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DPX³ 160 HP thermal magnetic circuit breakers with earth leakage module

Cat.Nos:
4 237 23 - 4 237 28 - 4 231 91

DPX³-I 160 HP trip-free switches with earth leakage module

CONTENT **Page**

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

2.1 DPX³ 160 HP thermal magnetic circuit breaker with RCD

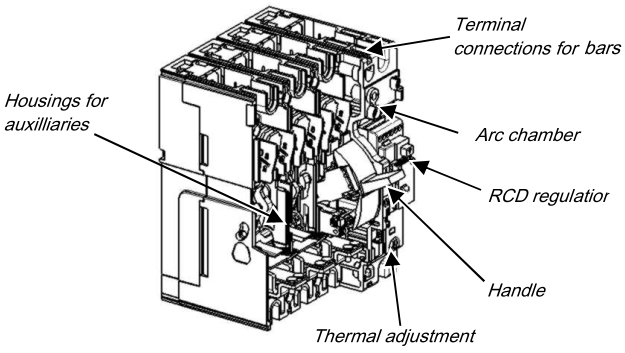
Icu	36 kA	50 kA
In (A)	4P	4P
160	4 237 23	4 237 28

2.2 DPX³-I 160 HP trip-free switch with RCD

In (A)	4P
160	4 231 91

2.3 Composition

DPX³ 160 HP thermal magnetic with earth leakage module is supplied with:
- 4 fixing screws
- 8 screws for connections
- 3 phase insulators



3. TECHNICAL CHARACTERISTICS

3.1 Electrical characteristics

DPX³ 160 HP thermal magnetic circuit breakers with RCD	
Rated current	160 A
Poles	4P
Pole pitch	25 mm
Rated insulation voltage (50/60Hz) Ui	500 V
Rated operating voltage (50/60Hz) Ue	500 V
Rated impulse withstand current Uimp	6 kV
Rated frequency	50 Hz to 60 Hz
Reference ambient temperature	40 °C to 50 °C
Operating temperature	-25 °C to 70 °C
Electrical endurance at In (cycles)	8000
Utilization category	A
Suitable for isolation	Yes
Type of protection	Thermal magnetic
Thermal adjustment Ir	0.8 - 0.9 - 1 x In
Magnetic adjustment Ii (A)	In = 1600 A (not adjustable)
Neutral protection for 4P (%Ith of phase pole)	100
Earth leakage type	A- Integrated
Adjustable sensitivity	0.03 A - 0.3 A - 1 A - 3 A
Adjustable tripping	0s - 0.3s - 1s - 3s (with 0.03 possible only 0s)
Reverse feed	Yes

3. TECHNICAL CHARACTERISTICS *(continued)*

■ 3.1 Electrical characteristics *(continued)*

DPX³-I 160 HP trip-free switches with RCD	
Uninterrupted nominal current Ie	160 A
Short-time resistive current Icw for 1s	1.5 kA
Rated short-circuit making capacity Icm	2.5 kA
Rated insulation voltage Ui	500 V~
Maximum rated operating voltage Ue	500 V~
Rated impulse withstand voltage Uimp	6 kV
Utilisation category	AC23A
Suitable for isolation	Yes
Rated frequency (Hz)	50 Hz to 60 Hz
Operating temperature	-25 °C to 70 °C
Electrical endurance at In (cycles)	8000
Reverse feed	Yes

The maximum temperature allowed on power terminals is 125 °C (absolute). For details, see IEC 60947-1 and 60947-2.

Breaking capacity (4P)

	Breaking capacity (kA) & Ics		
	Ue	Icu	
		36 kA	50 kA
IEC 60947-2	220/240 V~	70	90
	380/415 V~	36	50
	440/460 V~	20	25
	480/500 V~	12	16
	Ics (% Icu)	100	
	Rated making capacity under short circuit Icm		
	Icm (kA) at 415 V	76.5	105

Rated current (In) at 40 °C / 50 °C

Phases limit trip current (A)				
	Thermal (Ir)		Magnetic (Ii)	
In (A)	0.8 x In	1 x In	Min.	Max.
160	128	160	1600	1600

■ 3.2 Mechanical characteristics

Mechanical endurance (cycles): 20000

Load operations

	Force on handle (N)
Opening operation	40
Closing operation	40
Restore operation	53

■ 3.3 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.

Icc (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, the installer must take into account the weight of the conductors so that it does not affect the electrical junction between the conductor itself and the connection point.

■ 3.4 Power losses per pole under In (W)

Circuit breakers	
In (A)	**160**
Lugs	15.62
Cage terminals	16.94
External terminals	16.94
Spreaders	16.94
Rear terminals	16.94
Plug-in version	28.42

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.

Trip-free switches	
In (A)	**160**
Lugs	13.76
Cage terminals	14.93
External terminals	14.93
Spreaders	14.93
Rear terminals	14.93
Plug-in version	26.56

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

4. INSTALLATION RULES

According to IEC/EN 60947-1.

Temperature deratings

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)										
In (A)	**-20**	**-10**	**-5**	**0**	**10**	**20**	**30**	**40**	**50**	**60**	**70**
160	201	193	189	187	179	173	166	160	160	146	138

4. INSTALLATION RULES *(continued)*

For derating temperature with other configurations, see table below.

