

# TemBreak<sup>PRO</sup>

## B Model Moulded Case Circuit Breaker

Basic Electronic Trip Unit from 250A up to 1600A

USER MANUAL



Version  
1.4.1

## Using this manual

### Safety Precautions

#### Authorised Personnel Only

The product or system described in this documentation must be installed, operated and maintained by qualified personnel only. NHP or Terasaki accept no responsibility for the consequences of the use of this equipment by unqualified personnel.

A qualified person is one with the necessary skills and knowledge of the construction and operation of the installation of electrical equipment and has been trained to identify and avoid risks.

#### Appropriate use of NHP / Terasaki products

NHP / Terasaki products are intended to be used only for the applications described in the catalogue and technical documentation, which is dedicated to them. If products and components from other manufacturers are used, they must be recommended or approved by NHP or Terasaki.

Appropriate use of NHP / Terasaki products during transport, storage, installation, assembly, commissioning, operation and maintenance is necessary to ensure safe operation and without any problems.

The permissible ambient conditions must be met. The information contained in the technical documentation must be observed.

#### Publication of responsibility

The contents of this document have been reviewed to ensure that the reliability of the information is correct at time of publication.

NHP or Terasaki are not responsible for printing or damage resulting from errors. NHP or Terasaki reserve the right to make corrections and changes needed in subsequent edition.

#### Warnings and notes

This documentation contains safety instructions that you must follow for your personal safety and to prevent damage to property.

Safety instructions, referring to your personal safety are reported in the literature by a safety alert symbol.

Safety warning symbols and the words below are classified according to the degree of risk.



**WARNING:** Indicates an imminently hazardous situation which, if it cannot be avoided, will result in death or serious injury.



**WARNING:** Indicates a potentially hazardous situation which, if it cannot be avoided, can result serious injury or death.



**WARNING:** Indicates a potentially hazardous situation which, if it cannot be avoided, may cause minor or moderate injury.



**Notice:** Indicates a warning of property damage and can also indicate important operating and especially useful information on the product, that it should pay particular attention to efficient and safe operation.

## Summary of Changes

This section highlights the details of changes made since the previous issue of this document.

The versioning convention used to track changes in this document follows the structure **Vx.y.z** where:

**x:** Major revision, where extensive changes are made which is generally incompatible with the previous version. Such changes may include new products and/or features, or removal of information which is no longer relevant or applicable to the previous version

**y:** Minor revision, where changes made do not change the overall scope of the previous version, but may include additional information which complements or corrects the previous version, or provides additional clarity on an existing topic.

**z:** Patch version, where small changes are made to correct minor errors or adjust existing text, charts, figures and/or images, and which do not add or remove information from the previous version. Example changes may include spelling corrections, image re-sizing and adjustments, updated images, etc.

Version	Publication date	Changes	By
V 1.0.0	3-May-2021	Initial release	D.NAT
V 1.1.0	28-May-2021	Correction to Product Information tables, rewording to Watts Loss tables, Label Identification section added, typo in Temperature Rating tables removed and aligned headings with TD-001-EN, added references and links to, TD-001-EN, TD-002-EN, TD-003-EN, & Type2_TBpro_MotorStartTables-TD-001-EN	N.ALEX
V 1.2.0	23-August-2021	Changes Part Number Break down, fix to Available MCCBs in the TemBreak <i>PRO</i> range, fix to Product Information tables, correction to Annex B neutral adjustments, B250_BE – In 160 A curves to Annex B, fixed typo on B400 K factor, added long time equation table, added Resistance watts loss table to Annex E, added lower In trip unit versions of the B250 to Annex F	N.ALEX
V 1.2.1	3-September	Fixed link error on NP, corrected typo on B800 Dimensions	N.ALEX
V 1.3.0	6-May-2022	Fixed errors to derived k factors, expanded on further long-time curve calculations, typo in Annex headings	N.ALEX
V 1.4.0	26-July-2022	Additional information added to Internal Accessories, corrections to Internal Accessories descriptions Annex G added, corrected Table of Contents error, 4 <sup>th</sup> CT information added	N.ALEX
V 1.4.1	28-July-2022	Fixed table formatting issues	N.ALEX

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## Introduction

This user manual describes the TemBreak *PRO* B Model Basic Electronic (**B\_BE**) MCCB's MCCB features and instructions for use, and provides information for commissioning and configuring.

Some additional features may require the use of additional products and accessories to achieve full utilization of that feature. Refer the respective User Manual in the TemBreak *PRO* series for additional information on the respective product.



**Notice:** Not all MCCBs in the TemBreak *PRO* series are identical. This document specifically covers the B\_BE series MCCB only. Refer to the respective TemBreak *PRO* User Manual (e.g. B\_SE, P\_SE, etc.) for information and instructions on other models in the TemBreak *PRO* range.

### Who Should Use This Manual?

This manual aims to provide users, electricians, panel builders and maintenance personnel, with the technical information required for commissioning and operation of the NHP / Terasaki TemBreak *PRO* B\_BE MCCB.

Users of this document must have at minimum a basic understanding of electrical circuit protection topics including (but not limited to):

- Power distribution and reticulation
- Circuit protection devices
- Fault currents
- Arc faults
- Temperature rise and thermal derating of switchgear

### Additional resources

The following resources contain additional information which should be read in conjunction with this document.

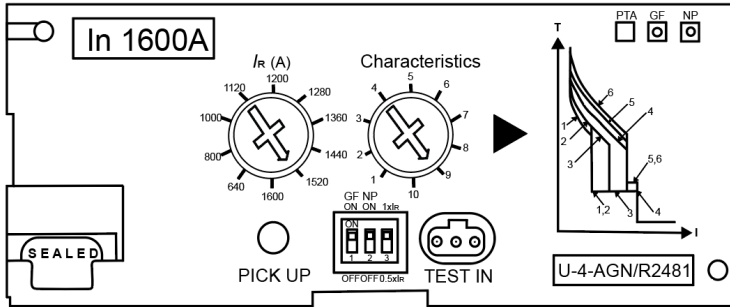
Resource	Description
NHP/Terasaki TemBreak <i>PRO</i> B_BE Installation Instructions B250_3_BE-IN-001-EN B250_4_BE-IN-001-EN B400_3_BE-IN-001-EN B400_4_BE-IN-001-EN B800_3_BE-IN-001-EN B800_4_BE-IN-001-EN B1000_3_BE-IN-001-EN B1000_4_BE-IN-001-EN B1250_3_BE-IN-001-EN B1250_4_BE-IN-001-EN B1600_3_BE-IN-001-EN B1600_4_BE-IN-001-EN	Information on installing, mounting, and wiring the TemBreak <i>PRO</i> B Model Basic Electronic MCCB.  <u>COMING SOON</u>
Technical Data – Cascading and Selectivity <a href="#">TBP-TD-002-EN</a>	Cascading and Selectivity tables for TemBreak <i>PRO</i> Moulded Case Circuit Breakers with Din-T, Din-Safe, & MOD6 MCBs/RCBOs
Technical Data – Coordination <a href="#">TBP-TD-003-EN</a>	Socomec Backup Tables with TemBreak <i>PRO</i> Moulded Case Circuit Breakers
Technical Data – Type 2 Coordination <a href="#">Type2_TBpro_MotorStartTables-TD-001-EN</a>	Type 2 Coordination for Premium Efficiency Motor Starters with TemBreak <i>PRO</i> Moulded Case Circuit Breakers

## Introduction

### Terminology and Abbreviations

Abbreviation	Description	Abbreviation	Description
<b>ACP</b>	Auxiliary Communications port: Plug for Smart auxiliary / alarm contact block	<b>MIP</b>	Maintenance Interface Port: Plug for temporary connection to OCR testing, servicing, and maintenance tools
<b>AL</b>	Alarm: An auxiliary contact indicating trip status	<b>N</b>	Neutral
<b>ASCII</b>	American Standard Code for Information Interchange	<b>NP</b>	Neutral Protection
<b>AX or AUX</b>	Auxiliary: Auxiliary contact indicating open / closed	<b>OAC</b>	Optional Alarm Contact: Connection connector optional alarm output contact
<b>BE</b>	Basic Electronic Trip Unit (dial type, <b>LSI</b> and <b>LSIG</b> )	<b>OCR</b>	Over Current Relay
<b>CCW</b>	Connected Components Workbench software	<b>P or PTA</b>	Pre-trip Alarm
<b>CIP</b> <sup>1 2</sup>	<sup>1</sup> Communication Interface Port: Plug for control power and data for use with the TPED remote display and TPCM communication module  <sup>2</sup> Common Industrial Protocol	<b>PDU</b>	Protocol Data Unit
<b>CRC</b>	Cyclic Redundancy Check – error-detecting code used at the end of each Modbus message	<b>PELV</b>	Protected Extra Low Voltage (earthed system)
<b>dec</b>	Decimal (base-10) numbering system	<b>PTA</b>	Pre-Trip Alarm: is a programmable output contact to advise when a trip may be imminent.
<b>DINT</b>	Signed Double Integer datatype (4 bytes or 32 bits in length)	<b>RTU</b>	Remote Terminal Unit
<b>EIPM</b>	TemBreak <i>PRO</i> Ethernet/IP Module	<b>S or STD</b>	Short Time Delay Protection
<b>FF</b>	Fixed Thermal and Fixed Magnetic	<b>SE</b>	Smart Energy Trip Unit
<b>FM</b>	Fixed Thermal and Adjustable Magnetic	<b>SELV</b>	Separated Extra Low Voltage
<b>G or GF</b>	Ground Fault Protection	<b>SN</b>	Solid Neutral
<b>hex</b>	Hexadecimal (base-16) numbering system	<b>SSID</b>	Service Set Identifier (name of the Wi-Fi wireless network)
<b>I or INST</b>	Instantaneous Protection	<b>STR</b>	String datatype
<b>IEC</b>	International Electrotechnical Commission	<b>TCP</b>	Transmission Control Protocol
<b>IEEE</b>	Institute of Electrical and Electronics Engineers	<b>TF</b>	Adjustable Thermal and Fixed Magnetic
<b>I<sub>g</sub></b>	Ground Fault Protection Current	<b>THD</b>	Total Harmonic Distortion
<b>I<sub>i</sub></b>	Instantaneous Protection Current	<b>TM</b>	Adjustable Thermal Magnetic
<b>I<sub>n</sub></b>	Rated Current	<b>TPCM</b>	TemCom <i>PRO</i> Communication Module
<b>I<sub>N</sub></b>	Neutral Protection Current	<b>TPED</b>	TemView <i>PRO</i> External Display
<b>INT</b>	Signed Integer datatype (2 bytes or 16 bits in length)	<b>t<sub>r</sub> / t<sub>R</sub></b>	LTD Time delay
<b>IP</b>	International Protection (Ingress Protection)	<b>t<sub>sd</sub></b>	STD Time delay
<b>I<sub>r</sub> / I<sub>R</sub></b>	LTD Protection Current	<b>t<sub>tsp</sub></b>	Thermal Self-Protection Time delay
<b>I<sub>sd</sub></b>	STD Protection Current	<b>UDINT</b>	Unsigned Integer (2 bytes or 16-bits in length)
<b>I<sub>tsp</sub></b>	Thermal Self-Protection Current	<b>UINT</b>	Unsigned Integer (2 bytes or 16 bits in length)
<b>L or LTD</b>	Long Time Delay Protection	<b>ULINT</b>	Unsigned Long Integer datatype (8 bytes or 64 bits in length)
<b>LCD</b>	Liquid Crystal Display (LCD)	<b>URLs</b>	Uniform Resource Locator (address of an Internet website)
<b>LED</b>	Light Emitting Diode	<b>WORD</b>	2 bytes or 16-bits of data
<b>LINT</b>	Signed Long Integer datatype (8 bytes or 64 bits in length)	<b>ZSI</b>	Zone Selective Interlocking (zone selectivity)
<b>LSI</b>	Long Time, Short Time and Instantaneous Protection	<b>θ</b>	Thermal imaging value
<b>LSIG</b>	Long Time, Short Time, Instantaneous and Ground Fault Protection	<b>θ<sub>c</sub></b>	Cold start mode thermal imaging value
<b>MCCB</b>	Moulded Case Circuit Breaker	<b>θ<sub>H</sub></b>	Hot start mode thermal imaging value
<b>microSD</b>	Micro Secure Digital	<b>θ<sub>trip</sub></b>	Thermal imaging value tripping threshold

## Product Information



### Features

- Electronic overcurrent protection, for general & selectivity applications
- 3 & 4 Pole
- Adjustable Long Time ( $I_r$ )
- Base current  $I_r$  is adjustable from 40% - 100% of the nominal rated current  $I_n$ .
- Predefined LSI curves
  - 250A:** 8 characteristic curves
  - 400A to 1600A:** 10 characteristic curves,
- Instantaneous only
- Optional Adjustable Neutral Pole protection (OFF, 50%, 100%)
- Optional Ground Fault Trip on 400A to 1600A models ( $0.2 \times I_n$ )
- Optional Pre-Trip Alarm

### Ampere Frame Sizes

- B250
- B400
- B800
- B1000
- B1250
- B1600

### Protection Functions

- Long Time Delay
- Short Time Delay (Predefined curves)
- Instantaneous (Predefined curves)
- Ground/Earth Fault (LSIG model)
- Neutral Protection (LSIG 4P model)

B_BE MCCB optional protection features							
Rated ( $I_n$ )	Poles	Catalogue number suffix	Ground/Earth Fault Protection (GF)	Neutral Protection (NP)	Pre-Trip Alarm (PTA)		
250 A	3P	*P	—	—	✓		
	4P	*P	—	—	✓		
		*N	—	✓	—		
		*PN	—	✓	✓		
400...1600 A	3P	*P	—	—	✓		
		*G	✓	—	—		
		*PG	✓	—	✓		
	4P	*P	—	—	—	✓	
		*N	—	—	✓	—	
		*G	—	✓	✓	—	

### Additional Certificates



## Product Information

### Part Number Break Down



#### a) Model Type

A	Basic applications (160...250 A)
P	Mid to advanced applications (160...630 A)
B	High current, high kA applications (160...1600 A)
ZS	Earth Leakage applications (125...250 A)
XS	Highest current applications (2000...3200 A)

#### b) Ampere Frame

125 A
160 A
250 A
400 A
630 A
800 A
1000 A
1250 A
1600 A
2000 A
2500 A
3200 A

#### c) Short Circuit Break Capacity $I_{cu}$ (kA)

R	200 kA
L	150 kA
P	125 kA
S	110 kA
G	100 kA
HL	85 kA
H	70 kA
M	65 kA
N	50 kA
F	36 kA
E	25 kA
D	Switch

#### d) Pole Pitch Size (mm) <sup>1)</sup>

1	25
2	30
3	35

#### e) No. of Poles

1	<sup>7)</sup>
2	<sup>8)</sup>
3	
4	

#### f) Trip Unit Rating ( $I_n$ )

$I_n$  x A

#### g) Trip Unit Type

TF	Adj Thermal Fix Magnetic <sup>4)</sup>
FF	Fix Thermal Fix Magnetic
TM	Adj Thermal Adj Magnetic
SX	Smart Ammeter <sup>5) 6)</sup>
BE	Basic Electronic <sup>6)</sup>
SE	Smart Energy <sup>6)</sup>
NN	Non-Auto Switch

#### h) Trip Unit Option

G	Ground Fault <sup>2)</sup>
N	Neutral <sup>2)</sup>
P	Pre-Trip Alarm <sup>3)</sup>
SN	Solid Neutral <sup>9)</sup>



**Notice:** Not all combinations are possible. Confirm part number combination with NHP for availability.

- 160AF only
- For P\_SE versions these features are standard and therefore are not added to the end of the part number.
- PTA is standard with P electronic models and therefore P is not added to the end of the part number.
- Only available in A & ZS models
- Only available in B models
- Not available in A and ZS models
- Only available in A and B models (FF Only Trip Unit)
- Not available in A and B models (FF Only Trip Unit)
- ZS Models

## Product Information

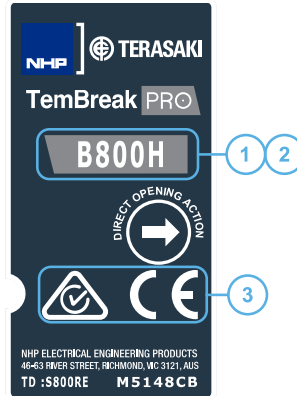
### Available MCCBs in the TemBreak PRO range










Rating Short Circuit Break Capacity (kA)		Frame Size											
		160	250	400	630	800	1000	1250	1600	2000	2500	3200	
E	25	A160E – TF A160E – FF B160E – FF	A250E – TM	P400E-TM	P630E – TM								
F	36	A160F – TF P160F – FF P160F – TM P160F – BE P160F – BEG P160F – SE	A250F – TM P250F – TM P250F – BE P250F – BEG P250F – SE	P400F – TM P400F – BE P400F – BEG P400F – SE	P630F – TM P630F – BE P630F – BEG P630F – SE	B800F – TM							
N	50	P160N – TM P160N – BE P160N – BEG P160N – SE	P250N – TM P250N – BE P250N – BEG P250N – SE	P400N – TM P400N – BE P400N – BEG P400N – SE	P630N – TM P630N – BE P630N – BEG P630N – SE	B800N – TM B800N – BE B800N – SX B800N – SE	B1000N – BE B1000N – BEG B1000N – SX B1000N – SE	B1250N – BE B1250N – BEG	B1600N – BE B1600N – BEG				
H	70	P160H – TM P160H – BE P160H – BEG P160H – SE	P250H – TM P250H – BE P250H – BEG P250H – SE	P400H – TM P400H – BE P400H – BEG P400H – SE	P630H – TM P630H – BE P630H – BEG P630H – SE	B800H – TM B800H – BE B800H – BEG B800H – SX B800H – SE	B1000H – BE B1000H – BEG B1000H – SX B1000H – SE	B1250H – BE B1250H – BEG					
HL	85							B1250HL – BE B1250HL – BEG	B1600HL – BE B1600HL – BEG	XS2000HL – BE XS2000HL – BEG	XS2500HL – BE XS2500HL – BEG	XS3200HL – BE	
G	100					B800G – TM B800G – BE B800G – BEG B800G – SX B800G – SE							
S	110			P400S – TM P400S – BE P400S – BEG P400S – SE	P630S – TM P630S – BE P630S – BEG P630S – SE								
P	125	B160P – TM	B250P – TM B250P – BE B250P – SE	B400P – BE B400P – BEG		B800P – BE B800P – BEG B800P – SX B800P – SE							
R	200	B160R – TM	B250R – TM	B400P – BE B400P – BEG		B800R – BE B800R – BEG B800R – SX B800R – SE							
D	Switch	A160D – NN P160D – NN	A250D – NN P250D – NN	P400D – NN	P630D – NN	B800D – NN	B1000D – NN	B1250D – NN	B1600D – NN	XS2000D – NN	XS2500D – NN		

## Product Information

### Label Identification

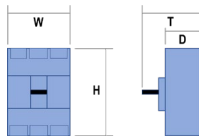
The label on the MCCB features information to aid in product identification.



