

Megatiker M3 125 thermal magnetic circuit breakers with earth leakage module

Megatiker MS3 125 trip-free switches with earth leakage module

Cat.Nos:
T7304F16D/20D/25D/32D/40D/50D/63D/80D/100D/125 D
T7304N16D/20D/25D/32D/40D/50D/63D/80D/100D/125 D
T7304S125D



CONTENT	Page
1. Use	1
2. Range	1
3. Technical characteristics	2
4. Installation rules	3
5. Dimensions and weight	4
6. Connections	5
7. Equipments and accessories	5
8. Marking	7
9. Curves	8
10. Standards and regulations	13
11. Other information	13

1. USE

Megatiker M3 range 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.

Megatiker M3 range 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 Megatiker M3 125 thermal magnetic circuit breaker with RCD

Icu	36 kA	50 kA
In (A)	4P	4P
16	T7304F16D	T7304N16D
20	T7304F20D	T7304N20D
25	T7304F25D	T7304N25D
32	T7304F32D	T7304N32D
40	T7304F40D	T7304N40D
50	T7304F50D	T7304N50D
63	T7304F63D	T7304N63D
80	T7304F80D	T7304N80D
100	T7304F100D	T7304N100D
125	T7304F125D	T7304N125D

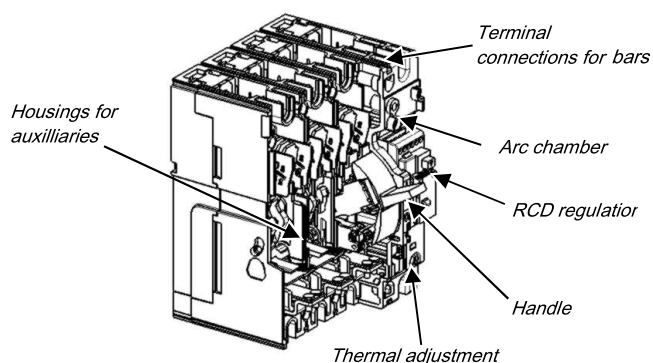
■ 2.2 Megatiker MS3 125 trip-free switch with RCD

In (A)	4P
125	T7304S125D

■ 2.3 Composition

Megatiker M3 125 thermal magnetic with earth leakage module is supplied with:

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



Megatiker M3 125 thermal magnetic circuit breakers with earth leakage module

Megatiker MS3 125 trip-free switches with earth leakage module

Cat.Nos:
T7304F16D/20D/25D/32D/40D/50D/63D/80D/100D/125 D
T7304N16D/20D/25D/32D/40D/50D/63D/80D/100D/125 D
T7304S125D

3. TECHNICAL CHARACTERISTICS

3.1 Electrical characteristics

Megatiker M3 125 thermal magnetic circuit breakers with RCD	
Rated current	16 A - 20 A - 25 A - 32 A 40 A - 50 A - 63 A - 80 A 100 A - 125 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 - 60 Hz
Reference ambient temperature	40 °C - 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)	400 A up to In = 40 A (not adjustable) 10 x In up to In = 125 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

Megatiker MS3 125 switch disconnectors with RCD	
Uninterrupted nominal current Ie	125 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 - 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		
IEC 60947-2	Ue	Icu	
		36 kA	50 kA
	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				
Thermal (Ir)			Magnetic (Ii)	
In (A)	0.8 x In	1 x In	Min.	Max.
16	13	16	400	
20	16	20		
25	20	25		
32	26	32		
40	32	40		
50	40	50	500	
63	51	63	630	
80	64	80	800	
100	80	100	1000	
125	100	125	1250	

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 BTcino bar kits), the choice of the distance to keep is to be calibrated by the installer.

3. TECHNICAL CHARACTERISTICS (continued)

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)	16	20	25	32	40	50	63	80	100	125
Lugs	3.47	4.82	7.54	2.98	4.42	6.90	6.61	6.40	10.00	10.63
Cage terminals	3.49	4.85	7.57	3.04	4.51	7.04	6.84	6.77	10.58	11.53
High capacity cage terminals	3.49	4.85	7.58	3.05	4.52	7.07	6.88	6.84	10.68	11.69
Spreaders	3.50	4.86	7.60	3.08	4.58	7.15	7.01	7.04	11.00	12.19
Rear terminals	3.56	4.96	7.76	3.34	4.98	7.78	8.00	8.64	13.50	16.09
Plug-in version	3.60	5.02	7.85	3.49	5.22	8.15	8.59	9.60	15.00	18.44

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)	125
Lugs	7.81
Cage terminals	9.11
High capacity cage terminals	9.24
Spreaders	9.38
Rear terminals	13.28
Plug-in version	16.21

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
16	20	20	19	19	18	17	17	16	16	15	14
20	25	24	24	23	23	21	21	20	20	18	17
25	31	30	30	29	28	27	26	25	25	23	22
32	40	39	38	37	36	35	33	32	32	29	28
40	50	49	48	47	45	43	42	40	40	37	35
50	62	61	59	58	56	54	52	50	50	45	43
63	79	77	75	74	71	68	65	63	63	57	54
80	100	97	95	93	90	86	83	80	80	73	69
100	125	121	119	117	112	108	104	100	100	91	86
125	157	151	148	146	140	135	130	125	125	114	108

For derating temperature with other configurations, see table below.

