

Megatiker M1 thermal magnetic with earth leakage circuit breakers and MS1 switch disconnectors with earth leakage

Reference(s) : **see items in the table**


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1. USE

Megatiker platform has been developed to give a new solution of protection devices for a more precise approach in flow installations in order to offer the correct answer for different project needs.

Megatiker platform provide a complete project approach in premium market segment, offering a range completely suitable for medium power application with high performance breakers in compact dimensions and at a competitive costs.

2. RANGE

Circuit breakers

I _n (A)	16 kA		25 kA	
	4P	3P + N/2	4P	3P + N/2
16	T714E16DB	-	T714B16DB	-
25	T714E25DB	-	T714B25DB	-
40	T714E40DB	-	T714B40DB	-
63	T714E63DB	-	T714B63DB	-
80	-	T714E80DB	-	T714B80D
100	-	T714E100DB	-	T714B100D
125	-	T714E125DB	-	T714B125D
160	-	T714E160DB	-	T714B160D
I _n (A)	36 kA		50 kA	
	4P	3P + N/2	4P	3P + N/2
16	T714F16D	-	T714N16D	-
25	T714F25D	-	T714N25D	-
40	T714F40D	-	T714N40D	-
63	T714F63D	-	T714N63D	-
80	-	T714F80D	-	T714N80D
100	-	T714F100D	-	T714N100D
125	-	T714F125D	-	T714N125D
160	-	T714F160D	-	T714N160D

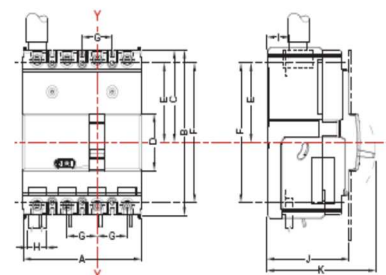
Switches

I _n (A)	4P
160	T714S160DB

3. DIMENSIONS AND WEIGHTS

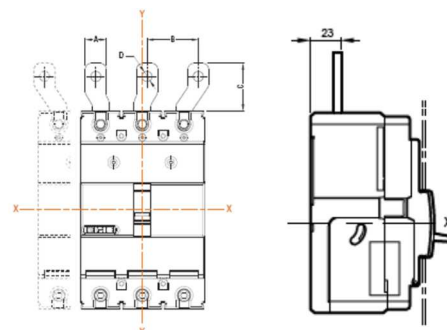
3.1 Dimensions

Fixed version



A	B	C	D	E	F	G	H	I	J	K
108	160	72,5	45	62,5	140	27	19	18	74	97

Fixed version, front terminals

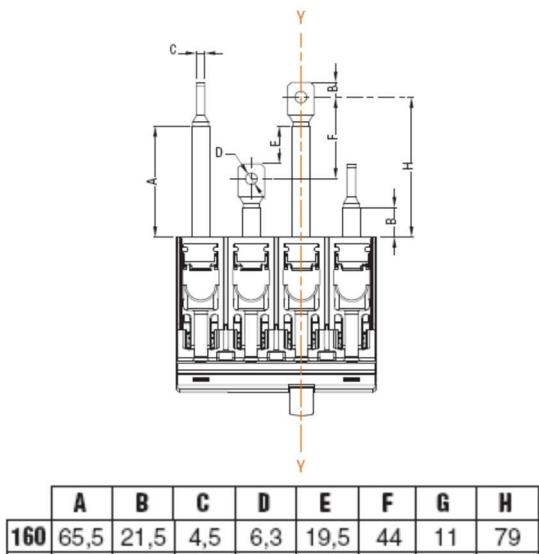


	A	B	C	D
160	17,5	35	41	8,5

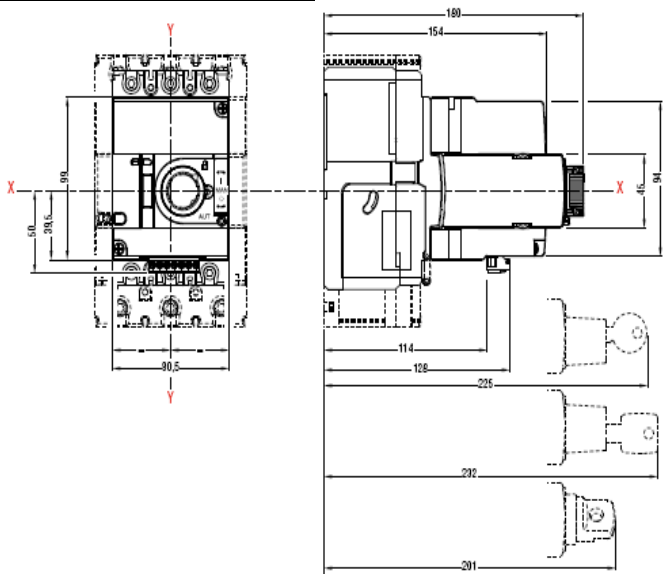
Megatiker M1 thermal magnetic with earth leakage circuit breakers and MS1 switch disconnectors with earth leakage

Reference(s) : see items in the table

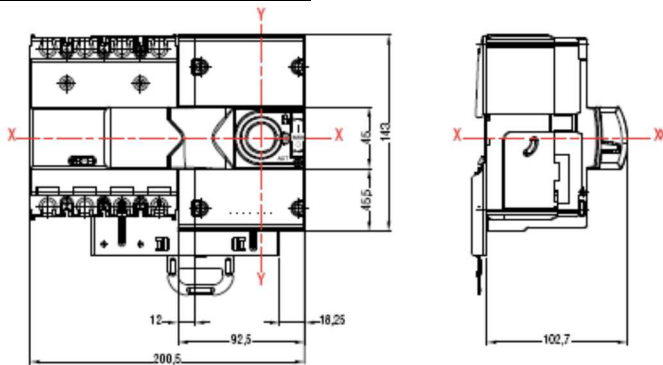
Fixed version, rear terminals



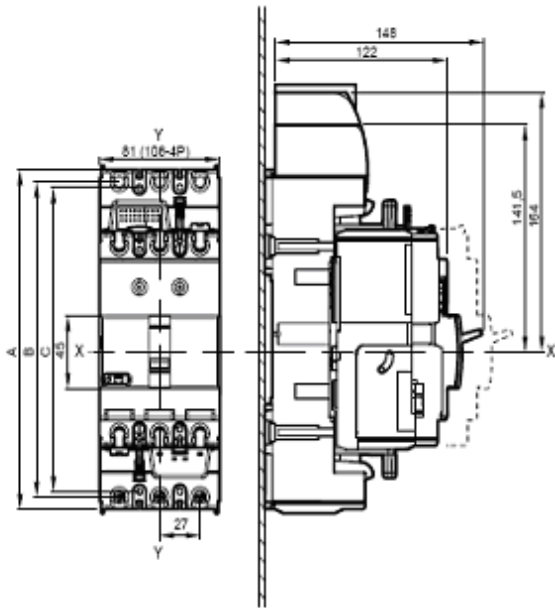
Fixed version, front motor operator



Fixed version, side motor operator



Plug-in version



	A	B	C
DPX ³ 160 + RCD - 4P	238	223	216

3.2 Weights

Configuration	Weights (Kg)
Circuit breaker/switch disconnector	4P 1.89
Direct rotary handle*	0.35
Vari depth rotary handle*	0.72
Interlock*	1.08
Spreader*	0.17
* to add to device weight	

