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# DPX³ 160 HP thermal magnetic with earth leakage circuit breakers
# DPX³-I 160 HP switch disconnectors with earth leakage

Reference(s) :
**from 4 237 23 to 4 237 28;**
**4 231 91;**

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 160 HP + earth leakage | |
|---|---|---|
| | 36 kA | 50 kA |
| $I_n$ (A) | 4P | |
| 160 | 423723 | 423728 |

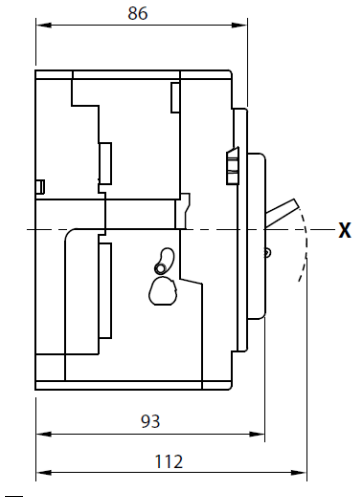
Switch disconnectors

| DPX³-I 160 HP + earth leakage | |
|---|---|
| $I_n$ (A) | 4P |
| 125 | 423191 |

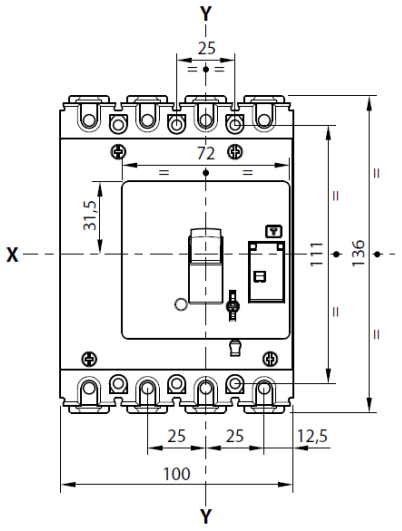
## 3. DIMENSIONS AND WEIGHTS

### 3.1 Dimensions

Lateral view




Frontal view (4 poles)



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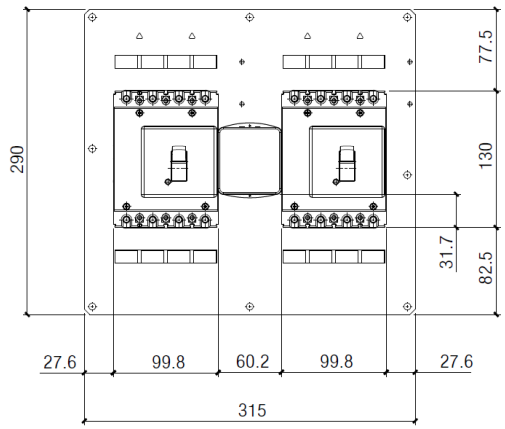
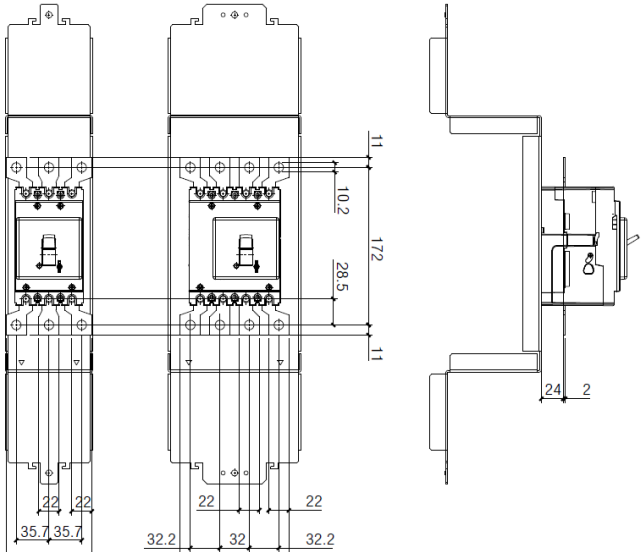
Interlock

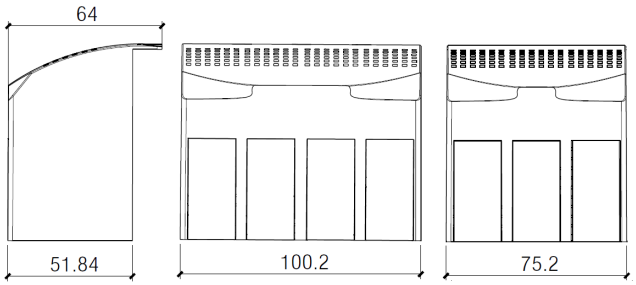
(for rear plate interlock dimension, see relative instruction sheet)