Description	Notes						
1 Circuit Break Identifier	Identifies the model type, ampere frame, and I <sub>cu</sub> rating.						
2 Trip unit type	<p>The trip unit type is indicated by the colour of the label.</p> <table border="1" data-bbox="400 965 1503 1787"> <tbody> <tr> <td data-bbox="400 965 568 1227">  </td> <td data-bbox="568 965 1503 1227"> <p><b>White label</b> – Thermal-magnetic type trip unit</p> <p>Trip Units FF, TF, FM, TM            Models A, P, B, ZS            Ampere Frame 125 – 800</p> </td> </tr> <tr> <td data-bbox="400 1227 568 1489">  </td> <td data-bbox="568 1227 1503 1489"> <p><b>Grey label</b> – electronic or non-auto type trip unit. To distinguish between the two, electronic trip units will have the “I<sub>cu</sub>” letter and non-auto will use the letter “D”, Switch.</p> <p>Trip Units BE, BEG, BEGN, NN            Models A, P, B, XS            Ampere Frame 160 – 3200</p> </td> </tr> <tr> <td data-bbox="400 1489 568 1787">  </td> <td data-bbox="568 1489 1503 1787"> <p><b>Blue Label</b> – SMART electronic type trip unit</p> <p>Trip Units SX, SE            Models P, B            Ampere Frame 160 – 1000</p> </td> </tr> </tbody> </table>		<p><b>White label</b> – Thermal-magnetic type trip unit</p> <p>Trip Units FF, TF, FM, TM            Models A, P, B, ZS            Ampere Frame 125 – 800</p>		<p><b>Grey label</b> – electronic or non-auto type trip unit. To distinguish between the two, electronic trip units will have the “I<sub>cu</sub>” letter and non-auto will use the letter “D”, Switch.</p> <p>Trip Units BE, BEG, BEGN, NN            Models A, P, B, XS            Ampere Frame 160 – 3200</p>		<p><b>Blue Label</b> – SMART electronic type trip unit</p> <p>Trip Units SX, SE            Models P, B            Ampere Frame 160 – 1000</p>
	<p><b>White label</b> – Thermal-magnetic type trip unit</p> <p>Trip Units FF, TF, FM, TM            Models A, P, B, ZS            Ampere Frame 125 – 800</p>						
	<p><b>Grey label</b> – electronic or non-auto type trip unit. To distinguish between the two, electronic trip units will have the “I<sub>cu</sub>” letter and non-auto will use the letter “D”, Switch.</p> <p>Trip Units BE, BEG, BEGN, NN            Models A, P, B, XS            Ampere Frame 160 – 3200</p>						
	<p><b>Blue Label</b> – SMART electronic type trip unit</p> <p>Trip Units SX, SE            Models P, B            Ampere Frame 160 – 1000</p>						
3 Certifications	<p>Identifies the additional localised certifications of the product, in addition to the international product standard, IEC 60947-2 / AS/NZS IEC 60947-2.</p> <p>For additional certifications please contact NHP.</p>						

## Product Information

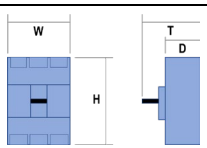
### B250\_BE & B400\_BE Information

Frame / Model	Quantity	Unit	Condition	B250P	B400P	B400R	
Number of Poles				3, 4	3, 4	3, 4	
Nominal current ratings Trip unit ratings	$I_{CT}$	(A)	45°C	40, 125, 160, 250	—	—	
			50°C	—	400	400	
			55°C	—	250	250	
<b>Electrical characteristics</b>							
Rated maximum operational voltage	$U_e$	(V)	AC 50/60 Hz	690	690	690	
		(V)	DC	250	—	—	
Rated insulation voltage	$U_i$	(V)		800	800	800	
Rated impulse withstand voltage	$U_{imp}$	(kV)		8	8	8	
Selectivity category				A	B	B	
Rated short time withstand current	$I_{cw}$	(kA)	0.4 sec	—	5 / 0.3 sec	5 / 0.3 sec	
Ultimate breaking capacity (IEC, JIS, AS/NZS)	$I_{cu}$	(kA)	690 Vac	20	35	50	
			400 /415 Vac	125	125	200	
			240 Vac	150	150	200	
Service breaking capacity (IEC, JIS, AS/NZS)	$I_{cs}$	(kA)	690 Vac	15	35	50	
			400 /415 Vac	85	85	150	
			220 /240 Vac	150	150	150	
<b>Protection - Over Current Release types</b>							
BE 2 dial 10 pre-set characteristic curves	Std	Standard		Std	Std	Std	
BE 2 dial Instantaneous only setting	Opt	Optional		Std	Std	Std	
BE Instantaneous only setting (ICB)	—	Not Available		Std	Std	Std	
LT Adjustable 40% to 100% in 1% increments				—	—	—	
LT Adjustable 40% to 100% in 1A increments				—	Std	Std	
<b>Installation (Std / Opt / —)</b>							
Front connection (FC)				Std	Std	Std	
Extension bar (FB)				Opt	Opt	Opt	
Cable tunnel clamp (FW)				Opt	Opt	Opt	
Rear Connection (RC)				Opt	Opt	Opt	
DIN rail adaptor				—	—	—	
Withdrawable mechanism				—	—	—	
Plug-in				Opt	Opt	Opt	
<b>Reverse supply connection possible to 440V</b>				Yes	Yes	Yes	
Dimensions		H	(mm)	3 pole	165	260	260
		W	(mm)	4 pole	105	140	140
		D	(mm)		140	185	185
		T	(mm)		103	140	140
						127	182
Weight	W	(kg)	3 pole	2.4	4.3	4.3	
			4 pole	3.2	5.7	5.7	
<b>Operation options (Std / Opt / —)</b>							
Toggle operation	Std	Standard		Std	Std	Std	
Extension handle TP-HS/HP or Direct mount T2HB	Opt	Optional		Opt	Opt	Opt	
Motor operation TP-MC	—	Not Available		Opt	Opt	Opt	
Endurance	Electrical	Cycles	415 Vac	10000	6000	6000	
	Mechanical	Cycles		20000	15000	15000	




## Product Information

### B800\_BE Information

Frame / Model	Quantity	Unit	Condition	B800N	B800H	B800G	B800P	B800R
Number of Poles				3, 4	3, 4	3, 4	3, 4	3, 4
<b>Nominal current ratings</b>	$I_{CT}$	(A)	45°C	630, 800	630, 800	800	800	800
Trip unit ratings			50°C	—	—	630	630	630
<b>Electrical characteristics</b>								
Rated maximum operational voltage	$U_e$	(V)	AC 50/60 Hz	690	690	690	690	690
		(V)	DC	—	—	—	—	—
Rated insulation voltage	$U_i$	(V)		800	800	800	800	800
Rated impulse withstand voltage	$U_{imp}$	(kV)		8	8	8	8	8
Selectivity category				B	B	B	B	B
Rated short time withstand current	$I_{cw}$	(kA)	0.4 sec	10	10	10	10	10
<b>Ultimate breaking capacity</b> (IEC, JIS, AS/NZS)	$I_{cu}$	(kA)	690 Vac	20	25	25	25	25
			400 /415 Vac	50	70	100	125	200
			240 Vac	85	100	125	150	200
<b>Service breaking capacity</b> (IEC, JIS, AS/NZS)	$I_{cs}$	(kA)	690 Vac	20	20	20	20	20
			400 /415 Vac	50	50	50	94	150
			220 /240 Vac	85	75	125	150	150
<b>Protection - Over Current Release types</b>								
BE 2 dials 10 pre-set characteristic curves	Std	Standard		Std	Std	Std	Std	Std
BE Ground Fault	Opt	Optional		—	Opt	Opt	Opt	—
BE Instantaneous only setting (ICB)	—	Not Available		Std	Std	Std	Std	Std
<b>Installation</b> (Std / Opt / —)								
Front connection (FC)				Std	Std	Std	Std	Std
Extension bar (FB)				Std	Std	Std	Std	Std
Cable tunnel clamp (FW)	Std	Standard		—	—	—	—	—
Rear connection (RC)	Opt	Optional		Opt	Opt	Opt	Opt	Opt
DIN rail adaptor	—	Not Available		—	—	—	—	—
Withdrawable mechanism				Opt	Opt	Opt	—	—
Plug-in				Opt	Opt	Opt	Opt	Opt
<b>Reverse supply connection</b> possible to 440V				Yes	Yes	Yes	Yes	Yes
<b>Dimensions</b>								
	H	(mm)		273	273	273	273	273
	W	(mm)	3 pole	210	210	210	210	210
			4 pole	280	280	280	280	280
	D	(mm)		103	103	103	140	140
	T	(mm)		145	145	145	182	182
<b>Weight</b>	W	(kg)						
			3 pole	9.1	9.1	9.1	14.8	14.8
			4 pole	12.3	12.3	12.3	18.8	18.8
			3 pole (630A)	7.0	8.7	8.7	13.3	13.3
			4 pole (630A)	10.5	11.9	11.9	16.8	16.8
<b>Operation options</b> (Std / Opt / —)								
Toggle operation	Std	Standard		Std	Std	Std	Std	Std
Extension handle TP-HS/HP or Direct mount T2HB	Opt	Optional		Opt	Opt	Opt	Opt	Opt
Motor operation TP-MC	—	Not Available		Opt	Opt	Opt	Opt	Opt
<b>Endurance</b>								
	Electrical	Cycles	415 Vac	4000	4000	4000	4000	4000
	Mechanical	Cycles		10000	10000	10000	10000	10000

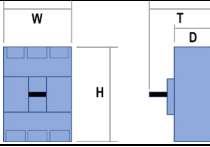
## Product Information

### B1000\_BE & B1250\_BE Information

Frame / Model	Quantity	Unit	Condition	B1000N	B1000H	B1250N	B1250H	B1250HL
Number of Poles				3, 4	3, 4	3, 4	3, 4	3, 4
<b>Nominal current ratings</b>	$I_{CT}$	(A)	45°C	1000	1000	—	—	—
Trip unit ratings			50°C	—	—	1250	1250	1250
<b>Electrical characteristics</b>								
Rated maximum operational voltage	$U_e$	(V)	AC 50/60 Hz	690	690	690	690	690
		(V)	DC	—	—	—	—	—
Rated insulation voltage	$U_i$	(V)		800	800	800	800	800
Rated impulse withstand voltage	$U_{imp}$	(kV)		8	8	8	8	8
Selectivity category				A	A	B	B	B
Rated short time withstand current	$I_{cw}$	(kA)	0.4 sec	—	—	15	15	15
<b>Ultimate breaking capacity</b> (IEC, JIS, AS/NZS)	$I_{cu}$	(kA)	690 Vac	20	25	20	25	45
			400 /415 Vac	50	70	50	70	85
			240 Vac	85	100	85	100	125
<b>Service breaking capacity</b> (IEC, JIS, AS/NZS)	$I_{cs}$	(kA)	690 Vac	15	20	15	20	34
			400 /415 Vac	38	50	38	50	65
			220 /240 Vac	65	75	65	75	94
<b>Protection - Over Current Release types</b>								
BE 2 dials 10 pre-set characteristic curves	Std	Standard						
BE-G Ground Fault	Opt	Optional		Std	Std	Std	Std	Std
BE Instantaneous only setting (ICB) <sup>1)</sup>	—	Not Available		—	Std	Std	Std	Std
<b>Installation</b> (standard / optional / -)								
Front connection (FC)				Std	Std	Std	Std	Std
Extension bar (FB)				Std	Std	Std	Std	Std
Cable tunnel clamp (FW)	Std	Standard		—	—	—	—	—
Rear connection (RC)	Opt	Optional		Opt	Opt	Opt	Opt	Opt
DIN rail adaptor	—	Not Available		—	—	—	—	—
Withdrawable mechanism				—	—	—	—	—
Plug-in				—	—	Opt	Opt	Opt
<b>Reverse supply connection</b> possible to 440V				Yes	Yes	Yes	Yes	Yes
<b>Dimensions</b>								
	H	(mm)		273	273	370	370	370
	W	(mm)	3 pole	210	210	210	210	210
			4 pole	280	280	280	280	280
	D	(mm)		103	103	120	120	120
	T	(mm)		145	145	171	171	171
<b>Weight</b>	W	(kg)	3 pole	11.0	11.0	19.8	19.8	19.8
			4 pole	14.8	14.8	25	25	25
<b>Operation options</b> (std / opt / -)								
Toggle operation	Std	Standard		Std	Std	Std	Std	Std
Extension handle TP-HS/HP or Direct mount T2HB	Opt	Optional		Opt	Opt	Opt	Opt	Opt
Motor operation TP-MC	—	Not Available		Opt	Opt	Opt	Opt	Opt
<b>Endurance</b>								
	Electrical	Cycles	415 Vac	4000	4000	4000	4000	4000
	Mechanical	Cycles		10000	10000	5000	5000	5000

## Product Information

### B1600\_BE Information

Frame / Model	Quantity	Unit	Condition	B1600N	B1600HL
Number of Poles				3, 4	3, 4
<b>Nominal current ratings</b> Trip unit ratings	$I_{CT}$	(A)	50°C	1600	1600
<b>Electrical characteristics</b>					
Rated maximum operational voltage	$U_e$	(V)	AC 50/60 Hz	690	690
		(V)	DC	—	—
Rated insulation voltage	$U_i$	(V)		800	800
Rated impulse withstand voltage	$U_{imp}$	(kV)		8	8
Selectivity category				B	B
Rated short time withstand current	$I_{cw}$	(kA)	0.4 sec	20	20
<b>Ultimate breaking capacity</b> (IEC, JIS, AS/NZS)	$I_{cu}$	(kA)	690 Vac	20	45
			400 /415 Vac	50	85
			240 Vac	85	125
<b>Service breaking capacity</b> (IEC, JIS, AS/NZS)	$I_{cs}$	(kA)	690 Vac	15	34
			400 /415 Vac	38	65
			220 /240 Vac	65	94
<b>Protection - Over Current Release types</b>					
BE 2 dials 10 pre-set characteristic curves	Std	Standard		Std	Std
BE-G Ground Fault	Opt	Optional		Std	Std
BE Instantaneous only setting (ICB)	—	Not Available		Std	Std
<b>Installation (Std / Opt / —)</b>					
Front connection (FC)				Std	Std
Extension bar (FB)				Std	Std
Cable tunnel clamp (FW)	Std	Standard		—	—
Rear connection (RC)	Opt	Optional		Opt	Opt
DIN rail adaptor	—	Not Available		—	—
Withdrawable mechanism				—	—
Plug-in				—	—
<b>Reverse supply connection possible to 440V</b>					
<b>Dimensions</b>					
	H	(mm)		370	370
	W	(mm)	3 pole	210	210
			4 pole	280	280
	D	(mm)		140	140
	T	(mm)		191	191
<b>Weight</b>	W	(kg)	3 pole	27	27
			4 pole	35	35
<b>Operation options (std / opt / -)</b>					
Toggle operation	Std	Standard		Std	Std
Extension handle TP-HS/HP or Direct mount T2HB	Opt	Optional		Opt	Opt
Motor operation TP-MC	—	Not Available		Opt	Opt
<b>Endurance</b>					
	Electrical	Cycles	415 Vac	4000	4000
	Mechanical	Cycles		5000	5000

## Internal Accessories

Internal accessories include Auxiliary and Alarm contacts, Shunt Trip and Undervoltage Trip (UVT) modules, which may be installed under the front cover of the MCCB in various combinations to provide additional functionality and connection with external control circuits.

### Auxiliary & Alarm Switches

#### Auxiliary Contact

An auxiliary contact can be installed to indicate whether an MCCB is Open (both OFF and Tripped positions) or Closed (ON). Auxiliary contacts come in either general purpose, heavy duty or micro-switch type, with some combinations pre-wired or with terminals. Each contact type is provided as a single change-over switching arrangement (1x C/O), or normally-open (1x N/O) for option in heavy-duty.



#### Alarm Contact

An alarm contact can be installed to indicate whether an MCCB is in the Tripped or Not Tripped position (ON, OFF). Alarm contacts come in either general purpose, heavy duty or micro-switch type, with some combinations pre-wired or with terminals. Each contact type is provided as a single change-over switching arrangement (1x C/O), or normally-open (1x N/O) for option in heavy-duty.



Part Number	Description	Contact Type	Contact Arrangement	Connection Type	Compatible MCCBs
T2AX00M3STA	Auxiliary	General purpose	C/O	Terminal	B & ZS Models
T2AX00M3SWA	Auxiliary	General purpose	C/O	Pre-wired	B & ZS Models
T2AX00B1STA	Auxiliary	Heavy duty	N/O	Terminal	B & ZS Models
T2AX00B2STA	Auxiliary	Heavy duty	N/C	Terminal	B & ZS Models
T2AX00M3RTA	Auxiliary	Micro-switch	C/O	Terminal	B & ZS Models
T2AL00M3STA	Alarm	General purpose	C/O	Terminal	B & ZS Models
T2AL00M3SWA	Alarm	General purpose	C/O	Pre-wired	B & ZS Models
T2AL00B1STA	Alarm	Heavy duty	N/O	Terminal	B & ZS Models Exception B1250, B1600
T2AL00B2STA	Alarm	Heavy duty	N/C	Terminal	B & ZS Models Exception B1250, B1600
T2AL00M3RTA	Alarm; left side only	Micro-switch	C/O	Terminal	B & ZS Models

General purpose contact						Minimum Load
AC (V)			DC (V)			
Volts (V)	Amperes (A)		Volts (V)	Amperes (A)		
		Resistive Load		Inductive Load		Resistive Load
480	—	—	250	—	—	100 mA @ 15 Vdc
250	3	2	125	0.4	0.05	
125	3	2	30	3	2	

Heavy duty contact						Minimum Load
AC (V)			DC (V)			
Volts (V)	Amperes (A)		Volts (V)	Amperes (A)		
		Resistive Load		Inductive Load		Resistive Load
500	1	1	—	—	—	—
440	3	3	250	0.5	0.5	
240	4	4	125	1	1	
110	5	5	48	3	2.5	
48	6	6	24	6	2.5	

Micro-switch contact			
DC (V)			Minimum Load
Volts (V)	Amperes (A)		
		Resistive Load	
30	0.1	—	1 mA @ 5 Vdc

Refer to [Annex G](#) for wiring diagrams and terminal designations

## Internal Accessories

### Shunt Trip

A shunt (normally de-energized) can be installed to trip the MCCB by applying voltage to the shunt coil.



Part Number	Rated voltage		Connection type
	AC (V)	DC (V)	
T2SH00A10TA	110	—	Terminal
T2SH00A20TA	230...240	—	Terminal
T2SH00A40TA	400...415	—	Terminal
T2SH00D01TA	—	12	Terminal
T2SH00D02TA	*	24	Terminal
T2SH00D04TA	—	48	Terminal
T2SH00D10TA	—	110	Terminal
T2SH00D20TA	—	230	Terminal

\* Whilst not a rated voltage, T2SH00D02TA will operate at 24V ac

Rated voltage	AC (V)			DC (V)				
	100...120	200...240	380...450	12	24	48	100...120	200...240
Excitation Current (mA)	14.0	14.0	6.5	30.0	30.0	30.0	11.0	11.0

### Under Voltage Trips

A UVT (normally energized) can be installed to trip the MCCB removing voltage from the UVT coil.



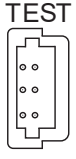

Part Number	Rated voltage		Compatible MCCB	Connection Type	Notes
	AC (V)	DC (V)			
T2UV00A10NTA	110	—	B 250 / 400	Terminal	Instantaneous
T2UV00A20NTA	200...240	—	B 250 / 400	Terminal	Instantaneous
T2UV00A40NTA	380...450	—	B 250 / 400	Terminal	Instantaneous
T2UV00D02NTA	—	24	B 250 / 400	Terminal	Instantaneous
T2UV00D04NTA	—	48	B 250 / 400	Terminal	Instantaneous
T2UV00D10NTA	—	110	B 250 / 400	Terminal	Instantaneous
T2UV00D20NTA	—	230	B 250 / 400	Terminal	Instantaneous
T2UV00A10DS	110	—	B 250 / 400	Terminal	Time Delay 500ms
T2UV00A24DS	230...240	—	B 250 / 400	Terminal	Time Delay 500ms
T2UV00A40DS	440...450	—	B 250 / 400	Terminal	Time Delay 500ms
T2UV00D02DS	—	24	B 250 / 400	Terminal	Time Delay 500ms
T2UV00D10DS	—	110	B 250 / 400	Terminal	Time Delay 500ms
T2UV00D24DS	—	230	B 250 / 400	Terminal	Time Delay 500ms
T2UV80A10NTA	110	—	B 800 / 1000 / 1250 / 1600	Terminal	Instantaneous
T2UV80A20NTA	200...240	—	B 800 / 1000 / 1250 / 1600	Terminal	Instantaneous
T2UV80A40NTA	380...450	—	B 800 / 1000 / 1250 / 1600	Terminal	Instantaneous
T2UV80D02NTA	—	24	B 800 / 1000 / 1250 / 1600	Terminal	Instantaneous
T2UV80D04NTA	—	48	B 800 / 1000 / 1250 / 1600	Terminal	Instantaneous
T2UV80D10NTA	—	110	B 800 / 1000 / 1250 / 1600	Terminal	Instantaneous
T2UV80D20NTA	—	230	B 800 / 1000 / 1250 / 1600	Terminal	Instantaneous
T2UV80A10DS	110	—	B 800 / 1000 / 1250 / 1600	Terminal	Time Delay 500ms
T2UV80A24DS	230...240	—	B 800 / 1000 / 1250 / 1600	Terminal	Time Delay 500ms
T2UV80A40DS	440...450	—	B 800 / 1000 / 1250 / 1600	Terminal	Time Delay 500ms
T2UV80D02DS	—	24	B 800 / 1000 / 1250 / 1600	Terminal	Time Delay 500ms
T2UV80D10DS	—	110	B 800 / 1000 / 1250 / 1600	Terminal	Time Delay 500ms
T2UV80D24DS	—	230	B 800 / 1000 / 1250 / 1600	Terminal	Time Delay 500ms

Rated Voltage	Power supply capacity (VA)						Excitation current (mA)		
	AC (V)						DC (V)		
	100...110	115...120	200...220	230...240	380...415	440...450	24	100...120	200...240
B 250 / 400	1.4	1.4	2.8	2.8	2.3	2.3	23	10	10
B 800 / 1000 / 1250 / 1600	1.5	1.6	2.4	2.9	2.1	2.3	29	13	11

Refer to [Annex G](#) for wiring diagrams and terminal designations

## Plugs and Ports

The B\_BE circuit breaker is equipped with specific connectors for factory use only.