Megatiker M3 125 thermal magnetic circuit breakers with earth leakage module

Cat.Nos:
T7304F16D/20D/25D/32D/40D/50D/63D/80D/100D/125 D
T7304N16D/20D/25D/32D/40D/50D/63D/80D/100D/125 D
T7304S125D

Megatiker MS3 125 trip-free switches with earth leakage module

4. INSTALLATION RULES (continued)

Ambient temperature	30 °C		40 °C		50 °C		60 °C		70 °C	
	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/rigid cable	128	1.02	125	1	125	1	113	0.90	106	0.85
Lugs, flexible/rigid cable	128	1.02	125	1	125	1	113	0.90	106	0.85
Spreaders, flexible/rigid cable	128	1.02	125	1	125	1	113	0.90	106	0.85

For further technical information, please contact BTCino 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 Megatiker M3 125 with RCD circuit breakers, according to IEC/EN 60947-2 Annex B.

Pollution degree: for Megatiker M3 125 circuit breakers, degree 3, according to IEC/EN 60947-2.

Altitude

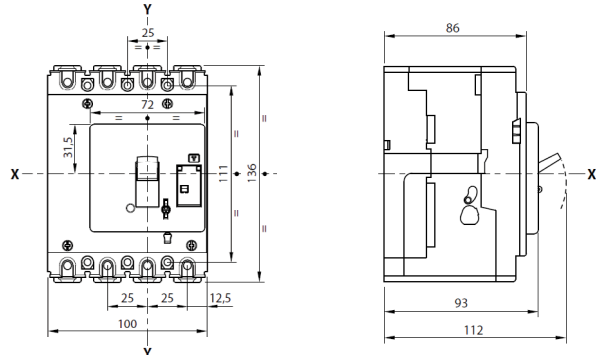
Altitude derating for Megatiker M3 and Megatiker MS3

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

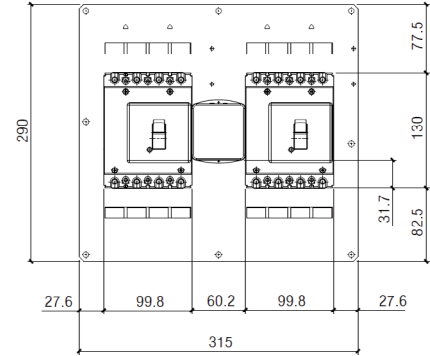
5. DIMENSIONS AND WEIGHT

■ 5.1 Dimensions (mm)
4P (W x H x D): 100 x 135 x 86

Device without accessories

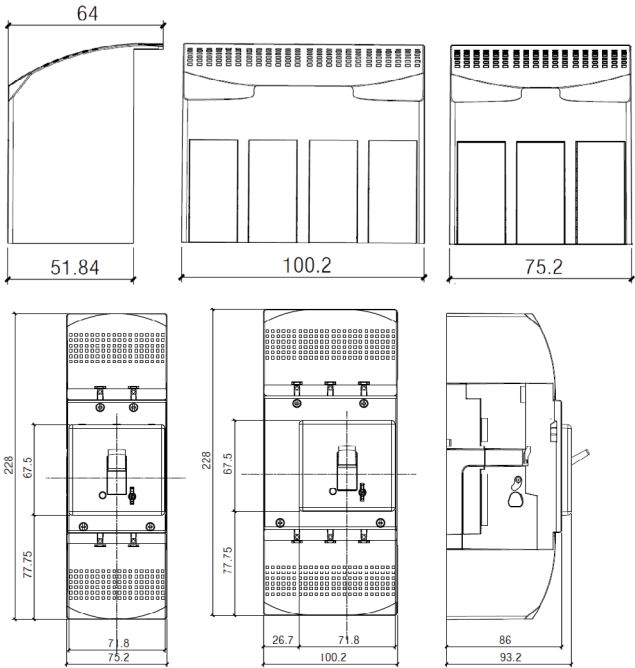


With interlock



For rear plate interlock dimension, see relative instruction sheet.

With sealable terminal shield



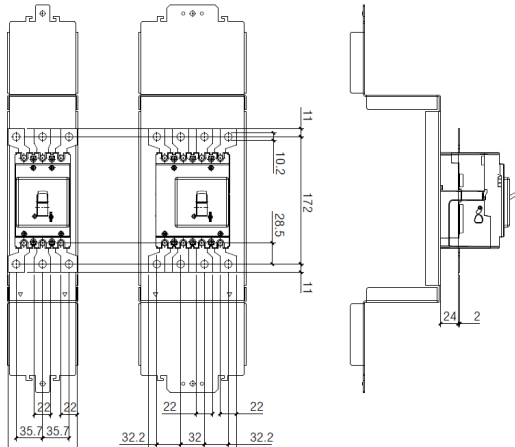
Megatiker M3 125 thermal magnetic circuit breakers with earth leakage module