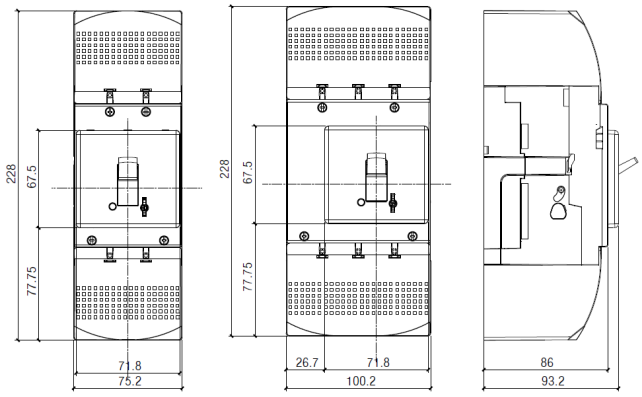



Spreaders

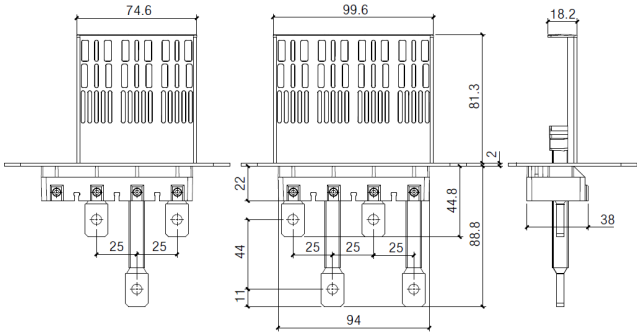


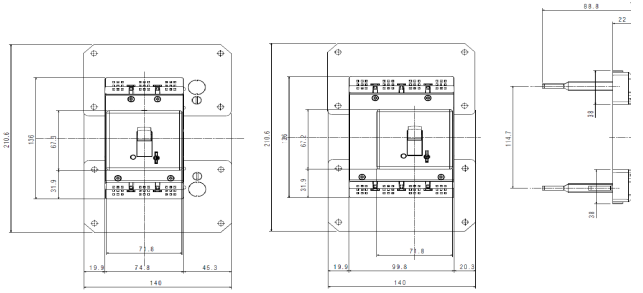

Sealable terminal shields




Rear terminals



# DPX³ 160 HP thermal magnetic with earth leakage circuit breakers
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**4 231 91;**

### 3.2 Weights

| | Weights (Kg) |
|---|---|
| **Configuration** | **4P** |
| Circuit breaker/switch disconnector | 1.4 |
| Direct rotary handle* | 0.18 |
| Vari depth rotary handle* | 0.55 |
| Interlock* | 0.35 |
| Spreader* | 0.175 |
| ** to add to device weight* | |

## 4. OVERVIEW

### 4.1 Supplied with:

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

## 5. ELECTRICAL CONNECTIONS

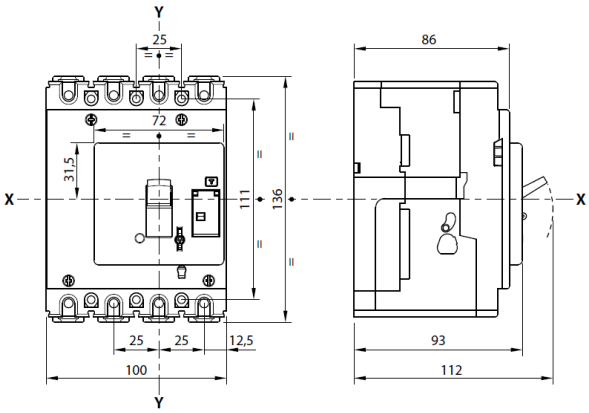
### 5.1 Mounting possibilities

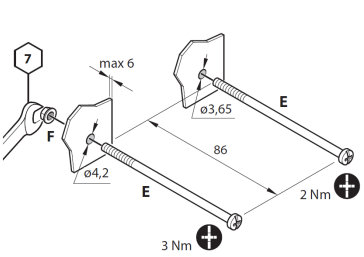
On plate:

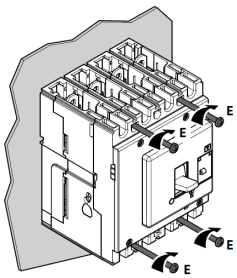
- Vertical
- Horizontal
- Supply invertor type

### 5.2 Mounting

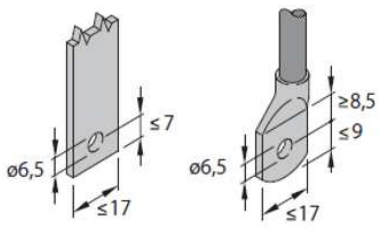
(see instruction sheet for detailed mounting procedures)

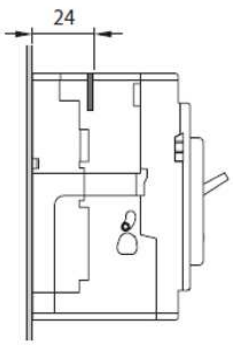



***Busbars/cable lugs:***



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# DPX³-I 160 HP switch disconnectors with earth leakage

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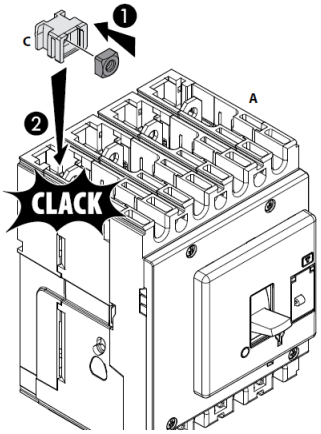
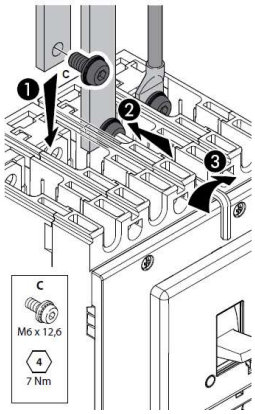
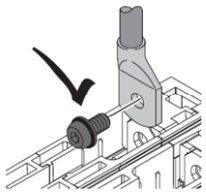
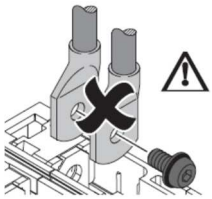
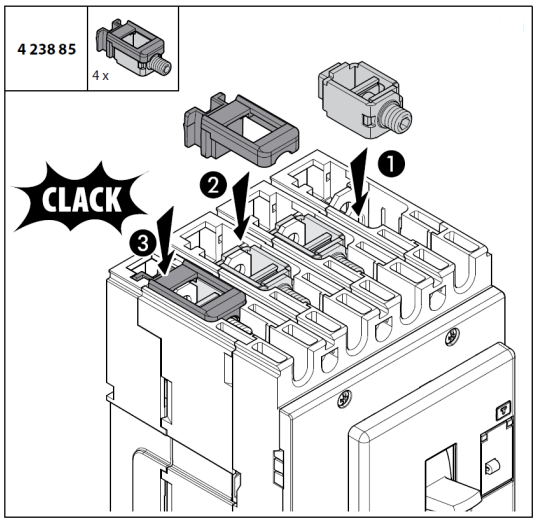