Port		Description	B 250	B 400 / 800 / 1000 / 1600
Test	 <p>TEST</p>	Factory Use Only	✓	—
Test	 <p>TEST IN</p>	Factory Use Only	—	✓

## Installation

### Precautions



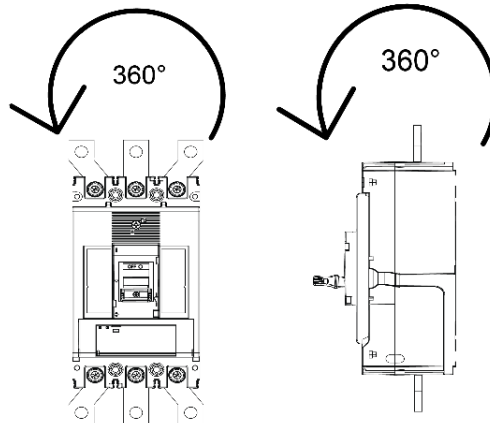
**WARNING:** To prevent electrical shock and damage to equipment, disconnect and isolate power source upstream of the MCCB before installing or servicing the MCCB including its connected accessories.



**Notice:** To ensure correct performance, and integrity of equipment, the installation instructions and recommendations provided herein shall be respected. Refer to the respective user manual and installation instructions provided with the MCCB and associated accessories.

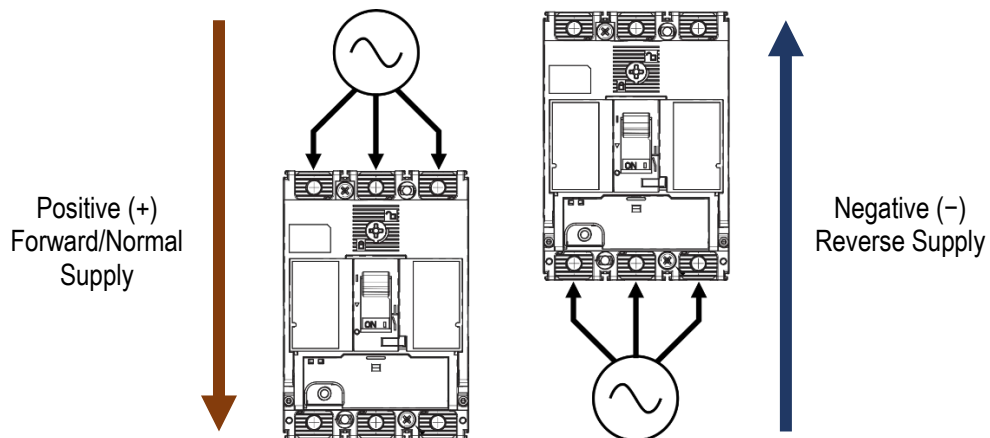
### Mounting Angles

TemBreak *PRO* MCCBs may be mounted at any angle without affecting performance.



### Direction of Power Supply

Power supply may be fed in either direction with respect to the MCCB without affecting performance.





## Installation

### Clearances

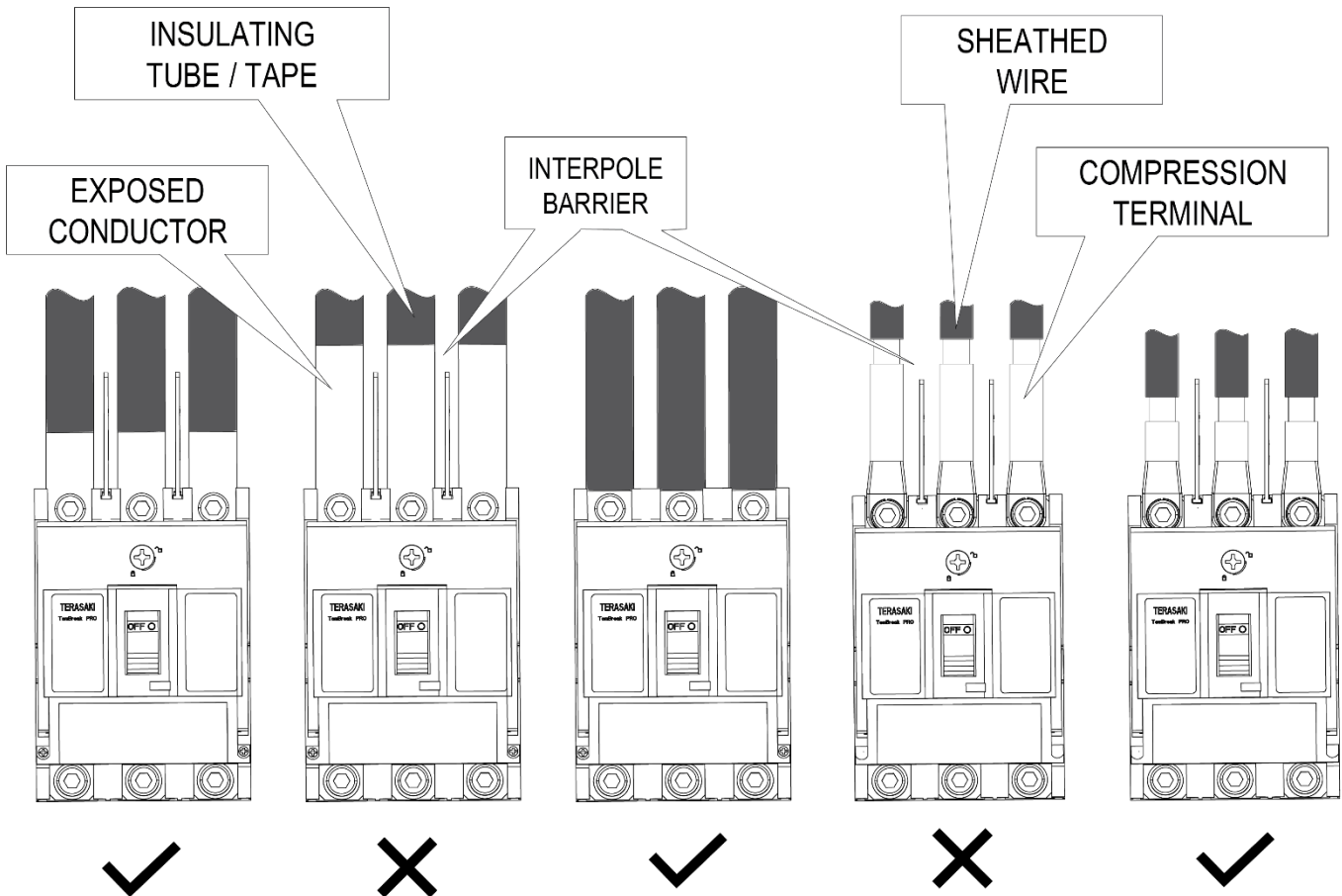


**WARNING:** Exposed conductors including terminals at attached busbars must be insulated to avoid possible short-circuit or earth faults due any foreign matter coming into contact with the conductors.

### Phase to Phase and Earth

Interruption of large currents during fault or normal switching operation produces ionised gases and arcing materials which expelled from the vents at the top of the MCCB. These ionised gases are highly conductive, concentrated, and at an elevated temperature when it exits the MCCB via the arc vents. Care must be taken to avoid an arcing fault from occurring due to the presence of concentrated ionised gases creating a conductive path between exposed conductors. Incoming conductors must therefore be insulated the full length up to the terminal opening of the MCCB, ensuring bare conductors are not exposed directly to concentrated ionised gases. This also applies to the attached busbars supplied as part of the MCCB.

Interpole barriers or terminal covers may be used to achieve creepage and clearance requirements. Conductors must not impede the flow of ionised gas and allow it to clear and disperse safely. Interpole barriers are supplied as standard with Terasaki MCCBs for the line side only. 2 barriers with 3P MCCBs and 3 with 4P MCCBs. In cases where two different MCCB types are installed one above the other, the insulation distance between the two models should be as for the lower model.



## Installation

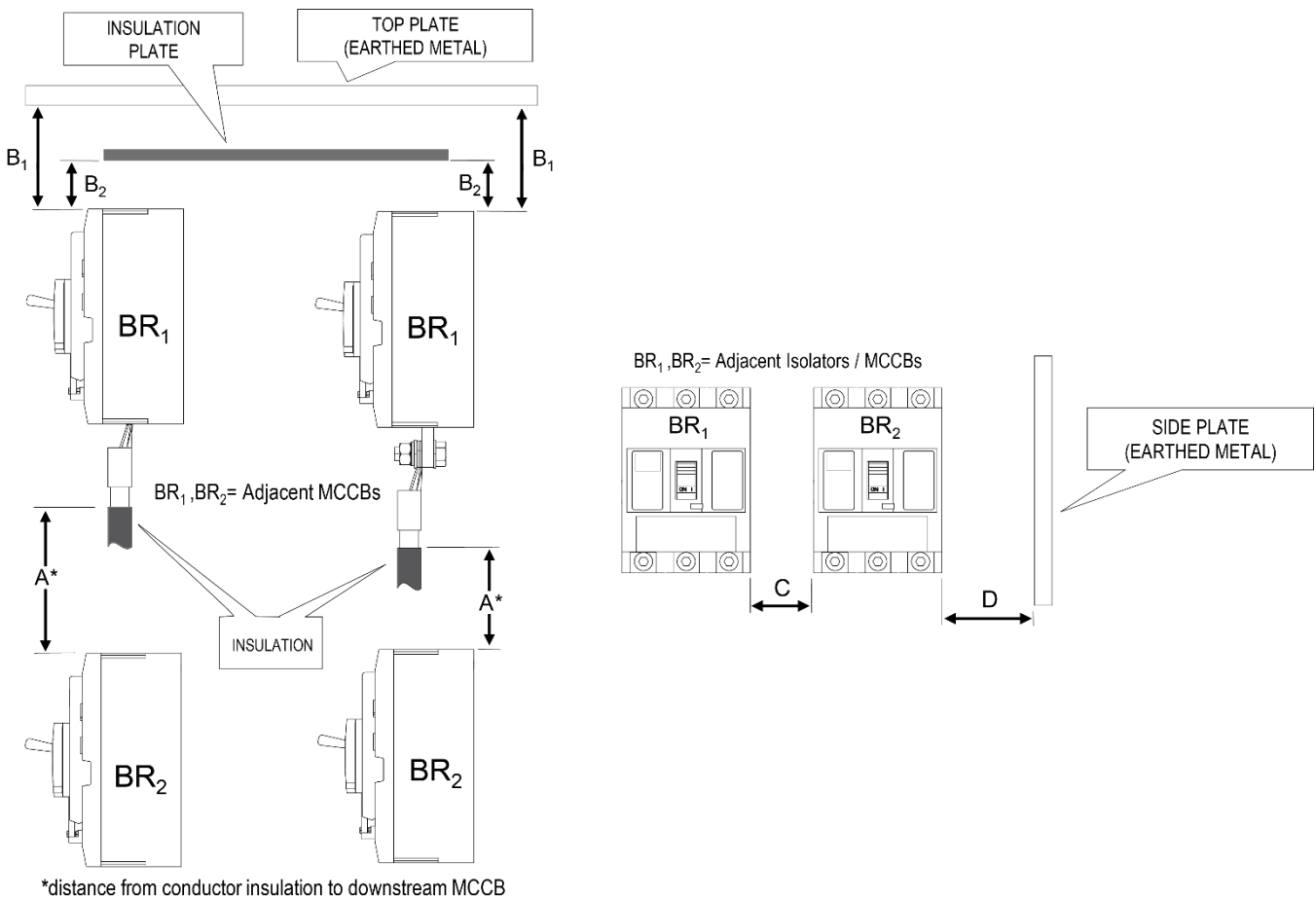
### Insulating Distance

When earth metal is installed within proximity of the breakers, the correct insulating distance must be maintained, (refer to Minimum Clearance). This distance is necessary to allow the exhausted arc gases to disperse. This could include the mounting plate or side panel within a switchboard.

### Minimum Clearance

Below illustrates the minimum clearance that must be maintained.

Dim.	Description	Distances (mm)						
		MCCB Cat. No.	A	B <sub>1</sub>	B <sub>2</sub>	C	D	E
A	Distance from lower breaker to open charging part of terminal on upper breaker (front connection) or the distance from lower breaker to upper breaker end (rear connection and plug-in type)	B250 P / R	100	80	60	0	50	^
		B400 P / R	120	120	80	0	80	^
		B800 F / N / D	120	70	40	0	30	^
B <sub>1</sub>	Distance from breaker end to ceiling (earthed metal)	B800 H / G	150	80	50	0	40	^
		B800 P / R	150	70	40	0	30	^
B <sub>2</sub>	Distance from breaker end to insulator	B1000 N / H / D	150	70	40	0	30	^
C	Clearance between breakers	B1250 N / H / HL / D	150	70	40	0	30	^
D	Distance from breaker side to side plate (earthed metal)	B1600 N / HL / D	150	70	40	0	30	^
E	Length of insulation over exposed conductors.	B1600 N / HL / D	150	150	100	0	100	^



^ Insulate the exposed conductor until it overlaps the moulded case at the terminal, or the terminal cover.

## Installation

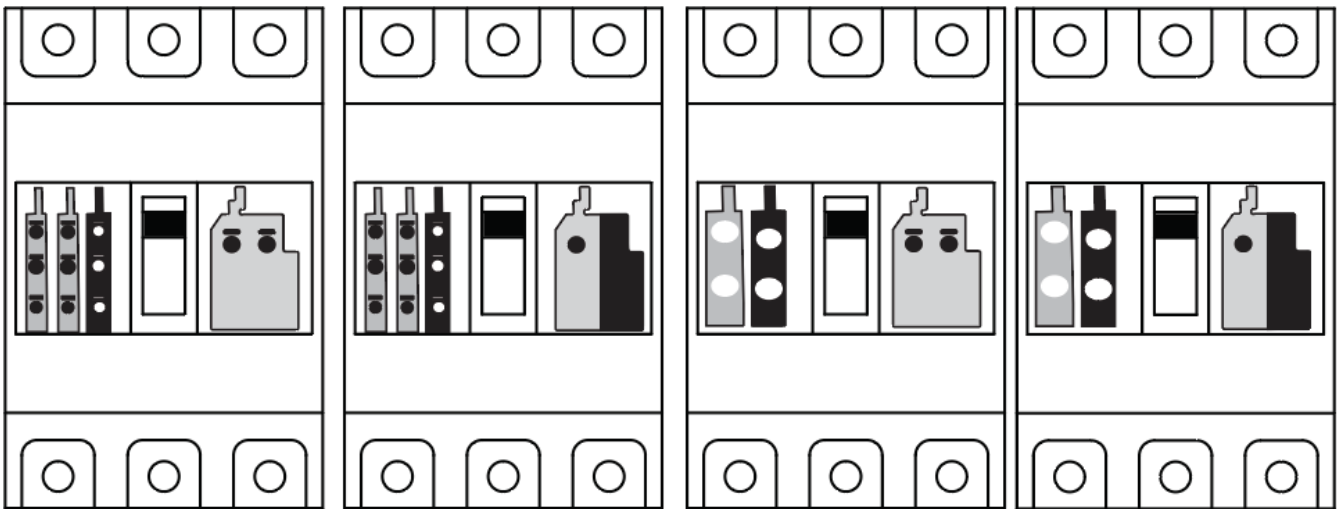
### Internal Accessory Mounting Locations

B250, B400, B800, B1000, B1250 and B1600 frame sizes have different internal mounting locations for auxiliary contacts, alarm contacts, shunts and, UVTs.

Left-side and right-side mounting locations are independent and accept unique combinations. For example, shunts and UVTs may only be mounted on the right side, whereas auxiliary and alarm contacts may be mounted on either left or right side.

Refer to the following illustrations for each frame size listing the various possible internal accessories combinations.