4. OVERVIEW

4.1 Supplied

Supplied with

- fixing screws
- cage terminals (70mm² flexible cable or 95mm² rigid cable)

5. ELECTRICAL CONNECTIONS

5.1 Mounting possibilities

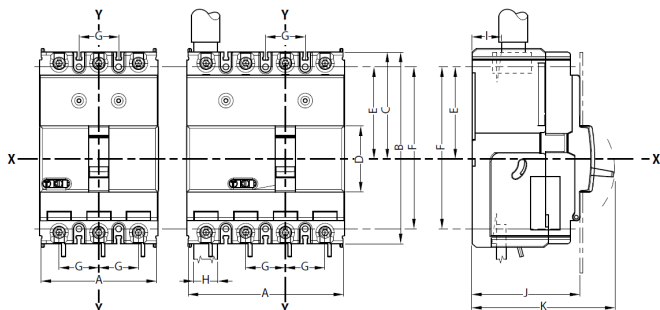
On DIN rail:

- Vertical
- Supply inverter type

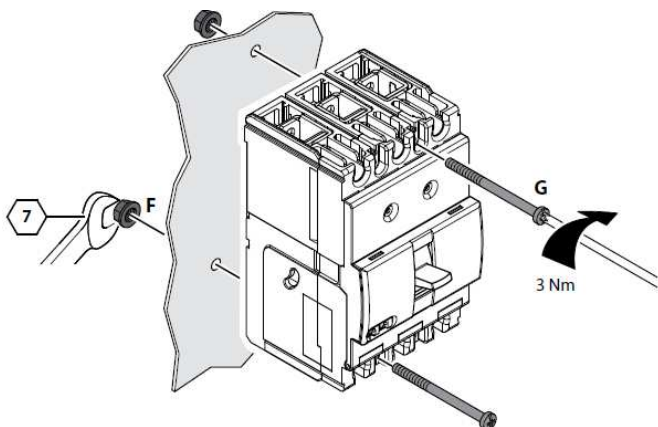
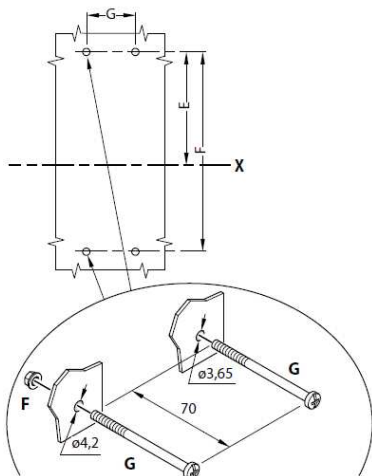
Reference(s) : **see items in the table**

5.2 Mounting

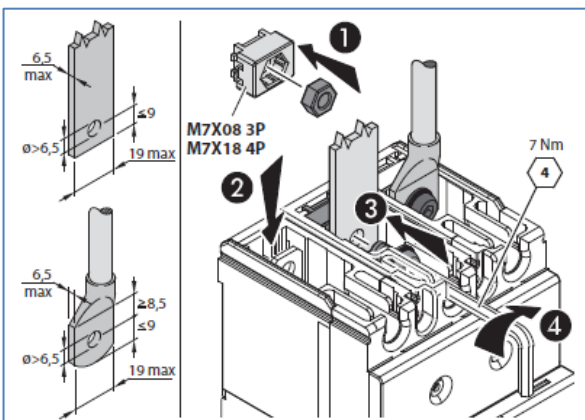
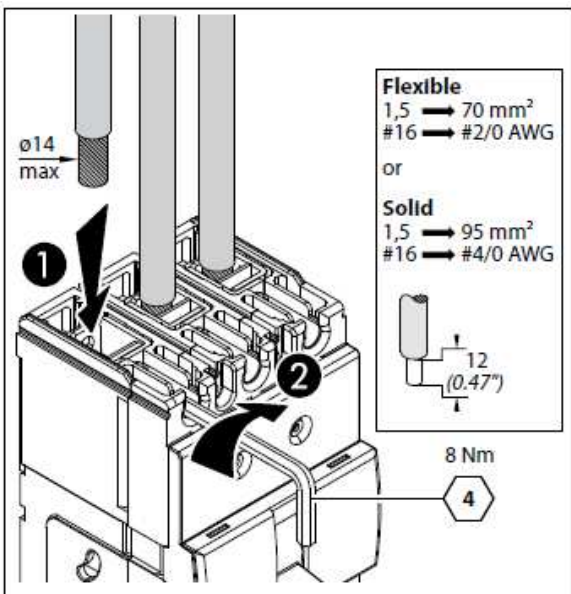
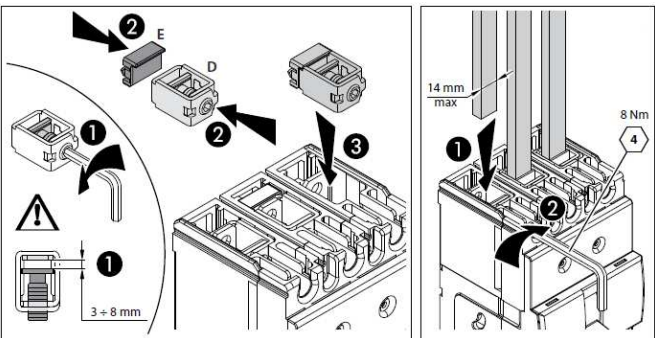
(see instruction sheet for detailed mounting procedures)