Megatiker MS3 125 trip-free switches with earth leakage module

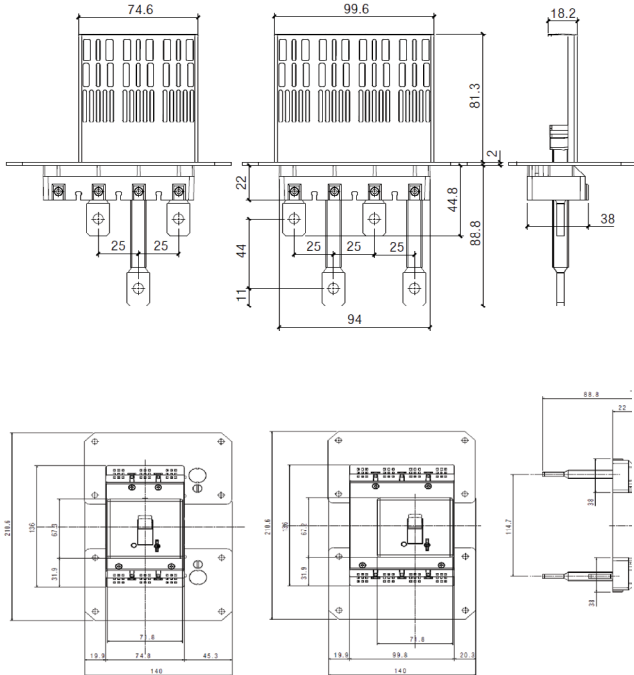
Cat.Nos:
T7304F16D/20D/25D/32D/40D/50D/63D/80D/100D/125 D
T7304N16D/20D/25D/32D/40D/50D/63D/80D/100D/125 D
T7304S125D

5. DIMENSIONS AND WEIGHT (continued)

With spreaders



With rear terminal



5.2 Weight

Weight (kg)	
Configuration	4P
Circuit breaker/switch disconnector	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 ensure 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 Megatiker M3 160/250 and Megatiker M1/M2):

Shunt releases (ST)

12 V~ / =

Cat.No M7S012

24 V~ / =

Cat.No M7S024

48 V~ / =

Cat.No M7S048

110 ÷ 130 V~

Cat.No M7S110

220 ÷ 277 V~

Cat.No M7S230

380 ÷ 480 V~

Cat.No M7S415

Maximum power = 400 VA / W

Undervoltage releases (UVR)

12 V~ / =

Cat.No M7U012

24 V~ / =

Cat.No M7U024

48 V~ / =

Cat.No M7U048

110 ÷ 130 V~ / =

Cat.No M7U110

220 ÷ 240 V~

Cat.No M7U230

277 V~

Cat.No M7U277

380 ÷ 415 V~

Cat.No M7U415

440 ÷ 480 V~

Cat.No M7U480

Maximum power = 4 VA

Circuit breaker opening time < 50 ms

Undervoltage releases can be used on Megatiker M3 125/160/250 starting from batch 19W15.

Time-lag undervoltage releases (800 ms)

- Release

Cat.No M7UEM

to be equipped with a time-lag module:

- 230 V~

Cat.No M7000MR/230

- 400 V~

Cat.No M7000MR/400

7.2 Auxiliary contacts

For the Megatiker M3 125 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

Megatiker M3 125 thermal magnetic circuit breakers with earth leakage module

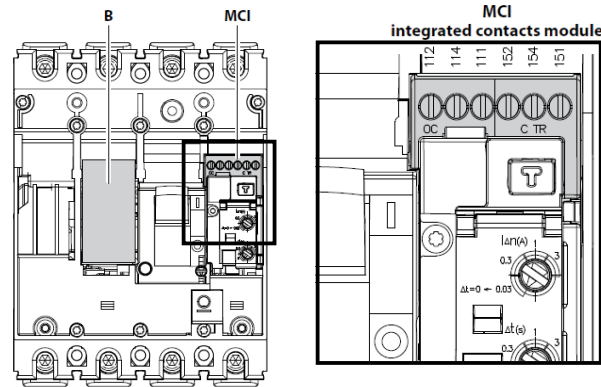
Megatiker MS3 125 trip-free switches with earth leakage module

Cat.Nos:
T7304F16D/20D/25D/32D/40D/50D/63D/80D/100D/125 D
T7304N16D/20D/25D/32D/40D/50D/63D/80D/100D/125 D
T7304S125D

7. EQUIPMENTS AND ACCESSORIES (continued)

7.2 Auxiliary contacts (continued)

Configurations:

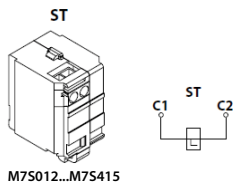
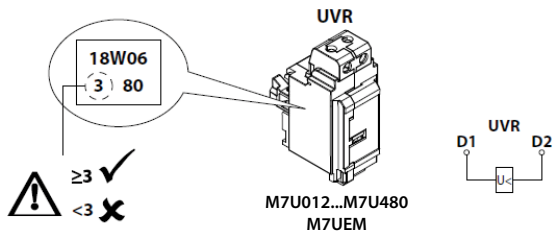


TRIP STATUS (CTR)	151 Common contact	154
	152 Normal close contact	152
	154 Normal open contact	151

OPEN/CLOSE STATUS (OC)	111 Common contact	114
	112 Normal close contact	112
	114 Normal open contact	111

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 Megatiker M3 125 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 M7X02
also compatible with Megatiker M3 160/250 and Megatiker M1/M2

Sealable terminal shields
- Set of 3 (for 4P) Cat.No M7C21

Insulated shields
- Set of 3 (for 4P) Cat.No M7F02
also compatible with Megatiker M3 250

7.5 Connection accessories

- Set of 4 standard terminals for Cat.No M7X51
1x95 mm² max (rigid) or 1x70 mm² max (flexible) Cu/Al cables
(for Al cables In max 80A)

- Set of 4 high capacity terminals for Cat.No M7X53
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 (mm ²)*			
	In (A)	Cu	Al
Standard cage terminals Cat.Nos M7X51	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
High capacity cage terminals Cat.Nos M7X53	100	35	-
	125	50	-
	125	50	70

* 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 M7X51	Min. cross-section (mm ²)		Max. cross-section (mm ²)	
	Flexible	Rigid	Flexible	Rigid
	2.5	4	70	95
High capacity cage terminals Cat.No M7X53	Min cross-section (mm ²)		Max cross-section (mm ²)	
	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.

