

# Megatiker M3 250 S10 electronic with configurable protection (display version)

**Cat.Nos:**  
see relative tables



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## 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 M3 range 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 a competitive costs.

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

## 2. RANGE

### ■ 2.1 Megatiker M3 electronic with configurable protection (display version)

| Icu    | 36 kA       |             | 50 kA       |             |
|--------|-------------|-------------|-------------|-------------|
| In (A) | 3P          | 4P          | 3P          | 4P          |
| 40     | T733F40E10  | T734F40E10  | T733N40E10  | T734N40E10  |
| 100    | T733F100E10 | T734F100E10 | T733N100E10 | T734N100E10 |
| 160    | T733F160E10 | T734F160E10 | T733N160E10 | T734N160E10 |
| 250    | T733F250E10 | T734F250E10 | T733N250E10 | T734N250E10 |

| Icu    | 70 kA       |             | 100 kA      |             |
|--------|-------------|-------------|-------------|-------------|
| In (A) | 3P          | 4P          | 3P          | 4P          |
| 40     | T733H40E10  | T734H40E10  | T733L40E10  | T734L40E10  |
| 100    | T733H100E10 | T734H100E10 | T733L100E10 | T734L100E10 |
| 160    | T733H160E10 | T734H160E10 | T733L160E10 | T734L160E10 |
| 250    | T733H250E10 | T734H250E10 | T733L250E10 | T734L250E10 |

### ■ 2.2 Megatiker M3 electronic with configurable protection (display version) with measurement function

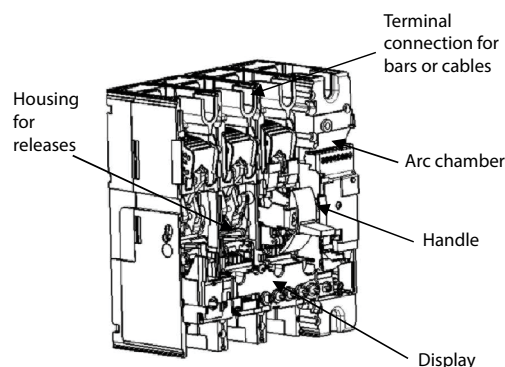
| Icu    | 36 kA       |             | 50 kA       |             |
|--------|-------------|-------------|-------------|-------------|
| In (A) | 3P          | 4P          | 3P          | 4P          |
| 40     | T733F40M10  | T734F40M10  | T733N40M10  | T734N40M10  |
| 100    | T733F100M10 | T734F100M10 | T733N100M10 | T734N100M10 |
| 160    | T733F160M10 | T734F160M10 | T733N160M10 | T734N160M10 |
| 250    | T733F250M10 | T734F250M10 | T733N250M10 | T734N250M10 |

| Icu    | 70 kA       |             | 100 kA      |             |
|--------|-------------|-------------|-------------|-------------|
| In (A) | 3P          | 4P          | 3P          | 4P          |
| 40     | T733H40M10  | T734H40M10  | T733L40M10  | T734L40M10  |
| 100    | T733H100M10 | T734H100M10 | T733L100M10 | T734L100M10 |
| 160    | T733H160M10 | T734H160M10 | T733L160M10 | T734L160M10 |
| 250    | T733H250M10 | T734H250M10 | T733L250M10 | T734L250M10 |

### ■ 2.3 Composition

Megatiker M3 250 S10 is supplied with:

- fixing screws (2 for 3P, and 4 for 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                           | 40 A - 100 A - 160 A - 250 A |
| Poles                                   | 3P - 4P                      |
| Pole pitch                              | 35 mm                        |
| Rated insulation voltage (50/60Hz) Ui   | 800 V                        |
| Rated operating voltage (50/60Hz) Ue    | 690 V                        |
| Rated impulse withstand current Uimp    | 8 kV                         |
| Rated frequency                         | 50 Hz - 60 Hz                |
| Operating temperature                   | -25 °C to 70 °C              |
| Electrical endurance at In (cycles)     | 6000                         |
| Electrical endurance at 0.5 In (cycles) | 6000                         |
| Utilization category                    | A                            |
| Suitable for isolation                  | Yes                          |
| 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 (3P and 4P)

|                   | Breaking capacity (kA) & Ics                  |       |       |       |        |
|-------------------|-----------------------------------------------|-------|-------|-------|--------|
| IEC 60947-2       | Ue                                            | Icu   |       |       |        |
|                   |                                               | 36 kA | 50 kA | 70 kA | 100 kA |
|                   | 220/240 V~                                    | 70    | 90    | 100   | 150    |
|                   | 380/415 V~                                    | 36    | 50    | 70    | 100    |
|                   | 440/460 V~                                    | 25    | 30    | 40    | 50     |
|                   | 480/500 V~                                    | 16    | 18    | 30    | 35     |
|                   | 550 V~                                        | 10    | 12    | 22    | 25     |
|                   | 690 V~                                        | 7     | 8     | 10    | 12     |
|                   | Ics (% Icu)                                   | 100   |       |       |        |
|                   | Rated making capacity under short circuit Icm |       |       |       |        |
| Icm (kA) at 415 V | 76.5                                          | 105   | 154   | 220   |        |

#### Rated current (In) at 40 °C / 50 °C

| In (A) | Phase limit trip current |        |                |      |
|--------|--------------------------|--------|----------------|------|
|        | Thermal (Ir)             |        | Magnetic (Isd) |      |
|        | 0.2 x In                 | 1 x In | MIN            | MAX  |
| 40     | 8                        | 40     | 60             | 400  |
| 100    | 20                       | 100    | 150            | 1000 |
| 160    | 32                       | 160    | 240            | 1600 |
| 250    | 50                       | 250    | 375            | 2500 |

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

#### ■ 3.2 Mechanical characteristics

Mechanical endurance (cycles): 12000

Mechanical endurance with motor control (cycles): 12000

#### Load operations

|                   | Force on handle (N) |
|-------------------|---------------------|
| Opening operation | 63.5                |
| Closing operation | 66                  |
| Restore operation | 86.5                |

#### ■ 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                   |
| 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, 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)

| In (A)          | 40   | 100  | 160   | 250   |
|-----------------|------|------|-------|-------|
| Cage terminals  | 0.42 | 2.60 | 6.66  | 16.25 |
| Lugs            | 0.45 | 2.82 | 7.22  | 17.63 |
| Spreaders       | 0.46 | 2.86 | 7.32  | 17.88 |
| Rear terminals  | 0.46 | 2.86 | 7.32  | 17.88 |
| Plug-in version | 0.93 | 5.80 | 14.85 | 36.25 |

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.

#### ■ 3.5 Megatiker electronic circuit breaker with configurable protection (display version) 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 = 3250 A               |
| Earth leakage trip type               | Integrated                 |
| Earth leakage trip IΔn [A]            | - / 0,2 to 1 (steps 0,1In) |
| Earth leakage trip Δt [s]             | 0 - 0,3 - 1 - 3            |

Electronic Megatiker circuit breakers equipped with configurable protection (display version) 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.

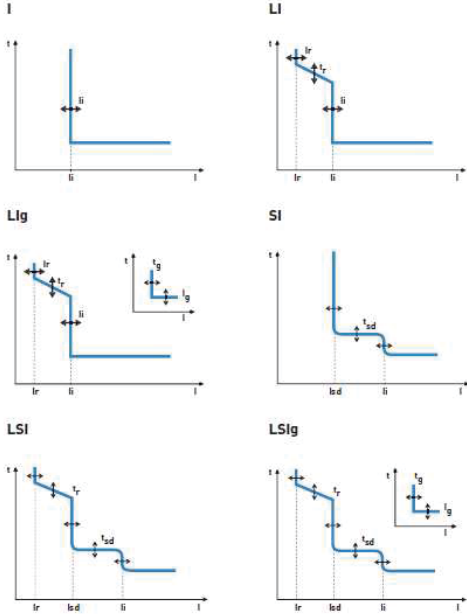
Thanks to the internal battery, the protection unit can be set even if the

3. TECHNICAL CHARACTERISTICS (continued)

■ 3.5 Megatiker electronic circuit breaker with configurable protection (display version) characteristics (continued)

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:



**I<sub>r</sub>** Long time protection against overloads  
**t<sub>r</sub>** Long time protection delay  
**I<sub>sd</sub>** Short time protection against short circuits  
**t<sub>sd</sub>** Short time protection delay  
**I<sub>i</sub>** Instantaneous protection against high-intensity short-circuits  
**I<sub>g</sub>** Earth fault current  
**t<sub>g</sub>** Earth fault current protection delay  
**I<sub>N</sub>** 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                                                |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| <b>I<sub>r</sub></b>                          | 0.2 to 1 x I <sub>n</sub> , in steps of 1 A (case I <sub>n</sub> > 40A);<br>0.4 to 1 x I <sub>n</sub> , in steps of 1 A (case I <sub>n</sub> = 40A)                                   | 0.2 to 1 x I <sub>n</sub> - OFF, in steps of 1 A                  |
| <b>t<sub>r</sub></b>                          | 3 - 5 - 10 - 15 s                                                                                                                                                                     | from 40ms to 15s, in steps of 40 ms                               |
| <b>I<sub>sd</sub></b>                         | 1.5 to 3 x I <sub>r</sub> , in steps of 0.5 x I <sub>r</sub> ; 3 to 10 x I <sub>r</sub> , in steps of I <sub>r</sub>                                                                  | 1.5 to 10 x I <sub>r</sub> - OFF, in steps of 1 A                 |
| <b>t<sub>sd</sub> (t=k, I<sup>2</sup>t=k)</b> | 40 to 480 ms (7 steps)                                                                                                                                                                | 40 to 480 ms, in steps of 40 ms                                   |
| <b>I<sub>i</sub> (t=k)</b>                    | OFF                                                                                                                                                                                   | 2 to 15 x I <sub>n</sub> - OFF, in steps of 1 A                   |
| <b>I<sub>g</sub></b>                          | 0.2 to 1 x I <sub>n</sub> , in steps of 0.1 x I <sub>n</sub> (case I <sub>n</sub> > 40A);<br>0.4 to 1 x I <sub>n</sub> , in steps of 0.1 x I <sub>n</sub> (case I <sub>n</sub> = 40A) | 0.2 to 1 x I <sub>n</sub> - OFF, in steps of 0.1 x I <sub>n</sub> |
| <b>t<sub>g</sub> (t=k, I<sup>2</sup>t=k)</b>  | 80 to 480 ms (5 steps) and 1 s                                                                                                                                                        | 80 ms to 1 s, in steps of 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 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 M3 250, M4 and M5 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 scheduled on some parameters, including minimum and maximum voltage, phase unbalance, and minimum and maximum frequency.