	A	B	C	D	E	F	G	H	I	J	K
160 DIFF	108	160	72,5	45	62,5	140	27	19	18	74	97



Busbars/cable lugs and cables:



Megatiker M1 thermal magnetic with earth leakage circuit breakers and MS1 switch disconnectors with earth leakage

Reference(s) : see items in the table

6. ELECTRICAL AND MECHANICAL CHARACTERISTICS

Circuit breaker

Circuit Breaker	Megatiker M1 E/B/F/N (16kA, 25kA, 36kA, 50kA)
Rated current (A)	16, 25, 40, 63, 80, 100, 125, 160
Poles	4
Rated insulation voltage U_i (V)	500
Rated operating voltage (50/60Hz) U_e (V)	500
Rated impulse withstand current U_{imp} (kV)	6
Rated frequency (Hz)	50 - 60
Reference ambient temperature (°C)	40 - 50
Operating temperature (°C)	-25 ÷ 70
Mechanical endurance (cycles)	25000
Mechanical endurance with motor control (cycles)	25000
Electrical endurance at I_n (cycles)	8000
Electrical endurance at 0.5 I_n (cycles)	10000
Utilization category	A
Suitable for isolation	Yes
Type of protection	Thermal-magnetic + earth leakage
Magnetic adjustment	400A (I_n up to 40A); 10 x I_n ($I_n > 40A$)
Thermal adjustment	$(0.8 \div 1) \times I_n$
Neutral protection for 4P version (% I_{nb})	100
Dimensions (W x H x D) (mm)	110 x 160 x 97
Weight (kg)	1.51
Earth leakage type	A - Integrated
Adjustable sensitivity (A)	0.03 - 0.3 - 1 - 3
Adjustable tripping (s)	0 - 0.3 - 1 - 3 (with 0.03 A possible only 0s)

Switch disconnectors

Switch	Megatiker MS1
Uninterrupted nominal current I_n (A)	160
Short-time resistive current I_{cu} (kA) for 1s	2
Rated short-circuit making capacity I_{cm} (kA)	3
Isolated voltage U_i (V AC)	500
Maximum rated operating voltage U_e (V AC/DC)	500
Rated impulse withstand voltage U_{imp} (kV)	8
Utilisation category	AC23A
Nominal frequency (Hz)	50-60
Operating temperature (°C)	-25 ÷ 70
Mechanical endurance (cycles)	25000
Mechanical endurance with motor control (cycles)	25000
Electrical endurance (cycles) at I_n	8000
Electrical endurance (cycles) at 0.5 I_n	10000
Dimensions (W x H x D) (mm) - 4P	110 x 160 x 97
Weight (kg)	1.51

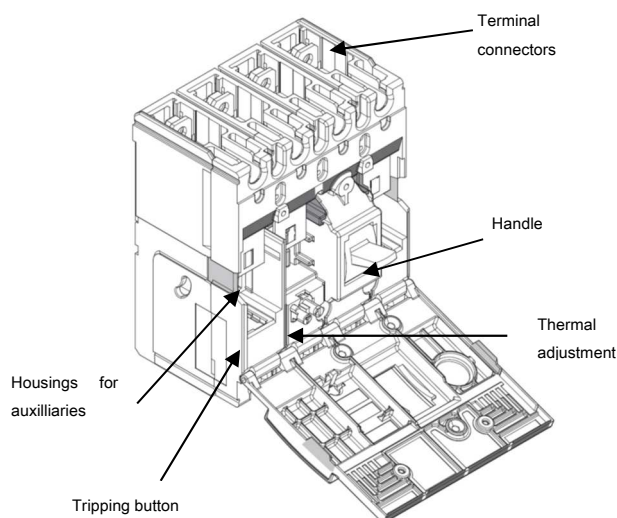
The maximum admissible (absolute) temperature is 125°C
(for detail, see IEC 60947-1 and 60947-2).

Megatiker iproduct line has the possibility to supply both in
“direct” and “reverse” feed.

If “direct”, the word “LINE” needs to be marked on supply
terminals (normally the top ones), as well as “LOAD” has to be
written on the output terminals to be connected to the load
(normally the bottom ones).

If “reverse”, any indications about LINE / LOAD are NOT
expected on the product.

6.1 Main parts constituting the circuit breaker



6.2 Breaking capacity (kA)

		Breaking capacity (kA) & I_{cs}			
		4P	4P	4P	4P
IEC 60947-2	U_e/I_{cu}	E	B	F	N
	220/240 V AC	25	35	50	65
	380/415 V AC	16	25	36	50
	440/460 V AC	10	18	25	30
	480/500 V AC	8	10	12	15
	$I_{cs}(\% I_{cu})$	100	100	100	100
	Rated making capacity under short circuit I_{cm}				
NEMA AB-1	I_{cm} (kA) at 415V	32	53	76	105
	220/240 V AC	25	35	50	65
	480/500 V AC	8	10	12	15

6.3 Rated current (I_n) at 40°C / 50°C

I_n (A)	Assigned current trip			
	thermal		magnetic	
	L1-L2-L3	N	L1-L2-L3	N
16	16	16	400	400
25	25	25	400	400
40	40	40	400	400
63	63	63	630	630
80	80	63	800	800
100	100	63	1000	1000
125	125	80	1250	1250
160	160	100	1600	1600

Megatiker M1 thermal magnetic with earth leakage circuit breakers and MS1 switch disconnectors with earth leakage

Reference(s) : see items in the table

6.4 Load operations

Loads operation	
Rated current (A)	$I_n = 160A$
Opening (N)	45
Closing (N)	78
Reset (N)	75

6.5 Electrodynamic forces

The table below shows an indication of suggested distances to keep between the breaker and the first fixing point of the conductor and bars in order to reduce the effects of the electrodynamic stresses that may be created during a short circuit. In the realization of anchorage system it is recommend the use of isolators suitable for the type of conductor used and the operating voltage.

I_{cc} (kA)	Maximum Distance (mm)
16	400
25	400
36	350
50	300

According to conductor type and bar system (except Legrand bar kits), the choice of the distance to keep is to be calibrated by the installer. Also installer must take into account the weight of the conductors so that this does not affect the electrical junction between the conductor itself and the connection point.

6.6 Power losses per pole under I_n

Circuit breaker

	Power losses per pole (W)							
	I_n (A)							
	16	25	40	63	80	100	125	160
Cage terminals	2.4	4.9	4.9	5.8	8.1	9.9	9.4	12.5

Note: power losses in the table above are referred and measured as described in the standard IEC 60947-2 (Annex G) for circuit-breakers. Values in the table are referred to a single phase.