Megatiker M3 125 thermal magnetic circuit breakers with earth leakage module

Megatiker MS3 125 trip-free switches with earth leakage module

Cat.Nos:

T7304F16D/20D/25D/32D/40D/50D/63D/80D/100D/125 D

T7304N16D/20D/25D/32D/40D/50D/63D/80D/100D/125 D

T7304S125D

7. EQUIPMENTS AND ACCESSORIES (continued)

■ 7.5 Connection accessories (continued)

Spreaders (incoming or outgoing)

- Set of 4 (for 4P)

Cat.No M7A51

Rear terminals (incoming or outgoing)

- Set of 4 (for 4P)

Cat.No M7A55

■ 7.6 Interlock mechanism

It is used for interlocking 2 Megatiker M3 125, either with another Megatiker M3 125 or with a Megatiker M3 160.

It is not possible to use other accessories than those recommended below for interlocking Megatiker M3 125 HP circuit breakers.

- Interlock mechanism – standard version
(for fixed version)

Cat.No M7I01

- Interlock mechanism – for electronic module
(for fixed version)

Cat.No M7I02

- Interlock plate

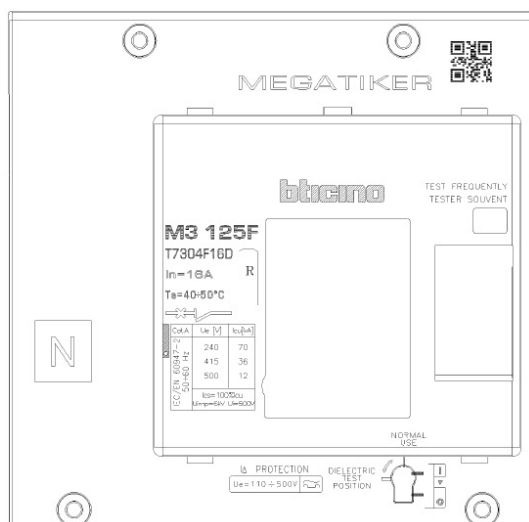
Cat.No M7I04

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):

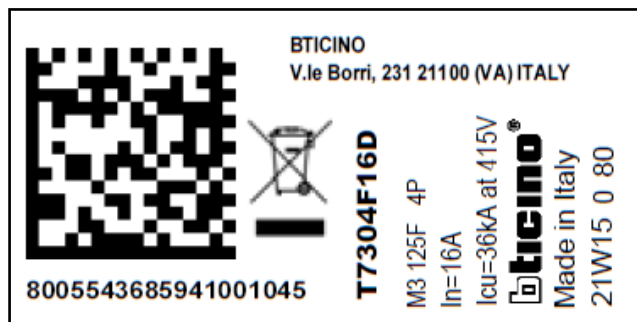
Product laser label on front

- Manufacturer responsible
- Denomination, type product, code
- Standard conformity
- Standard characteristics declared
- Coloured identification of Icu at 415 V



Product sticker label on side

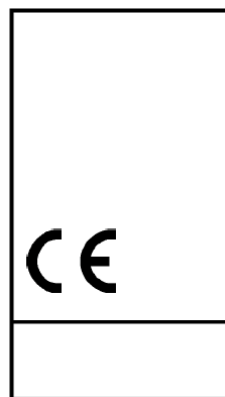
- Manufacturer responsible
- Denomination and type product
- Standard conformity
- Mark/Licence (if any)
- Directive requirements
- Bar code identification product
- Manufacturing Country



Mark sticker label on side

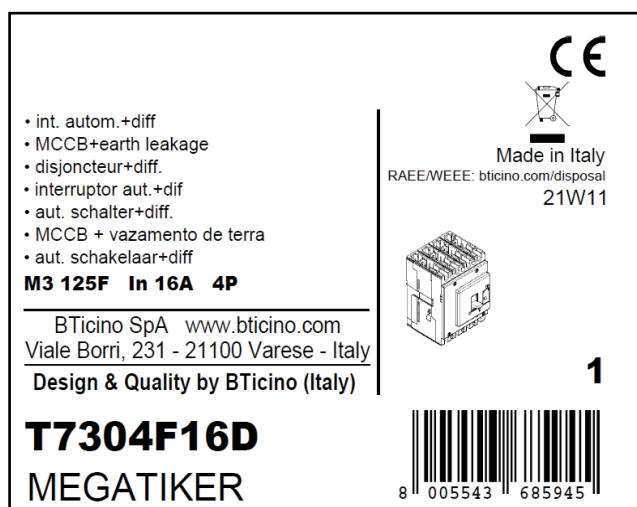
- Product code
- Mark/Licence (if any)
- Country deviation, if any