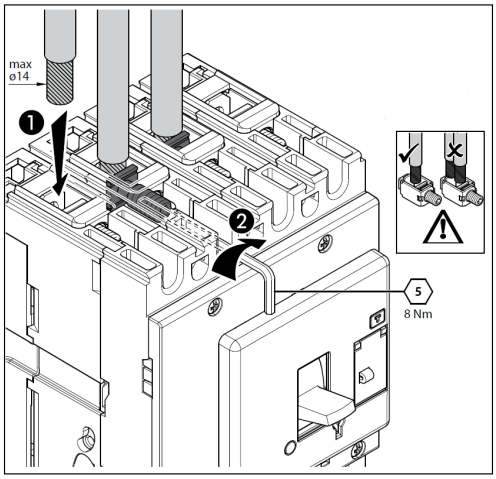





***Cables:***




*For Cu/Al cables, 1x70 mm2 for flexible and rigid cables (for Al cables In max 80A)*



# DPX³ 160 HP thermal magnetic with earth leakage circuit breakers
# DPX³-I 160 HP switch disconnectors with earth leakage

Reference(s) :
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## 6. ELECTRICAL AND MECHANICAL CHARACTERISTICS

Circuit breaker

| Circuit Breaker | DPX³ 160 HP + RCD F/N (36kA, 50kA) |
|---|---|
| Rated current (A) | 160 |
| Poles | 4 |
| Pole pitch (mm) | 25 |
| 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) | 20000 |
| Electrical endurance at $I_n$ (cycles) | 8000 |
| 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) | In=1600A (not adjustable); |
| 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) | 100 x 135 x 86 (4P) |

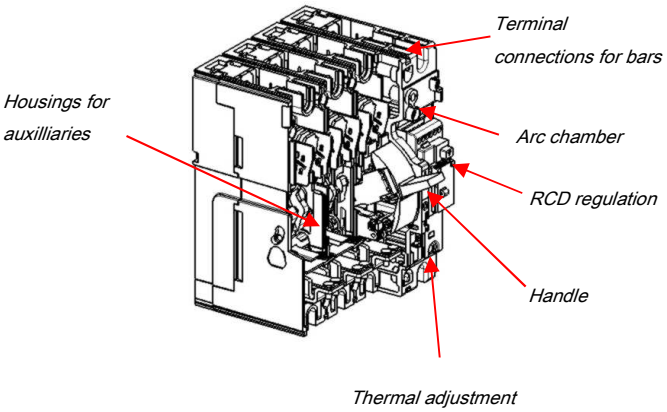
Switch disconnectors

| Switch | DPX³-I 160 HP |
|---|---|
| Uninterrupted nominal current $I_e$ (A) | 160 |
| Short-time resistive current $I_{cw}$(kA) for 1s | 1.5 |
| Rated short-circuit making capacity $I_{cm}$ (kA) | 2.5 |
| Rated insulation voltage $U_i$ (V AC) | 500 |
| Maximum rated operating voltage $U_e$ (V AC) | 500 |
| Rated impulse withstand voltage $U_{imp}$ (kV) | 6 |
| Utilisation category | AC23A |
| Suitable for isolation | Yes |
| Nominal frequency (Hz) | 50-60 |
| Operating temperature (°C) | -25 ÷ 70 |
| Mechanical endurance (cycles) | 20000 |
| Electrical endurance at $I_n$ (cycles) | 8000 |
| Dimensions (W x H x D) (mm) | 100 x 135 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 | 20 | 25 |
| | 480/500 V AC | 12 | 16 |
| | $I_{cs}$(% $I_{cu}$) | 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 | 12 | 16 |

### 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 |
| 160 | 128 | 160 | 1600 | 1600 |

### 6.4 Load operations

| Force on handle | N |
|---|---|
| Opening operation | 40 |
| Closing operation | 40 |
| Restore operation | 53 |

### 6.5 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.*

### 6.6 Power losses per pole under $I_n$

Circuit breaker

| | Power losses per pole (W) |
|---|---|
| In (A) | 160 |
| Lugs | 15.62 |
| Spreaders | 18.18 |
| Rear terminals | 24.58 |

*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) |
| | 160 |
| Lugs | 12.80 |
| Spreaders | 15.36 |
| Rear terminals | 21.76 |

*Note: power loss 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.*

### 6.7 DERATINGS

according to IEC/EN 60947-1

#### 6.7.1 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.

| | Temperature Ta (°C) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $I_n$ (A) | -20 | -10 | -5 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
| 160 | 201 | 193 | 189 | 187 | 179 | 173 | 166 | 160 | 160 | 146 | 138 |

For derating temperature with other configurations, see table A.

#### 6.7.2 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 160 HP circuit breakers, degree 3, according to IEC/EN 60947-2

#### 6.7.3 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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# DPX³-I 160 HP switch disconnectors with earth leakage

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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.

.