3. TECHNICAL CHARACTERISTICS (continued)

■ 3.5 Megatiker electronic circuit breaker with configurable protection (display version) characteristics (continued)

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. 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:

| Measure                   | Unit   | Description                                  |
|---------------------------|--------|----------------------------------------------|
| L1                        | A      | L1 realtime measured value                   |
| L2                        | A      | L2 realtime measured value                   |
| L3                        | A      | L3 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                       |
| V12 V23 V31 (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 | Measured range    |           |           |           | Other complementary characteristics                                    |       |       |       |
|-----------------|-------------------|-------------------|-----------|-----------|-----------|------------------------------------------------------------------------|-------|-------|-------|
|                 |                   | Megatiker M3 250A |           |           |           | I <sub>max</sub> PMD                                                   |       |       |       |
| In              |                   | 40 A              | 100 A     | 160 A     | 250 A     | 40 A                                                                   | 100 A | 160 A | 250 A |
| P               | 2                 | 0.5 kW            | 0.05 kW   | 0.05 kW   | 0.05 kW   | 48 A                                                                   | 120 A | 192 A | 300 A |
|                 |                   | 58 kW             | 144 kW    | 230 kW    | 360 kW    | I <sub>b</sub> = 40 A, U <sub>n</sub> = 400 V, f <sub>n</sub> = 50 Hz  |       |       |       |
| Qa, Qv          | 2                 | 0.1 kV Ar         | 0.1 kV Ar | 0.1 kV Ar | 0.1 kV Ar | 48 A                                                                   | 120 A | 192 A | 300 A |
|                 |                   | 58 kW             | 144 kW    | 230 kW    | 360 kW    | I <sub>b</sub> = 40 A, U <sub>n</sub> = 400 V, f <sub>n</sub> = 50 Hz  |       |       |       |
| Ea              | 2                 | 0...9999 GWh      |           |           |           | 48 A                                                                   | 120 A | 192 A | 300 A |
|                 |                   |                   |           |           |           | I <sub>b</sub> = 250 A, U <sub>n</sub> = 400 V, f <sub>n</sub> = 50 Hz |       |       |       |
| ErA, ErV        | 2                 | 0...9999 GWh      |           |           |           | 48 A                                                                   | 120 A | 192 A | 300 A |
|                 |                   |                   |           |           |           | I <sub>b</sub> = 40 A, U <sub>n</sub> = 400 V, f <sub>n</sub> = 50 Hz  |       |       |       |
| f               | 0.1               | 50...60 Hz        |           |           |           | -                                                                      |       |       |       |
| I               | 1                 | 2 A               | 2 A       | 2 A       | 2 A       | 48 A                                                                   | 120 A | 192 A | 300 A |
|                 |                   | 48 A              | 120 A     | 192 A     | 300 A     | I <sub>b</sub> = 250 A, U <sub>n</sub> = 400 V, f <sub>n</sub> = 50 Hz |       |       |       |
| IN              | 1                 | 2 A               | 2 A       | 2 A       | 2 A       | 48 A                                                                   | 120 A | 192 A | 300 A |
|                 |                   | 48 A              | 120 A     | 192 A     | 300 A     | I <sub>b</sub> = 250 A, U <sub>n</sub> = 400 V, f <sub>n</sub> = 50 Hz |       |       |       |
| U               | 0.5               | 88...690 V        |           |           |           | -                                                                      |       |       |       |
| PFV             | 0.5               | -                 |           |           |           | 48 A                                                                   | 120 A | 192 A | 300 A |
|                 |                   |                   |           |           |           | I <sub>b</sub> = 250 A, U <sub>n</sub> = 400 V, f <sub>n</sub> = 50 Hz |       |       |       |
| THDu            | 5                 | 110...690 V       |           |           |           | -                                                                      |       |       |       |
| THDi            | 5                 | 40 A              | 40 A      | 40 A      | 40 A      | -                                                                      |       |       |       |
|                 |                   | 40 A              | 100 A     | 160 A     | 250 A     |                                                                        |       |       |       |

### 3. TECHNICAL CHARACTERISTICS (continued)

#### ■ 3.5 Electronic protection S10 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  $I_n$  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  $I_n$  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  $I_n$  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/EMS 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 5 V $\equiv$  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)              | 40  | 50  | 60  | 70  |
| 40                  | 40  | 40  | 40  | 40  |
| 100                 | 100 | 100 | 100 | 95  |
| 160                 | 160 | 160 | 160 | 155 |
| 250                 | 250 | 250 | 210 | 190 |

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                |                                 |
|-------------------------------------------------|----------------------|---------------------------------|----------------------|---------------------------------|----------------------|---------------------------------|----------------------|---------------------------------|----------------------|---------------------------------|
|                                                 | I <sub>max</sub> (A) | I <sub>r</sub> / I <sub>n</sub> | I <sub>max</sub> (A) | I <sub>r</sub> / I <sub>n</sub> | I <sub>max</sub> (A) | I <sub>r</sub> / I <sub>n</sub> | I <sub>max</sub> (A) | I <sub>r</sub> / I <sub>n</sub> | I <sub>max</sub> (A) | I <sub>r</sub> / I <sub>n</sub> |
| <b>Fixed version</b>                            |                      |                                 |                      |                                 |                      |                                 |                      |                                 |                      |                                 |
| Cage terminals, flexible/rigid cable            | 250                  | 1                               | 250                  | 1                               | 240                  | 0.96                            | 225                  | 0.90                            | 210                  | 0.84                            |
| Lugs, flexible/rigid cable                      | 250                  | 1                               | 250                  | 1                               | 240                  | 0.96                            | 225                  | 0.90                            | 210                  | 0.84                            |
| Lugs, flexible/rigid cable and terminal shields | 250                  | 1                               | 240                  | 0.96                            | 225                  | 0.90                            | 210                  | 0.84                            | 200                  | 0.80                            |
| Spreaders, flexible/rigid cable                 | 250                  | 1                               | 250                  | 1                               | 240                  | 0.96                            | 225                  | 0.90                            | 210                  | 0.84                            |
| Rear terminals, flexible/rigid cable            | 250                  | 1                               | 240                  | 0.96                            | 225                  | 0.90                            | 210                  | 0.84                            | 200                  | 0.80                            |
| <b>Plug-in/draw-out version</b>                 |                      |                                 |                      |                                 |                      |                                 |                      |                                 |                      |                                 |
| Cage terminals, flexible/rigid cable            | 250                  | 1                               | 235                  | 0.94                            | 226                  | 0.90                            | 210                  | 0.84                            | 195                  | 0.78                            |
| Lugs, flexible/rigid cable                      | 250                  | 1                               | 235                  | 0.94                            | 225                  | 0.90                            | 210                  | 0.84                            | 195                  | 0.78                            |
| Lugs, flexible/rigid cable and terminal shields | 250                  | 1                               | 225                  | 0.90                            | 210                  | 0.84                            | 195                  | 0.78                            | 188                  | 0.75                            |
| Spreaders, flexible/rigid cable                 | 250                  | 1                               | 235                  | 0.94                            | 225                  | 0.90                            | 210                  | 0.84                            | 195                  | 0.78                            |
| Rear terminals, flexible/rigid cable            | 250                  | 1                               | 225                  | 0.90                            | 210                  | 0.84                            | 195                  | 0.78                            | 188                  | 0.75                            |

For further technical information, please contact Bticino technical support.

4. INSTALLATION RULES (continued)

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

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

**Electromagnetic disturbances (EMC):** for Megatiker M3 circuit breakers, according to IEC/EN 60947-2 Annex F

**Altitude**

Altitude derating for Megatiker M3 and M53

| 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 | 0.9 x In |

5. DIMENSIONS AND WEIGHT

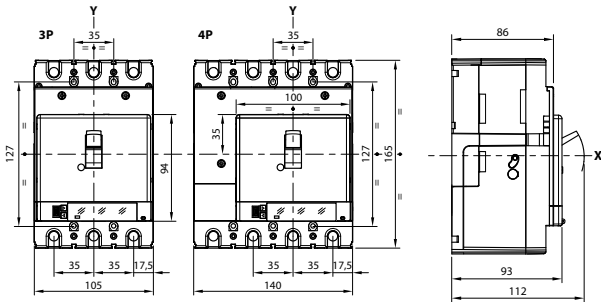
■ 5.1 Dimensions (mm)