T7304F16D



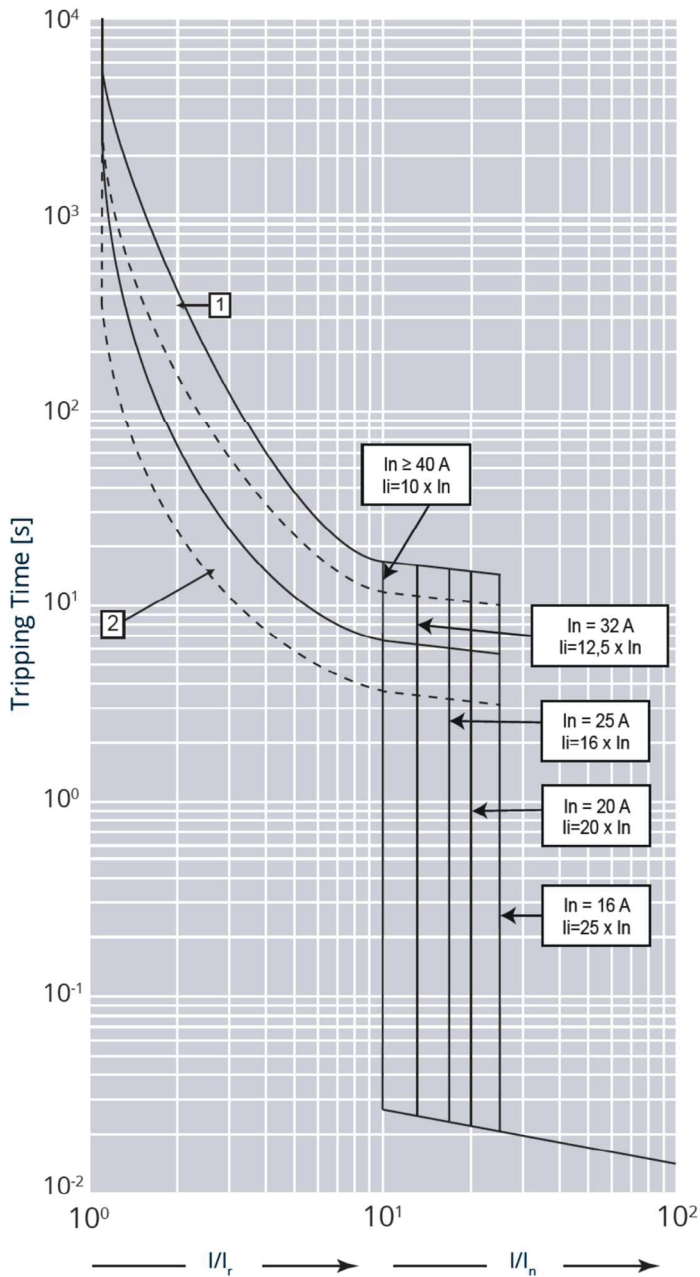
Packaging sticker label

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



9. CURVES

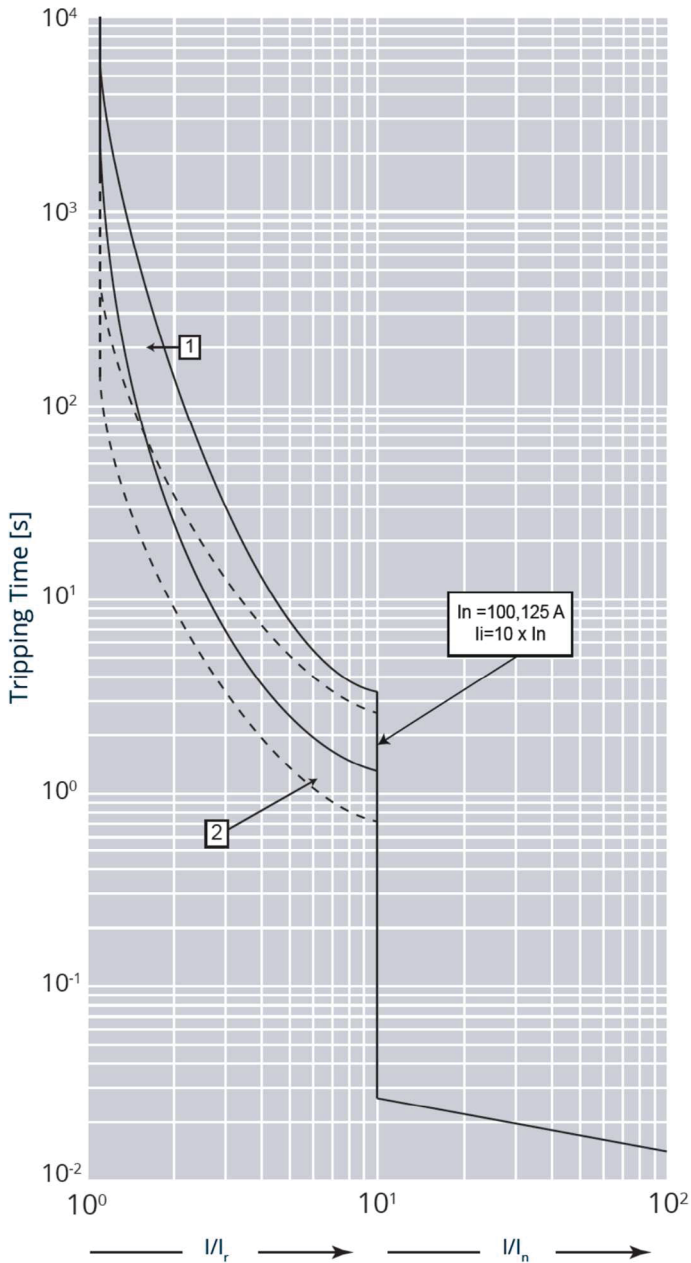
9.1 Thermal magnetic tripping curve (rated current $I_n \leq 80A$)