Switch disconnectors

	Power losses per pole (W)
	I_n (A)
	160
Cage terminals	10

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

6.7 DERATINGS

according to IEC/EN 60947-1

6.7.1 Temperature

Rated current and his adjustment has to be considered relating to a rise or fall of ambient temperature and to a different version or installation conditions. The table below indicates the maximum long-time (LT) protection setting depending on the ambient temperature.

I_n (A)	Temperature T_a (°C)											
	-25	-20	-10	-5	0	10	20	30	40	50	60	70
16	22	21	20	20	20	19	18	16	16	16	14	13
25	34	33	32	31	31	30	28	25	25	25	22	21
40	54	53	51	50	49	48	45	41	40	40	36	34
63	85	83	81	79	78	76	71	65	63	63	58	55
80	108	106	102	100	99	96	90	84	80	80	72	67
100	135	132	128	126	123	120	112	102	100	100	94	90
125	169	165	160	157	154	150	140	127	125	125	112	105
160	216	211	205	201	197	192	179	168	160	160	145	139

6.7.2 Specific condition use

Climatic conditions

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

Pollution degree

for Megatiker M1 circuit breakers, degree 3, according to IEC/EN 60947-2

6.7.3 Altitude

Altitude derating for Megatiker

Altitude (m)	2000	3000	4000	5000
U_e (V)	690	590	520	460
I_n (A) ($T_a = 40^\circ C/50^\circ C$)	I_n	$0.98 \times I_n$	$0.93 \times I_n$	$0.9 \times I_n$

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Reference(s) : see items in the table

7. CONFORMITY

Megatiker range of product concerning circuit-breakers and switch-disconnectors exceed compliance with the IEC/EN standard 60947-2 and 60947-3 respectively. Certification available by IECEE CB-scheme or LOVAG Compliance scheme.

Megatiker respect the European Directives REACh, RoHS, RAEE.

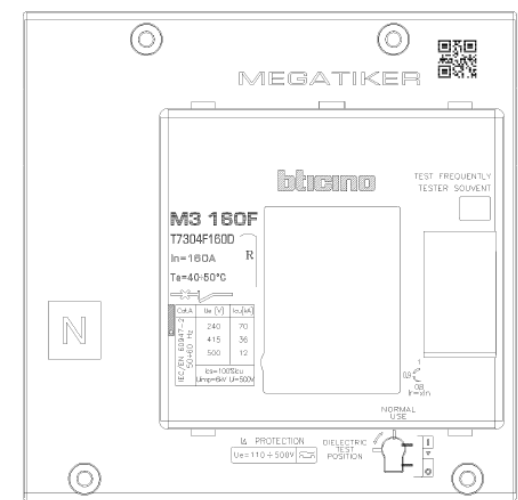
For specific information, please contact Legrand support.

7.1 Marking

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

Product laser label on front

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



Product sticker label on side

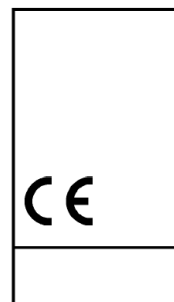
- Manufacturer responsible
- Denomination and type product
- Standard conformity
- Mark/Licence (if any)
- Directive requirements
- Bar code identification product
- Manufacturing Country



Mark sticker label on side

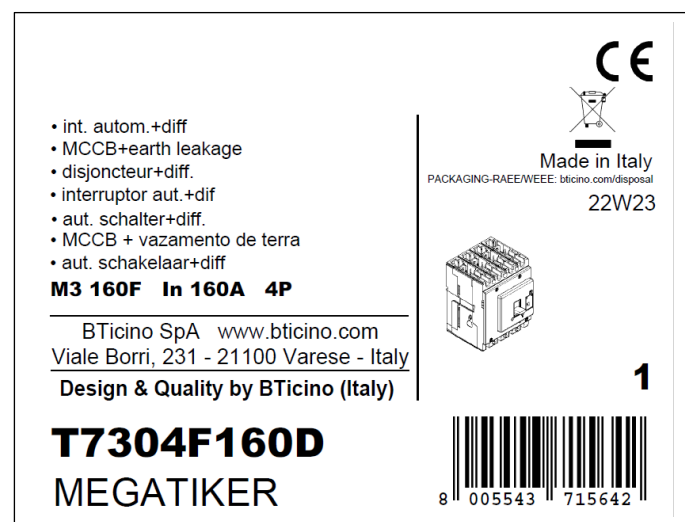
- Product code
- Mark/Licence (if any)
- Country deviation, if any

T7304F160D



Packaging sticker label

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



Megatiker M1 thermal magnetic with earth leakage circuit breakers and MS1 switch disconnectors with earth leakage

Reference(s) : **see items in the table**

8. EQUIPMENTS AND ACCESSORIES

8.1 Releases (for DPX³ 125/250 HP and DPX³ 160/250)

- shunt releases with voltage:

12 Vac and dc	ref. M7S012
24 Vac and dc	ref. M7S024
48 Vac and dc	ref. M7S048
110÷130 Vac	ref. M7S110
220÷277 Vac	ref. M7S230
380÷480 Vac	ref. M7S415

Maximum power = 400 VA / W

- undervoltage releases with voltage:

12 Vac and dc	ref. M7U012
24 Vac and dc	ref. M7U024
48 Vac and dc	ref. M7U048
110÷130 Vac and dc	ref. M7U110
220÷240 Vac	ref. M7U230
277 Vac	ref. M7U277
380÷415 Vac	ref. M7U415
440÷480 Vac	ref. M7U480

Maximum power = 4 VA

Circuit breaker opening time < 50 ms

- time-lag undervoltage releases (800 ms)

Time-lag modules with voltage:

24 V ac/dc	ref. M7000ME/024
230 V ac	ref. M7000MR/230
400 V ac	ref. M7000MR/400

Release *ref. M7UEM*
(to be equipped with a time-lag module 0 261 90/91)

8.2 Auxiliary contact

(for DPX³ 125/250 HP and DPX³ 160/250)

aux contacts (1NC and 1 NO) for all rotary handles *ref. M7R13*

Changeover switch 3A – 250 VAC *ref. M7X01*

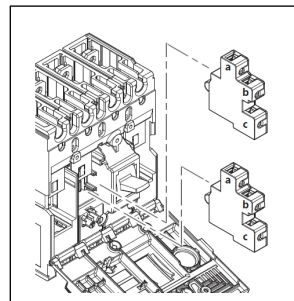
To show the state of the contacts or opening of the Megatiker on a fault:

Auxiliary contact (standard) **OC**
Fault signal **CTR**

Auxiliary contact		
Nominal voltage (V _n)	V (AC or DC)	24 to 250
Intensity (A)	24 V DC	5
	48 V DC	1.7
	110 V DC	0.5
	230 V DC	0.25
	110 V AC	4
	230/250 V AC	3

Configurations:

Megatiekr M1 → 1 auxiliary contact + 1 fault signal



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

8.3 Rotary handles

Direct

- Megatiker direct rotary handle *ref. M7R01*
- Megatiker emergency direct rotary handle *ref. M7R03*

Vari-depth handle IP55

- Megatiker direct rotary handle *ref. M7R01*
- Megatiker emergency direct rotary handle *ref. M7R03*

Locking accessories

- Ronis type flat key (cod. ABA90GEL6149) for direct rotary handle *ref. M7R07*
- Profalux type star key (cod. HBA90GPS6149) for direct rotary handle *ref. M7R08*
- Ronis type flat key (cod. ABA90GEL6149) for vari-depth handle *ref. M7R10*
- Profalux type flat key (cod. HBA90GPS6149) for vari-depth handle *ref. M7R11*

8.4 Mechanical accessories

Insulated shields (phase barriers)

- Set of 36 *ref. M7X04*

Sealable terminal shields

- sealable terminal shield for rear terminals 4P *ref. M7X02*
- sealable terminal shield for front spreaders 4P *ref. M7X06*

Padlocks

- Megatiker padlock accessory for handle ("open" position) *ref. M7X02*

Interlock

- Megatiker interlock for fixed version *ref. M7X03*

Megatiker M1 thermal magnetic with earth leakage circuit breakers and MS1 switch disconnectors with earth leakage

8.5 Connection accessories

Cage terminals

- terminals for Cu cables kit (3) - flex 1x70mm², rigid 1x95mm², bar/cable lug 14mm ref. M7X27
- terminals for Cu cables kit (4) - flex 1x70mm², rigid 1x95mm², bar/cable lug 14mm ref. M7X37
- high capacity terminals for Al or Cu cables kit (3) - flex 1x120mm², rigid 1x150mm², bar/cable lug 18mm ref. M7X07
- high capacity terminals for Al or Cu cables kit (4) - flex 1x120mm², rigid 1x150mm², bar/cable lug 18mm ref. M7X17
- rack screw and nut for cable lug kit (3) ref. M7X08
- rack screw and nut for cable lug kit (4) ref. M7X18

Front spreaders

- Megatiker front spreaders for 4P (set of 4) ref. M7A02

Cage terminal use specifications

Megatiker M1							
Type of cage terminal	Cable standard suggested cross section (mm²)*			Dimensions limits of cable for cage terminals			
	In (A)	Cu	Al	MIN cross section (mm²)		MAX cross section (mm²)	
				Flexible	Rigid	Flexible	Rigid
Standard	16	2,5	4	2,5	4	70	95
	20	2,5	4				
	25	4	6				
	32	6	10				
	40	10	16				
	50	10	16				
	63	16	25				
	80	25	35				
	100	35	\				
	125	50	\				
High capacity	160	70	\	35	35	95	120
	80	25	35				
	100	35	50				
	125	50	70				
High capacity	160	70	\	35	35	95	120
	80	25	35				
	100	35	50				
	125	50	70				

8.6 Mounting on rail fixing plate

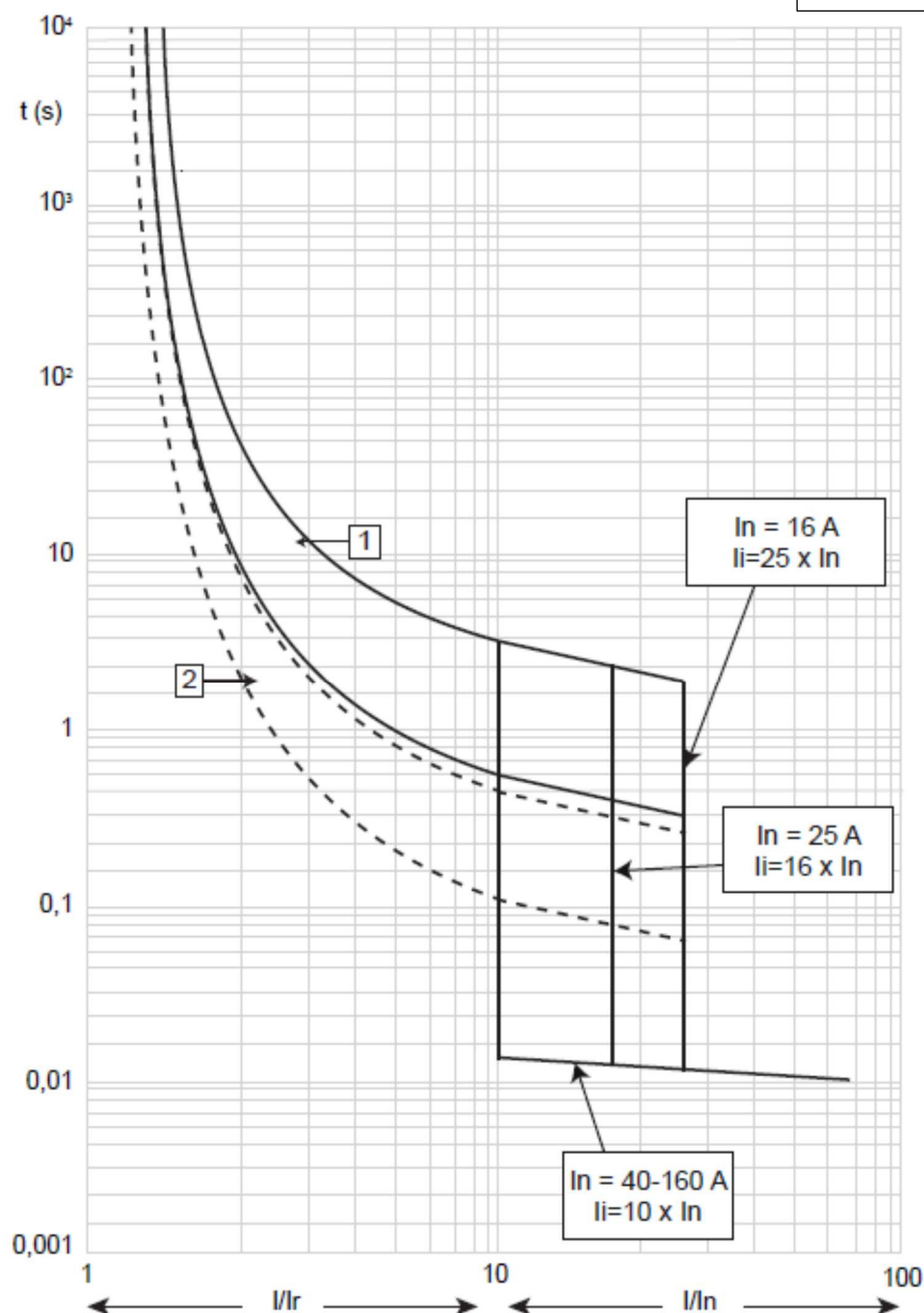
- Megatiker M1 4P with earth leakage module ref. M7X15