### B250 internal accessories combination



#### Legend

UVT SHUNT ALARM AUX



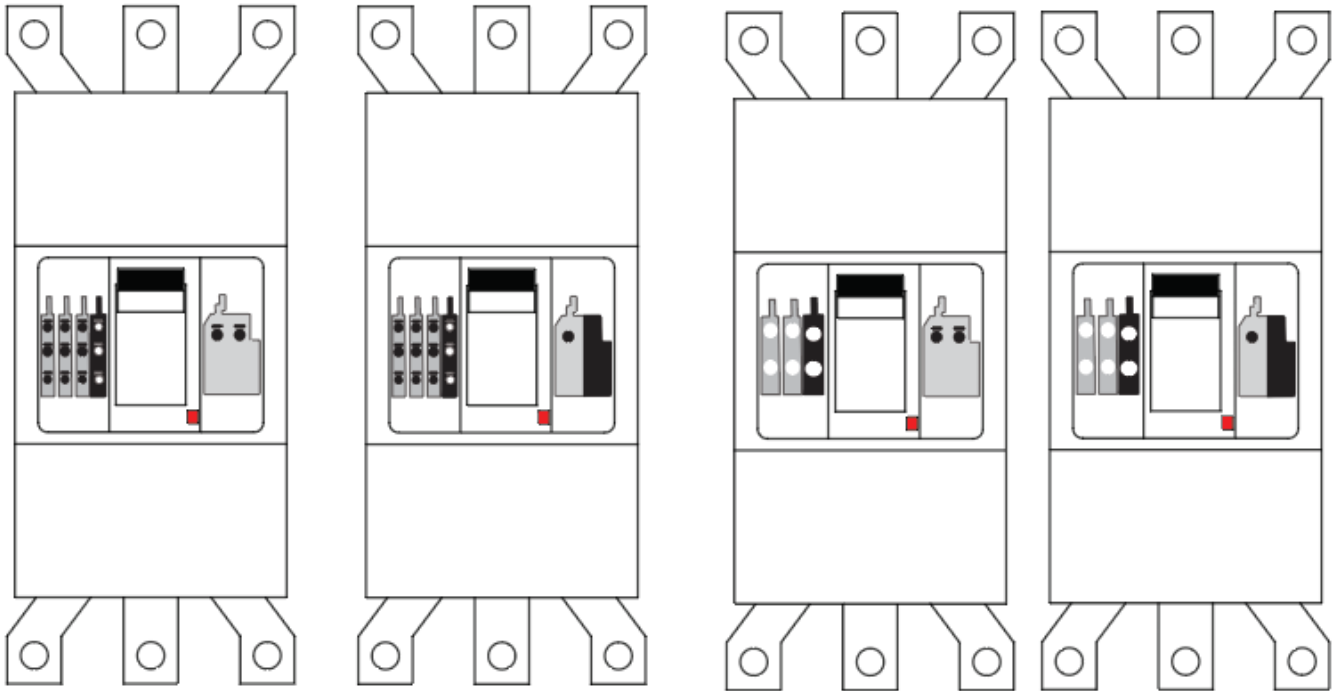
Heavy Duty ALARM

Heavy Duty AUX



## Installation

### B400 internal accessories combination



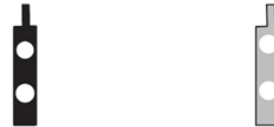
#### Legend

UVT SHUNT ALARM AUX



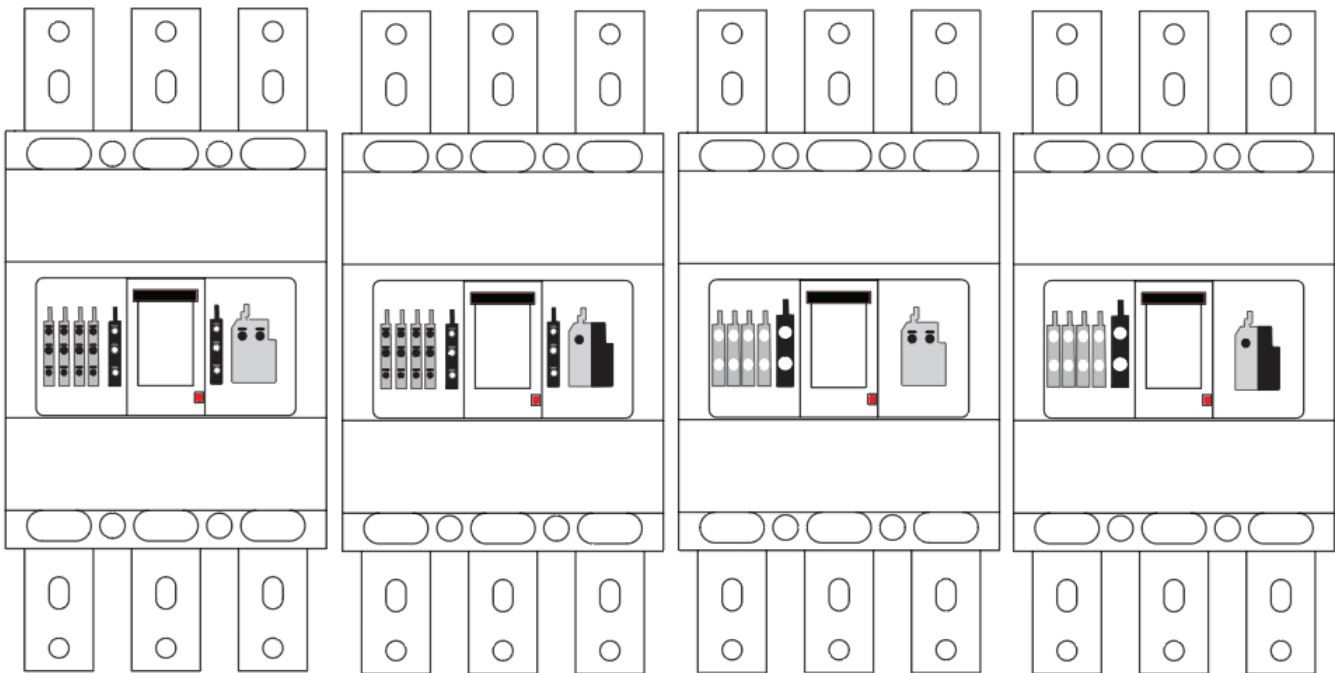
Heavy Duty ALARM

Heavy Duty AUX



# Installation

## B800 & B1000 internal accessories combination



### Legend

UVT SHUNT ALARM AUX

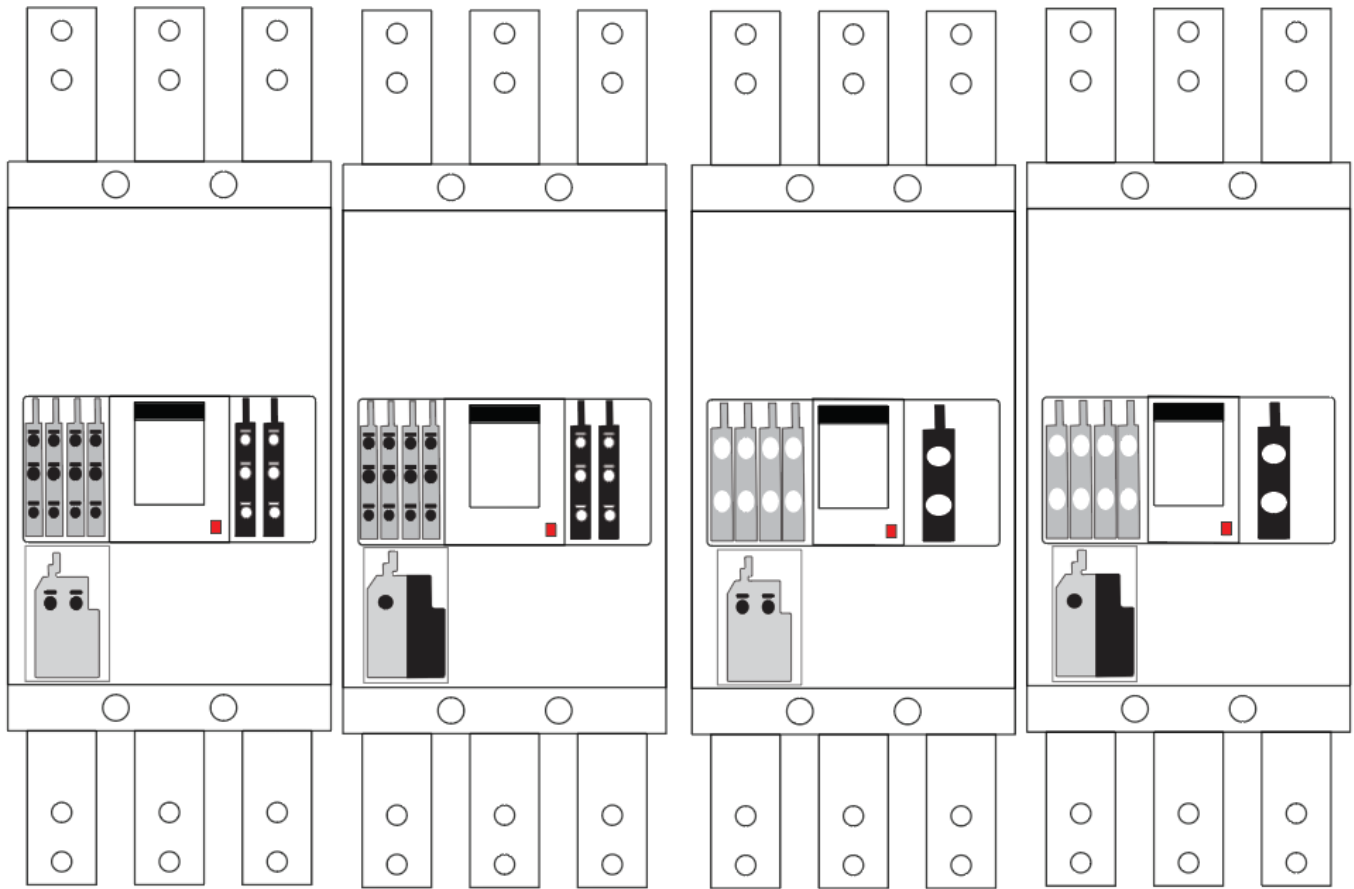


Heavy Duty ALARM Heavy Duty AUX



## Installation

### B1250 & B1600 internal accessories combination



#### Legend

UVT SHUNT ALARM AUX



Heavy Duty ALARM

Heavy Duty AUX



# Installation

## Alarm, Shunt & UVT Installation

The alarm, shunt and UVT have a trip bar that needs to interact with the MCCBs trip mechanism. As such they must be installed in a specific way. Refer to the supplied Installation Instructions for the respective accessories for further detail.

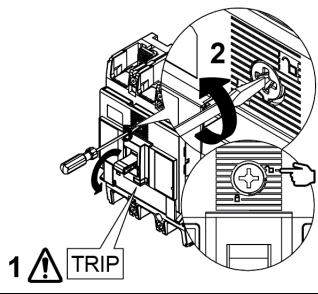
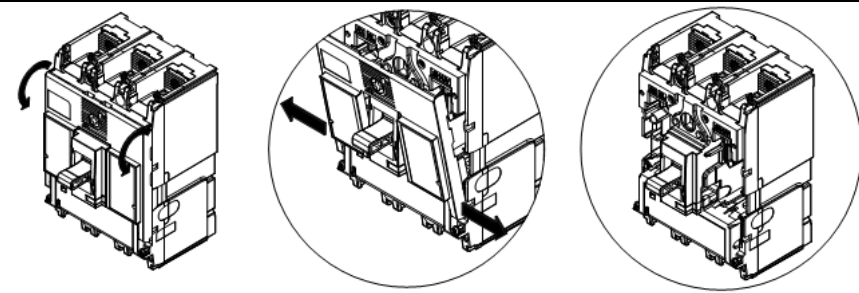
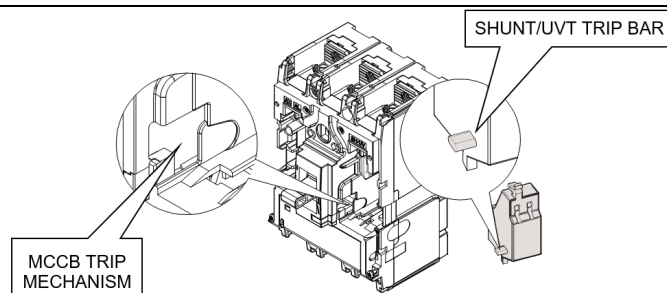
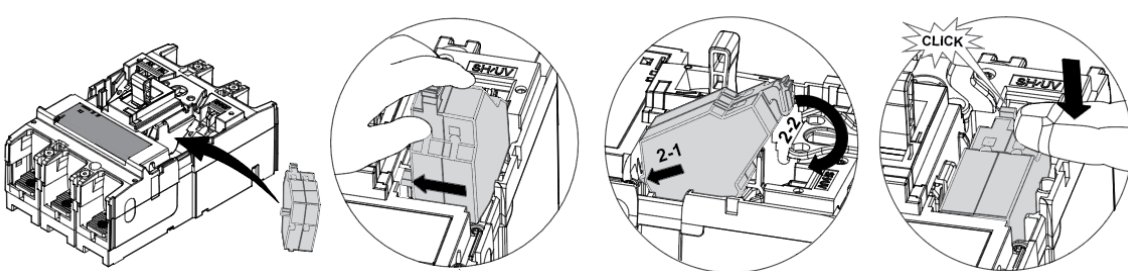
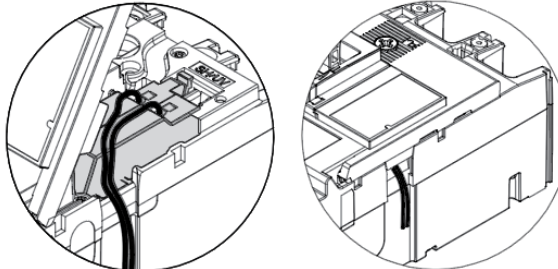
### Alarm & Auxiliary installation

Action	Note
<p>1 Switch the Smart MCCB to the Tripped Position.</p>	
<p>2 Open the front cover of the MCCB.</p>	
<p>3 Locate the alarm's trip bar into the MCCB trip mechanism slot.</p>	
<p>4 Position the alarm into place and click in to secure; follow the images to the right.</p>	
<p>5 Run the wires out the left-hand side of the MCCB, through the allocated grooves.</p>	



# Installation

## Shunt & UVT installation

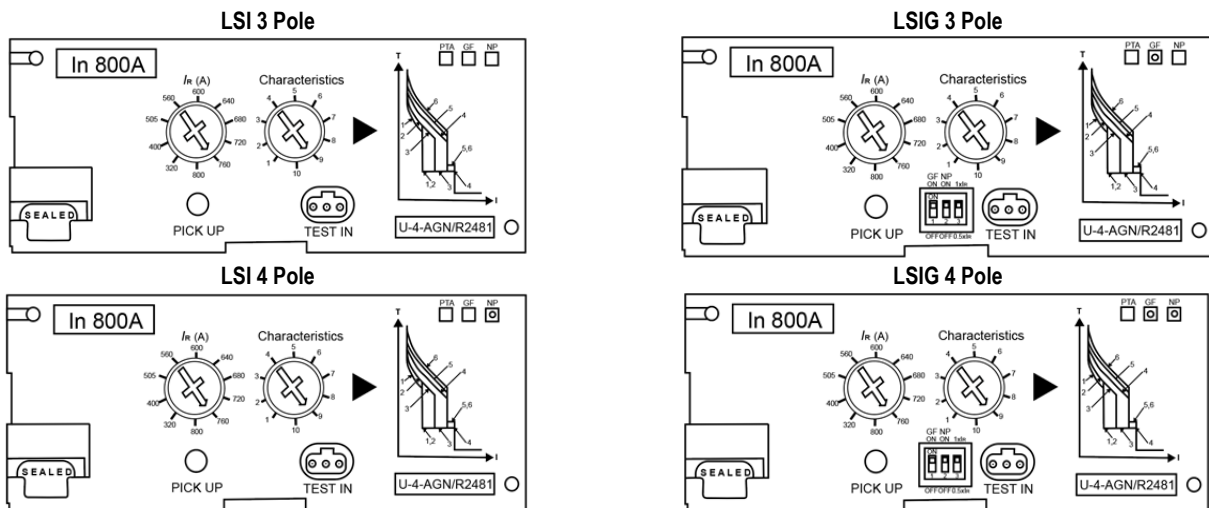
Action	Note
1 Switch the Smart MCCB to the Tripped Position.	
2 Open the front cover of the MCCB.	
3 Locate the shunt or UVT's trip bar into the MCCB trip mechanism slot.	
4 Position the shunt or UVT into place and click in to secure; follow the images to the right.	
5 Run the wires out the right-hand side of the MCCB, through the allocated grooves.	

# Protection Settings

## Trip Curve

The TemBreak *PRO* B\_BE electronic trip unit protects against overcurrent and short circuit faults for many types of electrical distribution systems. The P\_BE OCR has protective characteristics according to the requirements of the standard AS/NZS IEC 60947-2.

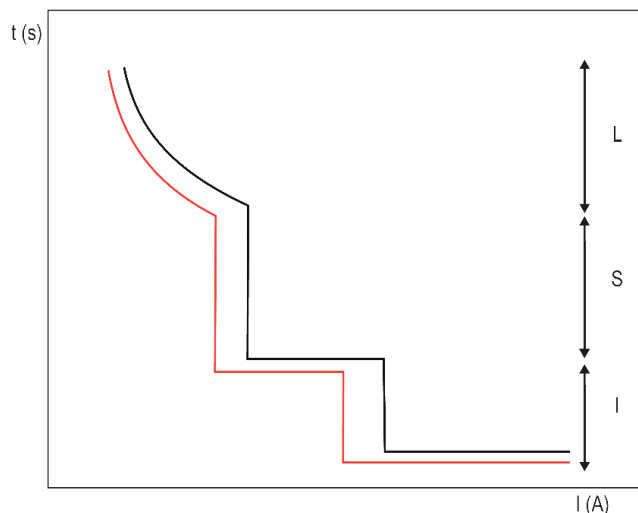
All protection functions are based on the effective value (RMS) of power, to reduce the effects of current harmonics. The wide range of protection curves adjustments assist in being able to achieve Selectivity combinations of upstream and downstream protection.



## List of Protection Functions

Abbreviation	Description	Protection against	Symbol	Definition	Adjustable
<b>L</b>	Long-time delay (LTD) protection	Low level current overload	$I_r$	Threshold long time protection	$I_r$ dial adjustment / fixed pre-defined curve selection
			$t_r$	Long Time Delay	
<b>S</b>	Short-time delay (STD) protection	Low level short-circuit	$I_{sd}$	Threshold short time protection	Pre-defined curve selection
			$t_{sd}$	Short Time Delay	
<b>I</b>	Instantaneous (INST) protection	Larger short-circuit	$I_i$	Instantaneous protection threshold	Pre-defined curve selection
<b>G</b>	Ground/Earth protection	Ground / Earth fault	$I_g$	Earth Protection Threshold	Dip switch
			$t_g$	Delay protection Earth	

## Time-current curve



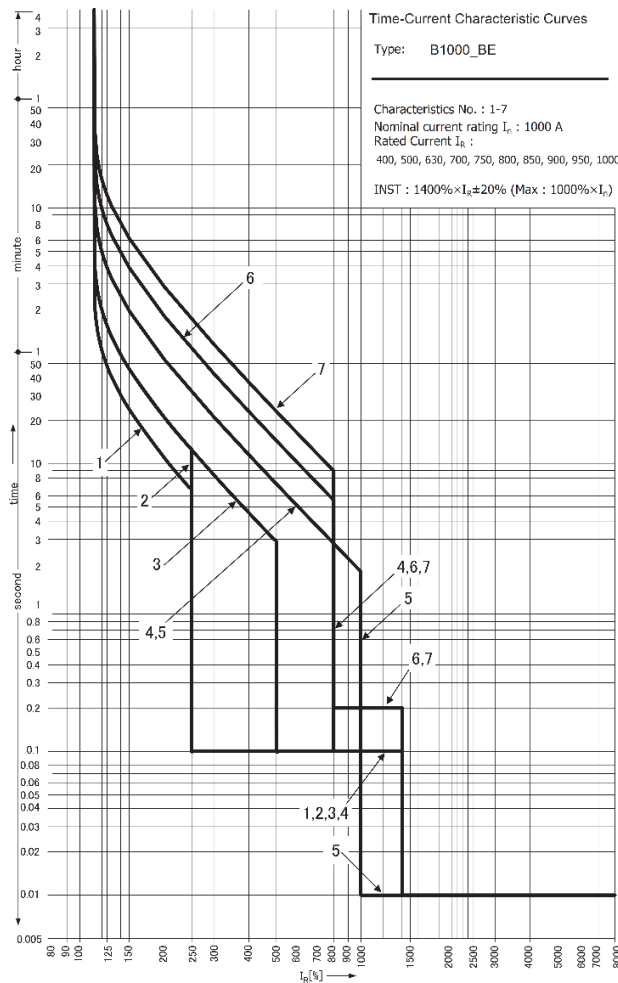
# Protection Settings

## Pre-Defined Curves

The B\_BE does not allow full customisation of the LSI protection functions; however, it does allow the election of several pre-defined protection curves, which cover a wide range of applications and industry requirements. Most pre-defined curves also offer adjustment of  $I_R$  to shift the curve along the current (I) axis for better refinement

**Notice:** Pre-defined curves can differ between MCCB models and OCR ratings, refer to [Annex B – Time Current Curves](#) for further detail on the pre-defined curves for each B\_BE MCCB model.

**Example** – pre-defined time current curve selection for B1000\_BE:



Not all curves are adjustable with the  $I_R$  dial, and are either a fixed current value, or calculated from the trip unit current rating  $I_n$ , as illustrated in the following table:

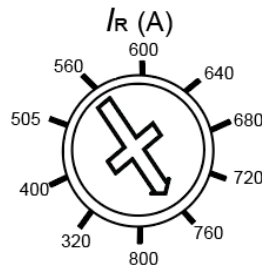
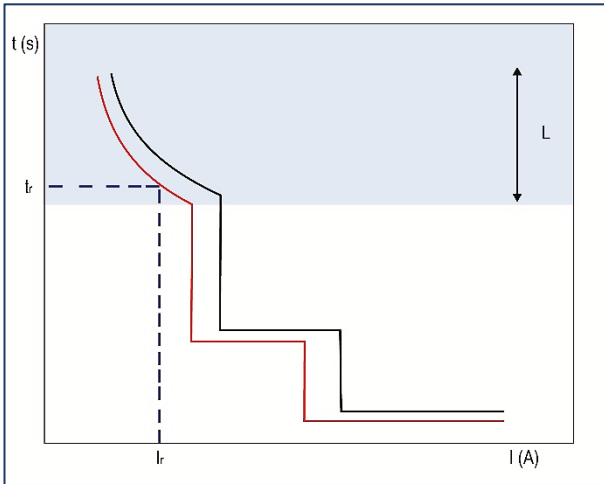
Pre-defined curve number	1	2	3	4	5	6	7	8	9	10
B250 $I_n = 40A, 125A, 250A$	R	R	R	R	R	F	F	N	—	—
B250 $I_n = 160A$	R	R	R	R	R	—	—	—	—	—
B400	R	R	R	R	R	R	R	F	F	N
B800 / 1000 / 1250 / 1600	R	R	R	R	R	R	R	R	R	R

- R Adjustable current with  $I_R$  dial
- F Fixed current
- N Calculated current from trip unit rating  $I_n$

## Protection Settings

### Long Time Delay Protection (LTD)

The Long Time Delay protection protects against current overloads or surges in power distribution or motor control applications. Long Time Delay protection is an inverse-time protection which includes a thermal image function.



Long Time Delay Settings		Description
L	$I_r$	Long Time Delay protection threshold (current rating)
	$t_r$	Long Time Delay (time delay)

### Adjusting $I_r$ (Current)

The LTD protection trip range is:  $1.05 \dots 1.20 \times I_r$  according to standard AS/NZS IEC 60947.2. The trip threshold tolerance  $I_r$  for the long-time delay protection is +5% to +20%.

The  $I_r$  threshold is set using the  $I_R$  adjustment dial in step increments.