Icu = 36-50 kA	Imax = 125 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 Thermal magnetic tripping curve (rated current $I_n > 80A$)

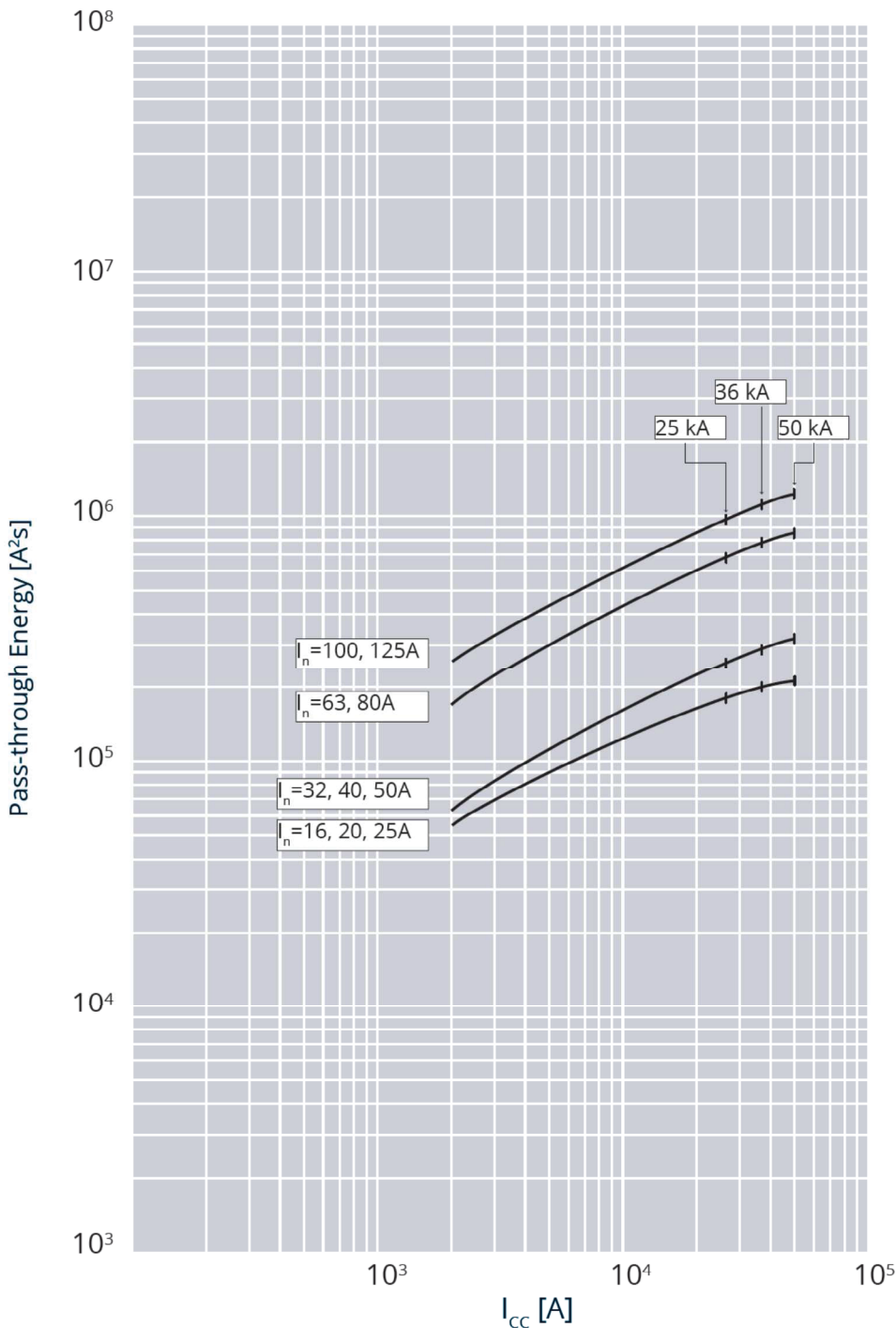


$I_{cu} = 36-50 \text{ kA}$	$I_{max} = 125 \text{ A}$	4P	$U_e = 415 \text{ V} \sim (\text{IEC/EN 60947-2})$
Value	Description		
t	Time		
I	Current		
I_n	Rated current		
I_r	Long time setting current		
Curve 1	Characteristic with cold start		
Curve 2	Characteristic with hot start		