Ambient temperature	30 °C		40 °C		50 °C		60 °C		70 °C	
	Imax (A)	Ir / In	Imax (A)	Ir / In	Imax (A)	Ir / In	Imax (A)	Ir / In	Imax (A)	Ir / In
Cage terminals, flexible/rigid cable	163	1.02	160	1	160	1	144	0.90	136	0.85
Lugs, flexible/rigid cable										
Spreaders, flexible/rigid cable										

For further technical information, please contact Legrand technical support.

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

Electromagnetic disturbances (EMC): for DPX³ 160 HP with RCD circuit breakers, according to IEC/EN 60947-2 Annex B.

Pollution degree: for DPX³ 160 HP circuit breakers, degree 3, according to IEC/EN 60947-2.

Altitude

Altitude derating for DPX³ and DPX³-I

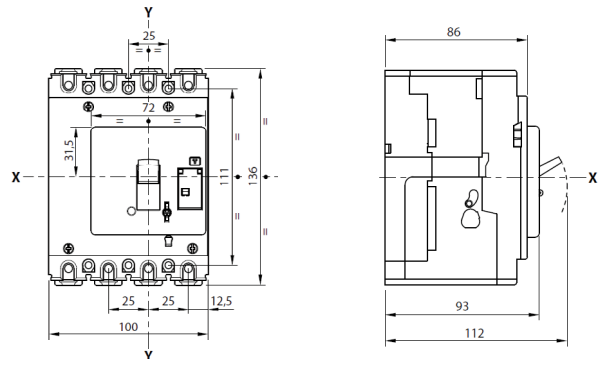
Altitude (m)	2000	3000	4000	5000
Ue (V)	500	430	380	330
In (A) (Ta = 40°C/50°C)	1 x In	0.98 x In	0.93 x In	0.9 x In

5. DIMENSIONS AND WEIGHT

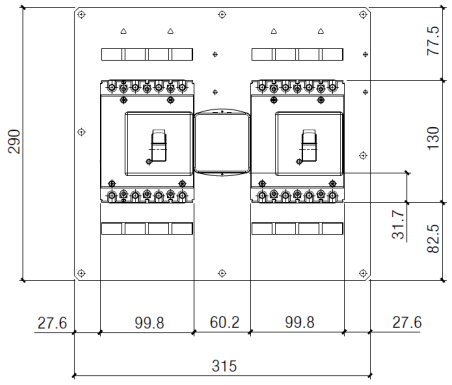
■ 5.1 Dimensions (mm)

4P (W x H x D): 100 x 135 x 86

Device without accessories

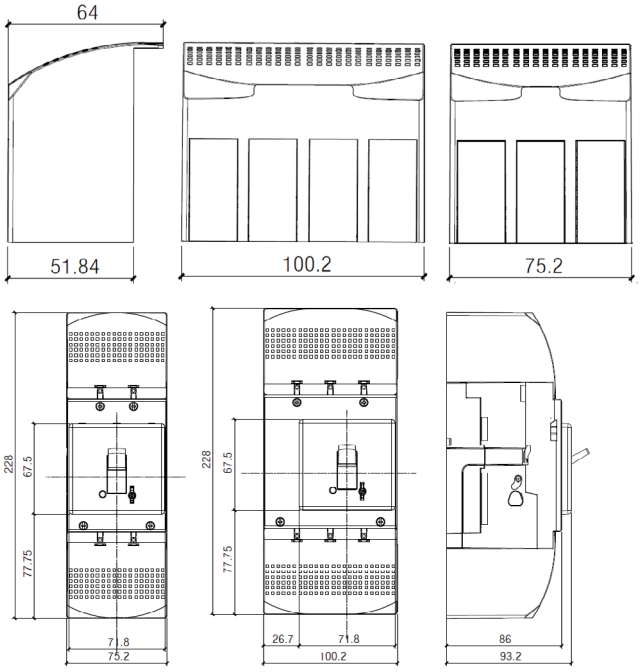


With interlock



For rear plate interlock dimension, see relative instruction sheet.