3P (W x H x D): 105 x 165 x 86

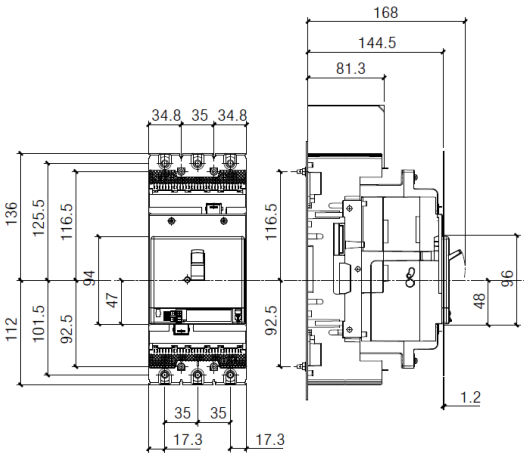
4P (W x H x D): 140 x 165 x 86

**Device with accessories**

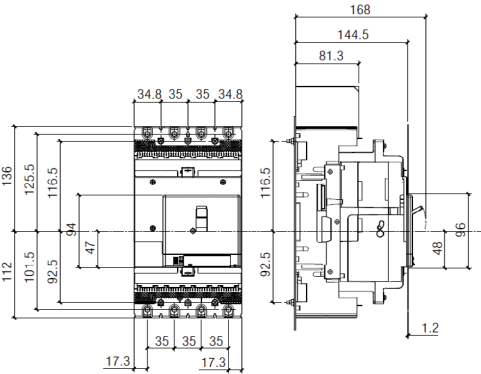
**Fixed version**



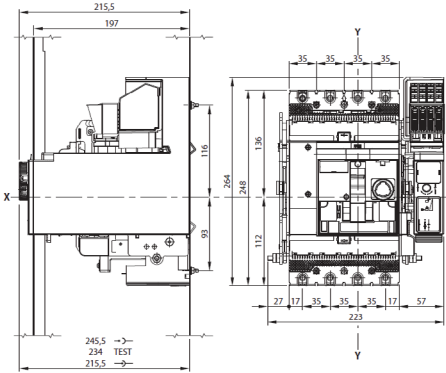
**Plug-in version**  
**3P**



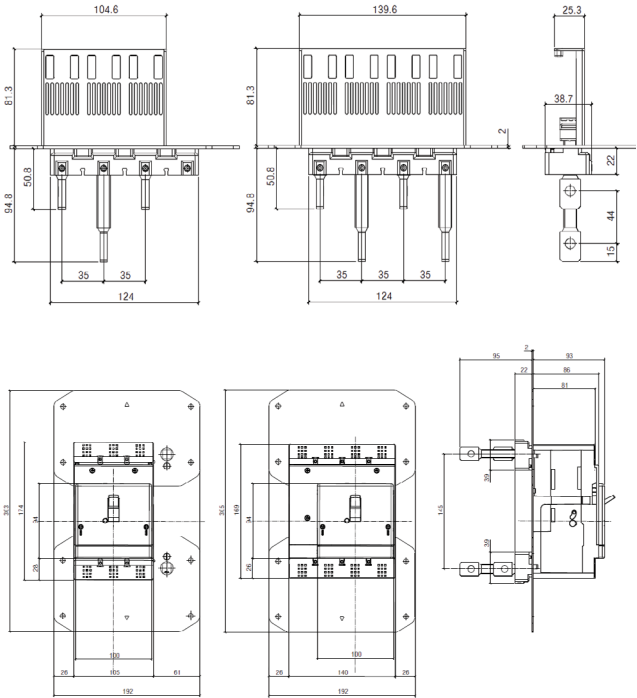
**4P**



**Draw-out version**  
**4P**



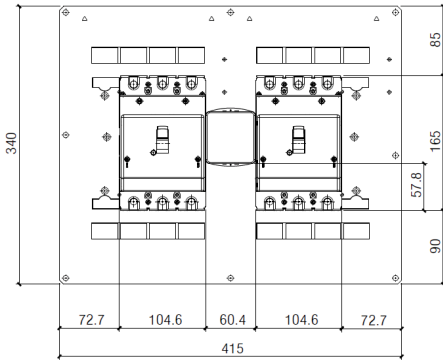
**With rear terminals**



**5. DIMENSIONS AND WEIGHT (continued)**

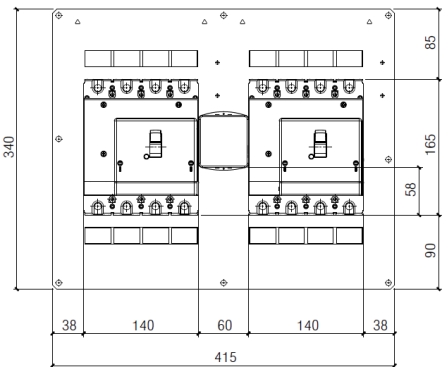
■ **5.1 Dimensions (mm) (continued)**

**With interlock  
3P**



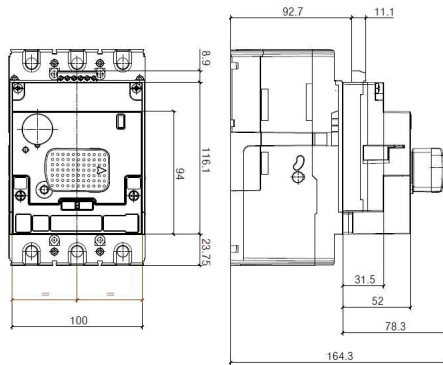
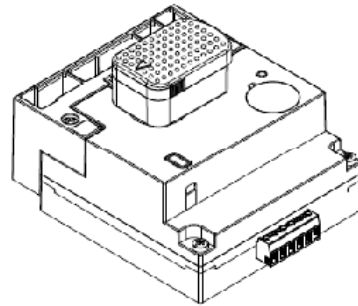
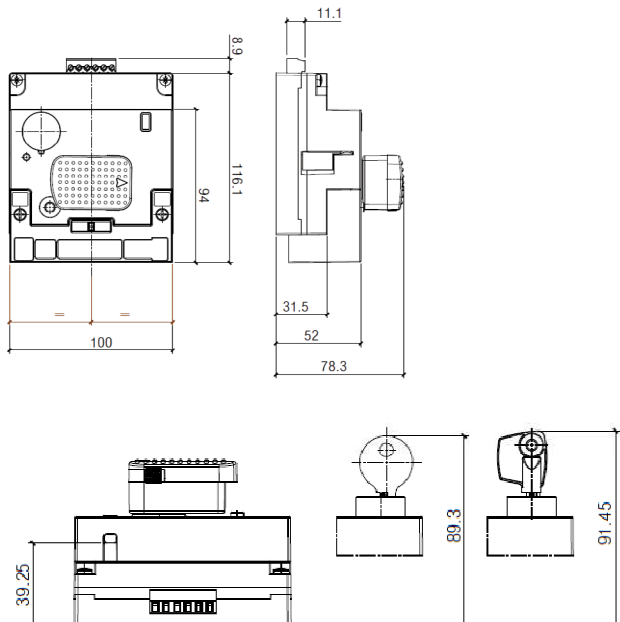
For rear plate interlock dimension, see relative instruction sheet.

**With interlock  
4P**

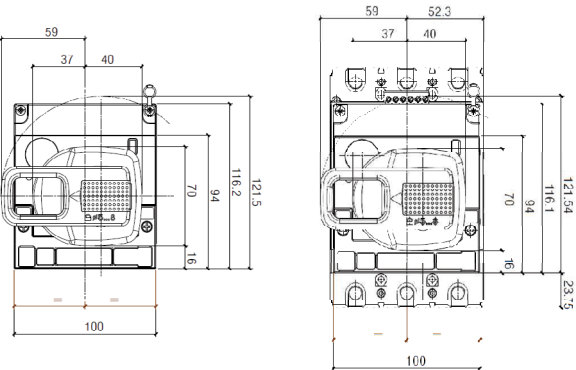
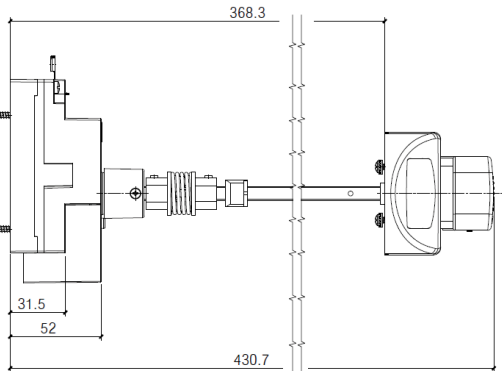


For rear plate interlock dimension, see relative instruction sheet.

**With direct rotary handle**



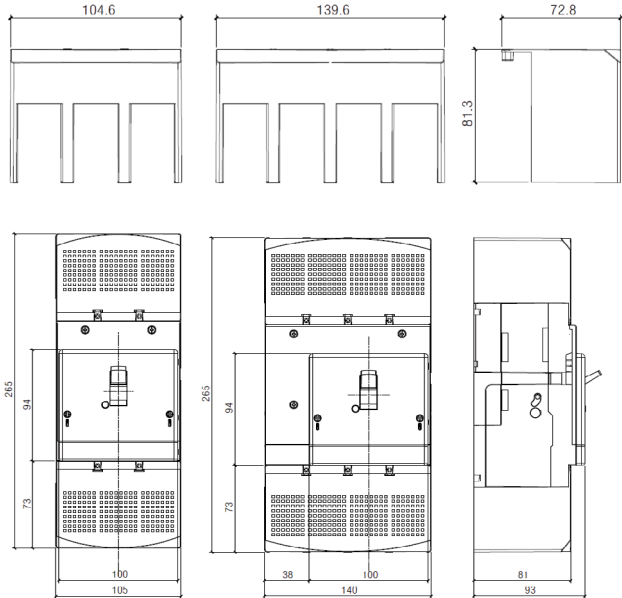
**With vary depth rotary handle**



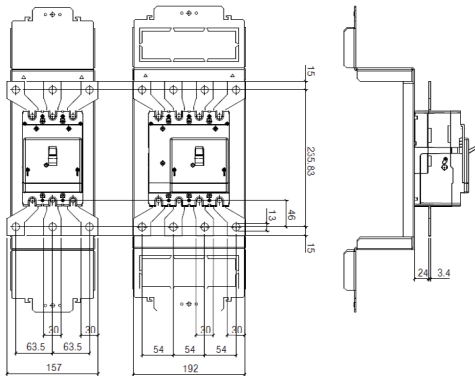
5. DIMENSIONS AND WEIGHT (continued)