9. CURVES (continued)

9.3 Pass-through specific energy characteristic curve

Update: 04/09/2019

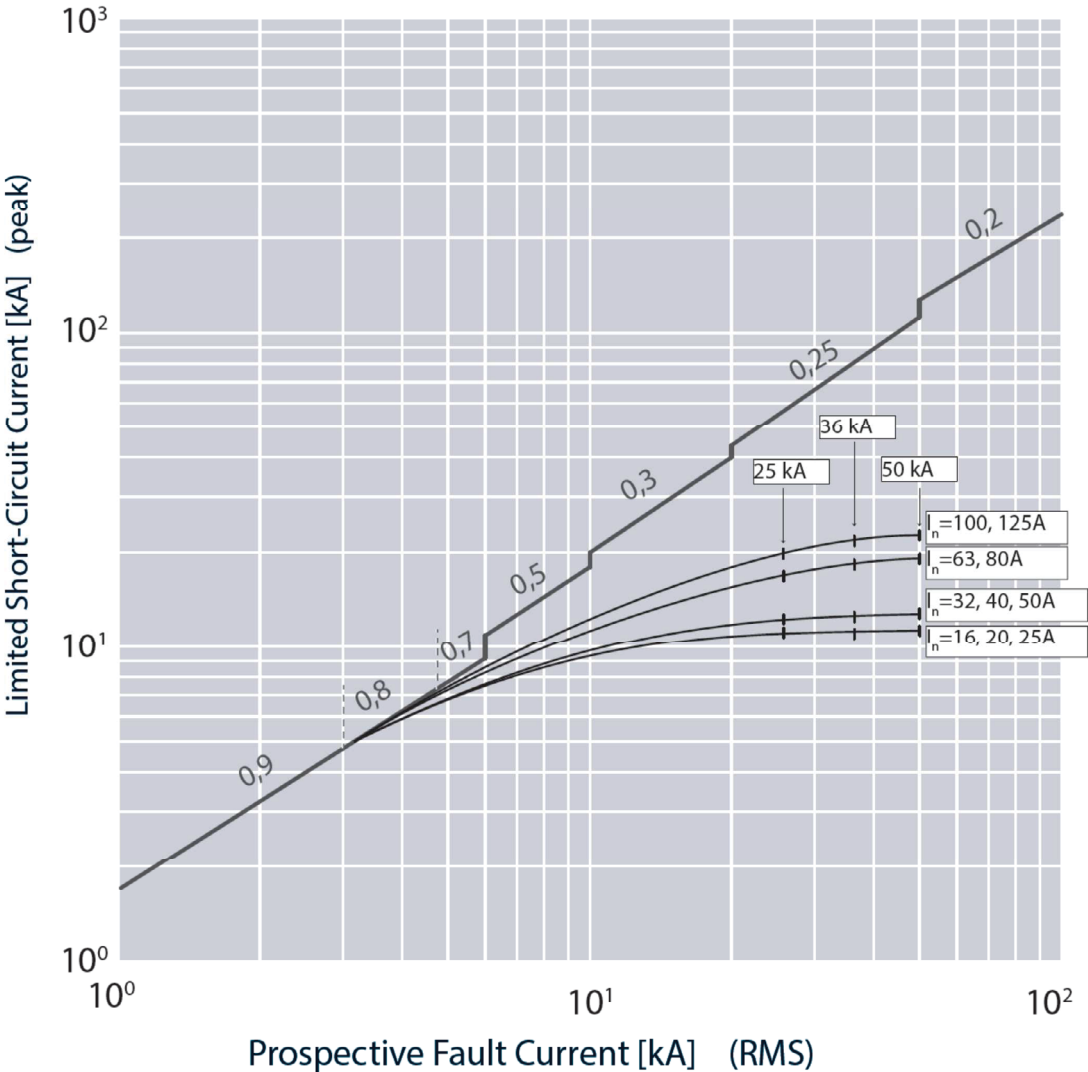


Icu = 36-50 kA	I _{max} = 125 A	4P	Ue = 415 V~ (IEC/EN 60947-2)
Value		Description	
I _{cc}		Short circuit current	
I²t (A²s)		Pass-through specific energy	