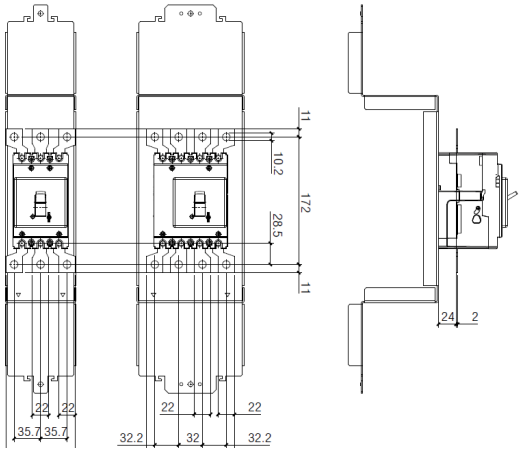
With sealable terminal shield



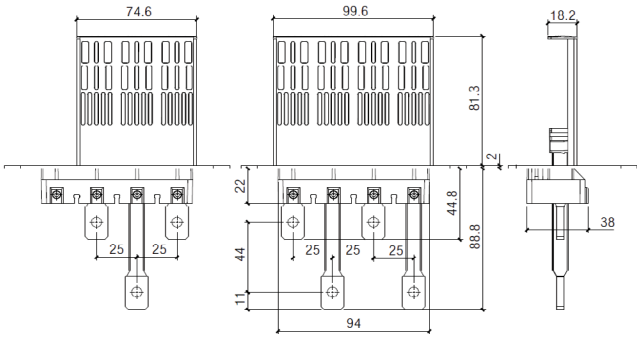
5. DIMENSIONS AND WEIGHT *(continued)*

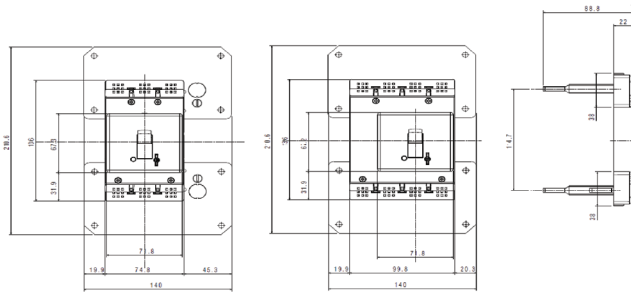
■ 5.1 Dimensions *(continued)*

With spreaders



With rear terminal





■ 5.2 Weight

Weight (kg)	
Configuration	**4P**
Circuit breaker/trip-free switch	1.4
Interlock*	0.35
Spreader*	0.175

* to add to device weight

6. CONNECTIONS

Possible way of assembly on plate:

- vertical
- horizontal

It is possible to use:
- busbars;
- cables lugs;
- spreaders;
- cage terminals;

to unsure the circuit breaker's connection.

For detailed mounting procedures, see instruction sheet.

7. EQUIPMENTS AND ACCESSORIES

■ 7.1 Releases

There are 3 types of releases (also suitable for DPX³ 125/250 HP and DPX³ 160/250):

Shunt releases (ST)

12 V~/⎓	Cat.No 4 210 12
24 V~/⎓	Cat.No 4 210 13
48 V~/⎓	Cat.No 4 210 14
110 to 130 V~	Cat.No 4 210 15
220 to 277 V~	Cat.No 4 210 16
380 to 480 V~	Cat.No 4 210 17

Maximum power = 400 VA / W

Undervoltage releases (UVR)

12 V~/⎓	Cat.No 4 210 18
24 V~/⎓	Cat.No 4 210 19
48 V~/⎓	Cat.No 4 210 20
110 to 130 V~/⎓	Cat.No 4 210 21
220 to 240 V~	Cat.No 4 210 22
277 V~	Cat.No 4 210 23
380 to 415 V~	Cat.No 4 210 24
440 to 480 V~	Cat.No 4 210 25

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

Undervoltage releases can be used on DPX³ 125/160/250 HP starting from batch 19W15.

Time-lag undervoltage releases (800 ms)

- Release	Cat.No 4 210 98

to be equipped with a time-lag module:

- 230 V~	Cat.No 0 261 90
- 400 V~	Cat.No 0 261 91

■ 7.2 Auxiliary contacts

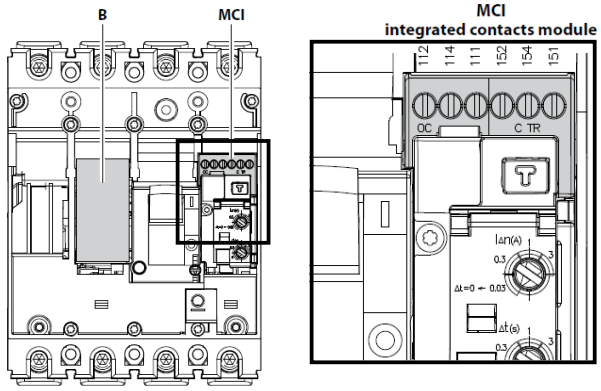
For the DPX³ 160 HP thermal magnetic, with earth leakage module version, auxiliary contacts are integrated inside module M.C.I (see instruction sheet for details).

Rated voltage (Vn)	Intensity (A)
24 V⎓	5
48 V⎓	1.7
110 V⎓	0.5
230 V⎓	0.25
110 V~	4
230/250 V~	3

7. EQUIPMENTS AND ACCESSORIES *(continued)*

■ 7.2 Auxiliary contacts *(continued)*

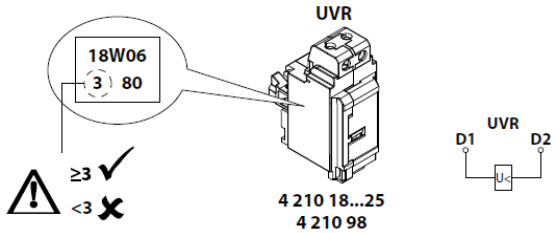
Configurations:

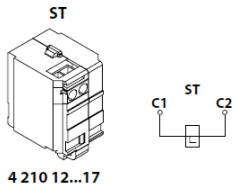


TRIP STATUS (CTR)	151 Common contact 152 Normal close contact 154 Normal open contact	154 / 151 / 152
OPEN/CLOSE STATUS (OC)	111 Common contact 112 Normal close contact 114 Normal open contact	114 / 111 / 112

CTR	152-151	154-151
OFF		
TRIP		
ON		

OC	112-111	114-111
OFF		
TRIP		
ON		





In the space B, it is possible to insert 1 (max.) shunt release, or alternatively 1 (max.) undervoltage release. The space B is not suited for a standard auxiliary contact (OC) or a fault signal (CTR).