■ 5.1 Dimensions (mm) (continued)

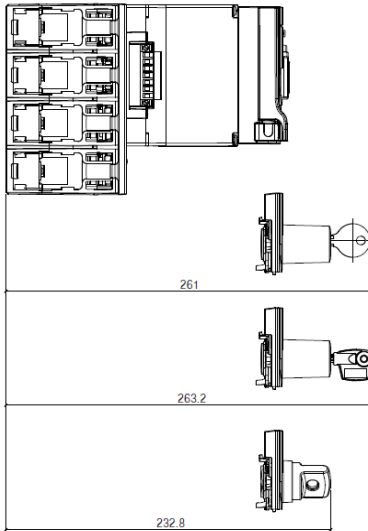
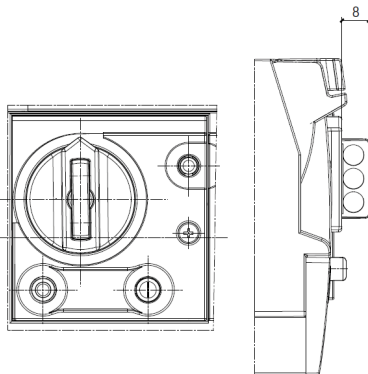
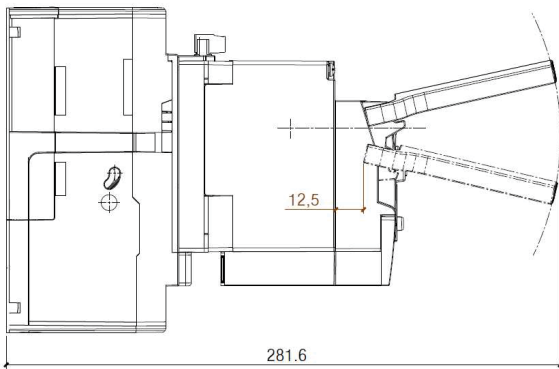
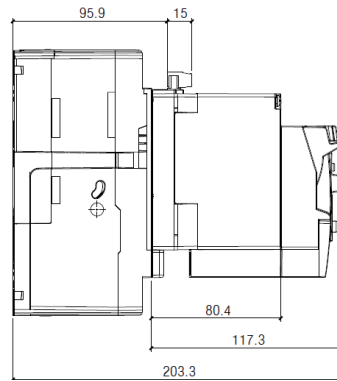
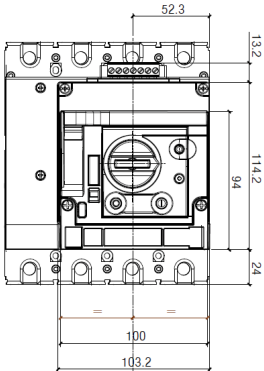
With sealable terminal shields



With spreaders



With motor operator



5. DIMENSIONS AND WEIGHT (continued)

■ 5.2 Weights

| Weights (kg)                                   |      |     |
|------------------------------------------------|------|-----|
| Configuration                                  | 3P   | 4P  |
| Circuit breaker                                | 1.6  | 2.5 |
| Plug-in*                                       | 3.5  | 4.5 |
| Draw-out**                                     | 2.5  |     |
| Interlock*                                     | 0.35 |     |
| Rear interlock (for plug-in/draw-out version)* | 5    |     |
| Motor operator*                                | 1    |     |

\*to add to device weight

\*\*to add to device and plug-in weights

6. CONNECTIONS

To ensure the circuit breaker's connection, it is possible to use:

- busbars;
- cable lugs;
- spreaders;
- cage terminals;
- cables

For detailed mounting procedures, see instruction sheet.

7. EQUIPMENTS AND ACCESSORIES

■ 7.1 Releases

There are 3 types of releases (suitable for Megatiker M3 125/160/250 and Megatiker M1/M2):

Shunt releases with voltage (ST)

12 V~/=

24 V~/=

48 V~/=

110 ÷ 130 V~/=

220 ÷ 277 V~/=

380 ÷ 480 V~/=

Maximum power = 400 VA/W

Cat.No M7S012

Cat.No M7S024

Cat.No M7S048

Cat.No M7S110

Cat.No M7S230

Cat.No M7S415

Undervoltage releases with voltage (UVR)

12 V~/=

24 V~/=

48 V~/=

110 ÷ 130 V~/=

220 ÷ 240 V~/=

277 V~/=

380 ÷ 415 V~/=

440 ÷ 480 V~/=

Maximum power = 4 VA

Cat.No M7U012

Cat.No M7U024

Cat.No M7U048

Cat.No M7U110

Cat.No M7U230

Cat.No M7U277

Cat.No M7U415

Cat.No M7U480

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 M7000ME/024

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 versions of Megatiker M3 250 electronic version, auxiliary contacts are integrated inside module M.C.I. (Insulation Control Module) (see instruction sheet for details).

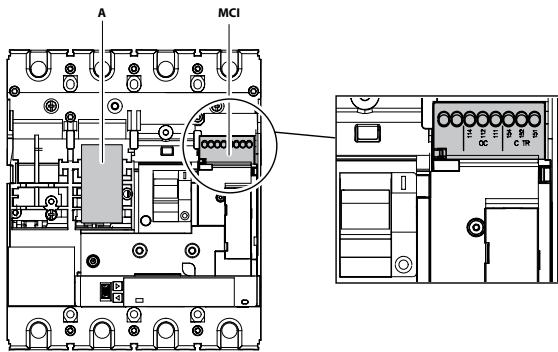
Auxiliary contacts assembly

| Voltage (Uc) | AC/DC | Current (A) |
|--------------|-------|-------------|
| 24           | DC    | 5           |
| 48           | DC    | 1.7         |
| 110          | DC    | 0.5         |
| 110          | AC    | 4           |
| 230          | DC    | 0.25        |
| 230 ÷ 250    | AC    | 3           |

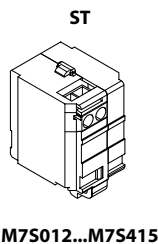
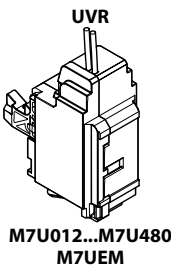
Integrated auxiliary contacts

| Voltage (Uc) | AC/DC | Current (A) |
|--------------|-------|-------------|
| 12           | DC    | 5           |
| 24           | DC    | 1           |
| 110          | AC    | 5           |
| 230          | AC    | 5           |

Wiring diagrams to get to the auxiliary functionality:



|                   |                          |     |     |  |
|-------------------|--------------------------|-----|-----|--|
| TRIP STATUS       | 151 Common contact       | 154 | 151 |  |
|                   | 152 Normal close contact | 152 | 152 |  |
|                   | 154 Normal open contact  |     |     |  |
| OPEN/CLOSE STATUS | 111 Common contact       | 114 | 111 |  |
|                   | 112 Normal close contact | 112 | 112 |  |
|                   | 114 Normal open contact  |     |     |  |



In the space A, it is possible to insert 1 shunt release, or alternatively 1 undervoltage release. To get more information on auxiliary mounting procedures, please refer to product instruction sheet.

■ 7.3 Universal keylocks

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

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

For each of these, a specific accessory (indicated in the specific section of this data sheet) 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. EQUIPMENTS AND ACCESSORIES (continued)

### ■ 7.7 Connection accessories (continued)

#### Dimensions limits of cable for cage terminals

| Cage terminals<br>Cat.Nos<br>M7X54<br>M7X55 | Min cross section (mm <sup>2</sup> ) |       | Max cross section (mm <sup>2</sup> ) |       |
|---------------------------------------------|--------------------------------------|-------|--------------------------------------|-------|
|                                             | Flexible                             | Rigid | Flexible                             | Rigid |
|                                             | 2.5                                  | 4     | 120                                  | 150   |

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 outgoing)

- Set of 3 (for 3P) Cat.No M7A52
- Set of 4 (for 4P) Cat.No M7A53

#### Rear terminals (incoming or outgoing)

- Set of 3 (for 3P) Cat.No M7A56
- Set of 4 (for 4P) Cat.No M7A57

### ■ 7.8 Plug-in version

A plug-in is a Megatiker M3 250 fitted with special terminals and mounted on a plug-in base.

#### Bases

For plug-in and draw-out versions for Megatiker M3 250 and MS3 250.

- Plug-in/draw-out base for 3P Cat.No M7B50
- Plug-in/draw-out base for 4P Cat.No M7B51
- Plug-in/draw-out mobile part kit for 3P Cat.No M7B52
- Plug-in/draw-out mobile part kit for 4P Cat.No M7B53

#### Plug-in accessories

- Locking accessory (for plug-in)
  - Key lock accessory for plug-in Cat.No M7B64
- Cat.No M7B64 must be used with universal keylocks to get the complete locking kit for plug-in version.

### ■ 7.9 Draw-out version

A Megatiker M3 250 draw-out version is a plug-in fitted with a "Debro-lift" mechanism which can be used to withdraw the breaker while keeping it on its base.

#### "Debro-lift" mechanism

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

- Transformation kit for 3P Cat.No M7B54
- Transformation kit for 4P Cat.No M7B55

#### Frontal masks for draw-out version

When using a "Debro-lift" mechanism, add the correct frontal mask according to the accessories associated with the "Debro-lift".