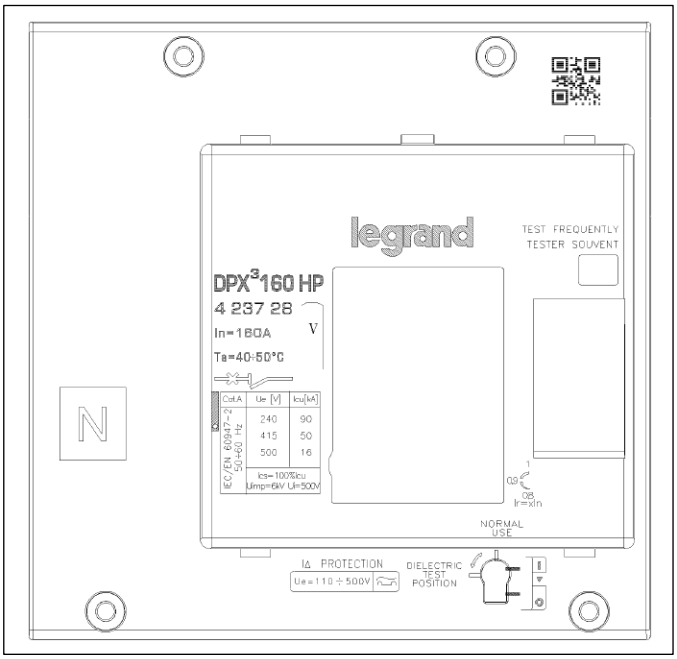
***For specific information, please contact Legrand support***

### 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:

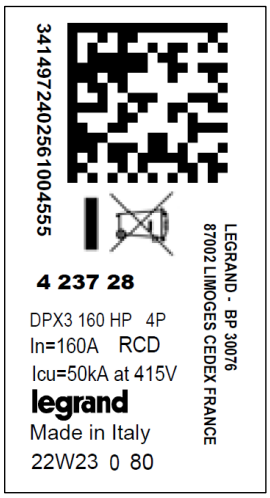
**Product laser label on front**

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



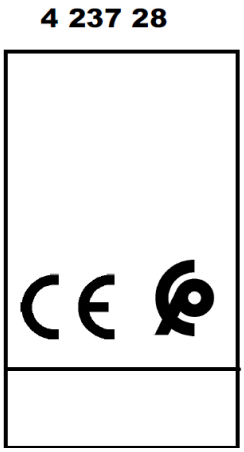

**Product sticker label on side**

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



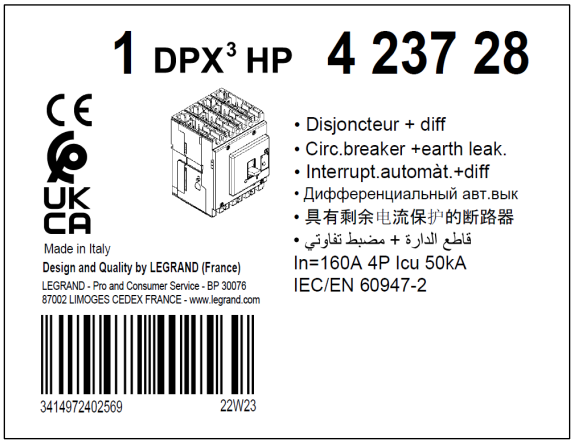

**Mark sticker label on side**

- -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



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## 8. EQUIPMENTS AND ACCESSORIES

### 8.1 Releases (for DPX³ 125/160/250 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:*

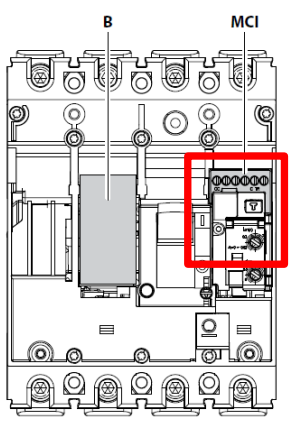
| | |
|---|---|
| 230 V ac | *ref. 0 261 90* |
| 400 V ac | *ref. 0 261 91* |

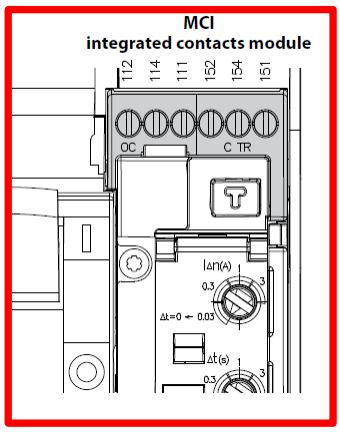
Release *ref. 4 210 98*
(to be equipped with a time-lag module 0 261 90/91)

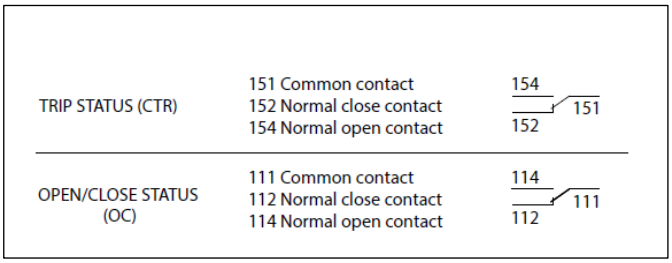
### 8.2 Auxiliary contacts

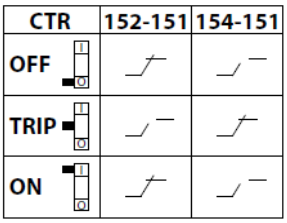
For version of DPX³ 160 HP thermal magnetic, with earth leakage module, auxiliary contacts are integrated inside module M.C.I (see instruction sheet for details).

