BTicino SpA
Viale Borri 231,21100 Varese - Italy

Megatiker M4 630 S10 electronic with configurable protection (display version)

Cat.Nos: see relative tables part.2

CONTENT **Page**

1. USE

Megatiker 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 M4 provides 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 competitive costs.

Megatiker M4 is a modern approach for electronic protection units that magnifies all flexibility allowed by technology.

2. RANGE

2.1 Megatiker M4 configurable protection (display version)

Icu	36 kA		50 kA	
In (A)	3P	4P	3P	4P
250	T743F250E10	T744F250E10	T743N250E10	T744N250E10
320	T743F320E10	T744F320E10	T743N320E10	T744N320E10
400	T743F400E10	T744F400E10	T743N400E10	T744N400E10
500	T743F500E10	T744F500E10	T743N500E10	T744N500E10
630	T743F630E10	T744F630E10	T743N630E10	T744N630E10

Icu	70 kA		100 kA	
In (A)	3P	4P	3P	4P
250	T743H250E10	T744H250E10	T743L250E10	T744L250E10
320	T743H320E10	T744H320E10	T743L320E10	T744L320E10
400	T743H400E10	T744H400E10	T743L400E10	T744L400E10
500	T743H500E10	T744H500E10	T743L500E10	T744L500E10
630	T743H630E10	T744H630E10	T743L630E10	T744L630E10

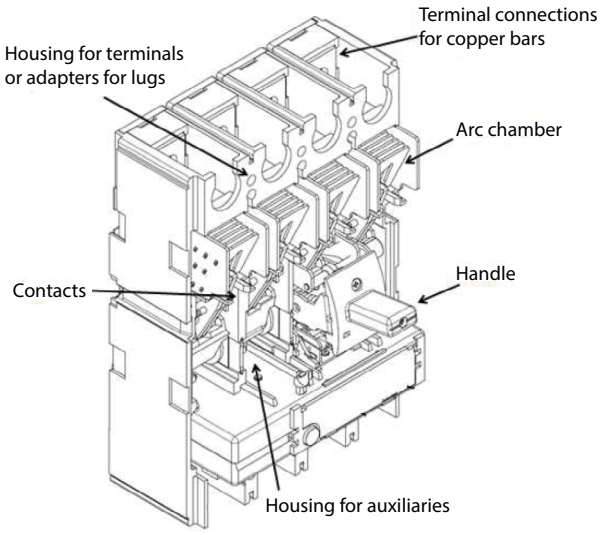
2.2 Megatiker M4 configurable protection (display version) with measurement function

Icu	36 kA		50 kA	
In (A)	3P	4P	3P	4P
250	T743F250M10	T744F250M10	T743N250M10	T744N250M10
320	T743F320M10	T744F320M10	T743N320M10	T744N320M10
400	T743F400M10	T744F400M10	T743N400M10	T744N400M10
500	T743F500M10	T744F500M10	T743N500M10	T744N500M10
630	T743F630M10	T744F630M10	T743N630M10	T744N630M10

Icu	70 kA		100 kA	
In (A)	3P	4P	3P	4P
250	T743H250M10	T744H250M10	T743L250M10	T744L250M10
320	T743H320M10	T744H320M10	T743L320M10	T744L320M10
400	T743H400M10	T744H400M10	T743L400M10	T744L400M10
500	T743H500M10	T744H500M10	T743L500M10	T744L500M10
630	T743H630M10	T744H630M10	T743L630M10	T744L630M10

2.3 Composition

Megatiker M4 are supplied with:
- fixing screws (4 for 3P and 4P)
- screws for connections (6 for 3P and 8 for 4P)
- phase insulators (2 for 3P and 3 for 4P)



3. TECHNICAL CHARACTERISTICS

■ 3.1 Electrical characteristics

Rated current	250 A, 320 A, 400 A, 500 A, 630 A
Poles	3P - 4 P
Pole pitch	42 mm
Rated insulation voltage at 50/60Hz (Ui)	800 V
Rated operating voltage (50/60Hz) (Ue)	690 V
Rated impulse withstand current (Uimp)	8 kV
Rated frequency	50 - 60 Hz
Operating temperature	-25 to +70 °C
Electrical endurance at In (cycles)	4000
Electrical endurance at 0.5 In (cycles)	8000
Utilization category	B (In ≤ 400A); A (In ≥ 500A)
Suitable for isolation	Yes
Reverse feed	Yes

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

Breaking capacity (3P and 4P)

	Breaking capacity (kA) & Ics			
Ue	Icu			
	36 kA	50 kA	70 kA	100 kA
220/240 V~	70	100	105	150
380/415 V~	36	50	70	100
440/460 V~	30	40	60	70
480/500 V~	25	30	40	50
480/550 V~	20	22	25	28
600 V~	20	22	25	28
690 V~	14	18	20	22
Ics (% Icu)	100	100	100	70
Rated making capacity under short circuit Icm				
Icm (kA) at 415V	76.5	105	154	220

IEC 60947-2

Rated current (In) at 40 °C / 50 °C

Phases limit trip current (A)				
	Thermal (Ir)		Magnetic (Ii)	
In (A)	0.2 x In	1 x In	1.5 x Ir	10 x Ir
250	50	250	375	2500
320	64	320	480	3200
400	80	400	600	4000
500	100	500	750	5000
630	126	630	945	6300

*For neutral adjustment, please consider the values ratios 100% on set currents.

■ 3.2 Mechanical characteristics

Mechanical endurance (cycles): 20000
Mechanical endurance with motor control (cycles): 10000

Load operations

	Force on handle (N)	
Rated current	**In ≤ 400 A**	**In ≥ 500 A**
Opening operation	80	130
Closing operation	180	210
Restore operation	145	200

■ 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 realisation 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
70	250
100	200

According to conductor type and bar system (except BTicino 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.

■ 3.4 Power losses per pole under In (W)

In (A)	250		320		400		500		630	
	Ph	N	Ph	N	Ph	N	Ph	N	Ph	N
Lugs	7.5	7.5	12.3	12.3	19.2	19.2	22.1	22.1	35.0	35.0
Cage terminals	7.5	7.5	12.3	12.3	19.2	19.2	22.1	22.1	35.0	35.0
High capacity cage terminals	8.2	8.2	13.5	13.5	21.1	21.1	25.1	25.1	39.8	39.8
Spreaders	9.0	9.0	14.7	14.7	22.9	22.9	26.7	26.7	42.3	42.3
Rear terminals	8.7	8.7	14.2	14.2	22.3	22.3	26.9	26.9	42.7	42.7
Plug-in version	15.0	15.0	24.7	24.7	38.5	38.5	52.3	52.3	83.0	83.0
Version with RCD	10.6	10.6	17.4	17.4	27.2	27.2	34.6	34.6	54.9	54.9

Note: power loss 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.

■ 3.5 Electonic protection characteristics

Type of protection	Electronic (with display)
Thermal type protection	Adjustable (Mem On/Off)
Ability to enable thermal protection	On/Off
Magnetic type protection	Adjustable
Ability to enable magnetic protection	On/Off
Fixed instantaneous override	Isf=5kA
Earth leakage trip type	A - External module
Earth leakage trip IΔn [A]	0.03-0.3-1-3/0.2 to 1 (steps 0.1 In)
Earth leakage trip tΔ [s]	0-0.3-1-3/0.08 to 1 (steps 40 ms)

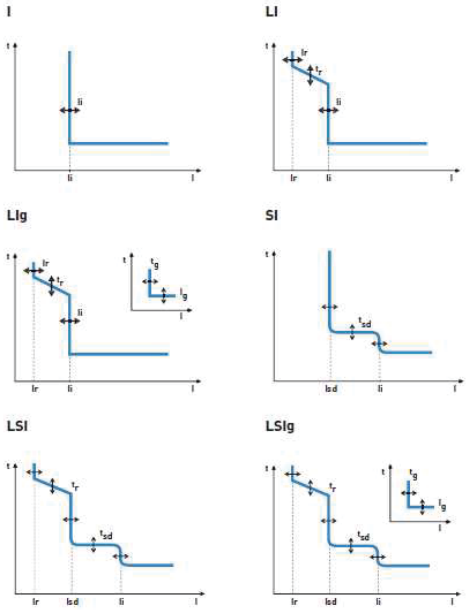
3. TECHNICAL CHARACTERISTICS *(continued)*

3.5 Electronic protection characteristics *(continued)*

Electronic Megatiker circuit breakers equipped with configurable protection units are fully configurable. They can be used to adapt settings as closely as possible to the requirements of your installation, either by enabling/ disabling the different protection devices (tripping time delays and currents), or by altering the different trip thresholds. The tripping curve is therefore fully customised to suit the real-life conditions of each project.

Thanks to the internal battery, the protection unit can be set even if the circuit breaker is de-energised. Parameters and fault histories can be consulted directly via the LCD screens.

A single circuit breaker can operate according to different tripping curves depending on the settings, as explained in the following images:



Ir Long time protection against overloads
tr Long time protection delay
Isd Short time protection against short circuits
tsd Short time protection delay
Ii Instantaneous protection against high-intensity short-circuits
Ig Earth fault current
tg Earth fault current protection delay
IN Neutral protection

See relative instruction sheet for details.