- Frontal module, with frontal mask (3P and 4P) Cat.No M7B60  
(if motor operator or rotary handle is not fitted)
- Frontal mask for motor operator (3P and 4P) Cat.No M7B61

#### Locking accessory (for draw-out)

- Padlock for draw-out position Cat.No M7B66
  - Key lock accessory for draw-out Cat.No M7B63
- Cat.No M7B63 must be used with universal keylocks to get the complete locking kit for draw-out version.

#### Auxiliary contacts

- Automatic auxiliary contacts for draw-out version Cat.No M7B21
  - 6 contact connectors (under sliding contacts) Cat.No F15/7500P6
- Cat.No F15/7500P6 can be used with both plug-in and draw-out version.

### ■ 7.10 Interlock mechanism

It is used for interlocking 2 Megatiker M3 250 circuit breakers. It is not possible to use other accessories than those recommended below for interlocking 2 Megatiker M3 250.

- Interlock mechanism – standard version Cat.No M7I01  
(for fixed version Megatiker M3 250)
  - Interlock mechanism – for electronic module Cat.No M7I02  
(for fixed version Megatiker M3 250)
  - Interlock plate for Megatiker M3 250 Cat.No M7I05
  - Rear interlock mechanism Cat.No M7I03  
for Megatiker M3 250 plug-in and/or draw-out version
- When using a rear interlocking mechanism, use a maximum of 1 set of contact connectors Cat.No F15/7500P6.

### ■ 7.11 Specific accessories for electronic version

#### Auxiliary power supply

Cat.No M7ALIM

It allows the supplying of electronic units.

It is used to supply Megatiker electronic circuit breakers 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.

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

| Cat.No M7ALIM<br>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

It 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%)
- Dimension: 1 DIN module
- 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.

If using the MODBUS interface Cat.No M7COM, the external power supply module Cat.No M7ALIM is not necessary because the external power is already provided by the MODBUS module.

#### Electronic interface - EMS DIN

Megatiker electronic interface EMS DIN Cat.No M7EMS

It is used for connecting electronic Megatiker (M3 250, M4, M5) 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 DIN power supply module Cat.No F80BA

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

**7. EQUIPMENTS AND ACCESSORIES (continued)**

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

**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 circuit breaker 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) is available for download via the e-catalog and does not require the use of Bluetooth communication key Cat.No MPXX02.

**Modular power supply**

230 V $\pm$  - 27 V = - 0.6 A (2 modules)

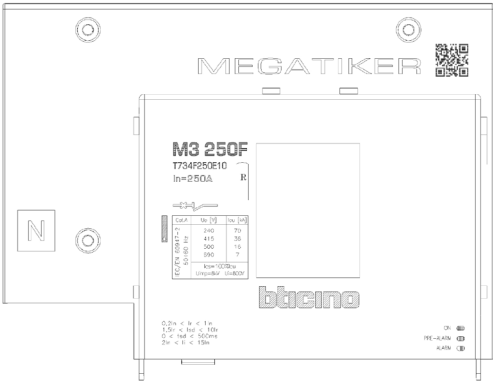
Cat.No BT-E49

**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**

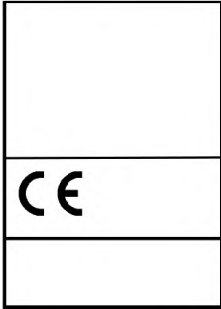
- Manufacturer responsible
- Denomination and type product
- Mark/Licence (if any)
- Directive requirements
- Bar code identification product
- Manufacturing Country



**Mark sticker label on side**

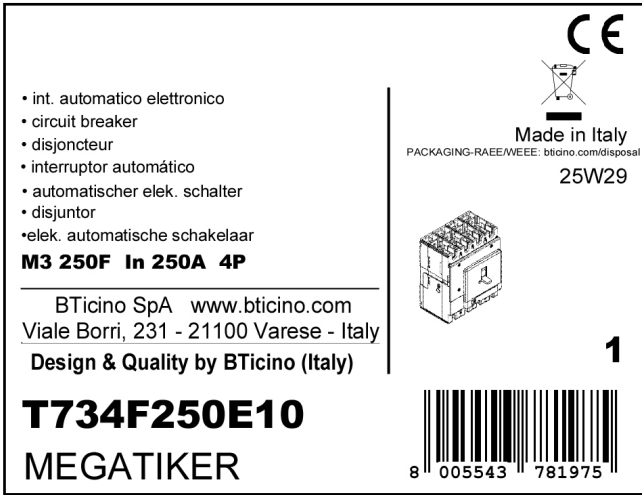
- Product code
- Mark/Licence (if any)
- Country deviation, if any

**T734F250E10**



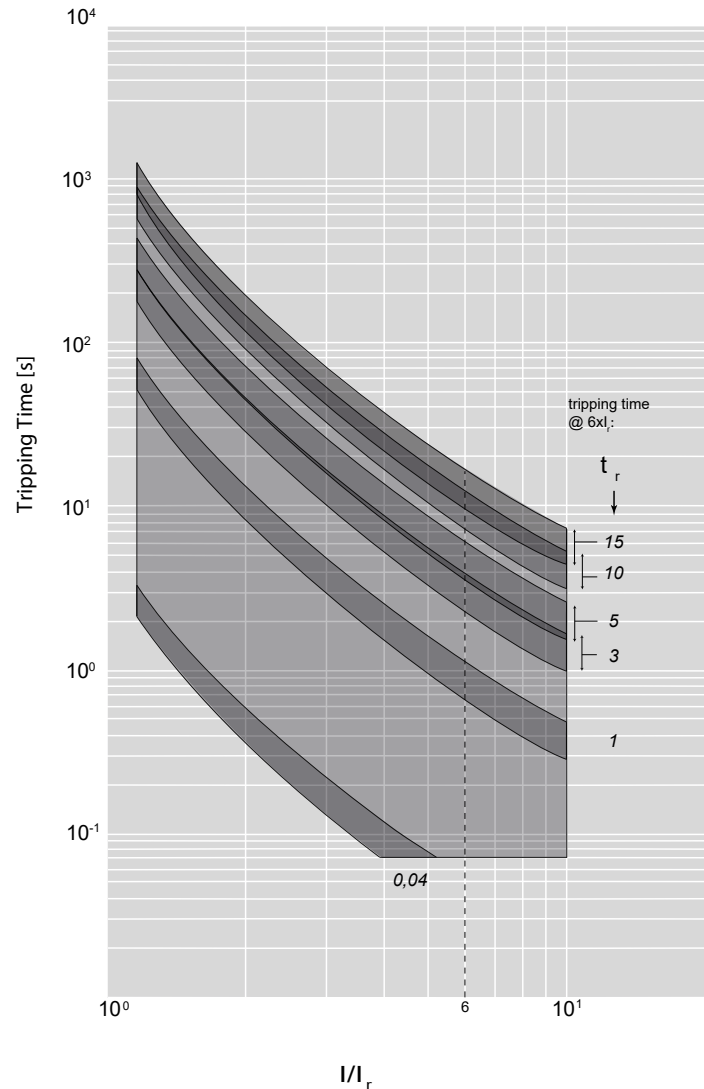
**Packaging sticker label**

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



9. CURVES

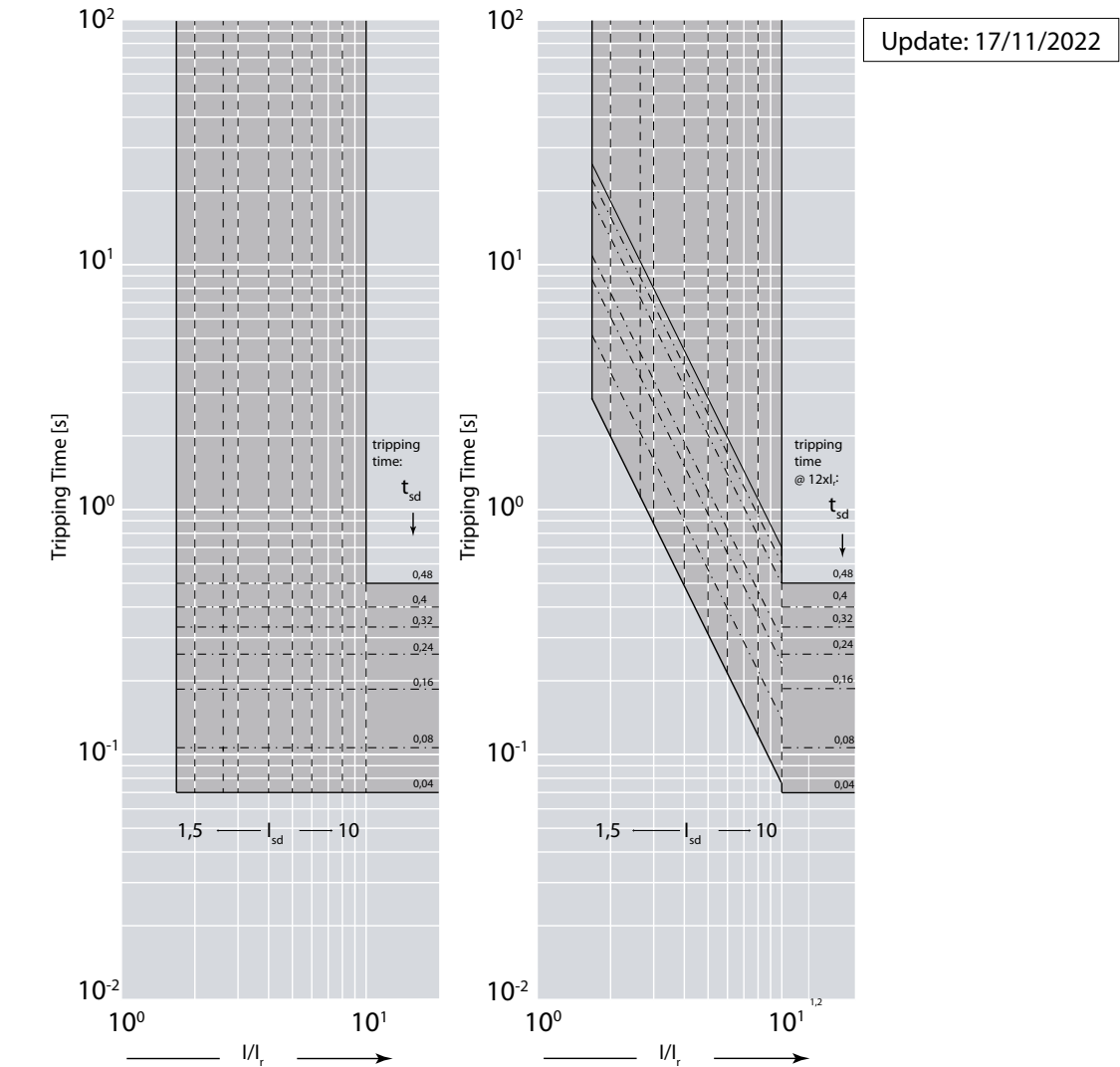
■ 9.1 Tripping curve (1/3)



