I_p	maximum short circuit peak current
	maximum prospective short circuit peak current corresponding at the power factor
	maximum real peak short circuit current

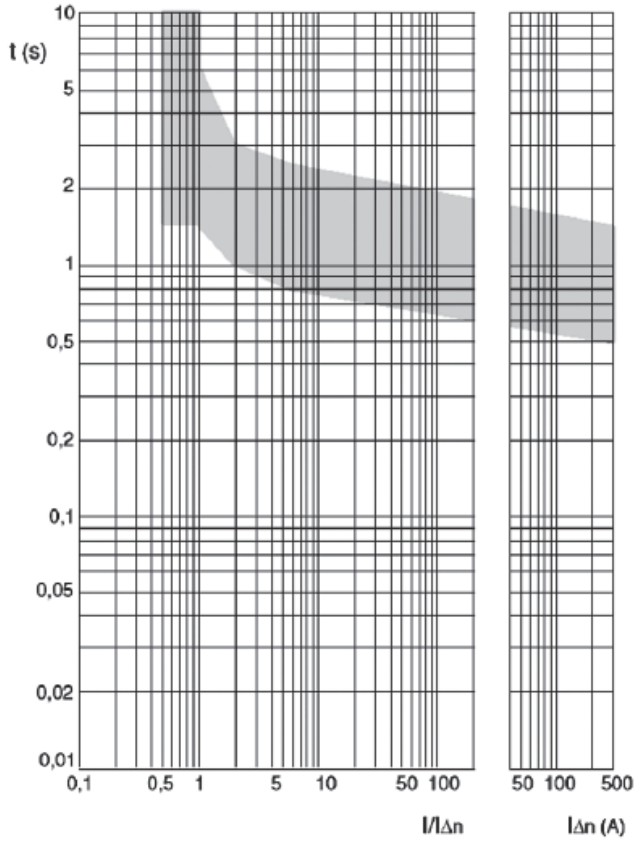
9.4.1 Earth leakage curves, instantaneous



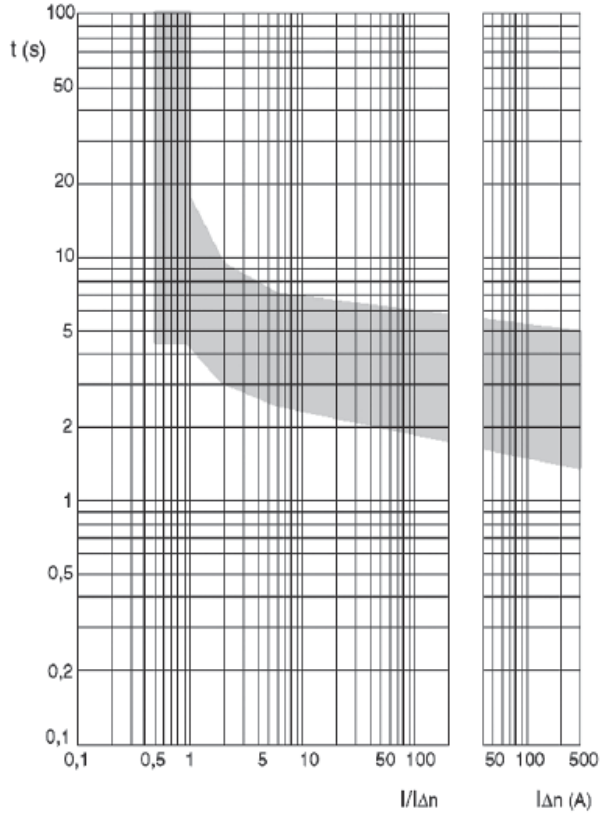
9.4.2 Earth leakage curves, time delay = 0.3 s



9.4.3 Earth leakage curves, time delay = 1 s



9.4.4 Earth leakage curves, time delay = 3 s



A) Derating Temperature and configurations

	Ambient temperature									
	30 °C		40 °C		50 °C		60 °C		70 °C	
Fixed version	I_{max} (A)	I_r / I_n	I_{max} (A)	I_r / I_n	I_{max} (A)	I_r / I_n	I_{max} (A)	I_r / I_n	I_{max} (A)	I_r / I_n
Cage terminals, flexible cable	250	1	250	1	250	1	255	0.90	213	0.85
Lugs, flexible cable	250	1	250	1	250	1	238	0.95	255	0.90
Spreaders, flexible cable	250	1	250	1	250	1	238	0.95	255	0.90
Draw-out version	I_{max} (A)	I_r / I_n	I_{max} (A)	I_r / I_n	I_{max} (A)	I_r / I_n	I_{max} (A)	I_r / I_n	I_{max} (A)	I_r / I_n
Cage terminals, flexible cable	250	1	255	0.90	255	0.90	213	0.85	188	0.75

For further technical information, please contact Legrand technical support.

Data indicated in this document refers exclusively to test conditions according to product standards, unless otherwise indicated in the documentation.
For the different conditions of use of the product, inside electrical equipment or in any case inserted in the installation context, refer to the regulatory requirements of the equipment, local regulations and design specifications of the system