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

■ 7.3 Rotary handles

Rotary handles are not compatible with DPX³ 160 HP thermal magnetic with earth leakage module because they cover the access to the earth leakage settings.

■ 7.4 Mechanical accessories

Padlock (for locking in "OPEN" position) Cat.No 4 210 49
also compatible with DPX³ 125/250 HP and DPX³ 160/250

Sealable terminal shields
- Set of 3 (for 4P) Cat.No 4 238 94

Insulated shields
- Set of 3 (for 4P) Cat.No 4 238 35
also compatible with DPX³ 250 HP

■ 7.5 Connection accessories

Cage terminals
- Set of 4 standard terminals for Cat.No 4 238 85
1 x 95 mm² max (rigid) or 1 x 70 mm² max (flexible) Cu/Al cables
(for Al cables In max 80 A)

- Set of 4 high capacity terminals for Cat.No 4 238 77
1 x 120 mm² max (rigid) or 1 x 95 mm² max (flexible) Cu/Al cables

Cage terminal use specifications

Cable standard suggested cross-section (mm²)*			
	In (A)	Cu	Al
Standard cage terminals Cat.No 4 238 85	16	2.5	4
	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	-
	160	70	-
High capacity cage terminals Cat.No 4 238 77	80	25	35
	100	35	50
	125	50	70
	160	70	120

* The suggested cross-section are in compliance with standard IEC 60947-1 (ed.6 2020/04) and IEC 60947-2 (ed.5.1 2019/07)

Dimensions limits of cable for cage terminals				
Standard cage terminals Cat.No 4 238 85	Min. cross-section (mm²)		Max. cross-section (mm²)	
	Flexible	Rigid	Flexible	Rigid
	2.5	4	70	95
High capacity cage terminals Cat.No 4 238 77	Min cross-section (mm²)		Max cross-section (mm²)	
	Flexible	Rigid	Flexible	Rigid
	35		95	120

Note : when the cross-section exceeds the maximum value specified for the material in the table, the allowable current is limited to the indicated value.

Spreaders (incoming or outcoming)
- Set of 4 (for 4P) Cat.No 4 238 89

7. EQUIPMENTS AND ACCESSORIES *(continued)*

■ 7.5 Connection accessories *(continued)*

Rear terminals (incoming or outcoming)
- Set of 4 (for 4P) Cat.No 4 238 92

■ 7.6 Interlock mechanism

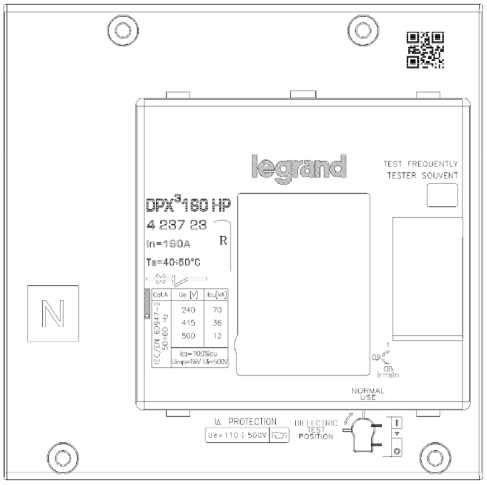
It is used for interlocking 2 DPX³ 160 HP, either with another DPX³ 160 HP or with a DPX³ 125 HP .
It is not possible to use other accessories than those recommended below for interlocking DPX³ 160 HP circuit breakers.

- Interlock mechanism – standard version (for fixed version) Cat.No 4 238 27
- Interlock mechanism – for electronic module (for fixed version) Cat.No 4 238 28
- Interlock plate Cat.No 4 238 25

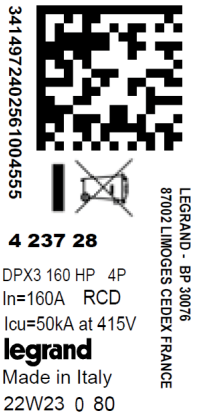
8. MARKING

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

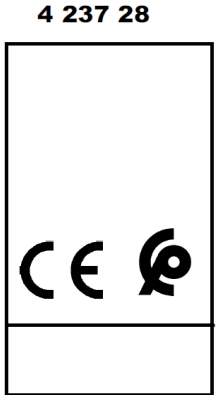
Product laser label on front
- Manufacturer responsible
- Denomination, type product, code
- Standard conformity
- Standard characteristics declared
- Coloured identification of Icu at 415 V