| Icu = 36-50-70-100 kA |                                                      | Imax = 250 A |  | 3P-4P | Ue = 415 V~ (IEC/EN 60947-2) |
|-----------------------|------------------------------------------------------|--------------|--|-------|------------------------------|
| Value                 | Description                                          |              |  |       |                              |
| t                     | time                                                 |              |  |       |                              |
| I                     | current                                              |              |  |       |                              |
| I <sub>r</sub>        | long time setting current                            |              |  |       |                              |
| t <sub>r</sub>        | long time delay                                      |              |  |       |                              |
| I <sub>sd</sub>       | short time setting current                           |              |  |       |                              |
| t <sub>sd</sub>       | short time delay                                     |              |  |       |                              |
| I <sub>i</sub>        | instantaneous release                                |              |  |       |                              |
| I <sub>cu</sub>       | rated ultimate short-circuit breaking capacity       |              |  |       |                              |
| I <sup>2</sup> t = 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 I <sub>sd</sub> ; 20% up to I <sub>i</sub> |              |  |       |                              |

9. CURVES (continued)

■ 9.2 Tripping curve (2/3)

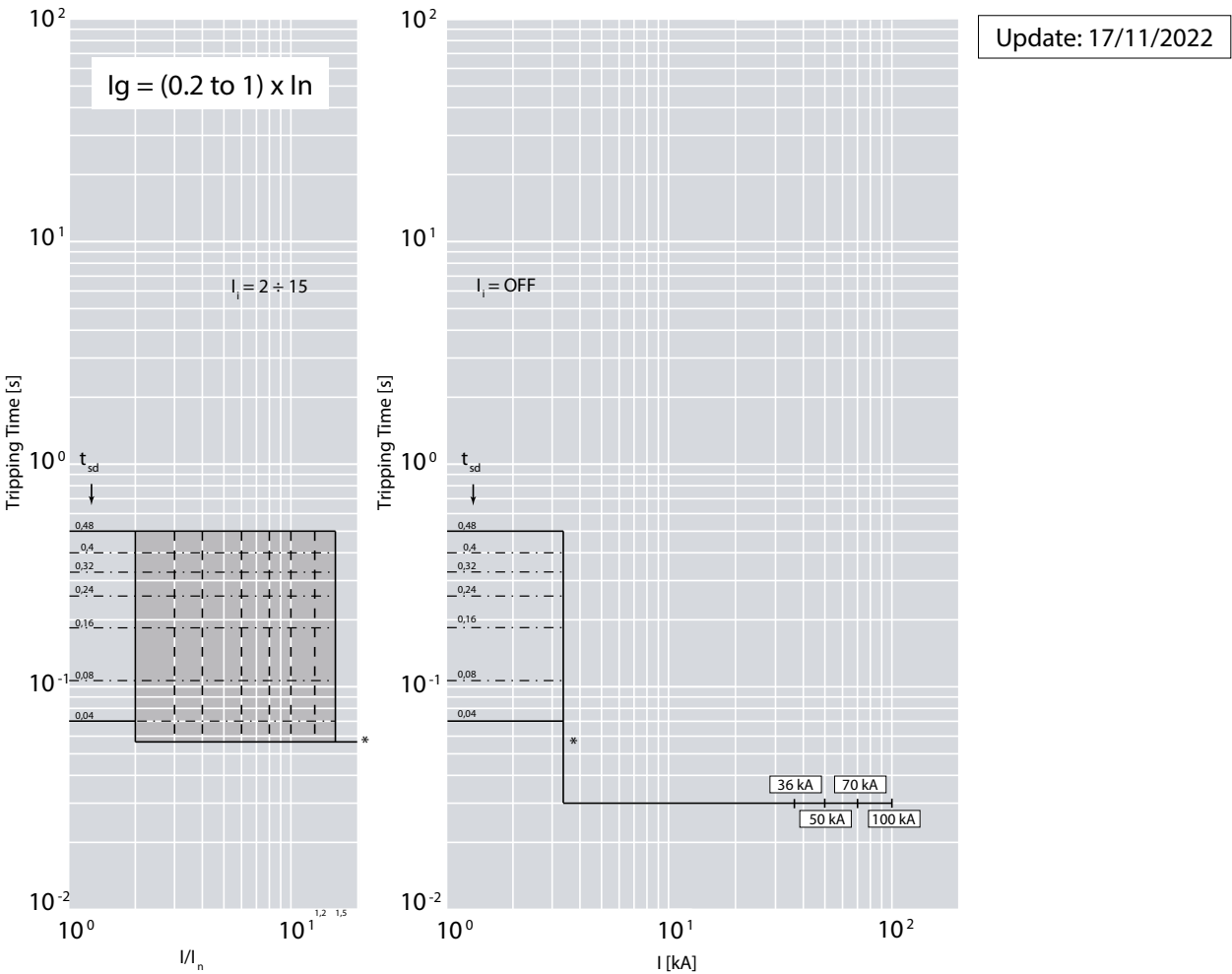


Icu = 36-50-70-100 kA      I<sub>max</sub> = 250 A      3P-4P      U<sub>e</sub> = 415 V~ (IEC/EN 60947-2)

| Value                | Description                                          |
|----------------------|------------------------------------------------------|
| t                    | time                                                 |
| I                    | current                                              |
| I <sub>r</sub>       | long time setting current                            |
| t <sub>r</sub>       | long time delay                                      |
| I <sub>sd</sub>      | short time setting current                           |
| t <sub>sd</sub>      | short time delay                                     |
| I <sub>i</sub>       | instantaneous release                                |
| I <sub>cu</sub>      | rated ultimate short-circuit breaking capacity       |
| I <sup>2</sup> t = 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 I <sub>sd</sub> ; 20% up to I <sub>i</sub> |

9. CURVES (continued)

9.3 Tripping curve (3/3)



Icu = 36-50-70-100 kA

I<sub>max</sub> = 250 A

3P-4P

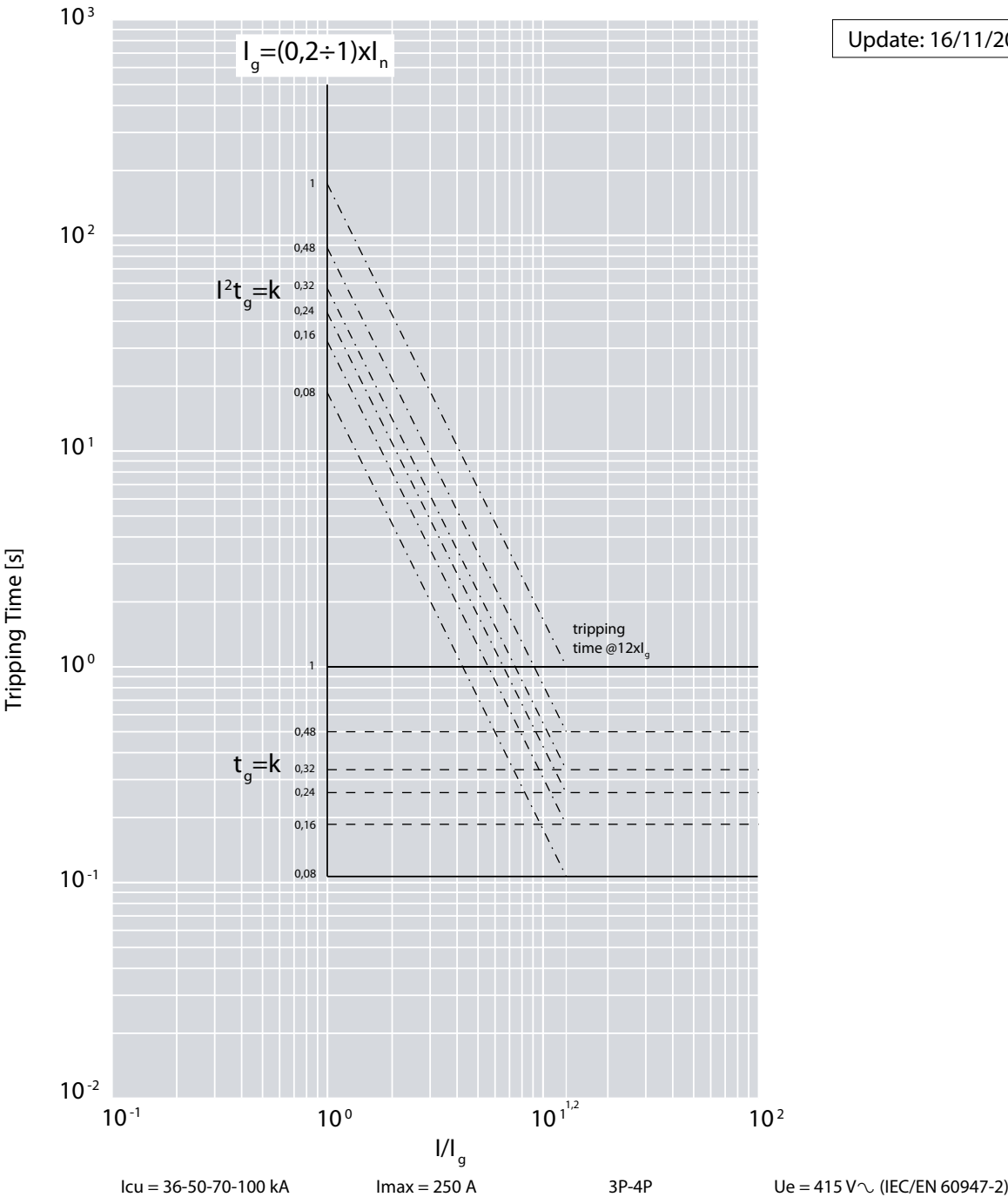
U<sub>e</sub> = 415 V~ (IEC/EN 60947-2)