Rating ( $I_n$ )	$I_r$ settings (A)									
	$I_R$ Dial position									
	1	2	3	4	5	6	7	8	9	10
40A	16	20	25	32	36	38	40			
125A	50	62	78	100	112	118	125			
160A	64	80	100	128	144	152	160			
250A	100	125	157	200	225	237	250			
400A	160	200	252	320	340	360	400			
630A	250	315	395	440	470	505	535	565	600	630
800A	320	400	505	560	600	640	680	720	760	800
1000A	400	500	630	700	750	800	850	900	950	1000
1250A	500	630	790	875	940	1000	1060	1125	1190	1250
1600A	640	800	1000	1120	1200	1280	1360	1440	1550	1600



**Notice:** For B250 / 400 models, the  $I_R$  dial adjusts in increments of percentage (%) values of  $I_n$ :  
 $I_R = 40, 50, 63, 80, 85, 90, 95, 100\% \times I_n$

## Protection Settings

### Long Time Delay (LTD) protection

#### Adjusting $t_r$ (Time Delay)

The  $t_r$  time delay defines the trip time of the long-time delay protection at a referenced current, either as a fixed value or as a multiple of  $I_r$ . The  $t_r$  time delay can only be adjusted by selecting a pre-defined curve. The time to trip at any given current is calculated using the below formulae, where  $k$  is a constant specific to each of the pre-defined curve settings.

The derivation of the constant  $k$  is given by the below formulae, where  $t_r$  and  $I_r$  are reference values depending on the MCCB model and trip unit, and the curve selected.

Below are the 3 equations for long time

Equation A	$k = \frac{-t_r}{\log_e \left( 1 - \left( \frac{1.125 \times I_r}{I} \right)^2 \right)}$	Standard Equation
Equation B	$k = \left( \left( \frac{I}{1.125 \times I_r} \right)^7 - 1 \right) t_r$	NHP Special 1
Equation C	$k = \left( \left( \frac{I}{1.125 \times I_r} \right)^{5.5} - 1 \right) t_r$	NHP Special 2 Models B800 / 1000 / 1250 / 1600, Curve 9 calculation limited down to 0.1s

Pre-defined curve number	1	2	3	4	5	6	7	8	9	10
B250 $I_n = 40A, 125A, 250A$	A	A	A	A	A	B	C	N/A	—	—
B250 $I_n = 160A$	A	A	A	A	A	—	—	—	—	—
B400 $I_n = 250A$	A	A	A	A	A	A	A	B	C	N/A
B400 $I_n = 400A$	A	A	A	A	A	A	A	C	C	N/A
B800 / 1000 / 1250 / 1600	A	A	A	A	A	A	A	C	C	N/A

Refer to [Annex B – Time Current Curves](#) for further detail on the pre-defined curves for each B\_BE MCCB model.

B250		Pre-defined curve number									
Rating ( $I_n$ )		1	2	3	4	5	6	7	8	9	10
40 A	$t_{r \text{ reference}}$ (s)	11	21	21	5	7.5	1	2.5	—	—	—
	$I_{\text{reference}}$ (A)	$2 \times I_r$	$2 \times I_r$	$2 \times I_r$	$6 \times I_r$	$6 \times I_r$	90	120	—	—	—
	Derived $k$	28.918	55.206	55.206	139.707	209.561	957.917	548.014	—	—	—
	$I_r$ (A)	Adjustable via dial						Fixed 30A	Fixed 40A	—	—
125 A	$t_{r \text{ reference}}$ (s)	11	21	21	5	7.5	1	2.5	—	—	—
	$I_{\text{reference}}$ (A)	$2 \times I_r$	$2 \times I_r$	$2 \times I_r$	$6 \times I_r$	$6 \times I_r$	300	375	—	—	—
	Derived $k$	28.918	55.206	55.206	139.707	209.561	957.917	548.014	—	—	—
	$I_r$ (A)	Adjustable via dial						Fixed 100A	Fixed 125A	—	—
160 A	$t_{r \text{ reference}}$ (s)	11	21	21	5	7.5	—	—	—	—	—
	$I_{\text{reference}}$ (A)	$2 \times I_r$	$2 \times I_r$	$2 \times I_r$	$6 \times I_r$	$6 \times I_r$	—	—	—	—	—
	Derived $k$	28.918	55.206	55.206	139.707	209.561	—	—	—	—	—
	$I_r$ (A)	Adjustable via dial						—	—	—	—
250 A	$t_{r \text{ reference}}$ (s)	11	21	21	5	7.5	1	2.5	—	—	—
	$I_{\text{reference}}$ (A)	$2 \times I_r$	$2 \times I_r$	$2 \times I_r$	$6 \times I_r$	$6 \times I_r$	600	750	—	—	—
	Derived $k$	28.918	55.206	55.206	139.707	209.561	957.917	548.014	—	—	—
	$I_r$ (A)	Adjustable via dial						Fixed 200A	Fixed 250A	—	—
B400		Pre-defined curve number									
Rating ( $I_n$ )		1	2	3	4	5	6	7	8	9	10
250 A	$t_{r \text{ reference}}$ (s)	11	21	21	5	10	19	29	1	2.5	—
	$I_{\text{reference}}$ (A)	$2 \times I_r$	$2 \times I_r$	$2 \times I_r$	$6 \times I_r$	$6 \times I_r$	$6 \times I_r$	$6 \times I_r$	600	750	—
	Derived $k$	28.918	55.206	55.206	139.707	279.415	530.888	810.302	957.917	548.014	—
	$I_r$ (A)	Adjustable via dial								Fixed 200A	Fixed 250A
400 A	$t_{r \text{ reference}}$ (s)	11	21	21	5	10	19	29	2.5	4	—
	$I_{\text{reference}}$ (A)	$2 \times I_r$	$2 \times I_r$	$2 \times I_r$	$6 \times I_r$	$6 \times I_r$	$6 \times I_r$	$6 \times I_r$	960	1200	—
	Derived $k$	28.918	55.206	55.206	139.707	279.415	530.888	810.302	548.014	876.823	—
	$I_r$ (A)	Adjustable via dial								Fixed 320A	Fixed 400A

## Protection Settings

### Long Time Delay (LTD) protection

#### Adjusting $t_r$ (Time Delay)

B800		Pre-defined curve number									
Rating ( $I_n$ )		1	2	3	4	5	6	7	8	9	10
630 / 800 A	$t_r$ reference (s)	11	21	21	5	5	10	29	46	1	—
	$I$ reference (A)	$2 \times I_r$	$2 \times I_r$	$2 \times I_r$	$6 \times I_r$	$6 \times I_r$	$6 \times I_r$	$6 \times I_r$	$1.5 \times I_r$	$3 \times I_r$	—
	Derived $k$	28.918	55.206	55.206	139.707	139.707	279.415	810.302	177.831	219.205	—
	$I_r$ (A)	Adjustable via dial									
B1000 / 1250 / 1600		Pre-defined curve number									
Rating ( $I_n$ )		1	2	3	4	5	6	7	8	9	10
1000 A	$t_r$ reference (s)	11	21	21	5	5	10	16	46	1	—
	$I$ reference (A)	$2 \times I_r$	$2 \times I_r$	$2 \times I_r$	$6 \times I_r$	$6 \times I_r$	$6 \times I_r$	$6 \times I_r$	$1.5 \times I_r$	$3 \times I_r$	—
	Derived $k$	28.918	55.206	55.206	139.707	139.707	279.415	447.063	177.831	219.205	—
	$I_r$ (A)	Adjustable via dial									
B1250 / 1600		Pre-defined curve number									
Rating ( $I_n$ )		1	2	3	4	5	6	7	8	9	10
1250 / 1600 A	$t_r$ reference (s)	11	21	21	5	5	10	29	46	1	—
	$I$ reference (A)	$2 \times I_r$	$2 \times I_r$	$2 \times I_r$	$6 \times I_r$	$6 \times I_r$	$6 \times I_r$	$6 \times I_r$	$1.5 \times I_r$	$3 \times I_r$	—
	Derived $k$	28.918	55.206	55.206	139.707	139.707	279.415	810.302	177.831	219.205	—
	$I_r$ (A)	Adjustable via dial									



**Notice:** The trip time tolerance for LTD protection is -20% + 20ms to 0% + 30ms.

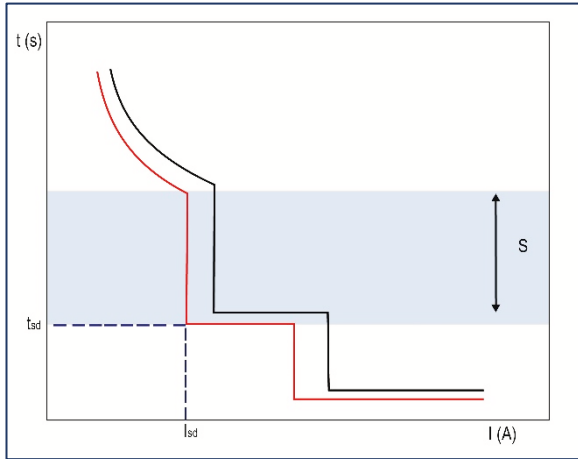
Example:

For  $t_r = 5$  s and  $I = 6 \times I_r$ , the trip time for long time delay protection will be between 4.02 s and 5.03 s.

## Protection Settings

### Short Time Delay Protection (STD)

The short time protection is designed to protect against low level short circuits.



Short Time Delay Settings		Description
<b>S</b>	$I_{sd} (x I_r)$	Short Time Delay protection threshold
	$t_{sd} (ms)$	Short Time Delay

### Adjustment $I_{sd}$ (Current)

The  $I_{sd}$  trip threshold tolerance for STD protection is  $\pm 15\%$ .

Adjustments to  $I_{sd}$  can only be made by selecting a pre-defined curve.  $I_{sd}$  trip threshold is defined as a multiple of  $I_r$  as shown in the below table:

Short Time Delay Threshold Multiplier of $I_r$		Pre-defined curve number									
	Rating ( $I_n$ )	1	2	3	4	5	6	7	8	9	10
B250	40 A	2.5	2.5	5	10	10	–	–	–		
	125 A										
	160 A										
	250 A										
B400	250 A	2.5	2.5	5	10	10	10	10	–	–	–
	400 A										
B800	630 A	2.5	2.5	5	10	–	10	10	1.6	–	–
	800 A										
B1000	1000 A	2.5	2.5	5	8	–	8	8	1.6	–	–
B1250	1250 A	2.5	2.5	5	10	–	10	10	1.6	–	–
B1600	1600 A	2.5	2.5	5	10	–	10	10	1.6	–	–



## Protection Settings

### Short Time Delay Protection (STD)

#### Adjusting $t_{sd}$ (Time Delay)

The trip time tolerance for short time delay protection is: -20 ms / +50 ms

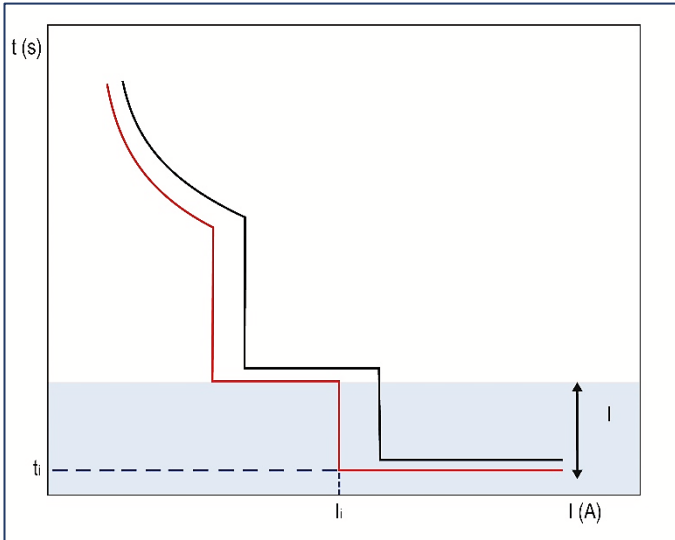
Adjustments to  $t_{sd}$  can only be made by selecting a pre-defined curve and have a fixed time delay, given in seconds.

Short Time Delay (s)		Pre-defined curve number									
	Rating ( $I_n$ )	1	2	3	4	5	6	7	8	9	10
B250	40 A	0.1	0.1	0.1	0.1	0.2	–	–	–		
	125 A										
	160 A										
	250 A										
B400	250 A	0.1	0.1	0.1	0.1	0.2	0.2	0.2	–	–	–
	400 A										
B800	630 A	0.1	0.1	0.1	0.1	–	0.2	0.2	0.05	–	–
	800 A										
B1000	1000 A	0.1	0.1	0.1	0.1	–	0.2	0.2	0.05	–	–
B1250	1250 A	0.1	0.1	0.1	0.1	–	0.2	0.2	0.05	–	–
B1600	1600 A	0.1	0.1	0.1	0.1	–	0.2	0.2	0.05	–	–

## Protection Settings

### Instantaneous Protection (INST)

Instantaneous protection is designed to protect against high current short circuits. This protection is independent of time and is set as a multiple of  $I_r$ .



	Instantaneous Delay Settings	Description
I	$I_i (x I_r)$	Instantaneous protection threshold

### Adjusting $I_i$ (Current)

The  $I_i$  trip threshold tolerance for instantaneous protection is  $\pm 20\%$ .

The instantaneous protection has no adjustable time delay.

The trip units non-powered no trip time is 10 ms with a maximum cut-out time is 50 ms, if the trip unit already powered the performance is greatly increased.

Total clearing time differs between Ampere Frames.

The  $I_i$  can only be adjusted by selecting a pre-defined curve and is set as a multiple of  $I_r$ . Depending on the selected curve and MCCB model there are maximum values for  $I_i$  based on  $I_n$ .

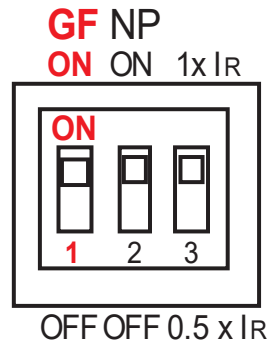
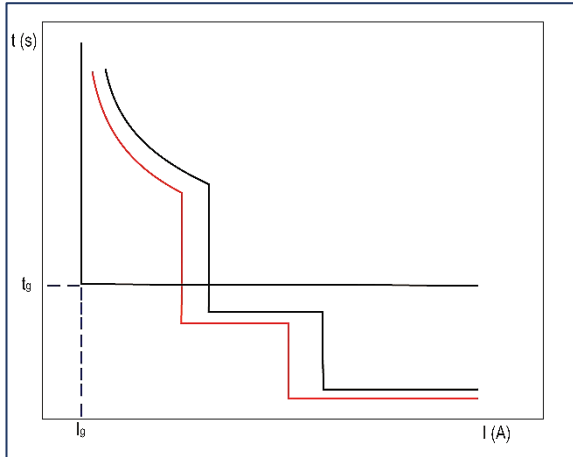
Instantaneous Threshold		Pre-defined curve number										
	Rating ( $I_n$ )	1	2	3	4	5	6	7	8	9	10	
B250	40 A	14 x $I_r$ (to a maximum 13 x $I_n$ )						250 A	300 A	520 A		
	125 A							650 A	700 A	1625 A		
	160 A											
	250 A							800 A	1000 A	3250 A		
B400	250 A	14 x $I_r$ (to a maximum 13 x $I_n$ )							800 A	1000 A	3250 A	
	400 A							1280 A	1600 A	5200 A		
B800	630 A	14 x $I_r$ (to a maximum 12 x $I_n$ )				10 x $I_r$	14 x $I_r$ (to a maximum 12 x $I_n$ )		2.5 x $I_r$	10 x $I_r$	12 x $I_r$	
	800 A											
B1000	1000 A	14 x $I_r$ (to a maximum 10 x $I_n$ )				10 x $I_r$	14 x $I_r$ (to a maximum 10 x $I_n$ )		2.5 x $I_r$	10 x $I_r$	10 x $I_r$	
B1250	1250 A	14 x $I_r$ (to a maximum 12 x $I_n$ )				10 x $I_r$	14 x $I_r$ (to a maximum 12 x $I_n$ )		2.5 x $I_r$	10 x $I_r$	12 x $I_r$	
B1600	1600 A	14 x $I_r$ (to a maximum 12 x $I_n$ )				10 x $I_r$	14 x $I_r$ (to a maximum 12 x $I_n$ )		2.5 x $I_r$	10 x $I_r$	12 x $I_r$	

## Protection Settings

### Ground/Earth Fault Protection (GF)

Ground Fault (GF) protection is protection against high strength insulation / earth faults. Ground fault is available for the B400\_BEG to B1600\_BEG in 3P and 4P MCCBs.

GF is independent time protection and fixed at 20% of  $I_n$ .



	Short Time Delay Settings	Description
<b>G</b>	$I_g = 0.2 \times I_n$	Ground fault protection threshold
	$t_g = 200 \text{ ms}$	Ground fault delay

GF pickup current  $I_g$  is fixed at  $I_g = 0.2 \times I_n$  and is not adjustable. The  $I_g$  trip threshold tolerance for ground protection is  $\pm 15\%$ .

GF time delay  $t_g$  is also fixed at  $t_g = 200 \text{ ms}$  and is not adjustable. The trip time tolerance for ground protection is  $-20 \text{ ms} / +50 \text{ ms}$

GF protection can be turned ON or OFF using the DIP switch on the MCCB by setting the GF switch (position 1) to the ON or OFF position, respectively.



**Notice:** Enabling GF for 3 pole MCCBs on a 4-wire system without a Ground Fault CT may result in nuisance tripping in the case of imbalanced loads. It is recommended in this case that GF should be disabled.

## Protection Settings

### Ground/Earth Fault Protection (GF)

#### Ground Fault Calculation

Ground current is calculated via zero-sum. Current IN ( $I_{IN}$ , towards load) is compared with Current OUT ( $I_{OUT}$ , return from load).

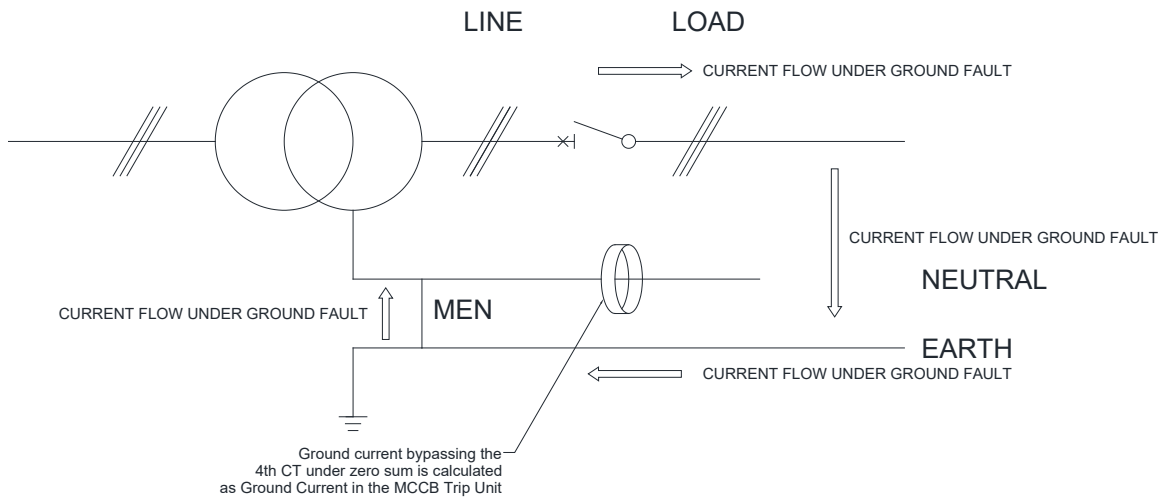
If  $I_{IN} = I_{OUT}$  the calculated ground current will be zero.

If  $I_{IN} \neq I_{OUT}$  the calculated ground current =  $I_{IN} - I_{OUT}$ .

As such it is important that when using a 3 pole MCCB on an unbalanced 4-wire system that the current flowing from the neutral is measured to ensure correct calculation of ground current. If the neutral current is not measured, any normal operation current flowing through the neutral will not be seen and will result in GF tripping if  $\geq I_g$  threshold setting.

The 4<sup>th</sup> CT can not be installed on a Protective Earth Neutral (PEN), as Ground currents will be calculated as next to zero. The CT must be installed after the MEN, see [Annex G](#) for installation location advice.

Below is an example of ground current return path in a 3 pole B\_BEG.



#### Ground Fault 4<sup>th</sup> CT

Ground Fault protection using 3 pole MCCBs on 4-wire systems require an external 4<sup>th</sup> CT installed on the Neutral Conductor.

To select a CT, match the primary current rating with the  $I_n$  rating of the trip unit.