Settings on Megatiker electronic circuit breaker with configurable protection (display version)

There are 2 options for configuring setting: locally on the circuit breaker or on a PC, smartphone or tablet:

Settings	Locally on the device	By software or app
Ir	0.2 to 1 x In, in steps of 1 A	0.2 to 1 x In - OFF, in steps of 1 A
tr	3, 5, 10, 15, 20, 25, 30s. @6Ir	from 40 ms to 30s with steps of 40ms @6Ir
Isd	1.5 to 3 x Ir, in steps of 0.5 x Ir; 3 to 10 x Ir, in steps of Ir	1.5 x Ir to 10 x In-OFF, in steps of 1 A*
tsd (t=k, I^2t=k @12Ir)	40 to 480ms (7 steps)	40 to 480ms, in steps of 40ms
Ii (t=k)	OFF	2 to 15 x In - OFF, in steps of 1 A**
Ig	0.2 to 1 x In - OFF, in steps of 0.1 x In	0.2 to 1 x In - OFF, in steps of 0.1 x In
tg (t=k, I^2t=k @12Ir)	80 to 480ms (5 steps) and 1s	80 to 480ms (steps of 40 ms) and 1s
Neutral protection for 4P (%Ith of phase pole)	0FF-50-100-150-200 50% not possible if Ir < 040% In or Ir = OFF; 150% not possible if Ir > 66,7% In or Ir = OFF; 200% not possible if Ir > 50% In or Ir = OFF;	

*Isd = xIn if Ir = OFF (see instruction sheet for detail).
**Fixed delay 40 ms.

There are several ways to configure the various settings: directly on the protection units (using the +/- and >/< buttons on the front face), on a PC with Power Control Station software installed, or on a tablet or smartphone via the EnerUp + Project app.

It is possible to modify the energy and power direction (top/bottom).

Power Control Station software for PC and the EnerUp + Project app for smartphone/tablet can be used to exchange data with the Megatiker with configurable protection unit.

The software and app can be used to:
- monitor the status of the circuit breaker
- display information (firmware and device versions, alarms, measurements, parameters, fault log, settings)
- configure the different protection devices *
- update the protection unit firmware **
- generate reports based on the data stored and read by the protection unit *
- run diagnostic tests
- upload data linked to your profile and installation to the Cloud (with the EnerUp + Project app only)

*With the Power Control Station software only.
**For BTicino technical support via the Power Control Station software only.

Together with above protections, activated in case of electric faults, the trip unit also integrates self-protection for:
- Over temperature: in case the internal temperature of protection unit exceed 95 °C;
- Auto diagnostics: in case embedded watchdog circuit detects internal malfunctions, which could compromise the correct working of microcontroller.

With electronic Megatiker M4 with integrated measurement, it is very easy to monitor the parameters and consumption of the different circuits in the installation.
Electronic Megatiker circuit breakers equipped with configurable protection units with integrated measurement can be used to display the current, voltage, active and reactive power, frequency and power factor values, as well as the energy consumption.

Alarms can be programmed on some parameters, including minimum and maximum voltage, phase unbalance, and minimum and maximum frequency.

The measured values are displayed directly on the LCD screen on the front of the equipment.

The measurement data can also be displayed on a PC equipped with Power Control Station software or remotely on a smartphone or tablet via the EnerUp + Project app.

3. TECHNICAL CHARACTERISTICS *(continued)*

■ 3.5 Electronic protection characteristics *(continued)*

In the electronic unit protection, an energy metering central unit is integrated.
The possible parameters that can be measured are listed in the following table:

Measured	Unit	Description
I1	A	I1 realtime measured value
I2	A	I2 realtime measured value
I3	A	I3 realtime measured value
IN (4P)	A	IN realtime measured value
IG	A	IG realtime measured value
U12 U23 U31 (3P)	V	Phase to Phase Voltage
V1N V2N V3N (4P)	V	Phase voltage
Freq.	Hz	Frequency
PTot	kW	Active Power
QTot	kVar	Reactive Power
PF	-	Power Factor
Ep ↓	kWh	Incoming active energy
Ep ↑	kWh	Outgoing active energy
Eq ↓	kVar h	Incoming reactive energy
Eq↑	kVar h	Outgoing reactive energy
THDU12 / THDU23 / THDU31 (3P)	%	Chained Voltage THD
THDV1N / THDV2N / THDV3N (4P)	%	Voltage THD
THDI1 / THDI2 / THDI3 / THDIN	%	Current THD
MEM	A - °C	Cause of the last intervention and its value

Function performance class according to IEC 61557-12

Function symbol	Performance class	Measurement range					Other complementary characteristics				
		Megatiker M4					Imax PMD				
In	-	250A	320A	400A	500A	630A	250A	320A	400A	500A	630A
P	2	0.3kW	0.3kW	0.3kW	0.3kW	0.3kW	300A	380A	480A	600A	750A
		360kW	460kW	580kW	720kW	900kW	Ib=250A, Un=400V, fn=50Hz				
QV	2	0.6kVar	0.6kVar	0.6kVar	0.6kVar	0.6kVar	300A	380A	480A	600A	750A
		360kVar	460kVar	580kVar	720kVar	900kVar	Ib=250A, Un=400V, fn=50Hz				
Ea	2	0…999 GWh					300A	380A	480A	600A	750A
							Ib=250A, Un=400V, fn=50Hz				
ErV	2	0…999 GWh					300A	380A	480A	600A	750A
							Ib=250A, Un=400V, fn=50Hz				
f	0.02	50…60 Hz					-				
I	2	12.5A	12.5A	12.5A	12.5A	12.5A	300A	380A	480A	600A	750A
		300A	380A	480A	600A	750A	Ib=250A, Un=400V, fn=50Hz				
In	2	12.5A	12.5A	12.5A	12.5A	12.5A	300A	380A	480A	600A	750A
		300A	380A	480A	600A	750A	Ib=250A, Un=400V, fn=50Hz				
U (3P), V (4P)	0.05	88…690V					-				
P_{FA}	0.05	-					300A	380A	480A	600A	750A
							Ib=250A, Un=400V, fn=50Hz				
THDu (3P) THDv (4P)	5	110…690V					-				
THD_i	5	250A	250A	250A	250A	250A	-				
		250A	320A	400A	500A	630A					

3.TECHNICAL CHARACTERISTICS *(continued)*

3.5 Electronic protection characteristics *(continued)*

General remarks on protection unit

The configurable protection units are normally supplied by the internal current transformers (CTs).

When the current flowing through the circuit breaker is greater than 12% of the maximum power (20% of In for single phase load), the internal current supply ensures all operation of the protection unit, included LED status, display indications and diagnostic functions (e.g. trip test).

Display backlight and integrated measure (if available) are instead guaranteed starting from 20% of the maximum power (35% of In for single phase load), in absence of any other supply. In any case the external power supply is strongly recommended for the correct working of measurement, as well as RS485 communication.

To ensure the same performance when the load is less than 12% of the maximum power (20% of In for single phase load) to grant complete functions, one of the following optional power supplies can be used:

- external auxiliary power supplier or, alternatively, Modbus (Cat.No M7COM) /EMS (Cat.No M7MEMS) communication interface.

Device	Maximum power consumption [mA]
Interface EMS/Megatiker	50
ELE, ELE + RCD	125
ELE + PMD, ELE + PMD + RCD	150

ELE : Electronic trip unit
RCD : Residual Current Device
PMD : Power Metering Device

- power supply temporarily connected to frontal USB socket, connected to a 5V DC power bank, Dongle BLE or PC.

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)	**Up to 50**	**60**	**70**
250	250	250	250
320	320	320	320
400	400	360	340
500	500	500	500
630	630	567	536

For derating temperature with other configurations, see table below.