Megatiker M1 thermal magnetic with earth leakage circuit breakers and MS1 switch disconnectors with earth leakage

9. CURVES

9.1 Thermal magnetic tripping curve

Update: 10/02/2017

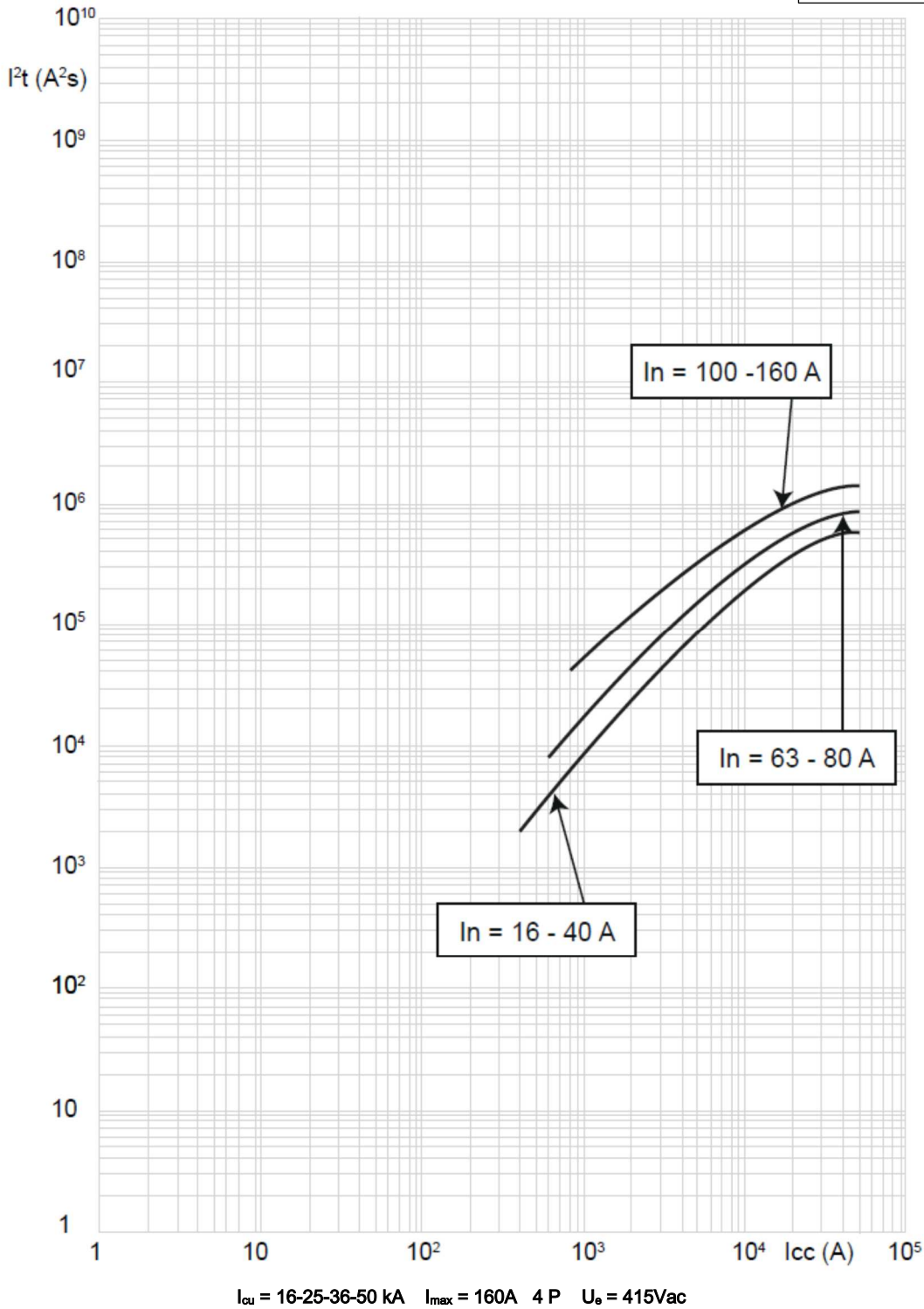

 $I_{cu} = 16-25-36-50 \text{ kA}$ $I_{max} = 160 \text{ A}$ 4 P $U_o = 415 \text{ Vac}$

Value	Description
t	time
I	current
I_n	rated current

Megatiker M1 thermal magnetic with
earth leakage circuit breakers and MS1
switch disconnectors with earth leakage