Fixed Instantaneous override I<sub>sf</sub> = 3.25 kA

| Value                | Description                                          |
|----------------------|------------------------------------------------------|
| t                    | time                                                 |
| I                    | current                                              |
| I <sub>r</sub>       | long time setting current                            |
| t <sub>r</sub>       | long time delay                                      |
| I <sub>sd</sub>      | short time setting current                           |
| t <sub>sd</sub>      | short time delay                                     |
| I <sub>i</sub>       | instantaneous release                                |
| I <sub>cu</sub>      | rated ultimate short-circuit breaking capacity       |
| I <sup>2</sup> t = 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 I <sub>sd</sub> ; 20% up to I <sub>i</sub> |

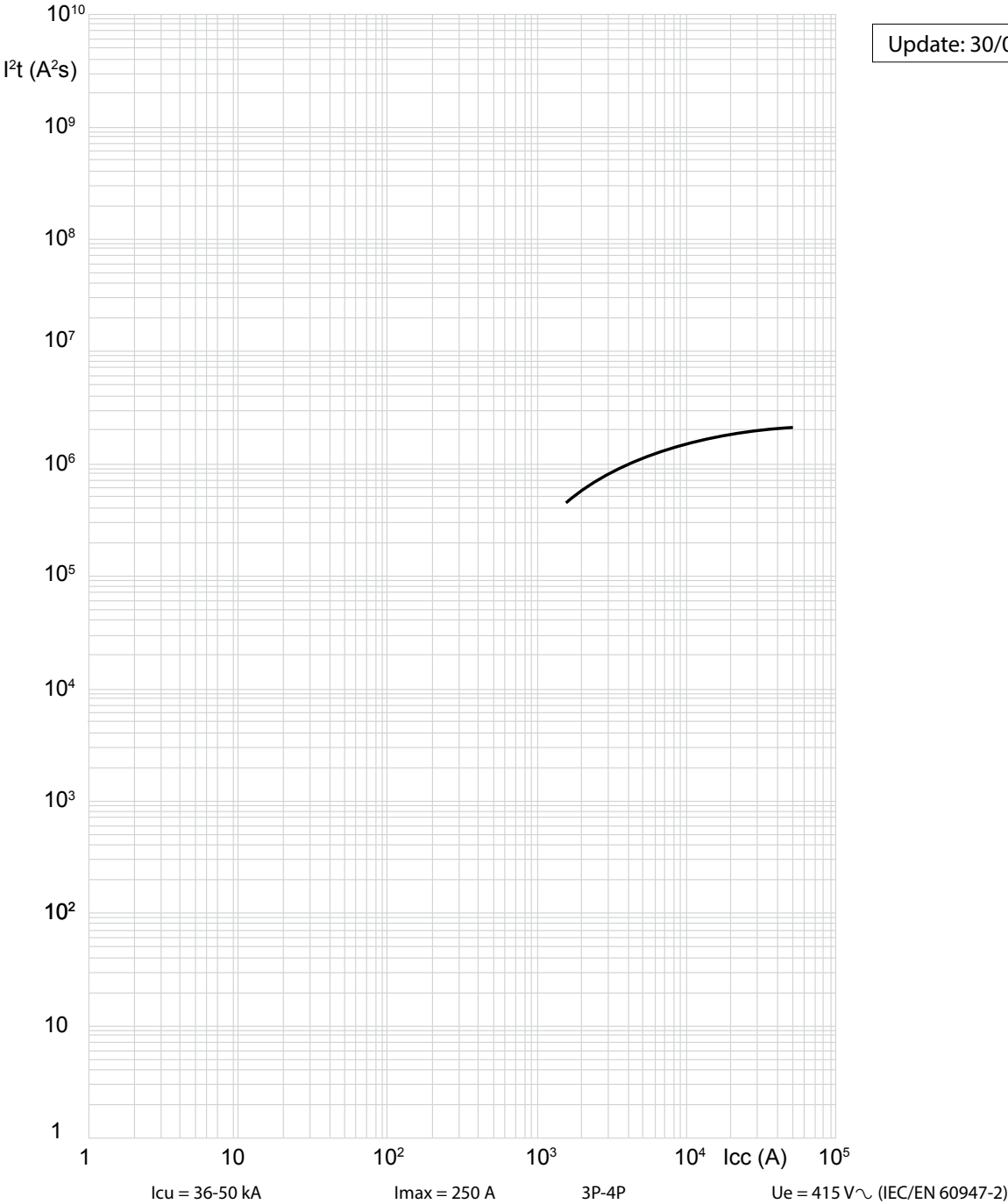
9. CURVES (continued)

■ 9.4 Ground fault curve



9. CURVES (continued)

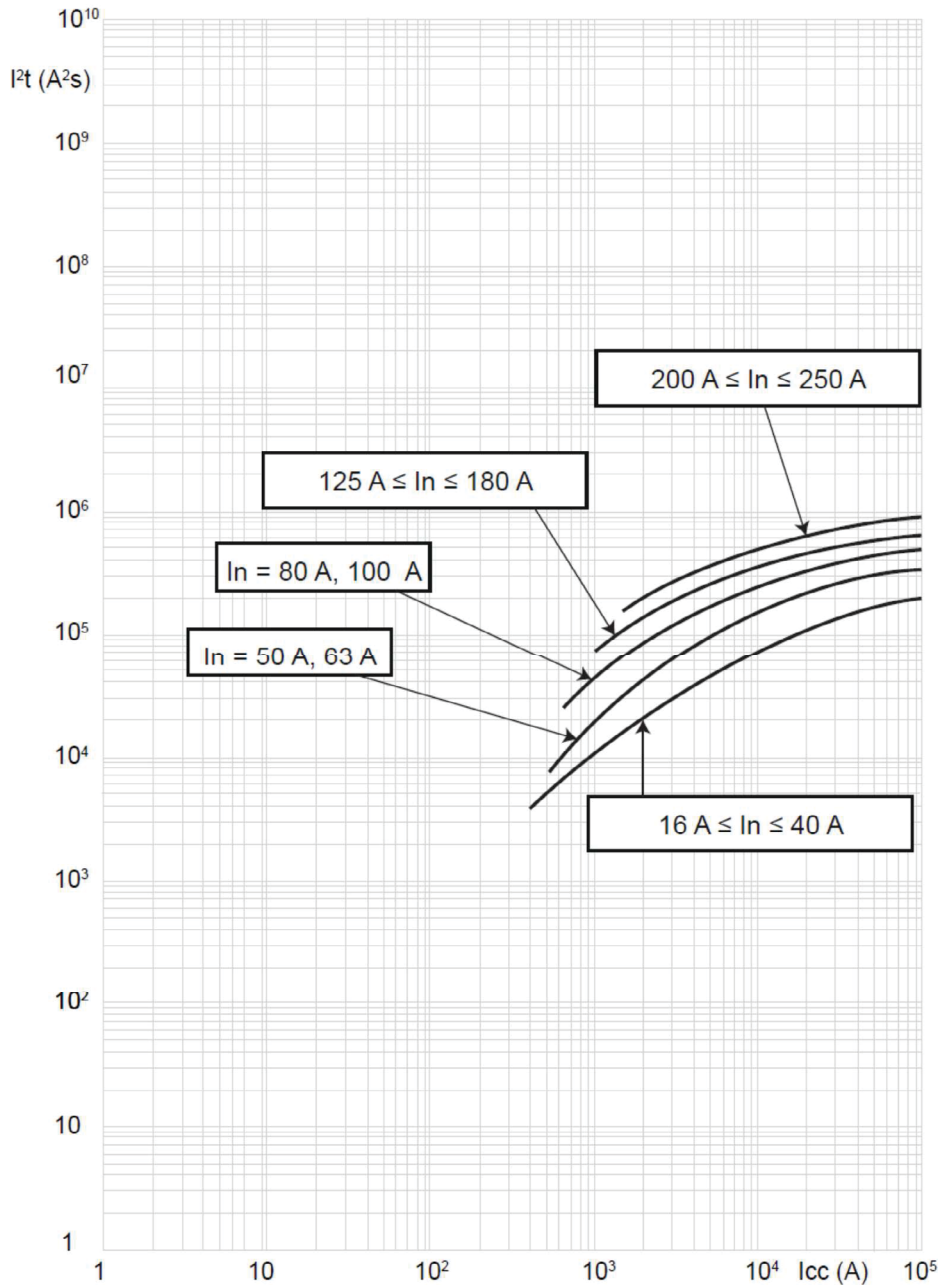
■ 9.5 Pass-through specific energy characteristic curve (breaking capacity  $I_{cu} \leq 50$  kA)



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

9. CURVES (continued)

■ 9.6 Pass-through specific energy characteristic curve (breaking capacity  $I_{cu} > 50$  kA)