Part Number	Description	Primary Current (A)	Secondary Current (mA)	Suitable MCCBs
T2GB40N04A	TBP GROUND FAULT NEUTRAL PHASE CT 400A FOR MCCB B400/L400	400	100	B400
T2GB40N06A	TBP GROUND FAULT NEUTRAL PHASE CT 630A FOR MCCB B800_630	630	100	B800_630
T2GB40N08A	TBP GROUND FAULT NEUTRAL PHASE CT 800A FOR MCCB B/L800	800	100	B800
T2GBX6N10A	TBP GROUND FAULT NEUTRAL PHASE CT 1000A FOR MCCB B1000	1000	100	B1000
T2GBX6N12A	TBP GROUND FAULT NEUTRAL PHASE CT 1250A FOR MCCB B1250	1250	100	B1250
T2GBX6N16A	TBP GROUND FAULT NEUTRAL PHASE CT 1600A FOR MCCB B1600	1600	100	B1600



**Notice:** 4<sup>th</sup> CT does not provide Neutral Conductor Protection (NP), and as the 4<sup>th</sup> CT is assisting with the calculation of zero-sum and specifically the "lack" of current has no requirement to be protection class and meets the accuracy requirements of 60947-2. If NP is also required see [Neutral Protection \(NP\)](#).

See [Annex A](#) for Dimensions & [Annex G](#) for CT Wiring.



**WARNING:** Terasaki purpose designed CT must be used, use of alternative CTs is not permitted.

## Protection Settings

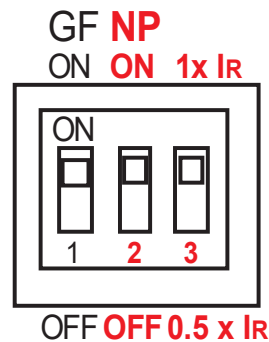
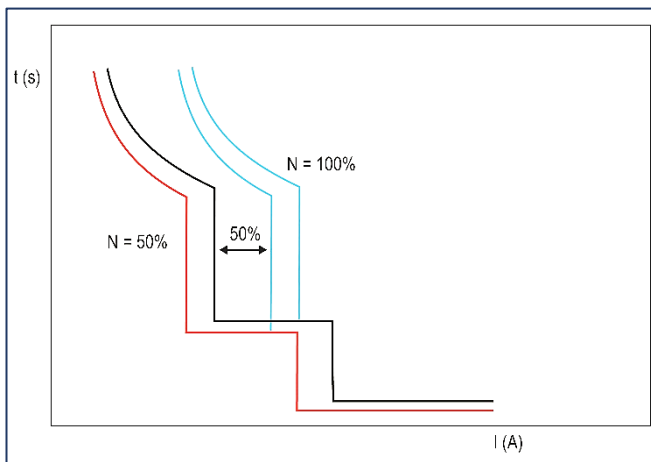
### Neutral Protection (NP)

Neutral protection is available with 4P B\_BE\_N MCCBs with Neutral trip unit option added. It is particularly useful when the cross-section of the neutral conductor is reduced in relation to the phase conductors.

Neutral protection is based off the standard LTD and STD protection parameter of the main phases. The  $I_r$  and  $I_{sd}$  parameters for the Neutral pole are adjusted according to the set Neutral Coefficient percentage. For example, If the Neutral conductor is sized at 50% of the main phases, and the N Coefficient Adjustment parameter is set to 50%, then  $I_r$  and  $I_{sd}$  of the Neutral pole will be 50% of  $I_r$  and  $I_{sd}$  of main phase poles.

The time delays for the Neutral pole remain identical to the  $t_r$  and  $t_{sd}$  time delay adjustment values for the main phases and cannot be independently changed.

INST protection of the Neutral pole is not affected by the N Coefficient adjustment setting and is identical to the  $I_i$  trip threshold of the main phases.



The Neutral Coefficient percentage can be adjusted using the DIP switches on the MCCB by setting the two NP switches (positions 2 and 3).

#### DIP switch 2:

- OFF: NP disabled
- ON: NP enabled

#### DIP switch 3:

- OFF:  $N\% = 50\% \times I_r$
- ON:  $N\% = 100\% \times I_r$

N Coefficient Adjustment Settings (%)	Parameters Impacted
50 – 100 – OFF	The coefficient is applied to the adjustment value of the phase $I_r$ and $I_{sd}$ thresholds




## Alarms & Indication

The B\_BE OCR provides alarming to indicate trip status and warning.

**Overload alarm:** Provides a warning about current overload which may result in an imminent trip/

**Pre-Trip alarm (PTA):** Optional on select MCCB models. Provides an early warning for current loading which is approaching the overload trip region of the OCR.

Indicators in the form of LEDs on the front indicate the operational status changes and alarm for B\_BE MCCBs.

Alarm/Status type	Indication	LED Status	Description
Normal	 PICK UP	OFF	Current < 80% x I <sub>r</sub>
Optional Pre-Trip alarm (PTA)	 PICK UP	RED Flashing	80% x I <sub>r</sub> ≤ Current < 105% x I <sub>r</sub>
Overload alarm	 PICK UP	RED Solid	105% x I <sub>r</sub> ≤ Current ≤ 125% x I <sub>r</sub>

## Alarms & Indication

### PTA (Pre-Trip Alarm)





The Pre-Trip Alarm permits monitoring and early warning of overload conditions prior to an actual LTD trip. The PTA setting is defined by two parameters which define the Pre-trip warning and Pre-trip Alarm zones and thus the behaviour of the PTA contact and status LED:

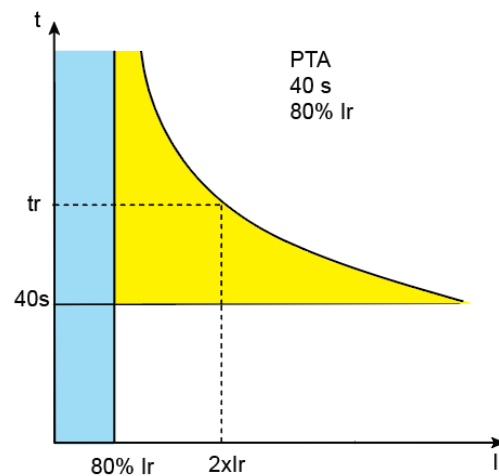
- PTA current threshold  $I_p$ : Threshold expressed as a percentage of  $I_r$  and is fixed at  $80\% \times I_r$ .
- PTA time delay  $t_p$ : Expressed as a percentage of  $t_r$  and is fixed at 40 seconds.

The  $I_p$  current threshold defines the lowest current that could be considered to be within the Pre-trip alarm zone. The  $t_p$  time delay threshold defines the shortest time in which the Pre-trip alarm will activate.

If the load current is less than the  $I_p$  current threshold, then this is considered the normal load zone. The PICK UP LED and PTA contact are unaffected and remain OFF and OPEN, respectively.

As the load current increases to at or above  $I_p$ , the Pre-trip warning zone is entered, and is indicated by the PICK UP LED illuminating FLASHING red.

Pre-trip zone	Current $I$ vs $I_p$	LED status	PTA contact status
Normal Load 	$I < I_p (0.8 \times I_r)$	OFF  PICK UP	OPEN
Pre-trip Alarm 	$I \geq I_p (0.8 \times I_r)$	FLASHING  PICK UP	CLOSED



### Power supply requirement

Operation of the PTA option requires an external OCR control power supply, which is mounted either locally on the side of the MCCB (all models), or remotely on special request (all models excluding B250).

OCR power supply specifications	Attribute
Voltage	200...240 Vac
Rated power	2 VA

## Alarms & Indication

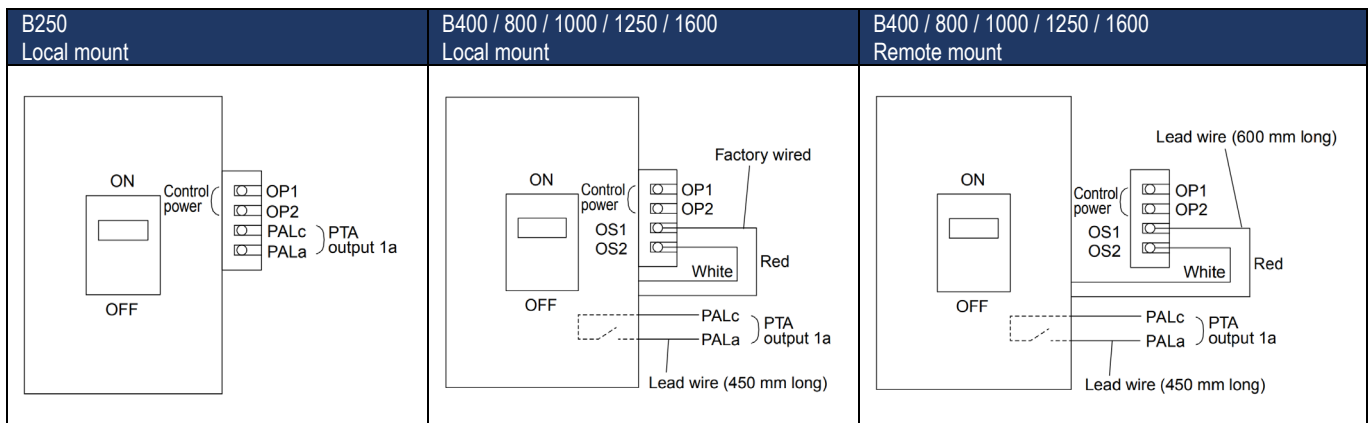
### PTA (Pre-Trip Alarm)

#### Connections and contact specification

OCR Power supply is connected to control power terminals OP1 (L1) and OP2 (L2/N).

The PTA contact is a volt-free contact, which is connected to either via terminals PALc and PALa (B250 model only), or via PALc and PALa lead wires on all other models.

Rated current of PTA output contact		
	Resistive load	Inductive load
250 Vac	2 A	2 A
220 Vdc	2 A	2 A





## Commissioning



**WARNING:** Before applying power to the MCCB for the first time, an initial inspection must be performed.



**WARNING:** Risk of nuisance tripping. Only qualified personnel are to set the protection levels. Failure to respect these instructions may cause death, serious injuries or equipment damage.

### LTD Adjustments (I<sub>R</sub>)

The LTD protection is configured by the I<sub>R</sub> adjustment rotary dials, which is performed as follows. Refer to [Protection Settings – Long Time Delay Protection \(LTD\)](#) section for further detail on setting I<sub>R</sub>

Action	Note / Illustration
<p>1 Turn the MCCB to the OFF Position</p> <p>Open the transparent flap in order to access the I<sub>R</sub> adjustment dial.</p>	
<p>2 Using a PH1, PH2 or PZ2 size screwdriver, rotate the I<sub>R</sub> adjustment dial to the maximum scale value of I<sub>R</sub> in Amperes or % depending on the MCCB model.</p>	

# Commissioning

## Pre-Defined Curve Selection

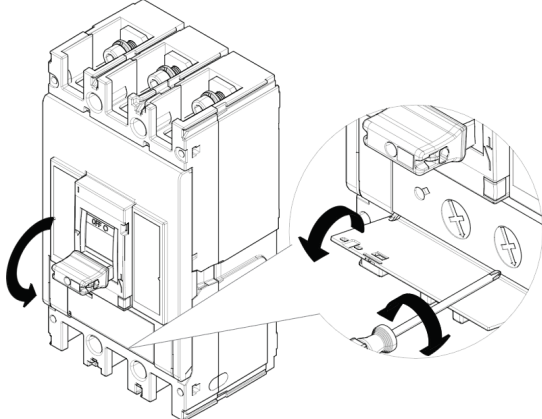
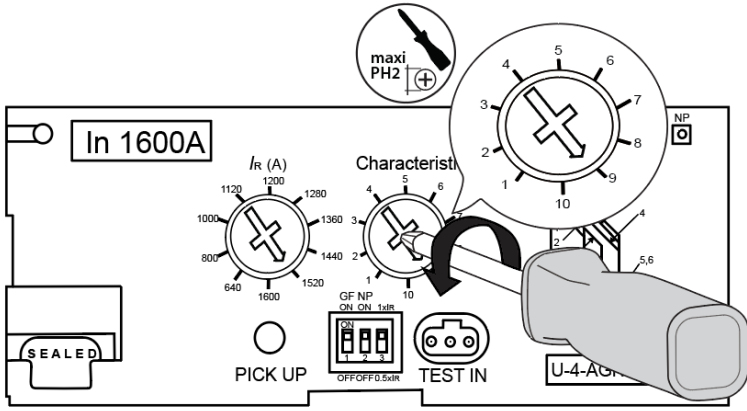
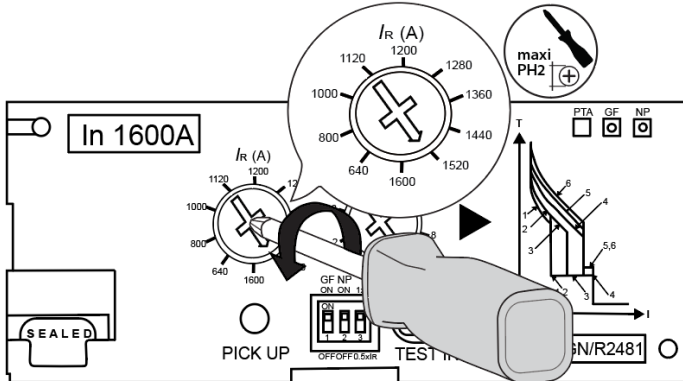
LTD, STD and INST protection is further defined by the selection of a pre-defined curve as selected via the Curve characteristic rotary dial, which is performed as follows. Refer to [Protection Settings – Pre-Defined Curves](#) section for further detail on selection of the pre-defined time-current curve.

Action	Note / Illustration
<p>1 Turn the MCCB to the OFF Position</p> <p>Open the transparent flap in order to access Curve adjustment dial</p>	
<p>2 Using a PH1, PH2 or PZ2 size screwdriver, position the adjustment dial on the desired curve number.</p>	

# Commissioning

## INST Protection Only Setting

The B\_BE can be configured for INST protection only by selecting the INST only pre-defined time-current curve as follows: Refer to [Protection Settings – Instantaneous Protection \(INST\)](#) section for further detail on setting  $I_i$ .

Action	Note / Illustration
<p>1</p> <p>Turn the MCCB to the OFF Position</p> <p>Open the transparent flap in order to access Curve adjustment dial.</p>	 <p>The illustration shows the MCCB with its transparent flap open, revealing the internal adjustment dial. A circular inset provides a magnified view of the dial and the screwdriver used to adjust it.</p>
<p>2</p> <p>Move the Curve adjustment dial using a PH1, PH2 or PZ2 size screwdriver.</p> <p>Position the adjustment dial on the curve below that matches the MCCB model:</p> <p><b>B250</b> – Curve 8</p> <p><b>B400 / 800 / 1000 / 1250 / 1600</b> – Curve 10</p>	 <p>The diagram shows the internal settings for the MCCB. It includes a 'Characterist' dial with numbers 1-10, a 'PICK UP' dial with values 640, 800, 1000, 1120, 1200, 1280, 1360, 1440, 1520, 1600, and a 'TEST IN' dial with 'OFF' and 'ON' positions. A 'SEALING' label is also present. A screwdriver icon indicates the use of a PH1, PH2, or PZ2 screwdriver.</p>
<p>3</p> <p><b>B800 / 1000 / 1250 / 1600 ONLY</b></p> <p>Using a PH1, PH2 or PZ2 size screwdriver, rotate the <math>I_R</math> adjustment dial to further adjust <math>I_i</math>.</p> <p>Refer to <a href="#">Protection Settings – Instantaneous Protection (INST)</a> section for further detail on setting <math>I_i</math>.</p>	 <p>The diagram shows the internal settings for the MCCB, similar to the previous one but with an additional 'PICK UP' dial with values 640, 800, 1000, 1120, 1200, 1280, 1360, 1440, 1520, 1600. A 'SEALING' label is also present. A screwdriver icon indicates the use of a PH1, PH2, or PZ2 screwdriver.</p>

## Commissioning

### LSIG 3P – GF Protection Adjustments ( $I_g$ )

On the LSIG 3P variant B\_BE MCCB, the GF protection is configured by the GF DIP switch, which is used to enable or disable GF protection, and is performed as follows. Refer to [Protection Settings – Ground/Earth Fault Protection \(GF\)](#) section for further detail on GF protection.

Action	Note / Illustration
<p>1</p> <p>Turn the MCCB to the OFF Position</p> <p>Open the transparent flap in order to access the GF DIP switch.</p>	
<p>2</p> <p>Move the GF dip switch using a small flat head screwdriver.</p> <p>Position the DIP switch to ON or OFF.</p>	

## Commissioning

### LSIG 4P – NP and GF Protection Adjustments ( $I_n$ )

On the 4P variant B\_BE MCCB, NP protection mode is configured by the NP DIP switches, which is performed as follows. Refer to [Neutral Protection \(NP\)](#) section for further detail on NP protection.

	Action	Note / Illustration
1	<p>Turn the MCCB to the OFF Position</p> <p>Open the transparent flap in order to access the NP DIP switches</p>	
2	<p>Move the NP DIP switches using a small flat head screwdriver.</p> <p>The Neutral Coefficient percentage can be adjusted using the DIP switches on the MCCB by setting the two NP switches (positions 2 and 3).</p> <p>DIP switch 2:      OFF:      NP disabled                           ON:      NP enabled</p> <p>DIP switch 3:      OFF:      N% = 50% x <math>I_r</math>                           ON:      N% = 100% x <math>I_r</math></p>	

## Troubleshooting

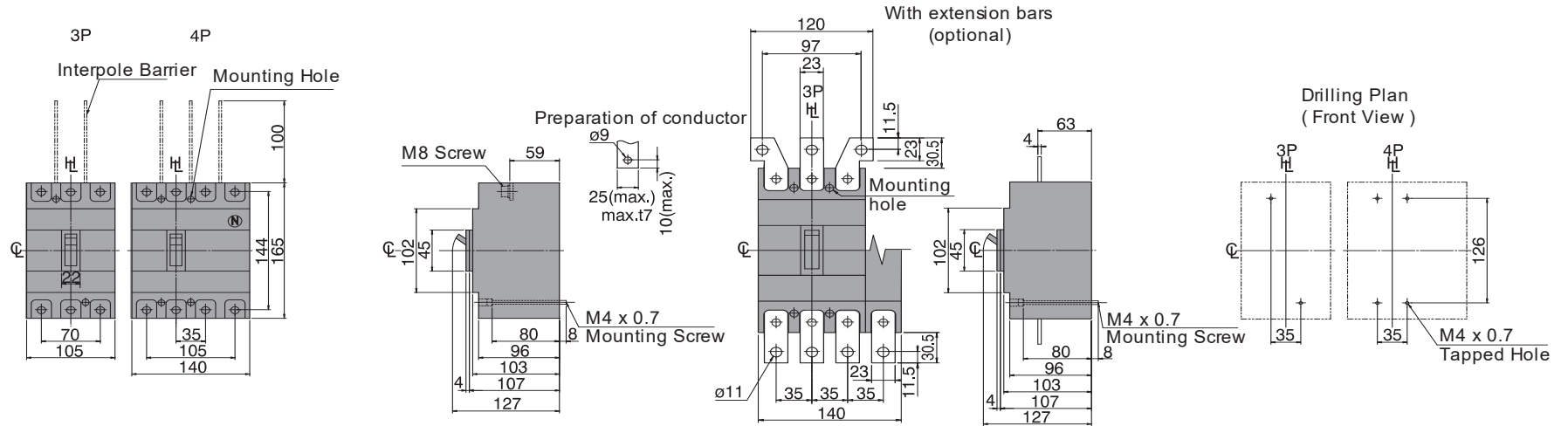
In the event of a problem when using the TemBreak *PRO* system, this section provides advice on how to resolve issues.