Derating temperature and configurations

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**
Megatiker M4 fixed										
Cage terminals, flexible cable	630	1	630	1	630	1	567	0.90	567	0.90
Lugs, flexible cable	630	1	630	1	630	1	567	0.90	536	0.85
Lugs, rigid cable	630	1	630	1	630	1	599	0.95	567	0.90
Spreaders, flexible cable	630	1	630	1	630	1	536	0.85	504	0.80
Rear flat staggered terminals, flexible cable	630	1	630	1	630	1	567	0.90	536	0.85
Megatiker M4 fixed + RCD										
Cage terminals, flexible cable + RCD	630	1	630	1	536	0.85	504	0.90	473	0.75
Lugs, flexible cable + RCD	599	0.95	599	0.95	536	0.85	504	0.80	473	0.75
Lugs, rigid cable + RCD	630	1	599	0.95	536	0.85	504	0.80	473	0.75
Staggered spreaders, flexible cable + RCD	630	1	630	1	536	0.85	504	0.80	473	0.75
Rear flat staggered terminals, flexible cable + RCD	630	1	630	1	536	0.85	504	0.80	473	0.75
Megatiker M4 draw-out										
Cage terminals, flexible cable	599	0.95	567	0.90	536	0.85	504	0.80	441	0.70
Cage terminals, rigid cable	599	0.95	567	0.90	536	0.85	504	0.80	441	0.70
Rear flat terminals, flexible cable	599	0.95	567	0.90	536	0.85	504	0.80	441	0.70
Rear flat terminals, rigid cable	599	0.95	567	0.90	536	0.85	504	0.80	441	0.70
Rear flat terminals, Cu bars, vertical	599	0.95	567	0.90	536	0.85	504	0.80	441	0.70
Megatiker M4 draw-out + RCD										
Cage terminals, flexible cable + RCD	504	0.80	441	0.70	410	0.65	378	0.60	347	0.50
Cage terminals, rigid cable + RCD	504	0.80	441	0.70	410	0.65	378	0.60	347	0.50
Rear flat terminals, flexible cable + RCD	504	0.80	441	0.70	410	0.65	378	0.60	347	0.50
Rear flat terminals, rigid cable	504	0.80	441	0.70	410	0.65	378	0.60	347	0.50
Rear flat terminals, Cu bars, vertical + RCD	504	0.80	441	0.70	410	0.65	378	0.60	347	0.50

For further technical information, please contact BTicino 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 M4 circuit breakers, according to IEC/EN 60947-2 Annex F

Pollution degree: degree 3 for Megatiker M4 circuit breakers, according to IEC/EN 60947-2.

Altitude derating for Megatiker M4

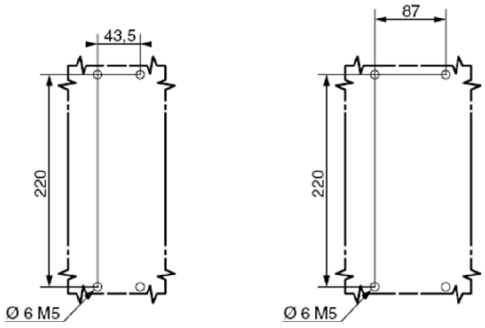
Altitude (m)	**2000**	**3000**	**4000**	**5000**
Ue (V)	690	590	520	460
In (A) (Ta = 40 °C/50 °C)	1 x In	0.98 x In	0.93 x In	0.90 x In

5. DIMENSIONS AND WEIGHTS

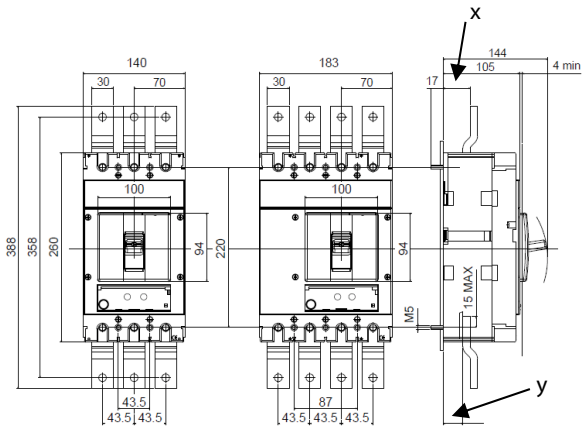
5.1 Dimensions (mm)

3P (W x H x D): 140 x 260 x 105
4P (W x H x D): 183 x 260 x 105

Implantation

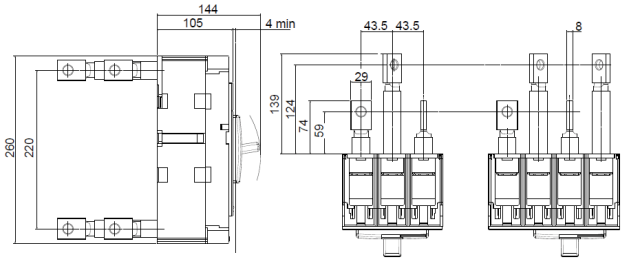


Fixed version
- with front terminals

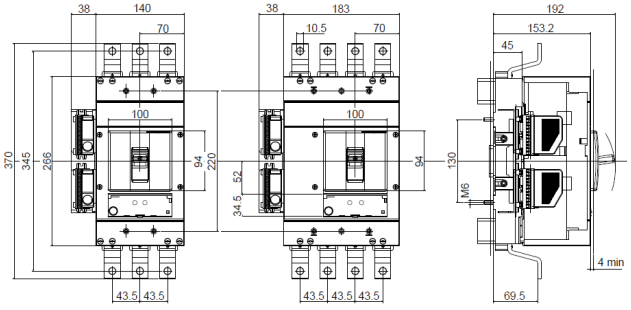


	In < 400	In ≥ 500 A
x	37	39
y	27	29

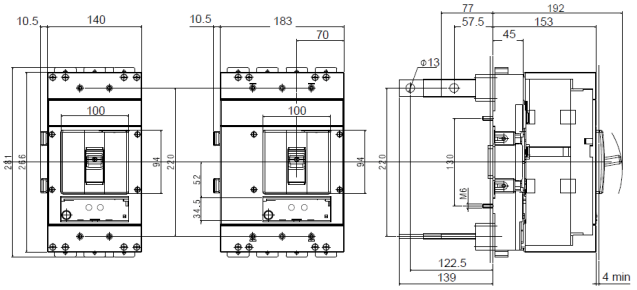
- with flat rear terminal



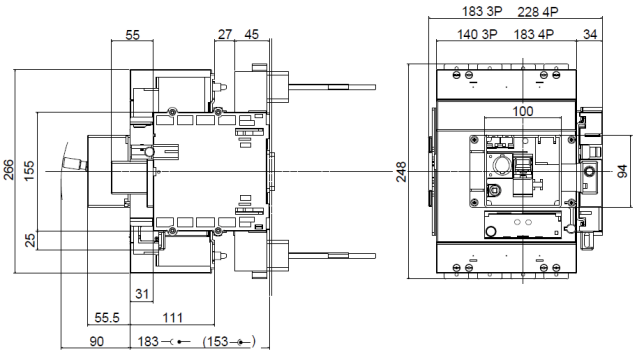
Plug-in version
- with cage terminals



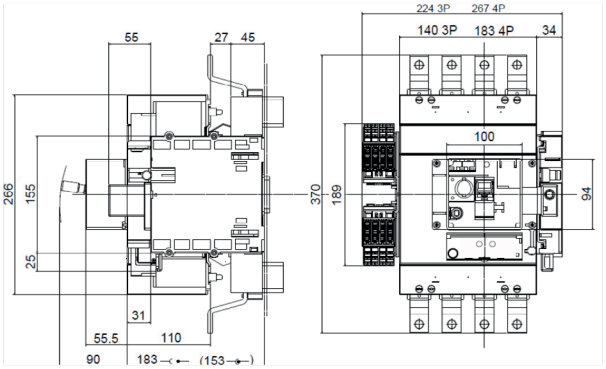
- without front terminals



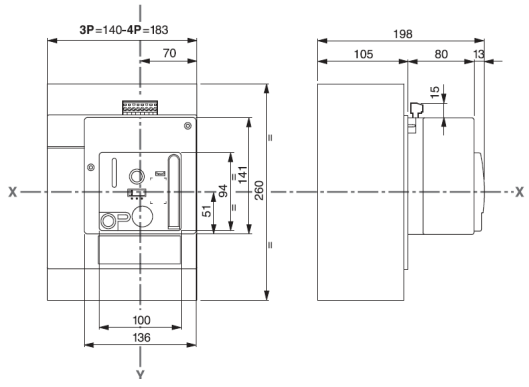
Draw-out version
- flat rear terminals



- with sliding auxiliary contacts



Motor operator
- for synchronized operations (energy storage type)

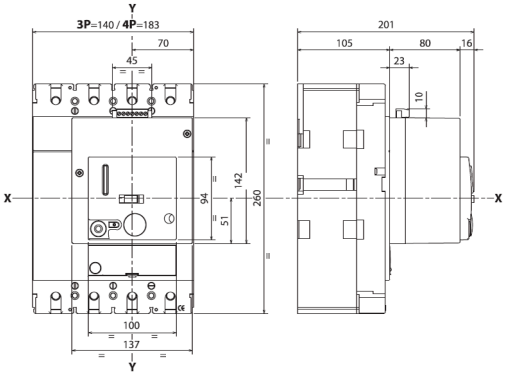


5.DIMENSIONS AND WEIGHTS *(continued)*

5.1 Dimensions (mm) *(continued)*

Motor operator *(continued)*

- for general purpose operations (direct action type)



5.2 Weights

	3P		4P	
In	**≤ 400 A**	**≥ 500 A**	**≤ 400 A**	**≥ 500 A**
Circuit breaker (fixed version)	5.80	6.20	7.30	7.80
Plug-in (with front terminals) *	3.35	3.35	4.29	4.29
Plug-in (with rear terminals) *	3.55	3.55	4.79	4.79
Draw-out *	2.30	2.30	5.50	5.50

* to add to fixed version.

6. CONNECTIONS

To unsure the circuit breaker's connection, it is possible to use:
- busbars;
- lugs;
- spreaders;
- cage terminals;

For detailed mounting procedures, see instruction sheet.