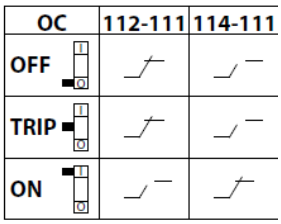
Here a connection scheme to get auxiliary functionality:

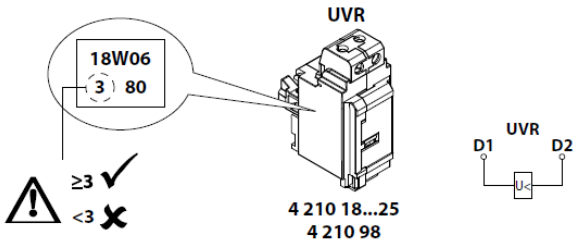


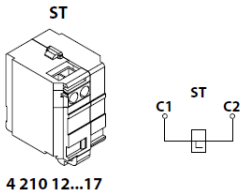



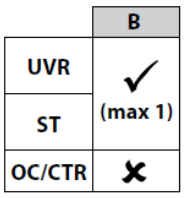




*To get more information on auxiliary mounting procedures, please refer to product instruction sheet.*

### 8.3 Universal keylocks

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

- rotary handle

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*

### 8.4 Mechanical accessories

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

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

- Sealable terminal shields:
  - Set of 3 (for 4P) *ref. 4 238 94*
- Insulated shields:
  - Set of 3 (for 4P) *ref. 4 238 35*

  *(ref. 4 238 35 is compatible with DPX³ 250 HP)*

### 8.5 Connection accessories

***Cage terminals***

- Set of 4 terminals *ref. 4 238 85*

for Cu/Al cables, 1x70 mm2 for flexible and rigid cables

(for Al cables In max 80A)

- Set of 4 terminals (high capacity) *ref. 4 238 77*

for cables 70 mm² max for Cu and 95 mm² max for Al
*Section relative to maximum current is 70 mm² (for Al)*

***Spreaders*** *(incoming or outcoming):*

- Set of 4 (for 4P) *ref. 6 238 89*

***Rear terminals*** *(incoming or outcoming):*

- Set of 4 (for 4P) *ref. 4 238 92*

## *Cage terminal use specifications*

| DPX³ 160HP | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***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 | 4 | 70 | 95 |
| | 20 | 2,5 | 4 | | | | |
| | 25 | 4 | 6 | | | | |
| | 32 | 6 | 10 | | | | |
| | 40 | 10 | 16 | | | | |
| | 50 | 10 | 16 | | | | |
| | 63 | 16 | 25 | | | | |
| | 80 | 25 | 35 | | | | |
| | 100 | 35 | \ | | | | |
| | 125 | 50 | \ | | | | |
| ***High capacity*** | 80 | 25 | 35 | 35 | 35 | 95 | 120 |
| | 100 | 35 | 50 | | | | |
| | 125 | 50 | 70 | | | | |

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

### 8.6 Interlock mechanism

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

No frame mixing in interlock mechanism

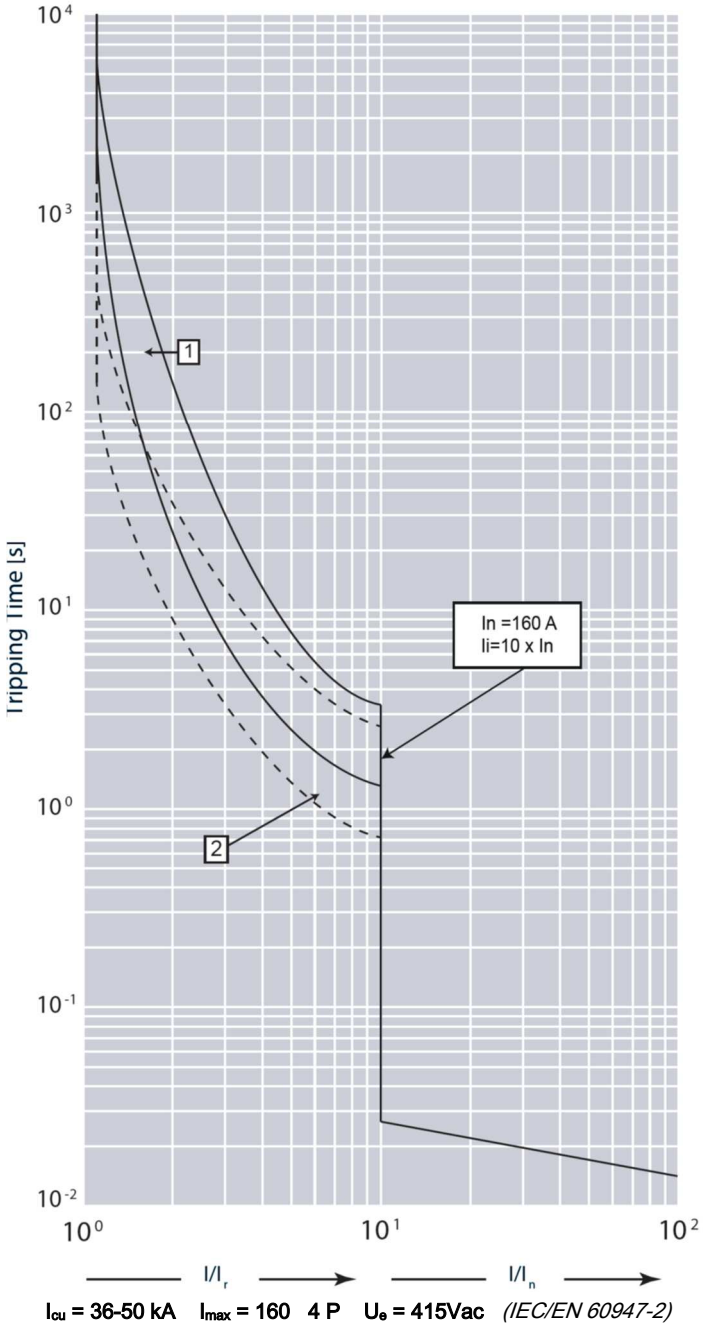
- Interlock mechanism – standard version *ref. 4 238 27*
  (for fixed version DPX³ 125 HP and DPX³ 250 HP)
- Interlock mechanism – for electronic module *ref. 4 238 28*
  (for fixed version DPX³ 125 HP and DPX³ 250 HP)