	Problem description	Possible cause	Remedial advice
1	Abnormal voltage on load side	Excessive wear of contacts	Replace MCCB.
		Foreign matter interfering with contacts or contact surfaces	
2	Failure in ON position	Reset operation not conducted after tripping operation.	Perform reset operation.
3	Failure in RESET position	UVT not energised	Apply voltage to UVT
		Circuit breaker service life ended due to large number of switching cycles using SHT or UVT	Replace MCCB
		Fault of tripping mechanism	
4	Nuisance tripping while rated current not reached	Vibration and/or shock	Dampen vibration of MCCB and review installation requirements
		High proportion of high frequency distortion in load current.	Decrease distortion content of load circuit
		Electromagnetic induced interference (from nearby conductors or external radio sources)	Review nearby sources of conducted and radiated emissions (e.g. radio sources, high-speed switching devices including variable frequency drives)
		Excessive surge	Isolate and mitigate surge source (e.g. surge protection devices)
		Erroneous connection of control circuit for SHT or UVT	Verify control wiring and supply to SHT and UVT
5	Nuisance tripping due to starting current	Excessive inrush starting current due to load type	Review INST and STD protection settings for load type where applicable
		Switching operation of star-delta motor starter, incorrect wiring	Verify and correct any issues with star-delta starter wiring with respect to the motor windings and phase sequence. Refer to motor and/or starter manufacturer
		Short-circuit in motor (e.g. windings, starter circuit)	Verify and correct any issues with motor wiring. Inspect and verify motor winding insulation. Refer to motor manufacturer
		Erroneous connection of control circuit for SHT or UVT	Verify control wiring and supply to SHT and UVT
6	No trip at pickup current	Failure in selectivity/coordination with upstream circuit breaker or fuse	Review selectivity/coordination study and protection parameters of each device
		Incorrect protection settings	Review enabled protection settings ensuring correct pickup current and time-delay for load type. (e.g. LTD, STD, INST pickup currents and time delays)

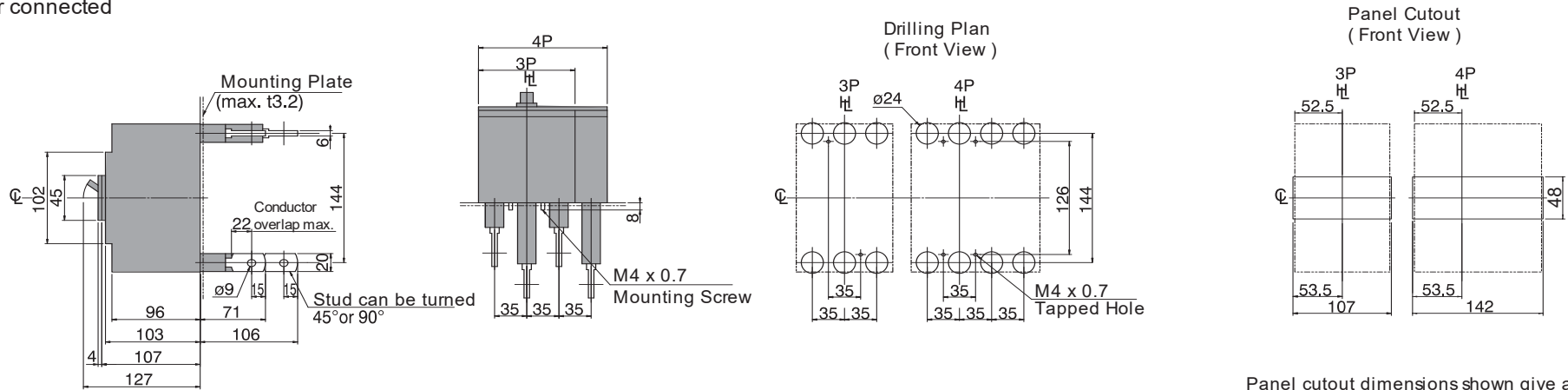
# Annex A – Dimensions

## B250P

### Front connected



### Rear connected



Panel cutout dimensions shown give an allowance of 1.0mm or more around the handle escutcheon.

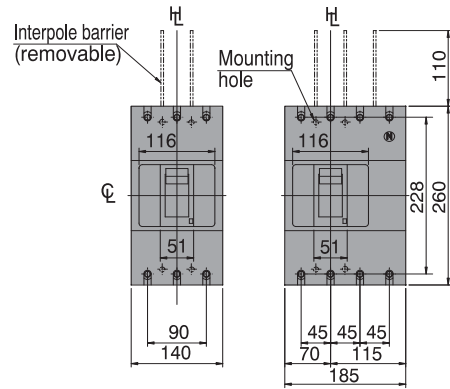




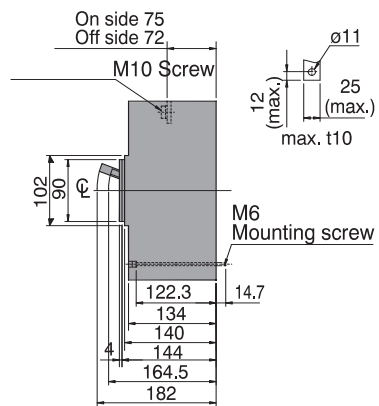
# Annex A – Dimensions

## B400P / R

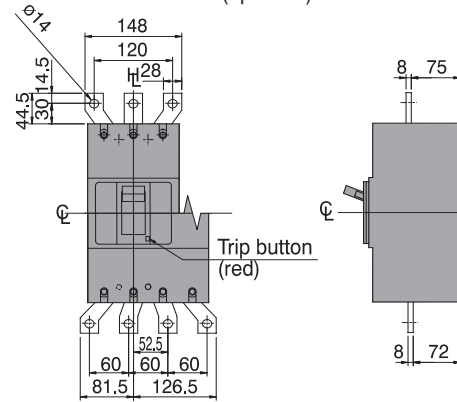
Front connected



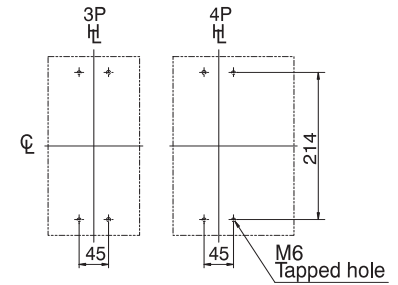
Preparation of conductor



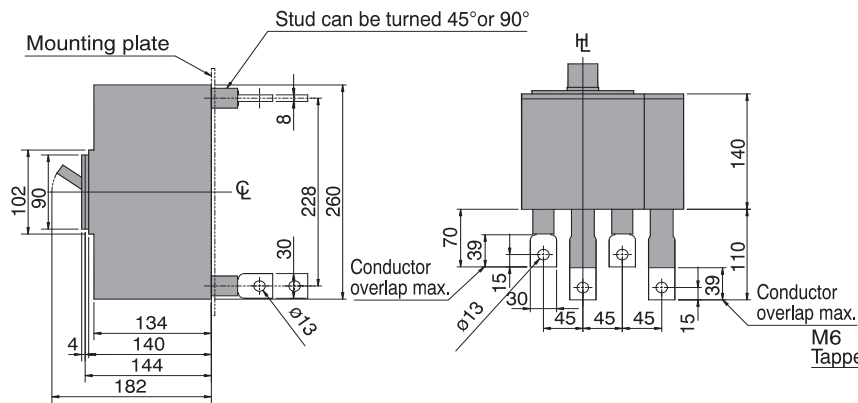
With extension bars (optional)



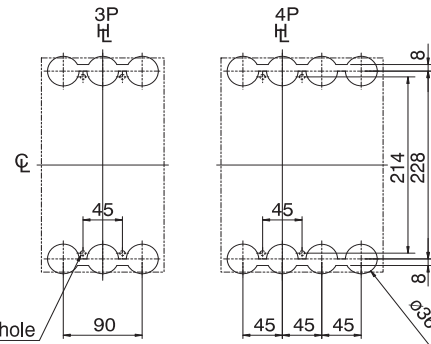
Drilling plan (front view)



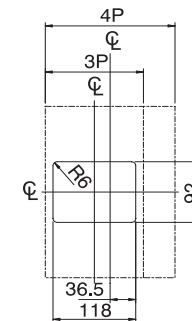
Rear connected



Drilling plan (front view)



Panel cutout (front view)



Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

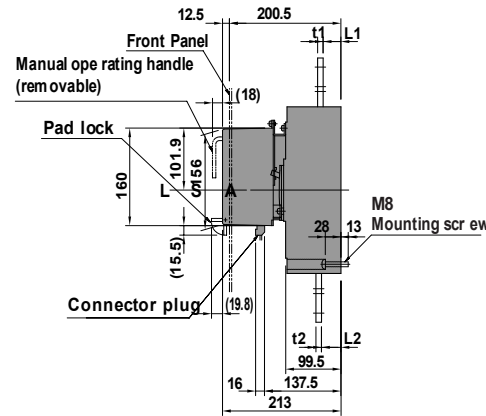
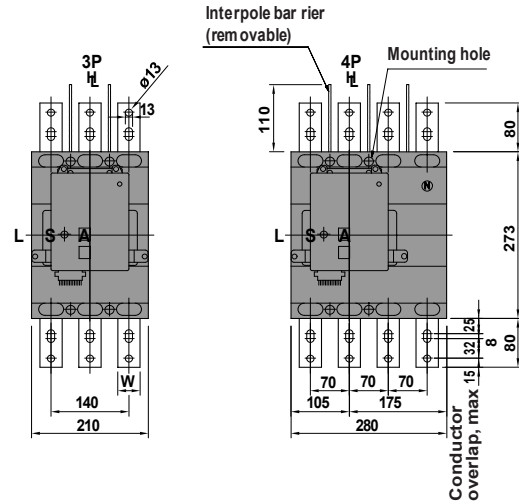




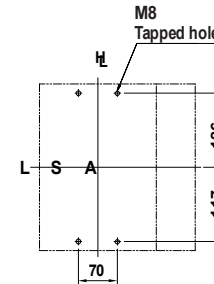
# Annex A – Dimensions

B800N / H / G

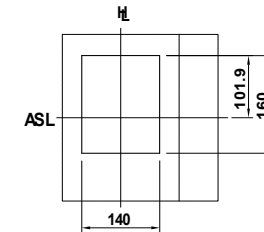
## Front connected with Motor Operator



## Drilling plan (front view)

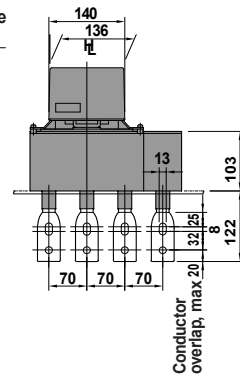
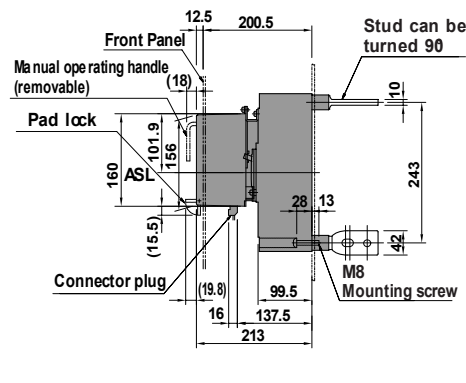


## Panel cutout (front view)

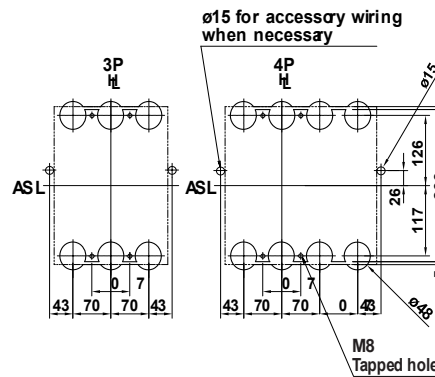


Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

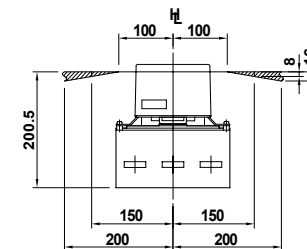
## Rear connected with Motor Operator



## Drilling plan (front view)



## Panel hinge position (hatching area) (bottom view)

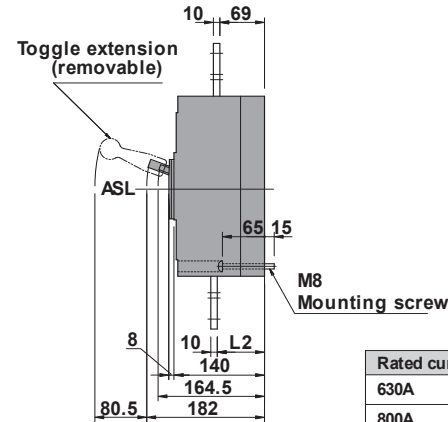
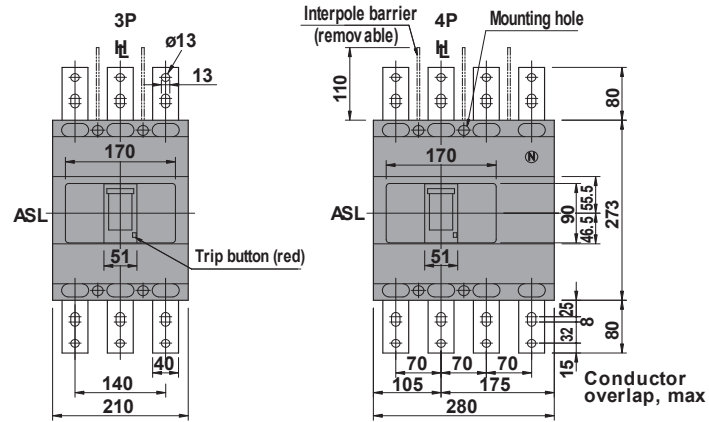


Note: Studs are factory installed in horizontal direction both on the line and load side

# Annex A – Dimensions

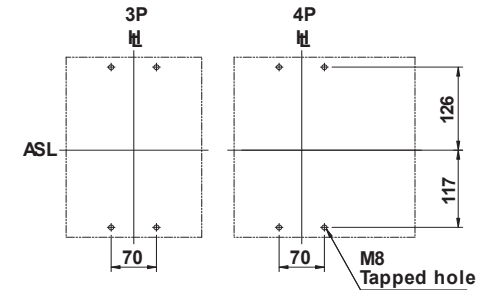
## B800P / R

### Front connected

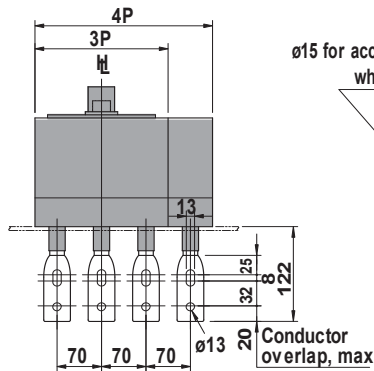
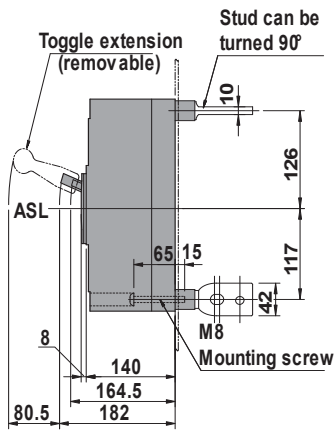


Rated current	L2
630A	73
800A	74

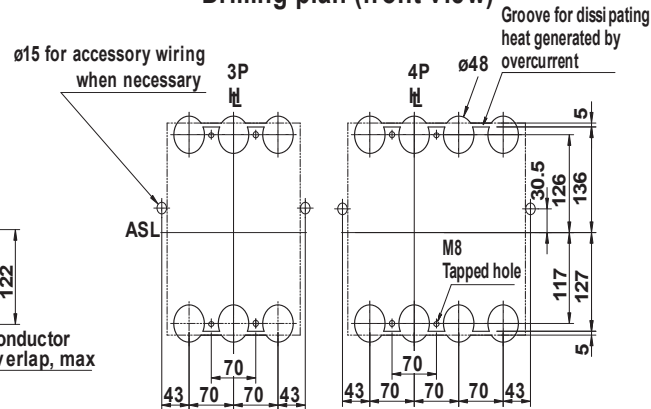
### Drilling plan (front view)



### Rear connected

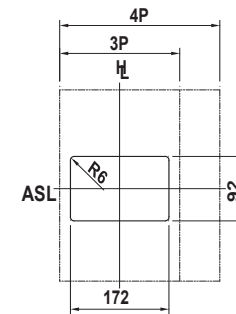


### Drilling plan (front view)



Note: Studs are factory installed in horizontal direction both on the line and load sides.

### Panel cutout (front view)

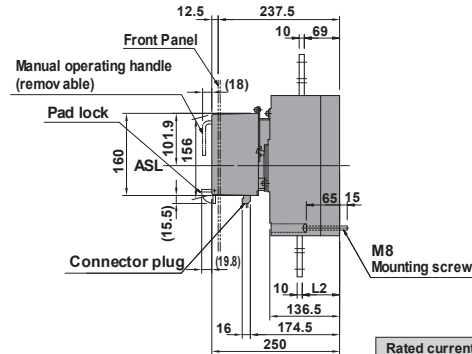
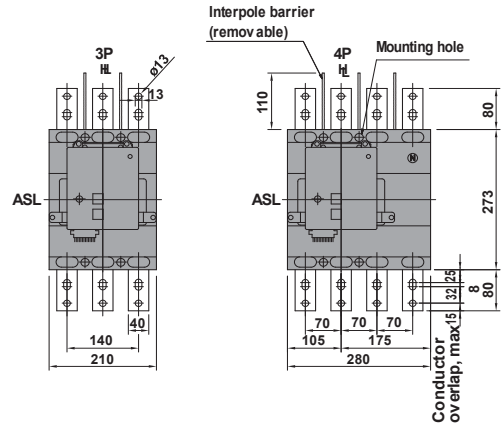


Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

# Annex A – Dimensions

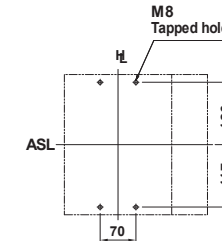
B800P / R

## Front connected with Motor Operator

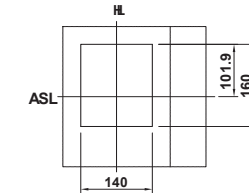


Rated current	L2
630A	73
800A	74

## Drilling plan (front view)

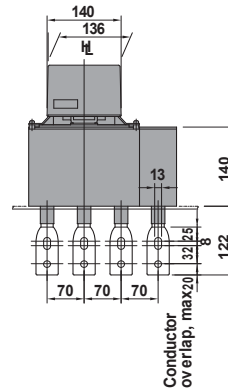
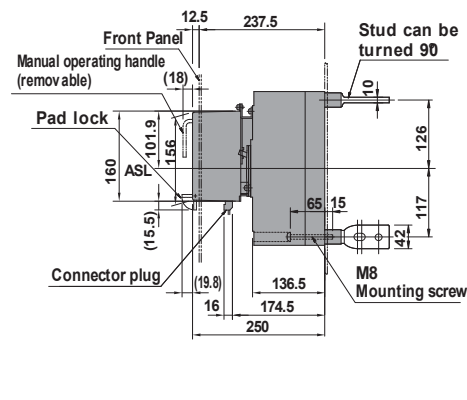


## Panel cutout (front view)

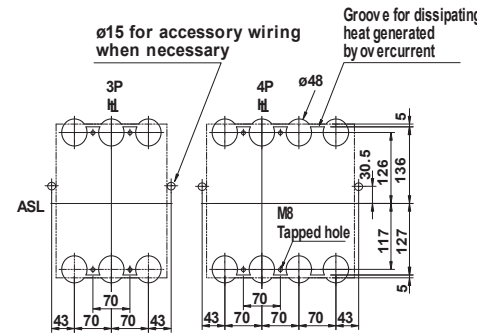


Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

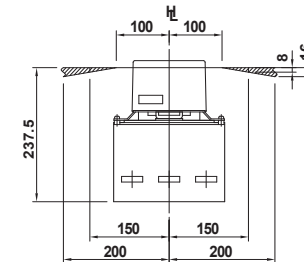
## Rear connected with Motor Operator



## Drilling plan (front view)



## Panel hinge position (hatching area) (bottom view)

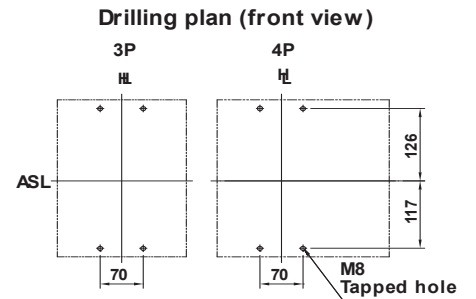
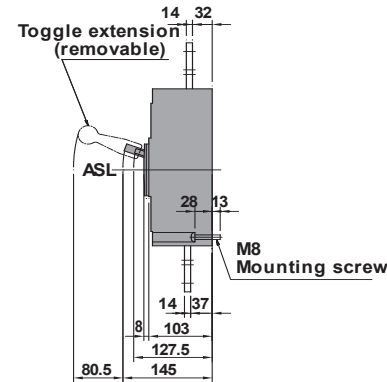
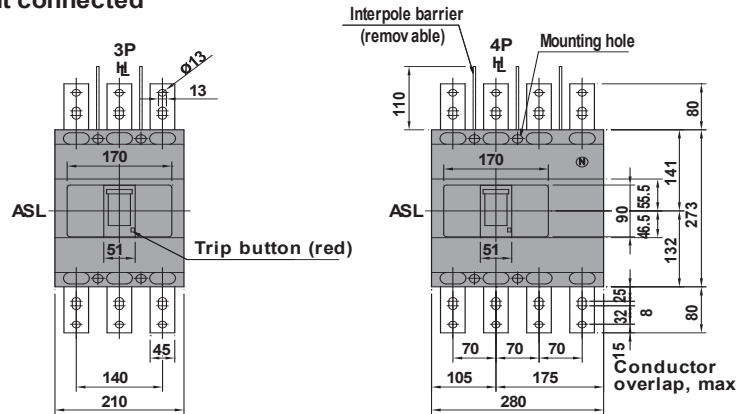


Note: Studs are factory installed in horizontal direction both on the line and load sides.