7. EQUIPMENTS AND ACCESSORIES

7.1 Earth leakage modules

There are two types of leakage modules:

Standard

In < = 400 A	4P	Cat.No T7082/400
In = 500 A - 630 A	4P	Cat.No T7092/630

LED version

In < = 400 A	4P	Cat.No T7081/400
In = 500 A - 630 A	4P	Cat.No T7091/630

	Standard	**With LED**
Type	A - S	A - S
Uninterrupted nominal current Iu (A)	Up to 630	Up to 630
Rated isolated voltage Ui (V∿)	500	500
Rated operating voltage Ue (V∿) (50-60 Hz)	500	500
Operating voltage (V∿) (50-60 Hz)	230 to 500	110 to 500
Nominal frequency (Hz)	50 - 60	50 - 60
Operating temperature (°C)	- 25 to 70	- 25 to 70
Trip	Electronic	Electronic
Earth leakage time adjustments (s)	0 - 0.3 - 1 - 3	0 - 0.3 - 1 - 3
Earth leakage breaking capacity Idm (% Icu)	60	60
Earth leakage protection adjustments IΔn (A)	0.03 to 3	0.03 to 3
Side-by-side mounting	No	No
Underneath mounting	Yes	Yes
50 % Earth fault detection contact Idn	No	Yes
Clip on rail DIN 35	No	No
Dimensions (W x H x D) (mm) for 4P	183 x 152 x 105	183 x 152 x 106

7.2 Releases (for Megatiker M4 and M5)

There are 3 types of releases (suitable for Megatiker M4 and M5):

Shunt releases with voltage

24 V∿/⎓	Cat.No M7C024
48 V∿/⎓	Cat.No M7C048
110 to 130 V∿/⎓	Cat.No M7C110
220 to 250 V∿/⎓	Cat.No M7C230
380 to 440 V∿/⎓	Cat.No M7C400

Rated voltage (Uc)	Both ∿/⎓: 24 V/48 V/110 to 130 V/ 220 to 250 V/380 to 440 V
Voltage range (% Uc)	70 to 110
Intervention time (ms)	≤ 50
Power consumption (W/VA)	300
Minimum opening time (ms)	50
Insulation voltage (kV)	2,5

Undervoltage releases with voltage

24 V⎓	Cat.No M7T024C
24 V∿	Cat.No M7T024
48 V⎓	Cat.No M7T048C
110 to 125 V∿	Cat.No M7T110
220 to 240 V∿	Cat.No M7T230
380 to 415 V∿	Cat.No M7T400

7. EQUIPMENTS AND ACCESSORIES *(continued)*

■ 7.3 Releases (for Megatiker M4 and M5) *(continued)*

Undervoltage releases with voltage *(continued)*

Rated voltage (Uc)	Both ∿/⎓: 24 V/48 V/110 to 125 V/ 220 to 240 V/380 to 415 V
Voltage range (% Uc)	85 to 110
Minimum opening time (ms)	50
Power consumption (W/VA)	1.6/5

Time-lag undervoltage releases (800 ms)

Time-lag modules with voltage:

24 V∿/⎓ Cat.No M7000E/024
230 V∿ Cat.No M7000MR/230
400 V∿ Cat.No M7000MR/400

Universal Release Cat.No M7TMEV
(to be equipped with a time-lag module Cat.No M7000MR/230/400)

■ 7.3 Auxiliary contacts (for Megatiker M4 and M5)

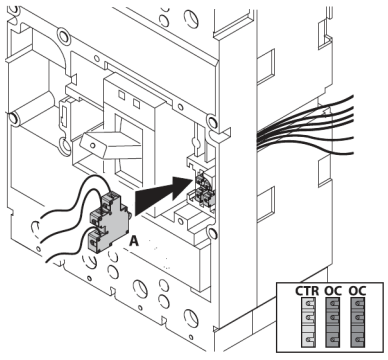
Changeover switch 3 A - 250 V~ Cat.No M7X01

To show the state of the contacts or opening of the Megatiker on a fault:
- an auxiliary contact (standard): OC
- a fault signal: CTR

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

Configurations

M4/MS4→ 2 auxiliary contacts + 1 fault signal + 1 release



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

■ 7.4 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 Cat.No M7K01
- 1 lock + 1 flat key with fixed mapping (EL43525) Cat.No M7K02
- 1 lock + 1 flat key with fixed mapping (EL43363) Cat.No M7K03
- 1 lock + 1 star key with random mapping Cat.No M7K04

■ 7.5 Rotary handles

There are four types of suited rotary handles:

Direct on Megatiker (with auxiliary option)
- Standard (black) Cat.No M7447
- For emergency use (red/yellow) adapting on standard handle Cat.No M7R14

Vari-depth handle IP55 (with auxiliary option)
- Standard (black) Cat.No T7449
- For emergency use (red/yellow) adapting on standard handle Cat.No T7449E

They can be locked with:

Locking accessories (for vary depth handle with auxiliary option)

Key lock accessory for vari-depth rotary handle Cat. No M7R17

Cat. No M7R17 must be used with universal keylocks to get the complete locking kit for rotary handle.

Locking accessories (for direct handle)

Key barrel and flat key Cat.No M7163

■ 7.6 Motor operators (front operated)

There are two types of motor operators:

For general purpose operations (direct action type)
- 230 V∿ Cat.No M74D230

For synchronized operations (energy storage type)
- 24 V∿/⎓ Cat.No M7475P/024
- 48 V∿/⎓ Cat.No M7475P/048
- 110 V∿ Cat.No M7475P/110
- 230 V∿ Cat.No M7475P/230

7. EQUIPMENTS AND ACCESSORIES *(continued)*

■ 7.6 Motor operators (front operated) *(continued)*

Type	Direct drive		Energy storage	
Rated operating voltage (Uc) ~	230 V∿ 50/60 Hz		24 - 48 - 230	
Rated operating voltage (Uc) ⎓	230 V∿ 50/60 Hz		24 - 48 - 230	
Voltage range (% Uc)	85 to 110		85 to 110	
	Opening	Closing	Opening	Closing
Pick-up consumption (W/VA)	240	200	300	300
Hold consumption (W/A)	80	120	300	300
Operating time/ Complete electric operation (ms)	450	550	2000	100
Operating time/ Main contacts change position (ms)	270	550	-	-
Mechanical endurance (O-C cycles) @In = 630 A	10000		-	
Electrical endurance (O-C cycles) @In = 630 A	4000		4000	
Cycles/Minutes	Up to 8 automatic open/close operations in a row		10	4

Locking accessories

Key lock accessory for motor operator — Cat.No M7M406

Cat.No M7M406 must be used with universal keylocks to get the complete locking kit for motor operator.

■ 7.7 Mechanical accessories

There are many types of mechanical accessories:

Padlock (for locking in "OPEN" position) — Cat.No M7045
Insulated shields (phase insulators) — Cat.No M7295

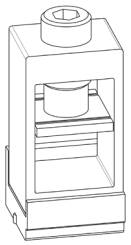
Sealable terminal shields:
Set of 2 (for 3P) — Cat.No M7475
Set of 3 (for 4P) — Cat.No M7476

Terminal covers to guarantee IP 20:
Set of 2 (for 3P) — Cat.No M7C11
Set of 3 (for 4P) — Cat.No M7C12

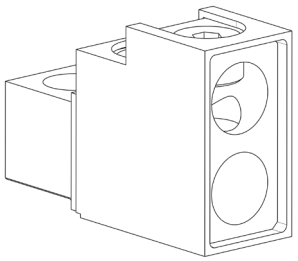
■ 7.8 Connection accessories

Cage terminals

- Set of 4 terminals for cables 300 mm² max (rigid) or 240 mm² max (flexible) Cu/Al — Cat.No M7400



- Set of 4 high-capacity terminals for cables 2 x 240 mm² max (rigid) or 2 x 185 mm² max (flexible) Cu/Al — Cat.No M7400/2



Type of cage terminal	Cable standard suggested cross section (mm²) *		
	In (A)	Cu	Al
Standard Cat. No M7400	250	120	185
	320	185	-
	400	240	-
	500	-	-
	630	-	-
High capacity Cat. No M7400/2	250	120	185
	320	185	2 x 120
	400	240	2 x 150
	500	2 x 150	2 x 240
	630	2 x 185	-

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

Type of cage terminals	Dimensions limits of cable for cage terminals	
	Min/Max cross-section (mm²)	
	Flexible	Rigid
Standard Cat. No M7400	6 mm²/240 mm²	4 mm²/300 mm²
High capacity Cat. No M7400/2	70 mm²/185 mm²	35 mm²/240 mm²

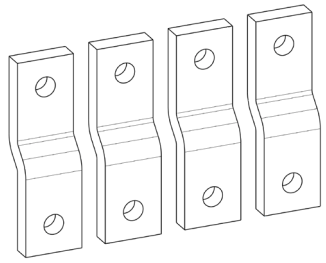
Note : when the cross-section exceeds the maximum value specified for the material in the table, the allowable current is limited to the indicated value.