9.2 Pass-through specific energy characteristic curve

Update: 10/02/2017

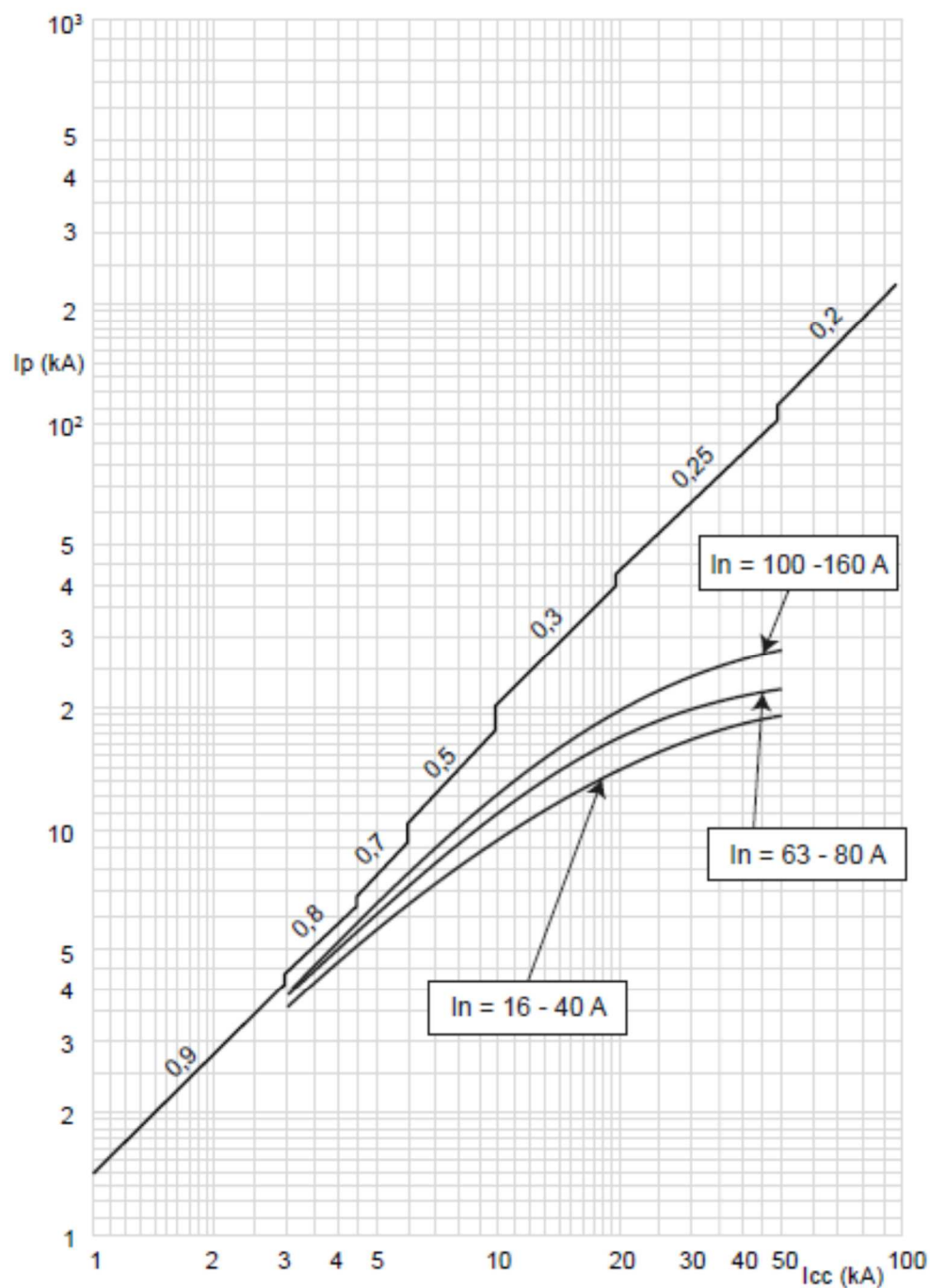


Value	Description
I_{cc}	short circuit current
I^2t (A ² s)	pass-through specific energy

Megatiker M1 thermal magnetic with earth leakage circuit breakers and MS1 switch disconnectors with earth leakage

9.3 Cut-off peak current characteristic curve (kA)

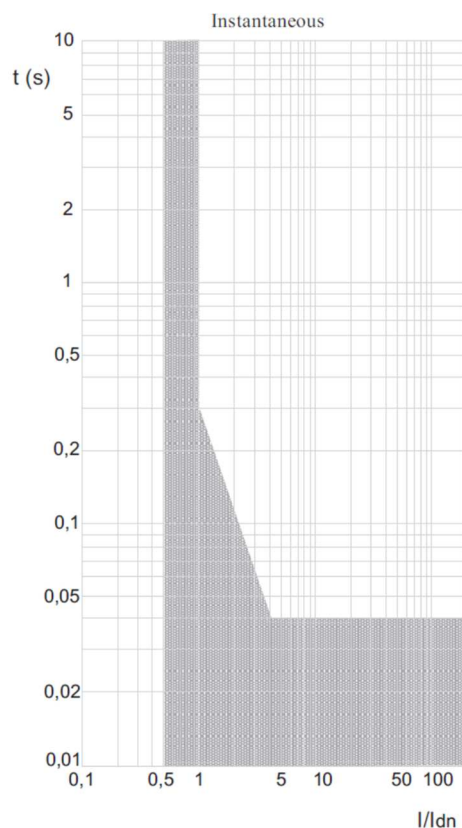
Update: 10/02/2017


 $I_{cu} = 16-25-36-50 \text{ kA}$ $I_{max} = 160 \text{ A}$ 4 P $U_e = 415 \text{ Vac}$

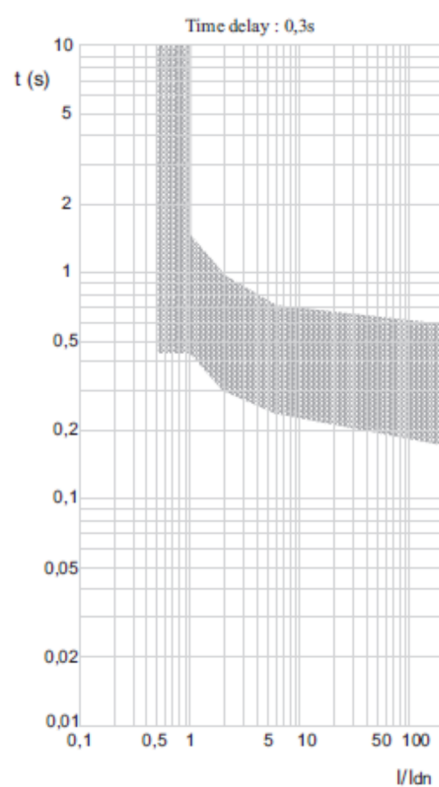
Value	Description
I_{cc}	estimated short circuit symmetrical current (RMS value)
I_p	maximum short circuit peak current
	maximum prospective short circuit peak current corresponding at the power factor
	maximum real peak short circuit current

Megatiker M1 thermal magnetic with earth leakage circuit breakers and MS1 switch disconnectors with earth leakage