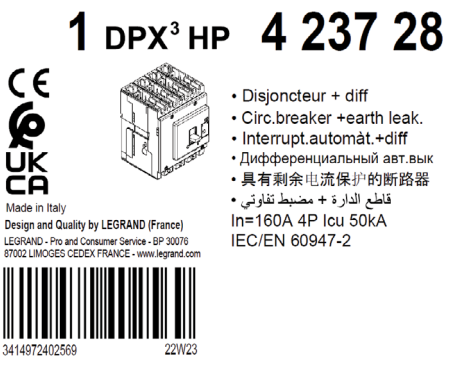
Product sticker label on side
- Manufacturer responsible
- Denomination and type product
- Standard conformity
- Mark/Licence (if any)
- Directive requirements
- Bar code identification product
- Manufacturing Country



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



9. CURVES

9.1 Thermal magnetic tripping curve

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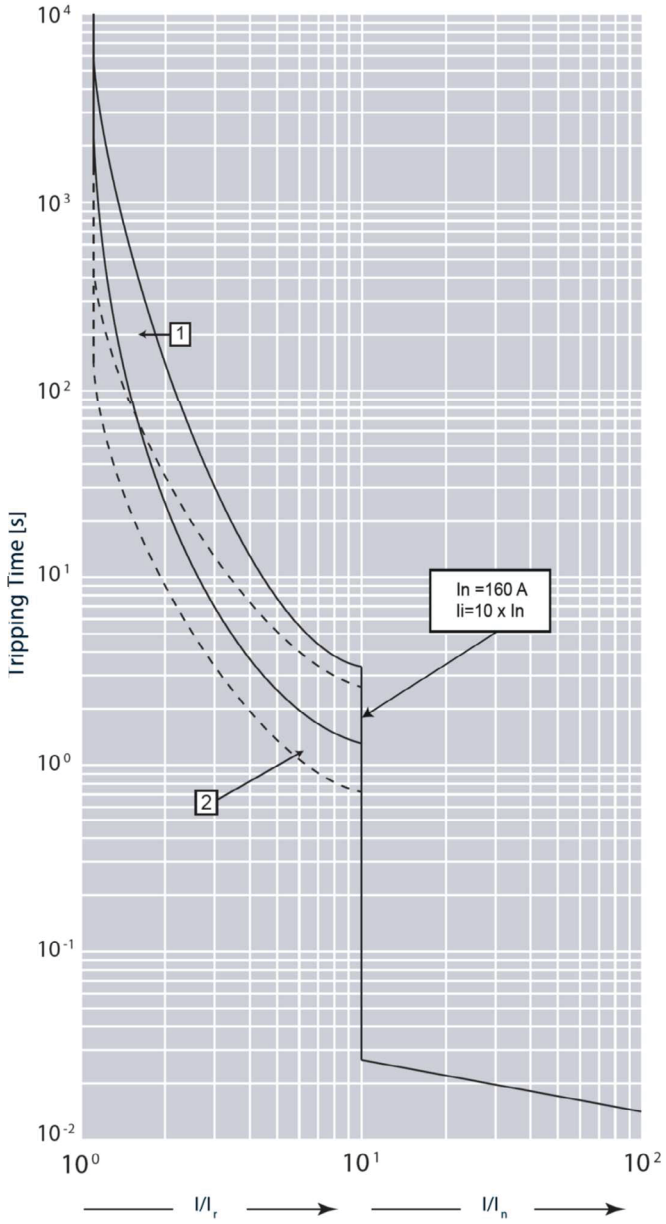