7. EQUIPMENTS AND ACCESSORIES *(continued)*

7.8 Connection accessories *(continued)*

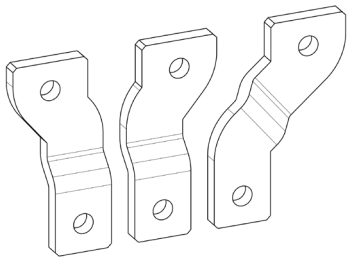
Extended front terminals

- Set of 4 Cat.No M7430

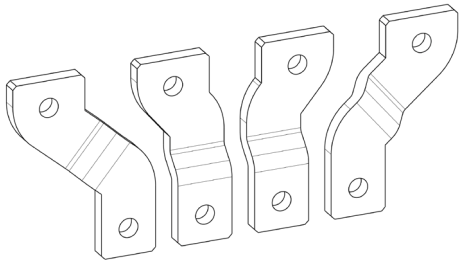


Spreaders (incoming or outgoing)

- Set of 2 (for 3P) Cat.No M7430/3



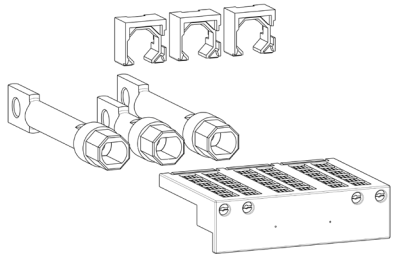
- Set of 3 (for 4P) Cat.No M7430/4



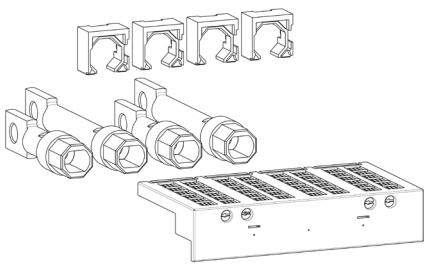
Rear terminals (incoming or outgoing)

They are used to convert the fixed version with front terminals into the fixed version with rear terminals:

- For 3P Cat.No M7450/P



- For 4P Cat.No M7451/P



7.9 Plug-in version

A plug-in is a Megatiker fitted with special terminals and mounted on a plug-in base.

Special terminals for plug-in/draw-out base

They are suited for incoming and outcoming terminals.

- Set of 6 terminals (3P) Cat.No M7B11
- Set of 8 terminals (4P) Cat.No M7B12

Bases

Bases accept Megatiker M4-MS4 fitted with special terminals.

- Front terminal mounting base for 3P Cat.No M7B13
- Front terminal mounting base for 4P Cat.No M7B14
- Flat rear terminal mounting base for 3P Cat.No M7B15
- Flat rear terminal mounting base for 4P Cat.No M7B16

Bases for breakers with mounted earth leakage module

- Front terminal mounting base for 4P Cat.No M7B17
- Flat rear terminal mounting base for 4P Cat.No M7B18

Accessories

- Set of 2 extractor handle Cat.No M7B19
- Set of connectors (24-pin) Cat.No M7B20

7.10 Draw-out version

A Megatiker draw-out version is a plug-in fitted with a "Debro-lift" mechanism which can be used to withdraw the Megatiker while keeping it on its base.

"Debro-lift" mechanism

Supplied with a rigid slide and handle for drawing-out:

- For base only (3P) Cat.No M7B22
- For base only (4P) Cat.No M7B23
- For base with earth leakage module (4P) Cat.No M7B24

Keylock for "Debro-lift" mechanism

One key for Megatiker only (enable locking in draw-out position).

Key lock accessory for draw-out
(frontal masks for motor operator or rotary handle) Cat.No M7B38
Key lock accessory for draw-out Cat.No M7B40

Cat.No M7B38 and M7B40 must be used with universal keylocks to get the complete locking kit for draw-out version.

Accessories for "Debro-lift" mechanism

- Signalling contact (plugged-in/draw-out) Cat.No MT7910N
- Handle for drawing-out Cat.No MT7412

Auxiliary contacts

Automatic auxiliary contacts for draw-out version (up to 2 contacts by Megatiker) Cat.No M7B21

Plate for transfer switches (factory assembled)

A transfer switch plate is composed of one plate with interlock for 2 devices.

- Plate for breaker or trip-free switch fixed version Cat.No M7197N

7.11 Specific accessories for electronic version

Auxiliary power supply

- For supplying electronic units Cat.No M7ALIM

Is used to supply Megatiker electronic circuit breakers with configurable protection with/without earth leakage module and with/without energy metering central unit.

It is mandatory in case of electronic breakers with integrated measure and not interconnected in a supervision system (MODBUS network not requested) to correctly manage the measure functions.

Technical characteristics:

- Input voltage: 24V~/⎓ (+/- 10%)
- Enclosure: 2 DIN modules
- Output: up to 250 mA (to supply many circuit breakers according to the following table):

7. EQUIPMENTS AND ACCESSORIES *(continued)*

■ 7.11 Specific accessories for electronic version *(continued)*

Auxiliary power supply *(continued)*

Cat.No M7ALIM Iout max. = 250 mA	Electronic/Electronic with configurable protection + RCD	70 mA
	Electronic/Electronic with configurable protection + RCD with power metering	83 mA

According to single absorptions, it can be possible to connect more than one breaker.

MODBUS communication

- RS485 MODBUS communication interface Cat.No M7COM

Is used for sharing on MODBUS network all information managed by Megatiker electronic circuit breakers Lsi/Lsig with/without earth leakage module and with/without energy metering central unit.

Technical characteristics:
- USB local PC connection
- Input voltage: 24 V~/⎓ (+/- 10%)
- Enclosure: 2 DIN modules
- MODBUS address configuration/transmission mode/transmission speed by physic configurators
- Output relay (220 V–0,2 A): to signal tripped position
- Consumption: 90 mA

It is possible to connect only one breaker to the interface.

In case of use of MODBUS interface M7COM, the external power supply module M7ALIM is not necessary because the external power is already provided by the MODBUS module.

Megatiker electronic interface - EMS CX³ Cat.No M7MEMS

It is used for connecting electronic Megatiker with configurable protection to an EMS communication
network. All the information managed by the circuit breaker's electronic card will be shared on the EMS network.

Dimension: 1 module
Power supply: with EMS CX3 power supply module Cat.No F80BA.

The address can be modified and set locally by DIP switches or remotely with the EMS configurator software.

Bluetooth communication key Cat.No MPXX02

USB key for BLE communication with electronic Megatiker with configurable protection (M3 250, M4, M5) allows to configure, monitor and manage the device remotely through an App.
Connection port USB on front of the circuit breaker
EnerUp + Project App for smartphone and tablet is available on Apple Store and Google Play Configuration, monitoring and management software (PCS) available for download via e-catalogue (does not require the use of Bluetooth communication key Cat.No MPXX02).

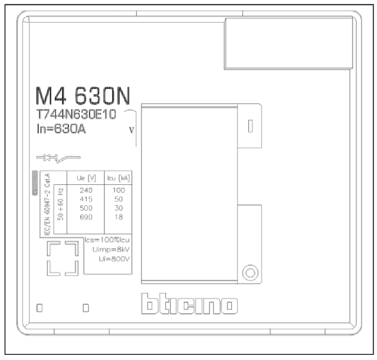
Modular power supply

230 V± - 27 V = - 0.6 A (2 modules) Cat.No BT-E49

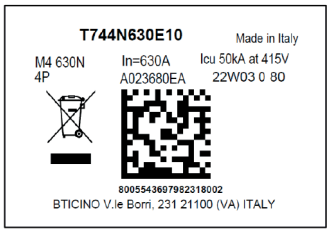
8. MARKING

Our products (borh circuit breakers and switch disconnectors) are provided with labelling in full conformity to the referred standard and directives requirements by laser or sticker labels as:

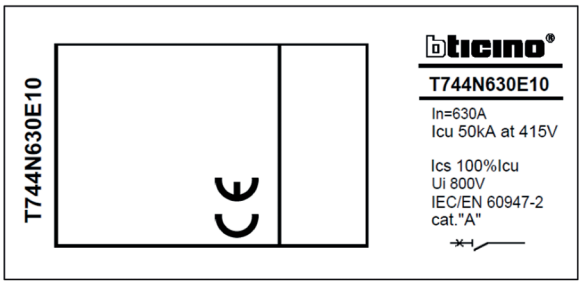
Product laser label on front
- Manufacturer responsible
- Denomination, type product, code
- Standard conformity
- Standard characteristics declared
- Coloured identification of Icu at 415 V