$I_{cu} = 70\text{-}100$  kA

$I_{max} = 250$  A

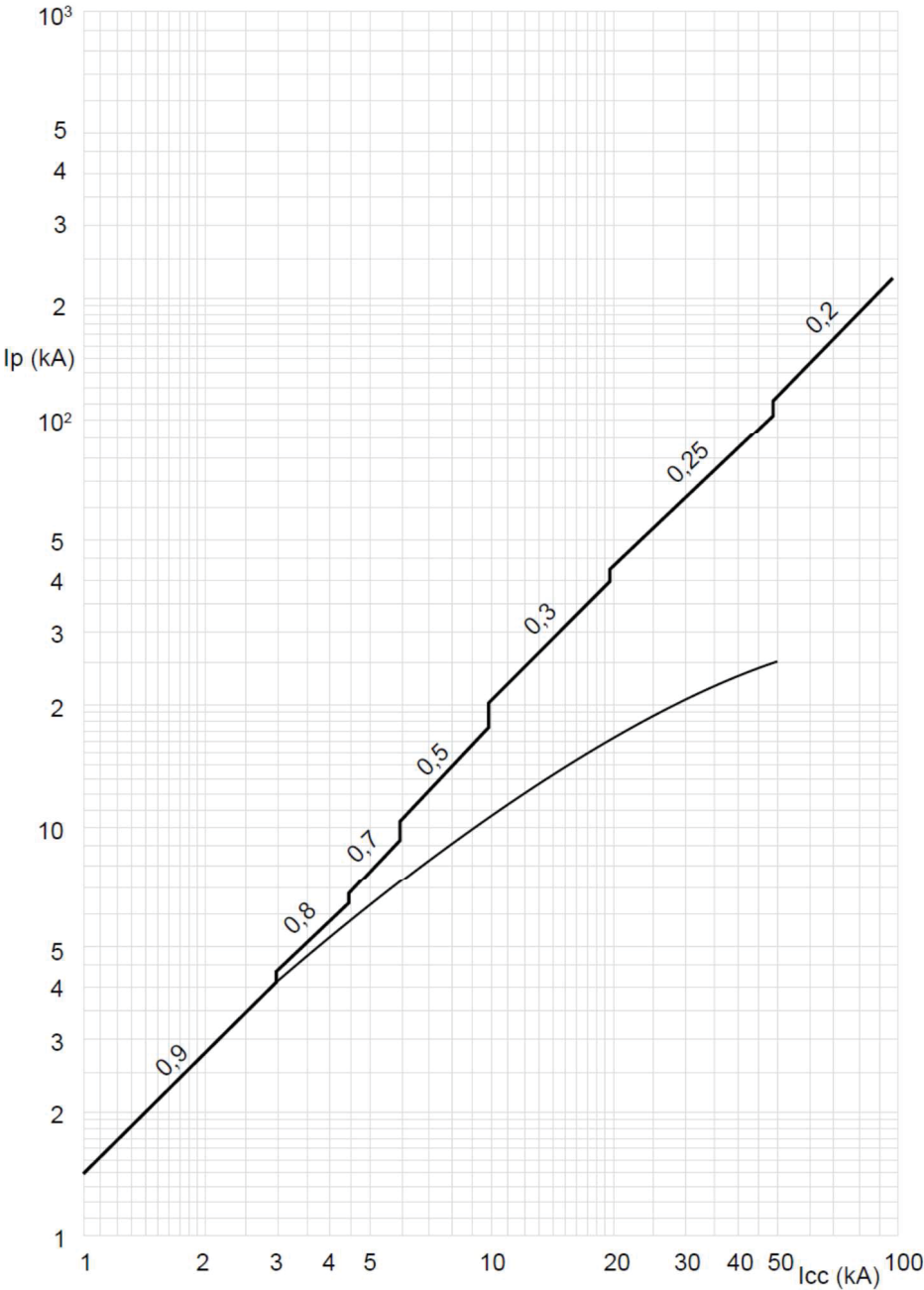
3P-4P

$U_e = 415$  V~ (IEC/EN 60947-2)

| Value        | Description                  |
|--------------|------------------------------|
| $I_{cc}$     | short circuit current        |
| $I^2t$ (A²s) | pass-through specific energy |

9. CURVES (continued)

■ 9.7 Cut-off peak current characteristic curve (breaking capacity  $I_{cu} \leq 50$  kA)



Update: 30/08/2019

$I_{cu} = 36-50$  kA

$I_{max} = 250$  A

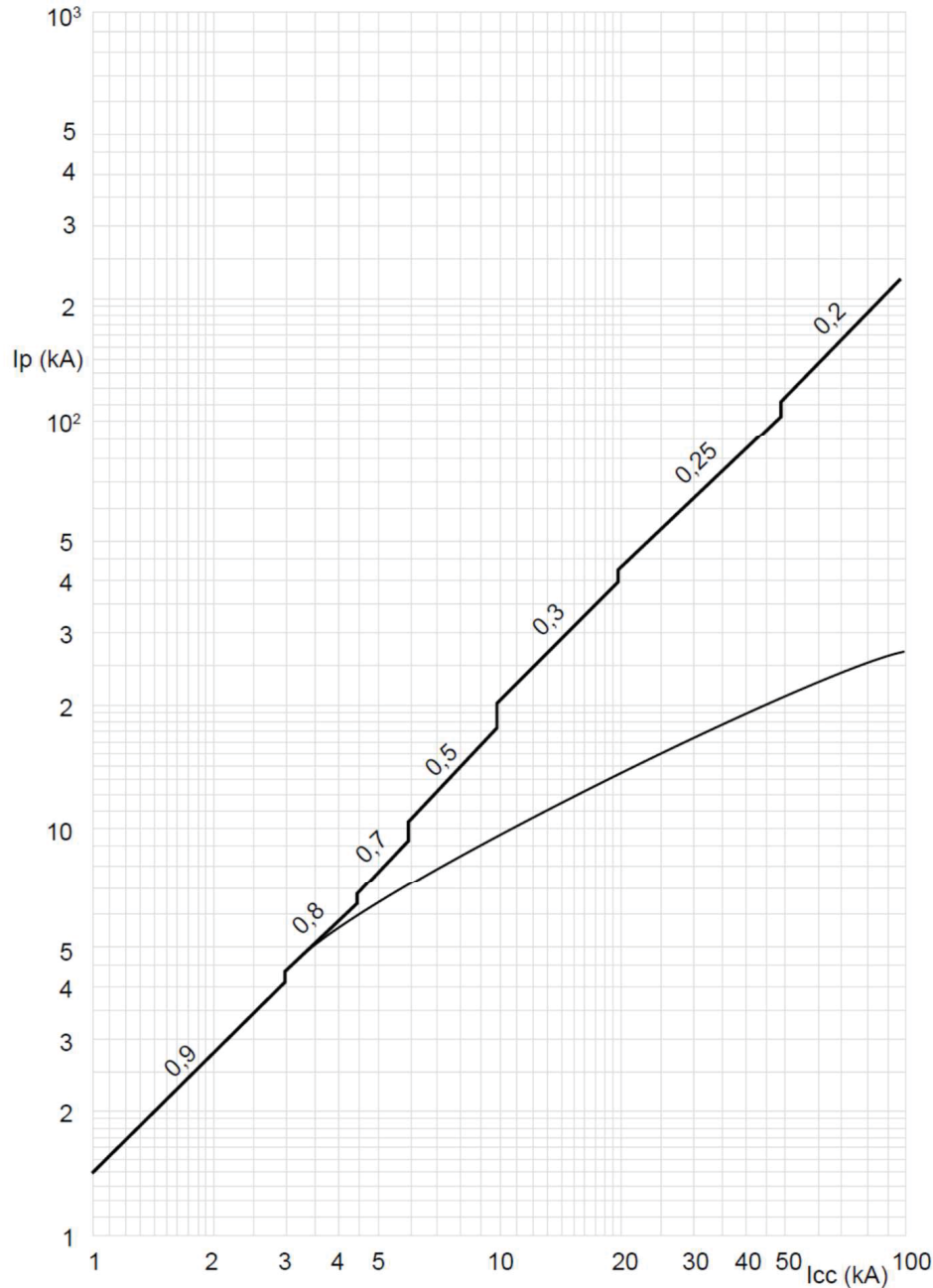
3P-4P

$U_e = 415$  V~ (IEC/EN 60947-2)

| Value    | Description                                             |
|----------|---------------------------------------------------------|
| $I_{cc}$ | estimated short circuit symmetrical current (RMS value) |
| $I_p$    | maximum short circuit peak current                      |

9. CURVES (continued)

■ 9.8 Cut-off peak current characteristic curve (breaking capacity  $I_{cu} > 50 \text{ kA}$ )



$I_{cu} = 70-100 \text{ kA}$

$I_{max} = 250 \text{ A}$

3P-4P

$U_e = 415 \text{ V} \sim (\text{IEC/EN 60947-2})$

| Value    | Description                                             |
|----------|---------------------------------------------------------|
| $I_{cc}$ | estimated short circuit symmetrical current (RMS value) |
| $I_p$    | maximum short circuit peak current                      |

## 10. STANDARDS AND REGULATIONS

Megatiker M3 250 electronic with configurable protection (display version) range of product concerning circuit-breakers exceed compliance with:

- IEC/EN standard 60947-2.
- Certification available by IECEE CB-scheme or LOVAG Compliance scheme.

They respect 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.

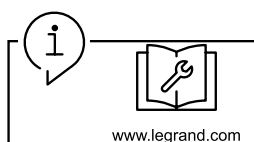
For specific information, please contact Bticino support.

## 11. OTHER INFORMATION

**XLPro<sup>3</sup> 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

**XLPro<sup>3</sup> Tool Selectivity 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<sup>3</sup> 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 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.