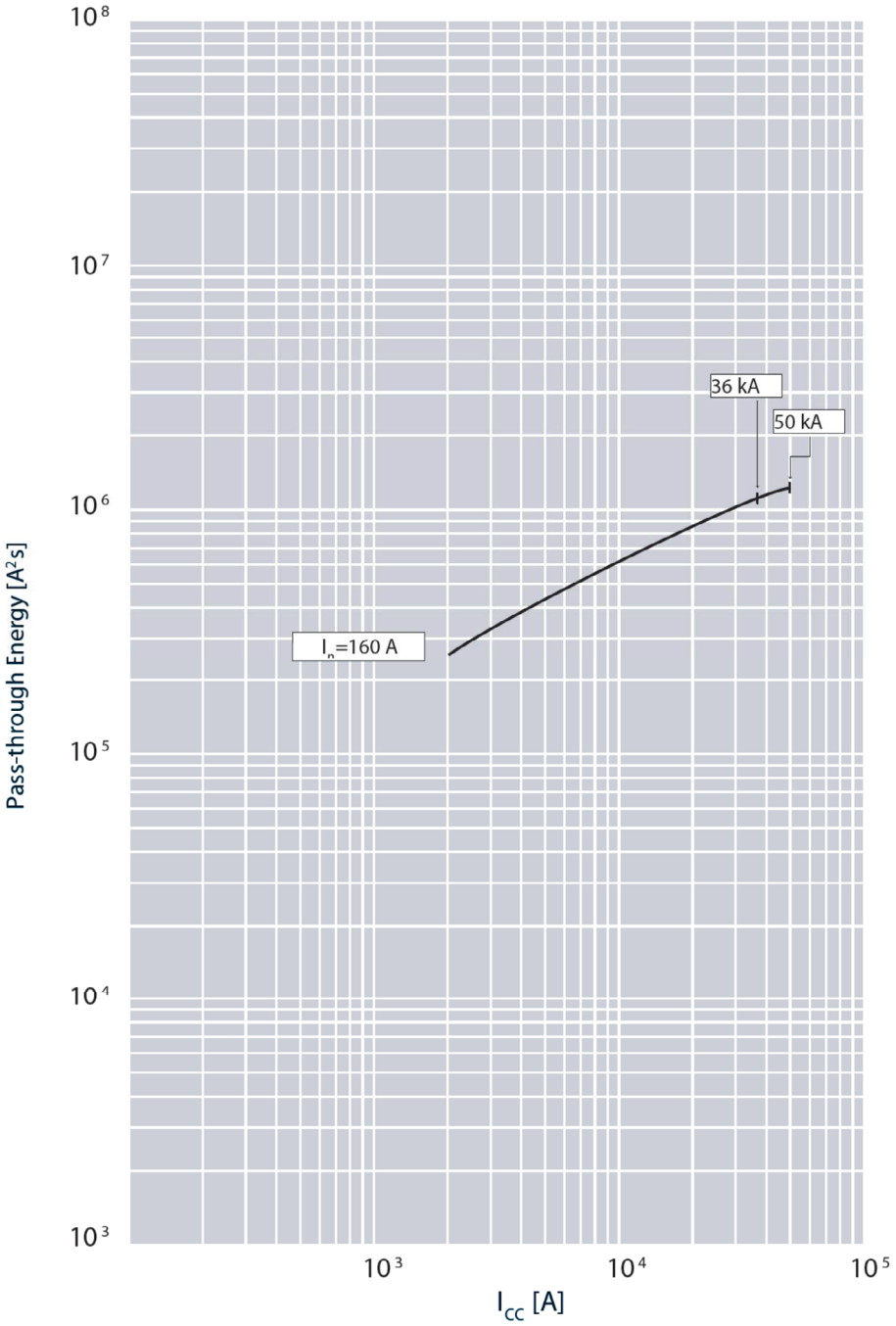
Icu = 36-50 kA Imax = 160 A 4P Ue = 415 V~ (IEC/EN 60947-2)

Value	Description
t	Time
I	Current
In	Rated current
Ir	Long time setting current
Curve 1	Characteristic with cold start
Curve 2	Characteristic with hot start

9. CURVES *(continued)*

9.2 Pass-through specific energy characteristic curve

Update: 01/04/2022



Icu = 36-50 kA Imax = 160 A 4P Ue = 415 V∿ (IEC/EN 60947-2)

Value	Description
Icc	Short circuit current
I^2t (A^2s)	Pass-through specific energy