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



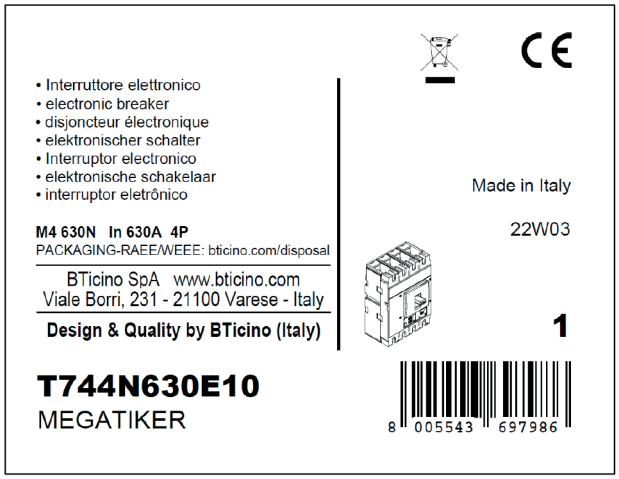
Mark sticker label on side
- Product code
- Mark/Licence (if any)
- Country deviation, if any



8. MARKING *(continued)*

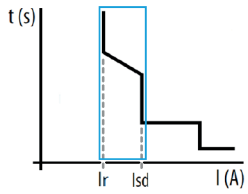
Packaging sticker label

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

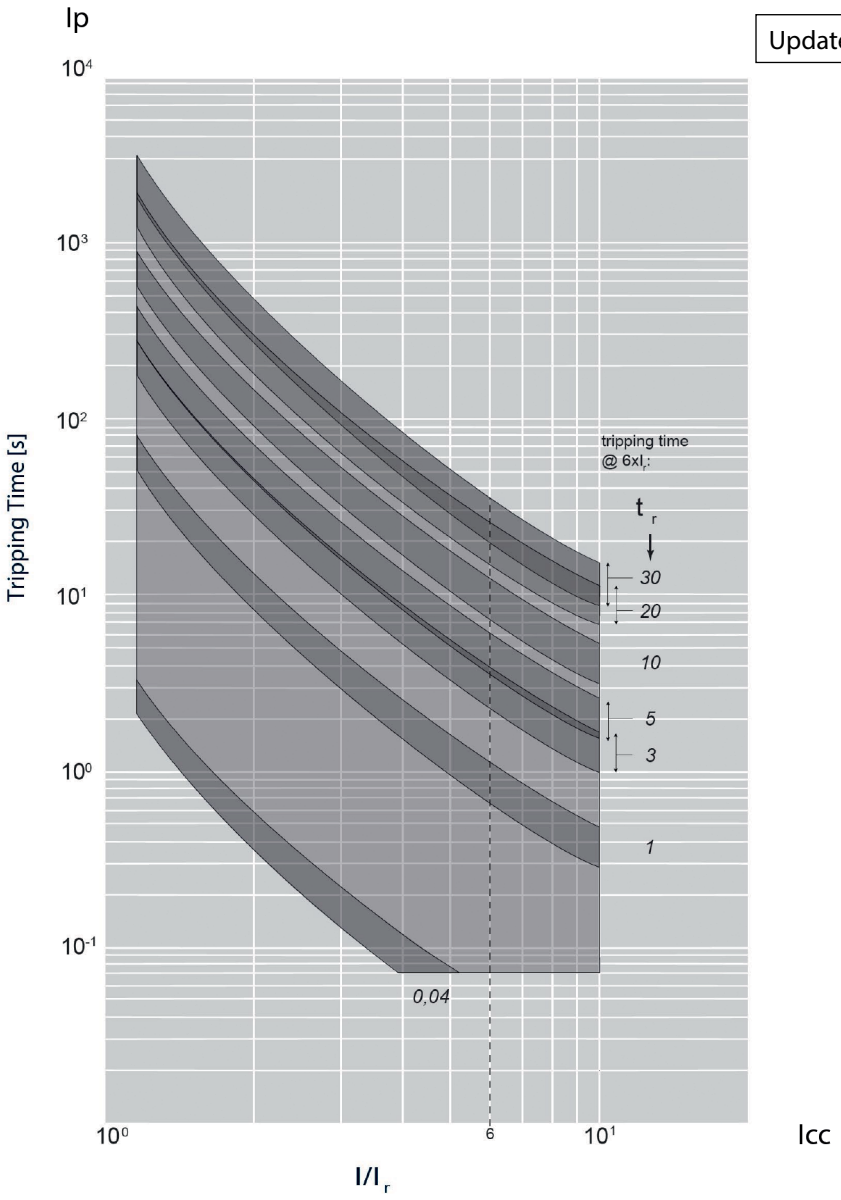


9. CURVES

■ 9.1 Tripping curve (1/3)



Update : 16/11/2022



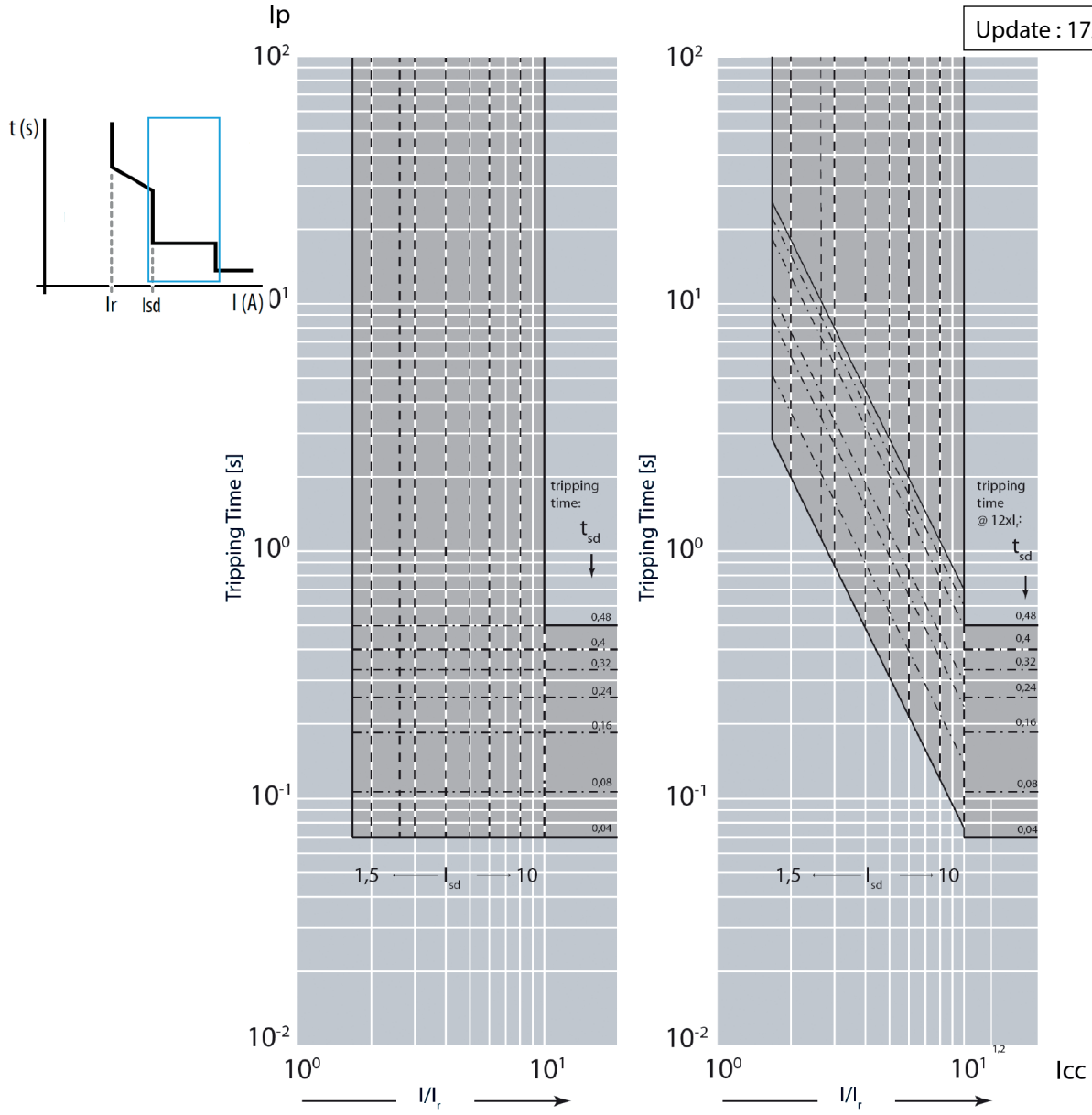
Icu = 36-50-70-100 Imax = 630 A 3P/4P Ue = 415 V~ (IEC/EN 60947-2)

Value	Description
t	Time
I	Current
Ir	Long time setting current
tr	Long time delay
Isd	Short time setting current
tsd	Short time delay
I_i	Instantaneous release
Icu	Rated ultimate short-circuit breaking capacity
$I^2t = K$	Constant pass-through energy setting
t = K	Constant tripping time setting
----------	Long time trip curve
----------	Short time trip curve
Current tolerance	10% Up to Isd; 20% up to Ii

9. CURVES *(continued)*

■ 9.2 Tripping curve (2/3)