9.4.1 Earth leakage curve, instantaneous

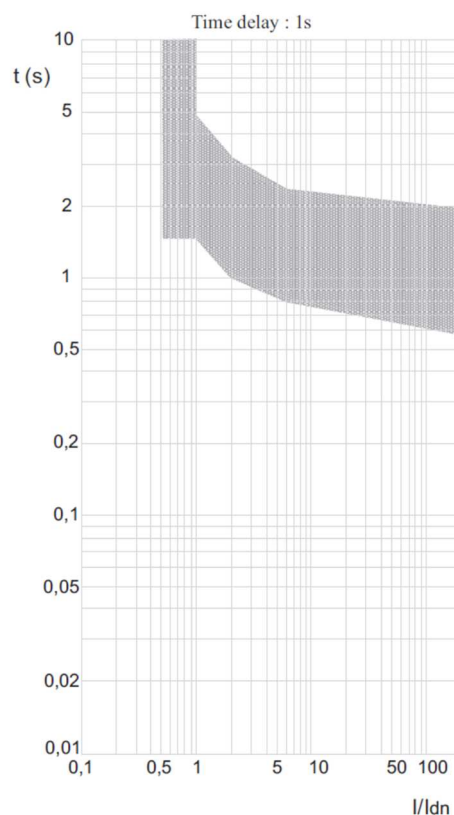


9.4.2 Earth leakage curve, time delay = 0.3 s

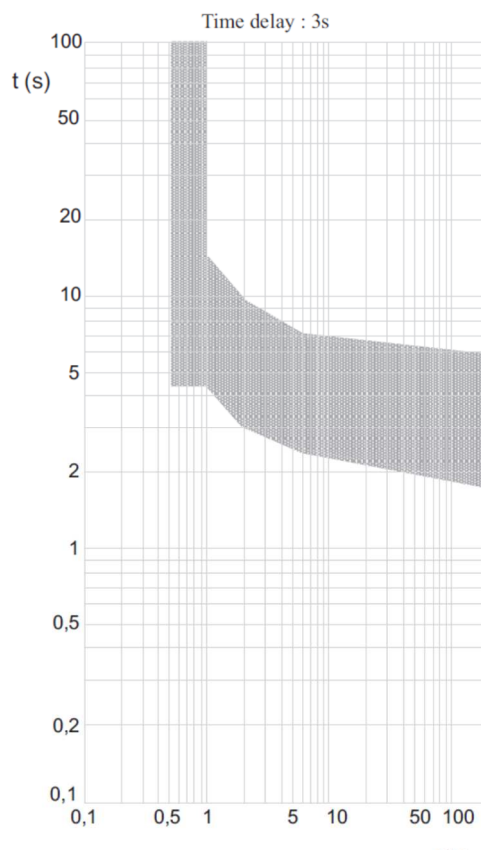


Megatiker M1 thermal magnetic with earth leakage circuit breakers and MS1 switch disconnectors with earth leakage

9.4.3 Earth leakage curve, time delay = 1 s



9.4.4 Earth leakage curve, time delay = 3 s



Megatiker M1 thermal magnetic with earth leakage circuit breakers and MS1 switch disconnectors with earth leakage

A) Derating Temperature and configurations

Fixed version		Ambient temperature									
		30 °C		40 °C		50 °C		60 °C		70 °C	
		I_{max} (A)	I_r / I_n	I_{max} (A)	I_r / I_n	I_{max} (A)	I_r / I_n	I_{max} (A)	I_r / I_n	I_{max} (A)	I_r / I_n
Megatiker M1 + RCD fixed - vertical installation	Flexible cable	160	1	160	1	144	0.9	128	0.8	104	0.65
	Flexible cable + sealable terminal shields	160	1	160	1	144	0.9	120	0.75	96	0.6
	Semirigid cable	160	1	160	1	144	0.9	128	0.8	104	0.65
	Semirigid cable + sealable terminal shields	160	1	160	1	144	0.9	120	0.75	96	0.6
	Clamps, flexible cable	160	1	160	1	144	0.9	128	0.8	104	0.65
	Clamps, flexible cable + sealable terminal shields	160	1	160	1	144	0.9	120	0.75	96	0.6
	Clamps, semirigid cable	160	1	160	1	144	0.9	128	0.8	104	0.65
	Clamps, semirigid cable + sealable terminal shields	160	1	160	1	144	0.9	120	0.75	96	0.6
	Cage terminals, flexible cable	160	1	152	0.95	128	0.8	120	0.75	96	0.6
	Cage terminals, semirigid cable	160	1	152	0.95	128	0.8	120	0.75	96	0.6
	Spreaders, flexible cable	160	1	160	1	136	0.85	120	0.75	96	0.6
	Spreaders, semirigid cable	160	1	160	1	136	0.85	120	0.75	96	0.6
	Rear terminals, flexible cable + sealable terminal shields	160	1	160	1	136	0.85	112	0.7	88	0.55
	Rear terminals, semirigid cable + sealable terminal shields	160	1	160	1	136	0.85	112	0.7	88	0.55
	Flexible cable	152	0.95	152	0.95	128	0.8	112	0.7	96	0.6
	Flexible cable + sealable terminal shields	152	0.95	144	0.9	128	0.8	112	0.7	88	0.55
Megatiker M1 + RCD fixed - horizontal installation	Semirigid cable	152	0.95	152	0.95	128	0.8	112	0.7	96	0.6
	Semirigid cable + sealable terminal shields	152	0.95	144	0.9	128	0.8	112	0.7	88	0.55
	Clamps, flexible cable	152	0.95	152	0.95	128	0.8	112	0.7	96	0.6
	Clamps, flexible cable + sealable terminal shields	152	0.95	144	0.9	128	0.8	112	0.7	88	0.55
	Clamps, semirigid cable	152	0.95	152	0.95	128	0.8	112	0.7	96	0.6
	Clamps, semirigid cable + sealable terminal shields	152	0.95	144	0.9	128	0.8	112	0.7	88	0.55
	Cage terminals, flexible cable	144	0.9	136	0.85	120	0.75	104	0.65	88	0.55
	Cage terminals, semirigid cable	144	0.9	136	0.85	120	0.75	104	0.65	88	0.55
	Spreaders, flexible cable	152	0.95	144	0.9	128	0.8	112	0.7	88	0.55
	Spreaders, semirigid cable	152	0.95	144	0.9	128	0.8	112	0.7	88	0.55
	Rear terminals, flexible cable + sealable terminal shields	144	0.9	128	0.8	120	0.75	104	0.65	80	0.5
	Rear terminals, semirigid cable + sealable terminal shields	144	0.9	128	0.8	120	0.75	104	0.65	80	0.5

Data indicated in this document refers exclusively to test conditions according to product standards, unless otherwise indicated in the documentation.

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