9. CURVES *(continued)*

9.3 Cut-off peak current characteristic curve (kA)

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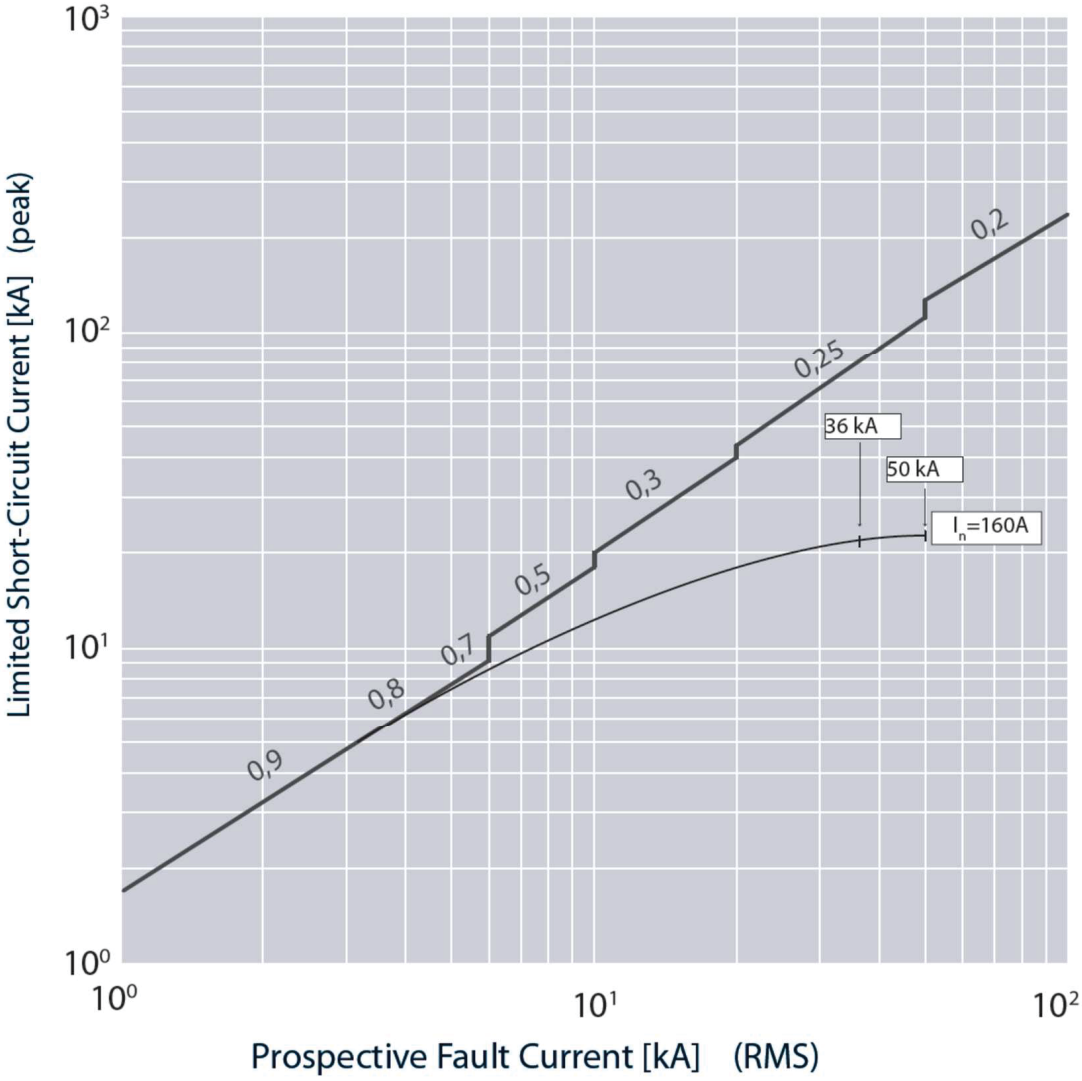
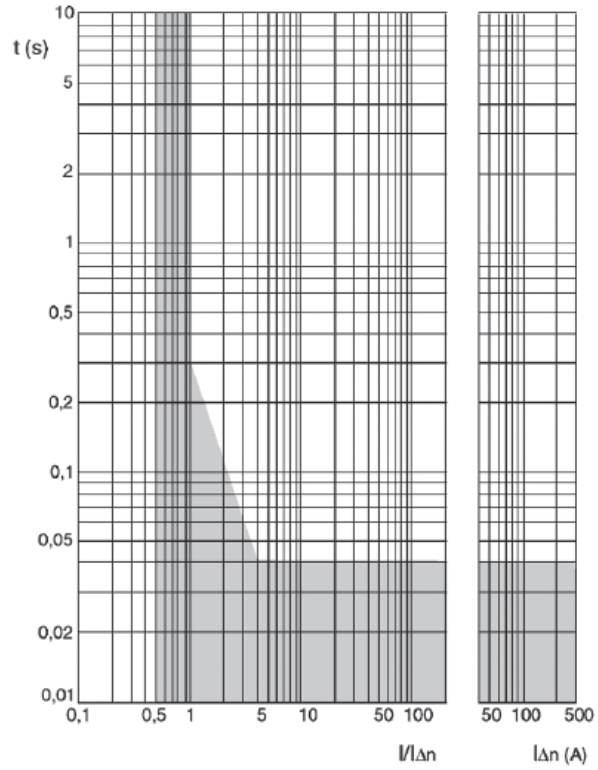


Icu = 36-50 kA Imax = 160 A 4P Ue = 415 V∿ (IEC/EN 60947-2)

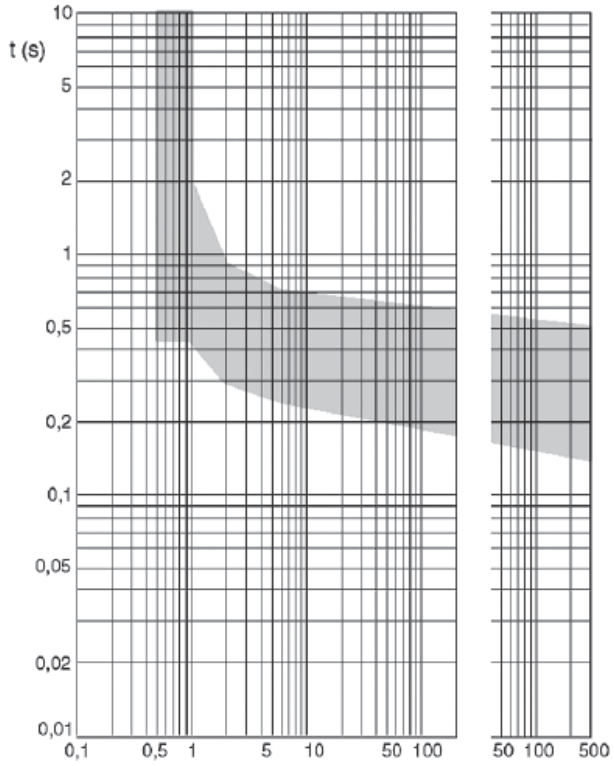
Value	Description
Icc	Estimated short circuit symmetrical current (RMS value)
Ip	Maximum short circuit peak current