- Interlock plate for DPX³ 125 HP *ref. 4 238 25*

## 9. CURVES

### 9.1.1 Thermal magnetic tripping curve

*Update: 01/042022*

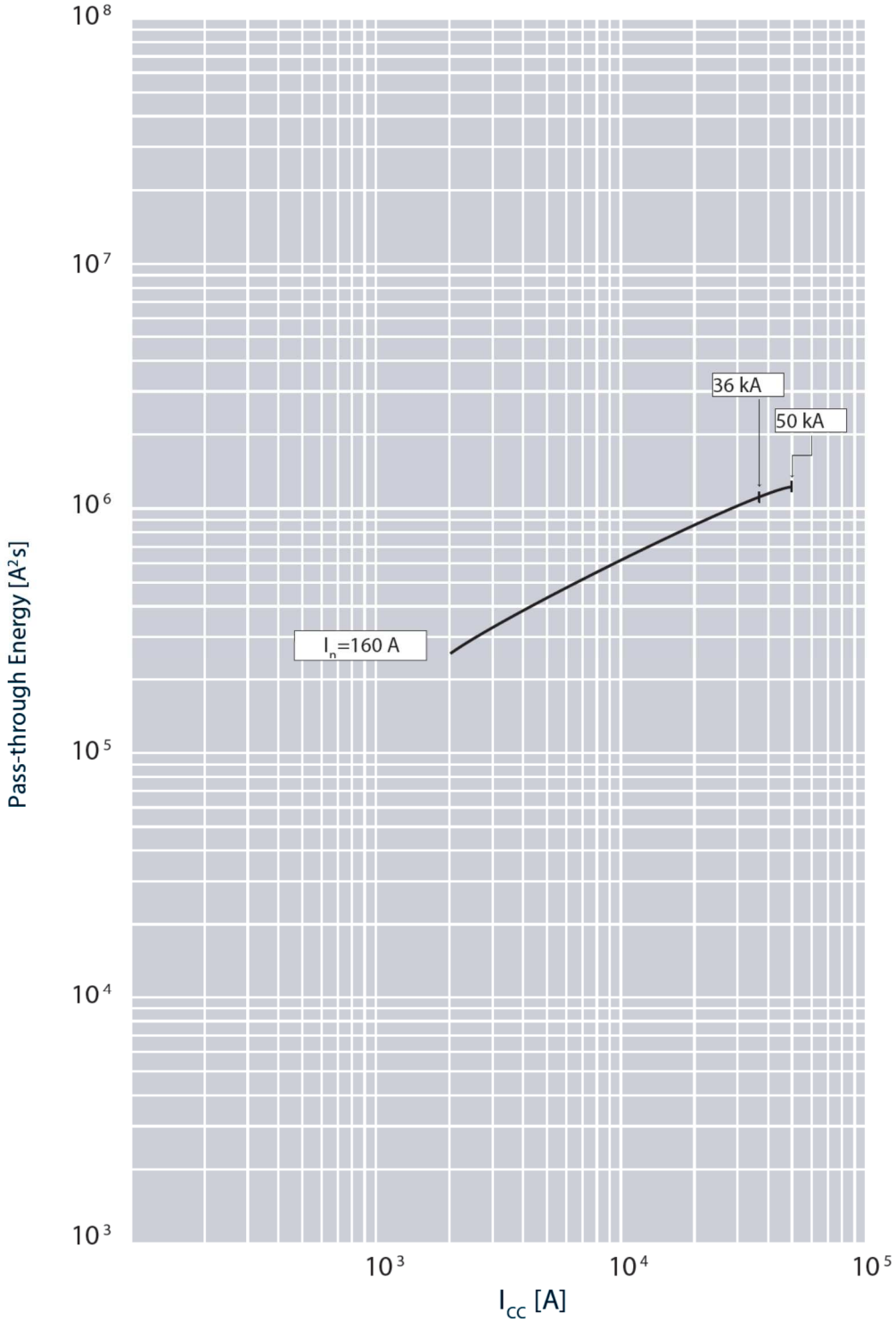



**$I_{cu}$ = 36-50 kA $I_{max}$ = 160 4 P $U_e$ = 415Vac** *(IEC/EN 60947-2)*

| 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: 01/04/2022*

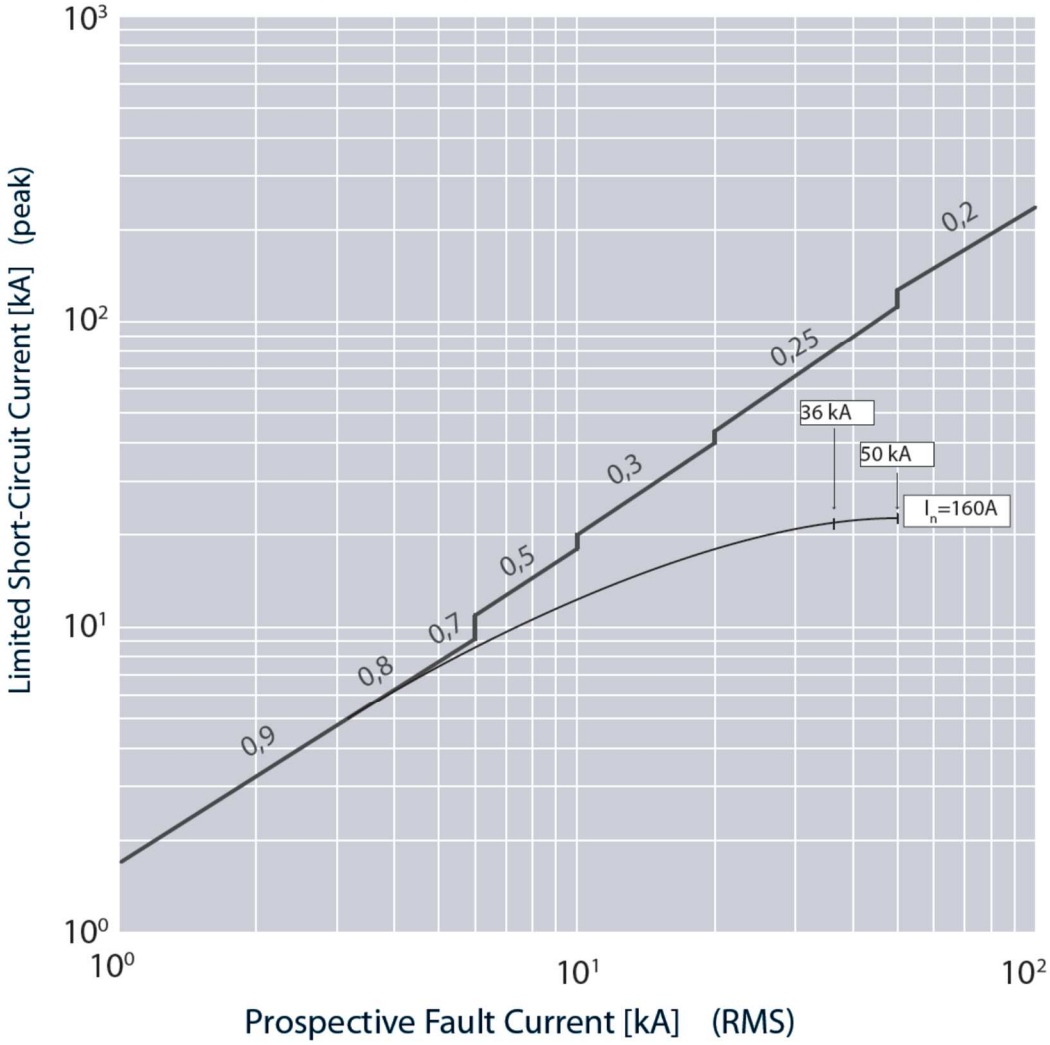



**$I_{cu}$ = 36-50 kA $I_{max}$ = 160A 4 P $U_e$ = 415Vac** *(IEC/EN 60947-2)*

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

### 9.3 Cut-off peak current characteristic curve (kA)

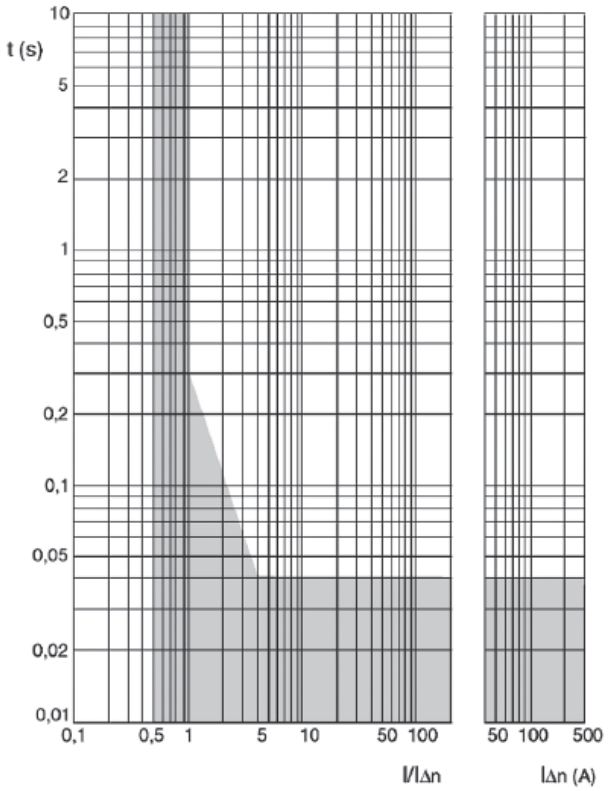
*Update: 01/04/2022*