Update : 17/11/2022



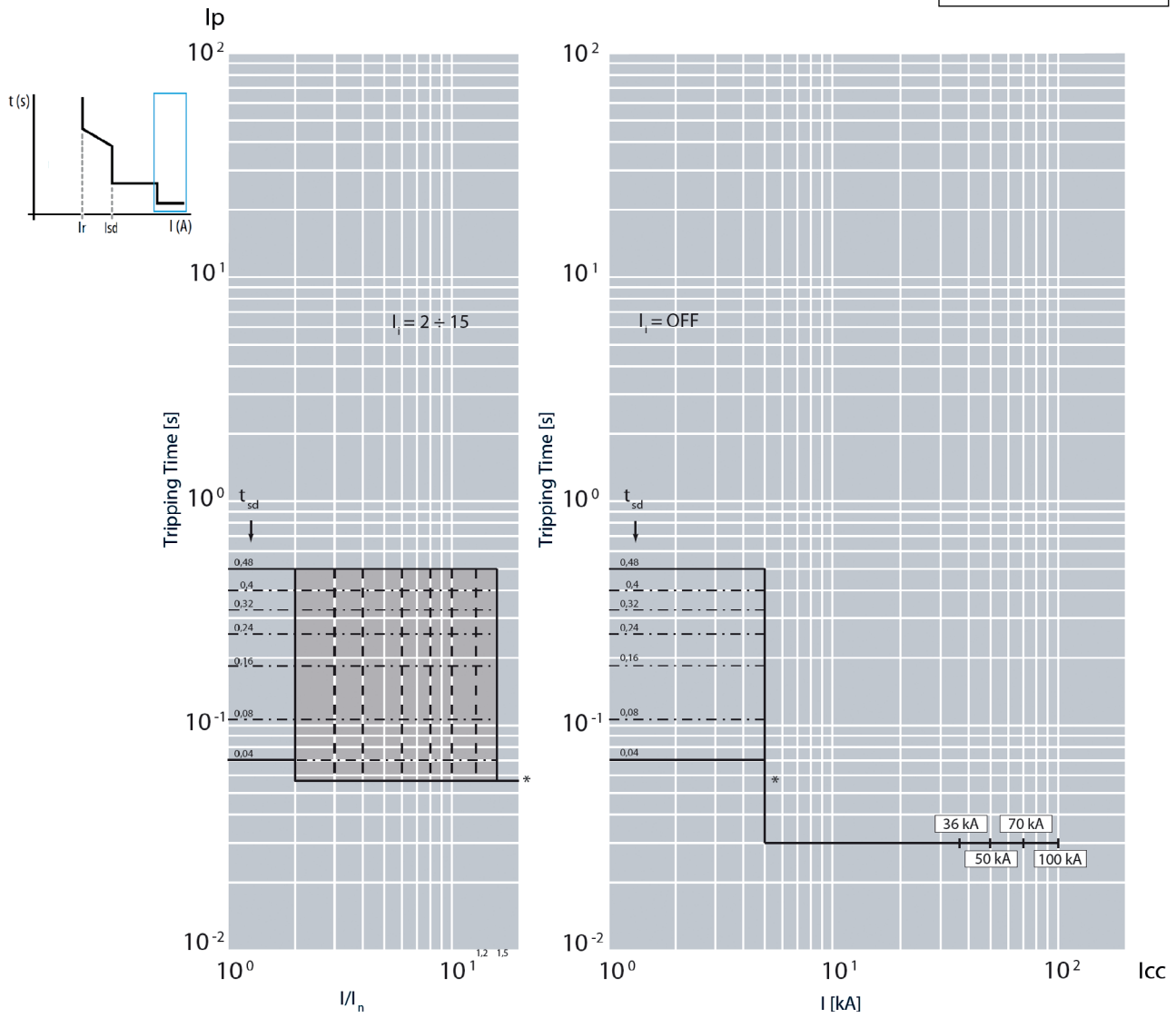
Icu = 36-50-70-100 kA Imax = 630 A 3P/4P Ue = 415 V~ (IEC/EN 60947-2)

Value	Description
t	Time
I	Current
Ir	Long time setting current
tr	Long time delay
Isd	Short time setting current
tsd	Short time delay
I_i	Instantaneous release
Icu	Rated ultimate short-circuit breaking capacity
$I^2t = K$	Constant pass-through energy setting
t = K	Constant tripping time setting
----------	Long time trip curve
----------	Short time trip curve
Current tolerance	10% Up to Isd; 20% up to Ii

9. CURVES *(continued)*

■ 9.3 Tripping curve (3/3)

Update : 17/11/2022



Icu = 36-50-70-100 kA Imax = 630 A 3P/4P Ue = 415 V~ (IEC/EN 60947-2)

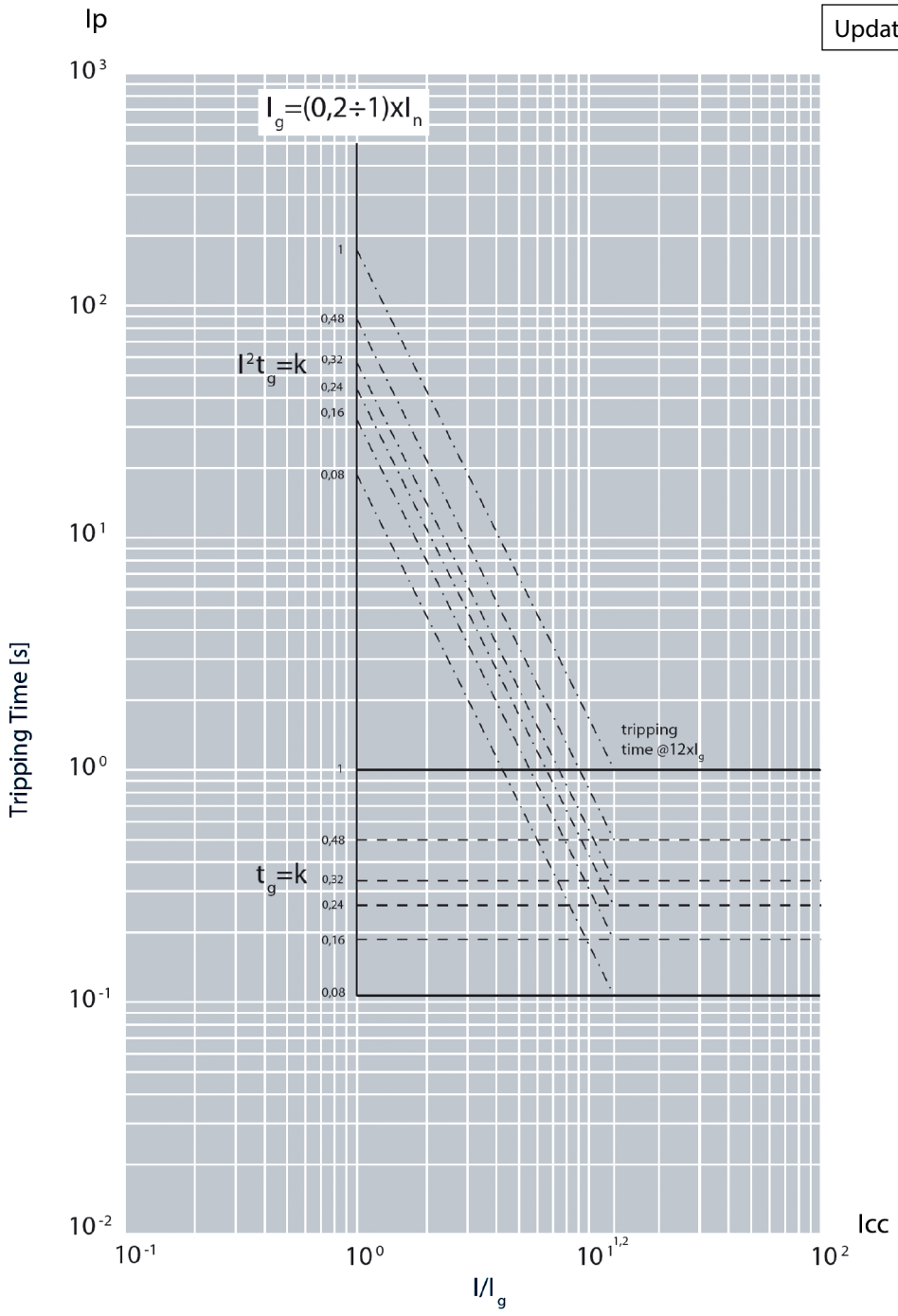
Fixed Instantaneous override Isf = 5 kA

Value	Description
t	Time
I	Current
Ir	Long time setting current
tr	Long time delay
Isd	Short time setting current
tsd	Short time delay
I_i	Instantaneous release
Icu	Rated ultimate short-circuit breaking capacity
$I^2t = K$	Constant pass-through energy setting
t = K	Constant tripping time setting
----------	Long time trip curve
----------	Short time trip curve
Current tolerance	10% Up to Isd; 20% up to Ii