9. CURVES *(continued)*

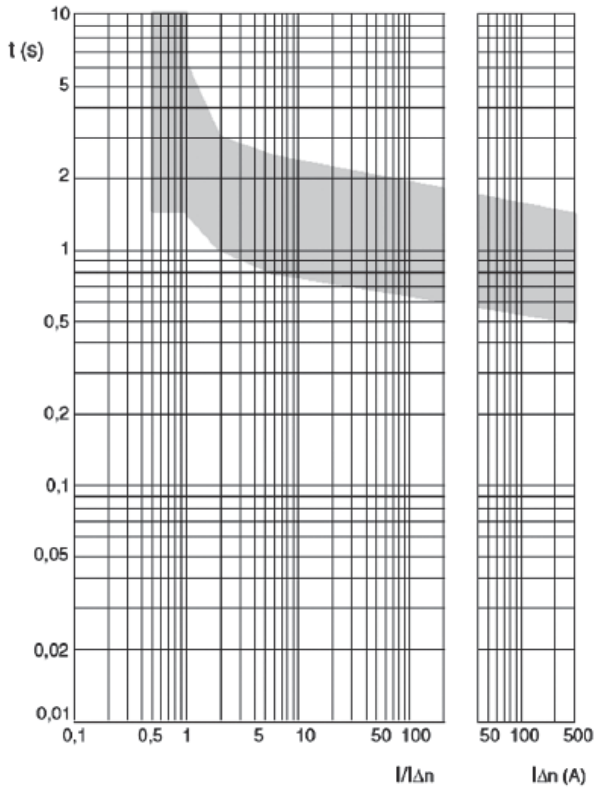
9.4 Earth leakage curves, instantaneous



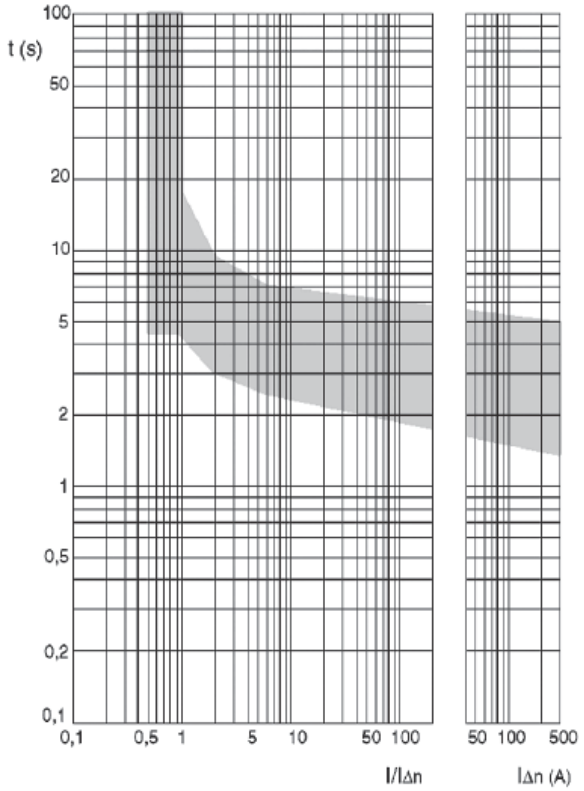
9.5 Earth leakage curves, time delay = 0.3 s



9.6 Earth leakage curves, time delay = 1 s



9.7 Earth leakage curves, time delay = 3 s



10. STANDARDS AND REGULATIONS

DPX³ HP range of product concerning circuit-breakers and trip-free switches exceeds compliance with the IEC/EN standard 60947-2 and 60947-3 respectively.
Certification available by IECEE CB-scheme or LOVAG Compliance scheme. DPX³ HP range respects the European Directives :

RoHS: Compliance with the 2011/65/EU Directive (RoHS), as modified by the 2015/863/EU Delegated Directive, on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

REACH: The substances identified as SVHC (Substances of Very High Concern) according to the REACH Regulation (1907/2006), if present in the products at a concentration above 0.1% weight by weight, are declared inside the European SCIP database. At the date of publication of this document none of the substance listed in the annex XIV is found in this product.

WEEE: WEEE Directive (2012/19/EU): the sale of this product includes a contribution to the appointed environmental bodies of each European country in charge of handling, at the end of their life, the products falling within the scope of the EU Directive on Electrical and Electronic Equipment Waste.

Packaging : Design and manufacture of packaging compliant with European Directive 94/62/CE

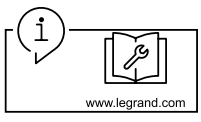
For specific information, please contact Legrand support.

11. OTHER INFORMATION

XLPro³ Calcul: Calculation notes creation software, addressed to installers, design office and maintenance operators. Definition of the electrical characteristics of a low voltage installation in compliance with the applicable standards

XLPro³ Tool Selectivity Backup: Software dedicated to installers, panelbuilders and design offices. Definition of the selectivity and backup values of an association of electrical devices and obtention of the tripping curves of the selected products.

XLPro³ Panels: Distribution panel design software, addressed to panelbuilders and electrical panel designers. Design of the electrical distribution of the panel, production of electrical diagrams, establishment of products and overall costing of the project.



Workshop book: mounting informations, equipments, accessories and spare parts available on e-catalog.

Instruction sheet: detailed mounting procedures, available on e-catalog.

PEP: available on e-catalog.

For further technical information, please contact Legrand technical support.

Unless otherwise indicated, data reported in this document refers exclusively to test conditions according to product standards.

For different conditions of use of the product, inside electrical equipment or in any different installation context, refer to the regulatory requirements of the equipment, local regulations and design specifications of the system.