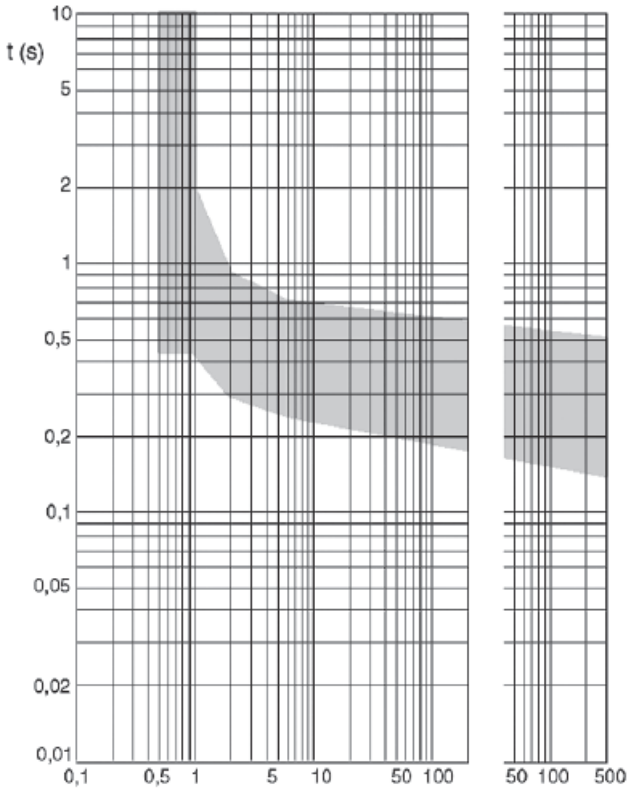

**$I_{cu}$ = 36-50 kA $I_{max}$ = 160A 4 P $U_e$ = 415Vac** *(IEC/EN 60947-2)*

| 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 |

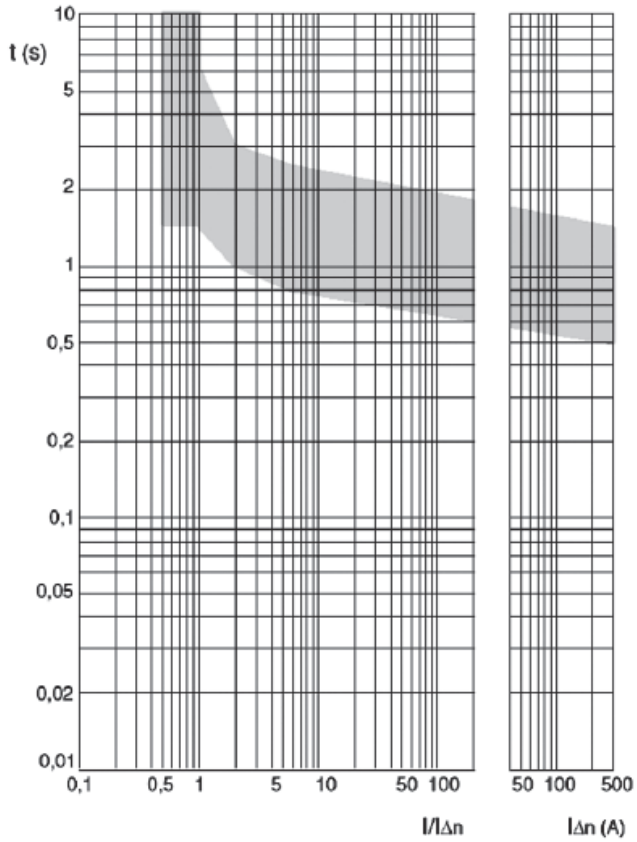
### 9.4.1 Earth leakage curves, instantaneous



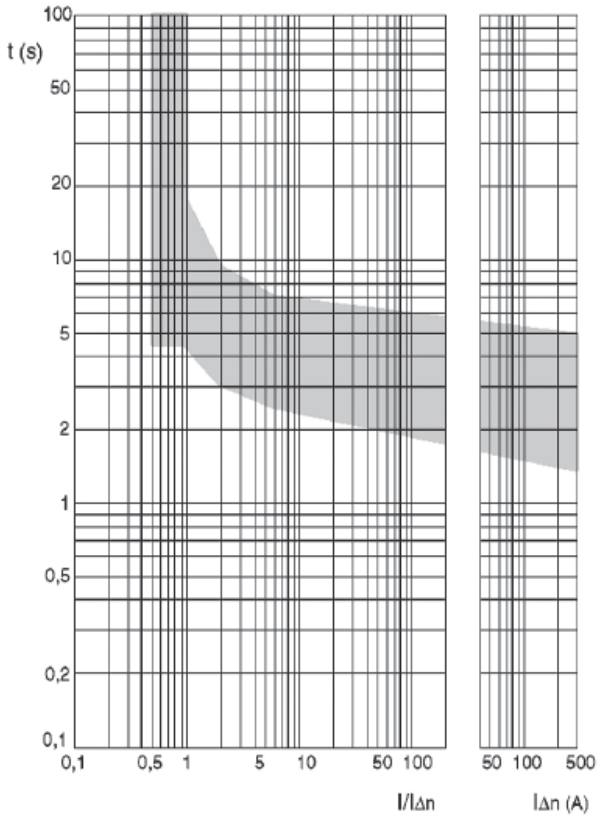

### 9.4.2 Earth leakage curves, time delay = 0.3 s



### 9.4.3 Earth leakage curves, time delay = 1 s




### 9.4.4 Earth leakage curves, time delay = 3 s



# DPX³ 160 HP thermal magnetic with earth leakage circuit breakers
# DPX³-I 160 HP switch disconnectors with earth leakage

Reference(s) :
**from 4 237 23 to 4 237 28;**
**4 231 91;**

**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 | 163 | 1.02 | 160 | 1 | 160 | 1 | 144 | 0.90 | 136 | 0.85 |
| Cage terminals, rigid cable | 163 | 1.02 | 160 | 1 | 160 | 1 | 144 | 0.90 | 136 | 0.85 |
| Lugs, flexible cable | 163 | 1.02 | 160 | 1 | 160 | 1 | 144 | 0.90 | 136 | 0.85 |
| Lugs, rigid cable | 163 | 1.02 | 160 | 1 | 160 | 1 | 144 | 0.90 | 136 | 0.85 |
| Spreaders, flexible cable | 163 | 1.02 | 160 | 1 | 160 | 1 | 144 | 0.90 | 136 | 0.85 |
| Spreaders, rigid cable | 163 | 1.02 | 160 | 1 | 160 | 1 | 144 | 0.90 | 136 | 0.85 |

*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*