9. CURVES *(continued)*

9.4 Ground Fault curve

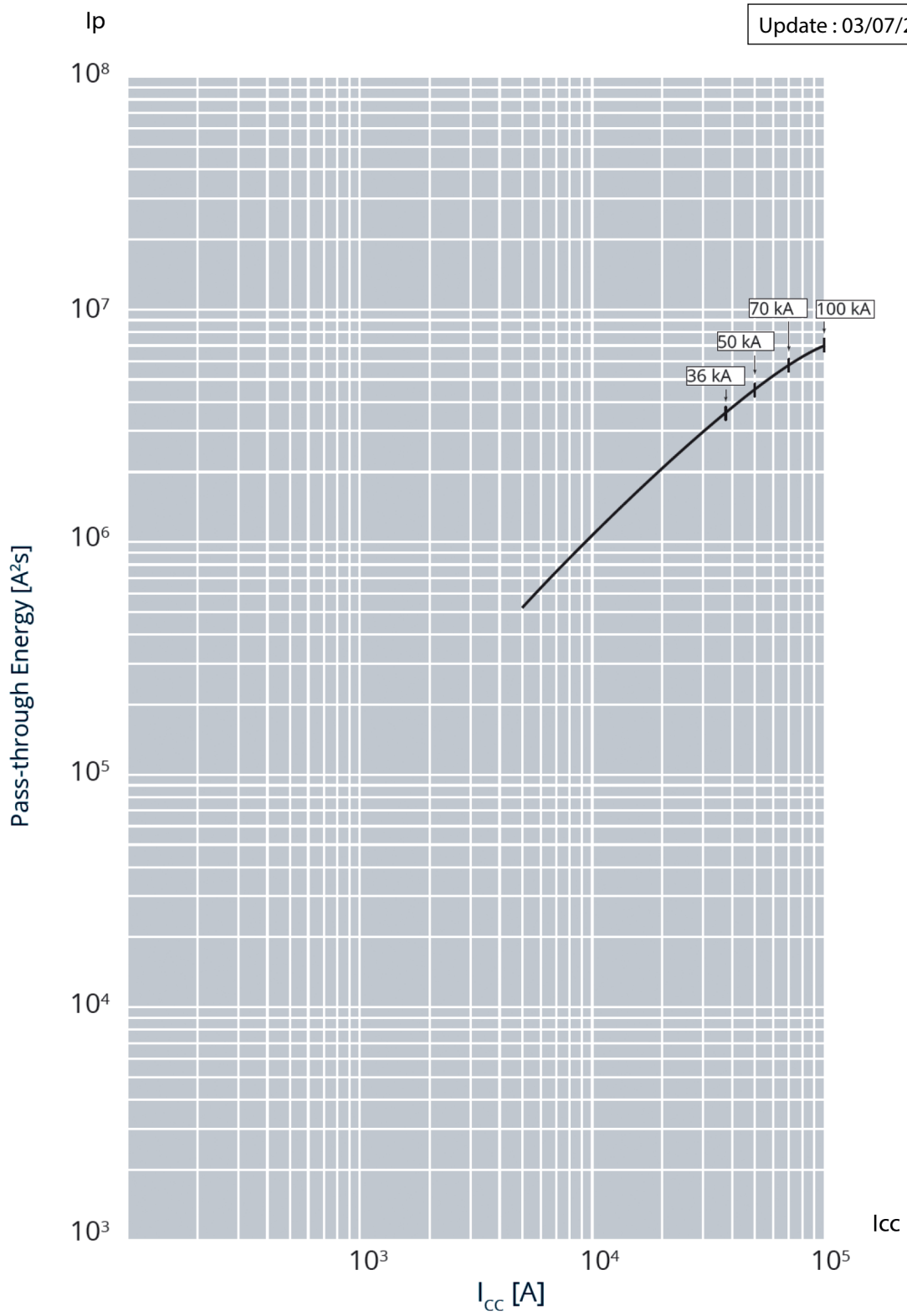
Update : 16/11/2022



Icu = 36-50-70-100 kA Imax = 630 A 3P/4P Ue = 415 V~ (IEC/EN 60947-2)

9. CURVES *(continued)*

■ 9.5 Pass-through specific energy characteristics curve



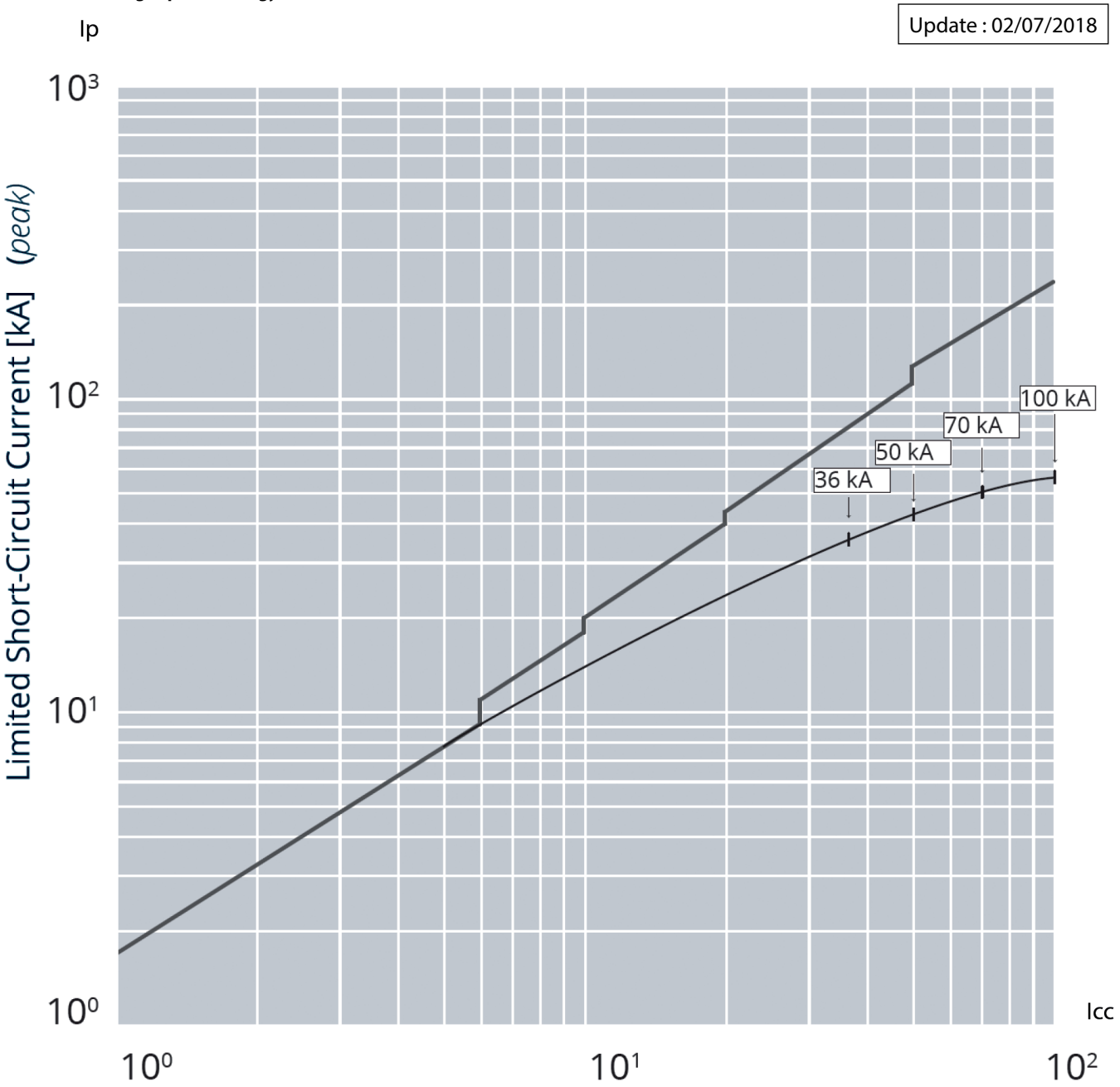
Icu = 36-50-70-100 kA Imax = 630 A 3P/4P Ue = 415 V~ (IEC/EN 60947-2)

Value	Description
Icc	Short circuit current
$I^2t = K$	Pass-through specific energy

9. CURVES *(continued)*

■ 9.6 Pass-through specific energy characteristics curve

Update : 02/07/2018



Prospective Fault Current (kA)

Icu = 36-50-70-100 kA Imax = 630 A 3P/4P Ue = 415 V~ (IEC/EN 60947-2)

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

10. STANDARDS AND REGULATIONS

Megatiker range of product concerning circuit-breakers exceed compliance with:
- IEC/EN standard 60947-2.
- Certification available by IECEE CB-scheme or LOVAG Compliance scheme.
- Marks as CCC (China), EAC (Eurasian Federation) or different local certification are available.

Megatiker are in conformity with the Lloyds Shipping Register, RINA and Bureau Veritas Marine.

The 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.

Batteries: The batteries included in this product comply with the requirements set out in European Regulation 2023/1542, according to the application timing indicated therein.

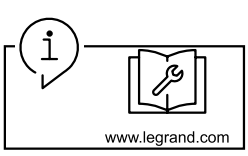
For specific information, please contact Legrand support.

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 / Legrand 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: all mounting information, available on e-catalog.

PEP: available on e-catalog.

For further technical information, please contact BTicino 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.