9. CURVES (continued)

9.4 Cut-off peak current characteristic curve (kA)

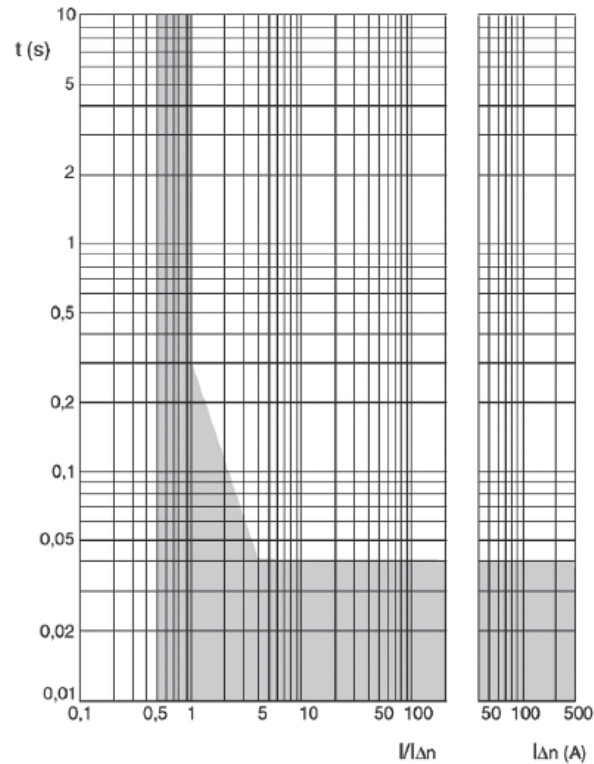
Update: 04/02/2020



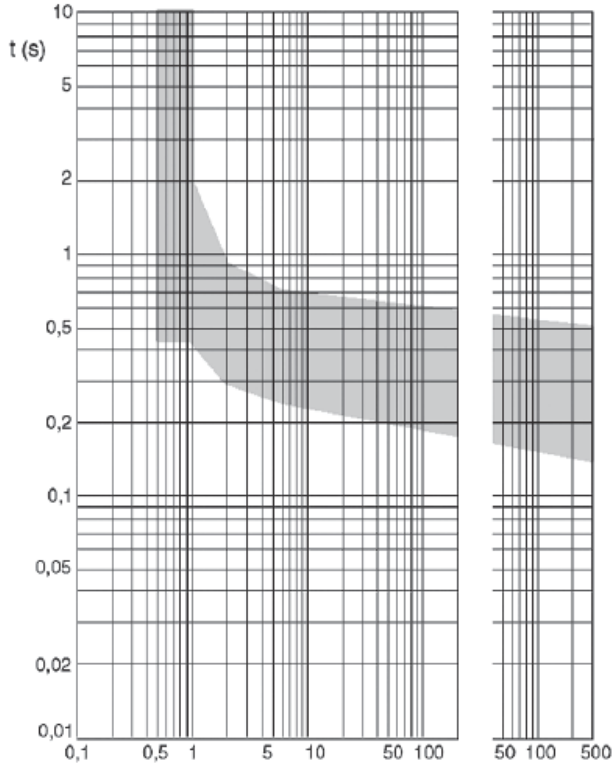
Icu = 36-50 kA Imax = 125 A 4P Ue = 415 V~ (IEC/EN 60947-2)	
Value	Description
Icc	Estimated short circuit symmetrical current (RMS value)
Ip	Maximum short circuit peak current

9. CURVES (continued)

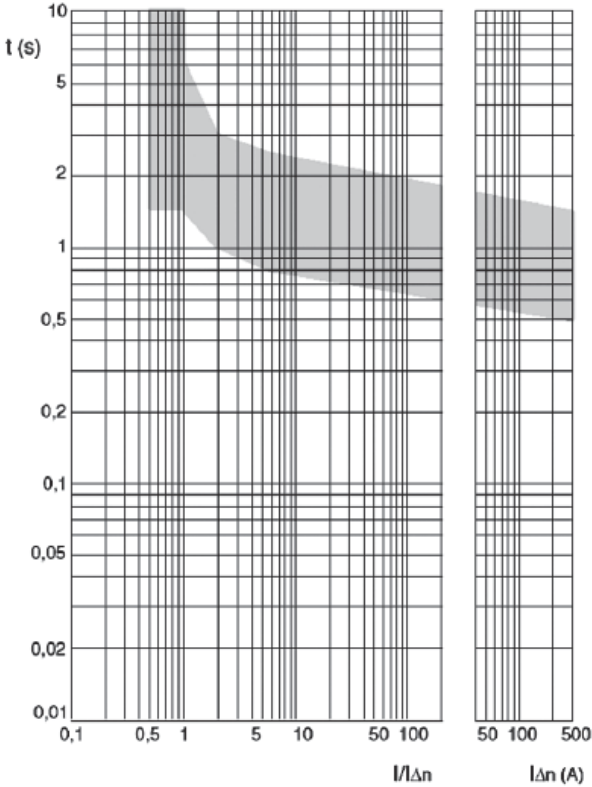
■ 9.5 Earth leakage curves, instantaneous



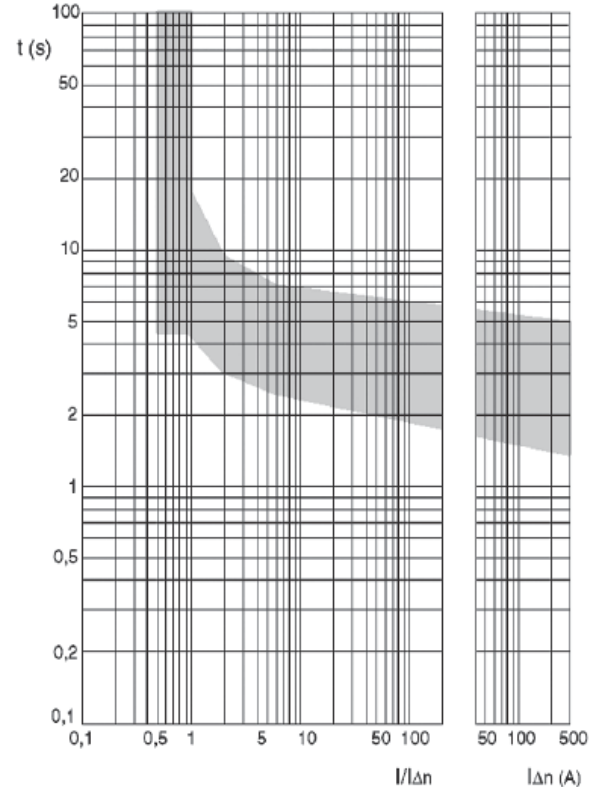
■ 9.6 Earth leakage curves, time delay = 0.3 s



■ 9.7 Earth leakage curves, time delay = 1 s



■ 9.8 Earth leakage curves, time delay = 3 s



10. STANDARDS AND REGULATIONS

Megatiker 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. Megatiker 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

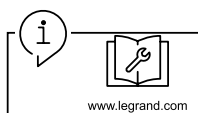
For specific information, please contact BTcino support.

11. OTHER INFORMATION

XLPro 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 and backup/BTcino Selectivity and 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.

XLPro 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 BTcino 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.