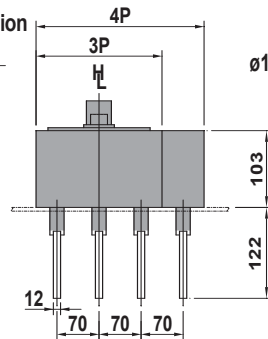
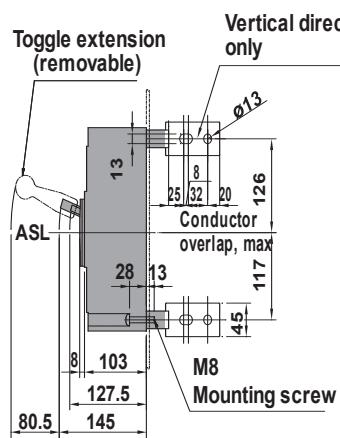
# Annex A – Dimensions

B1000N / H

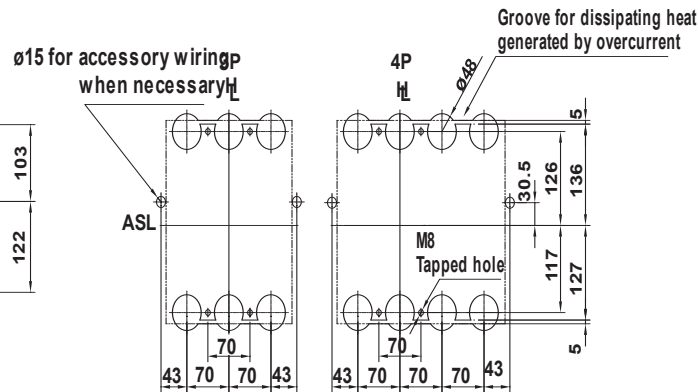
## Front connected



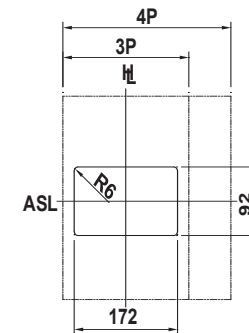
## Rear connected



## Drilling plan (front view)



## Panel cutout (front view)



Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

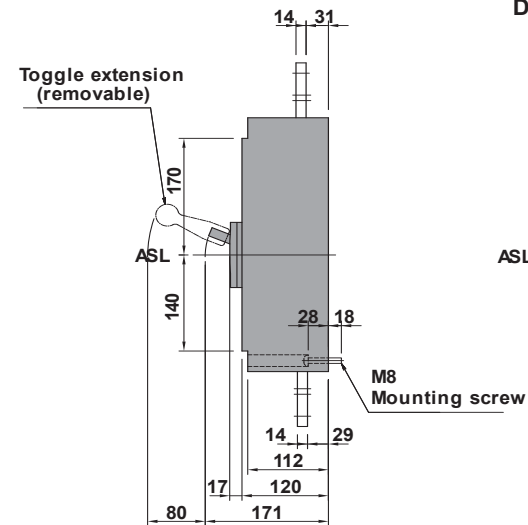
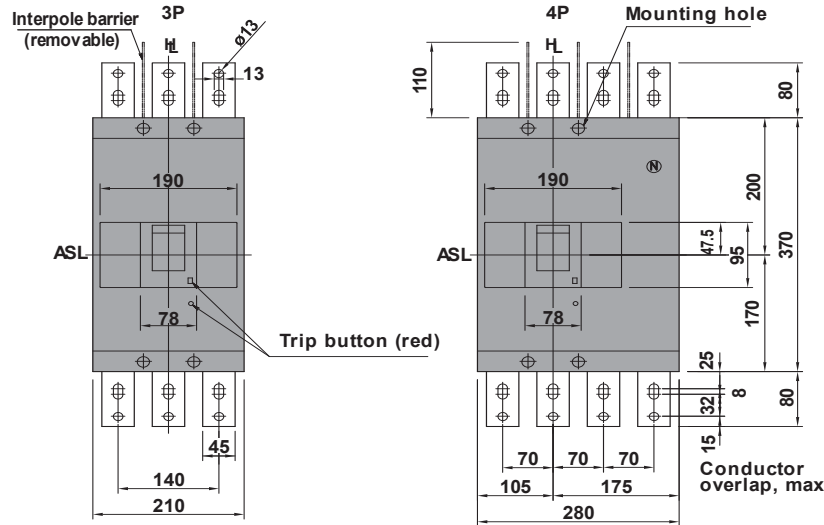




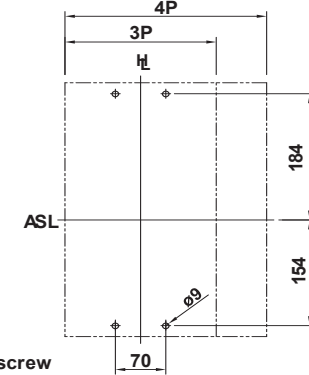
# Annex A – Dimensions

## B1250N / H / HL

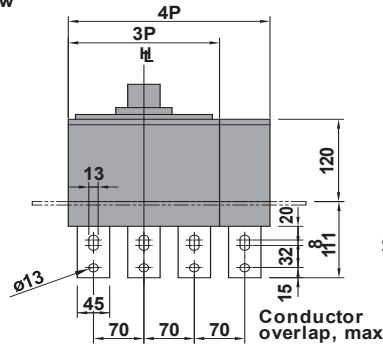
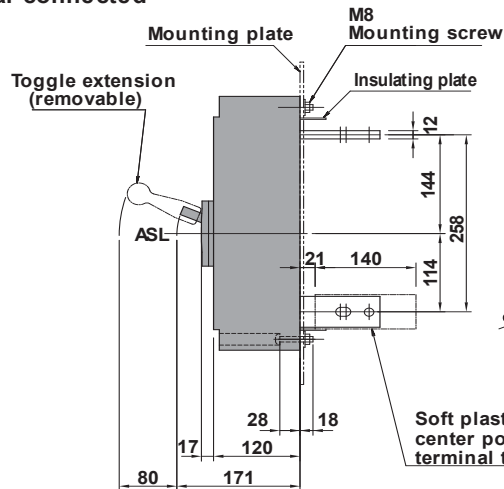
### Front connected



### Drilling plan (front view)

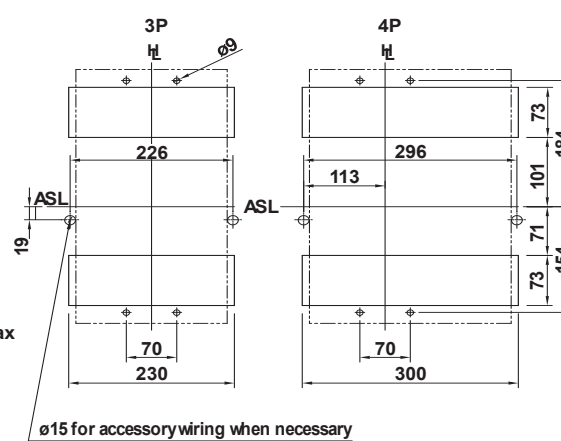


### Rear connected

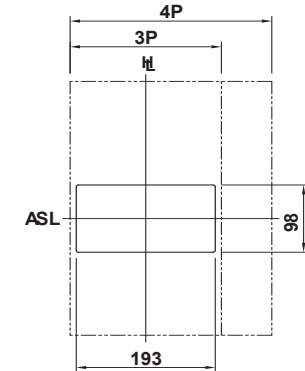


Soft plastic tubing  $\varnothing 50$  to be provided on center pole and neutral pole of vertical terminal type for insulation.

### Drilling plan (front view)



### Panel cutout (front view)



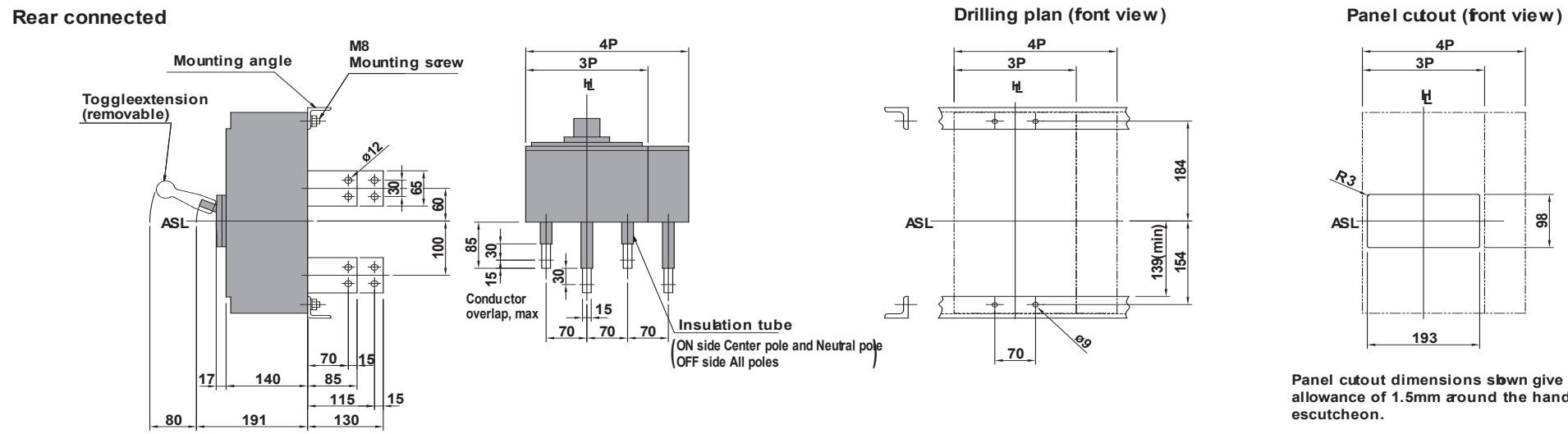
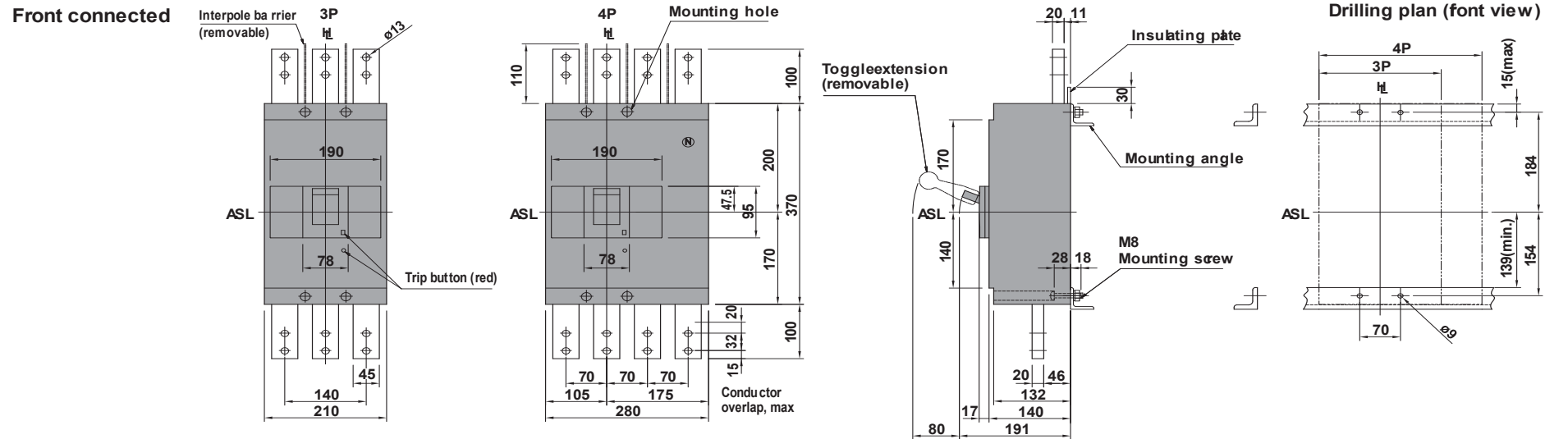
Panel cutout dimensions shown give an allowance of 1.5mm around the handle escutcheon.

Note: Studs are factory installed in horizontal direction both on the line and load sides.



# Annex A – Dimensions

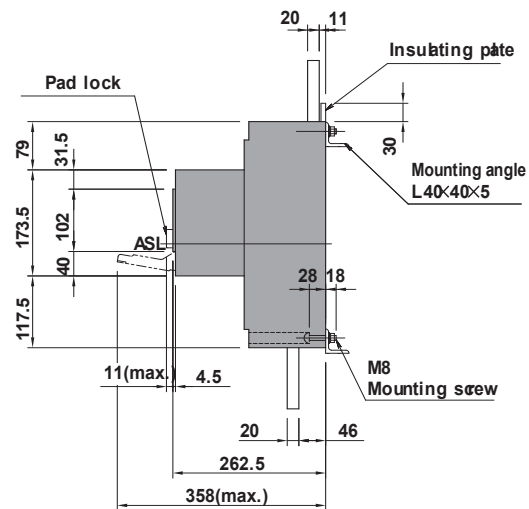
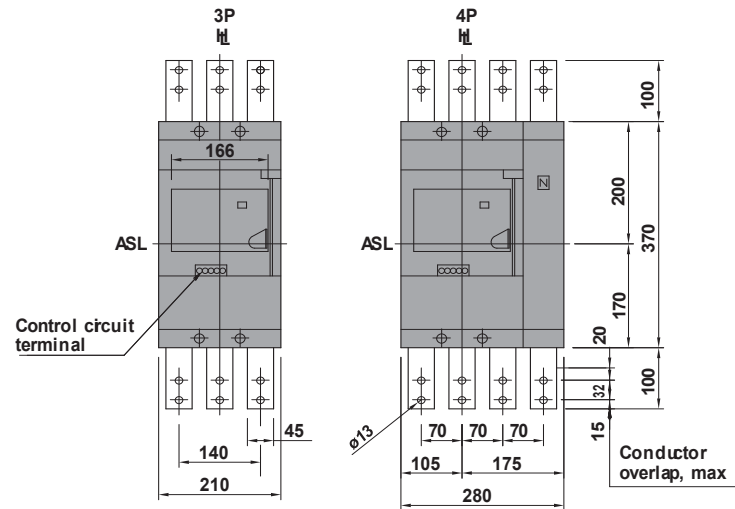
## B1600N / HL



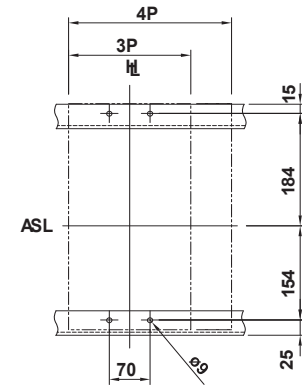
# Annex A – Dimensions

B1600N / HL

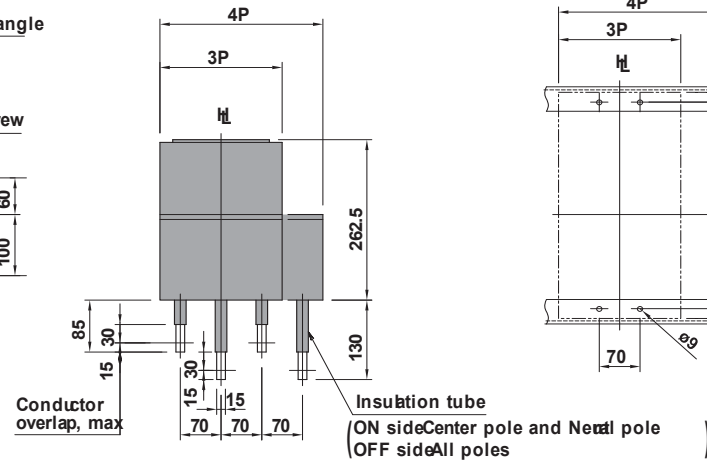
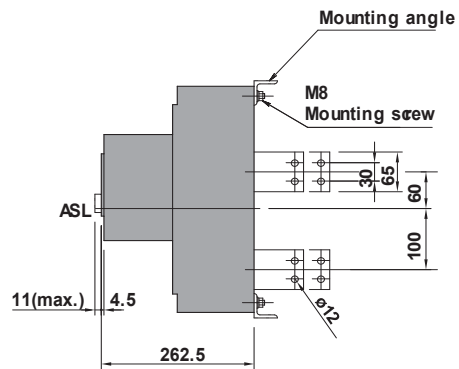
Front connected with Motor Operator



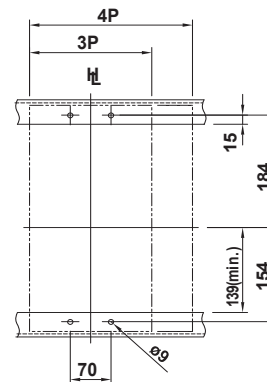
Drilling plan (front view)



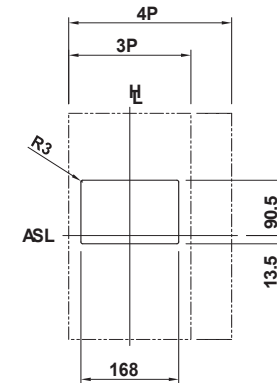
Rear connected with Motor Operator



Drilling plan (front view)



Panel cutout (front view)

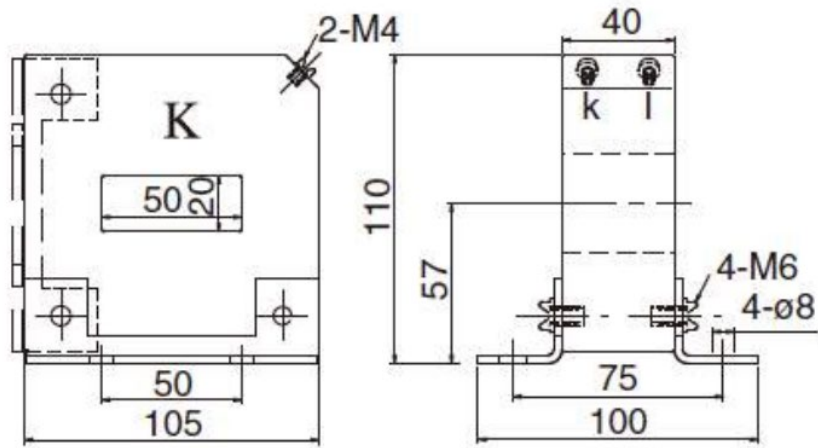


Panel cutout dimensions shown give an allowance of 1.0mm around motor operator.

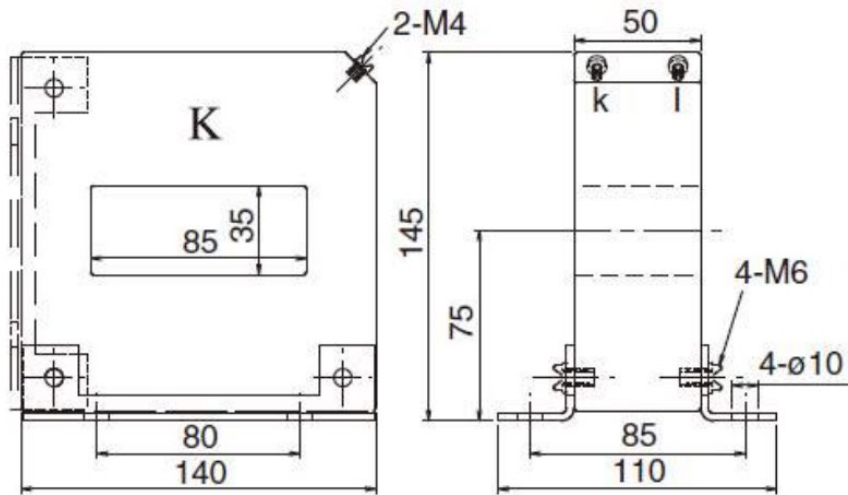
## Annex A – Dimensions

### Ground Fault CT

#### T2GB40

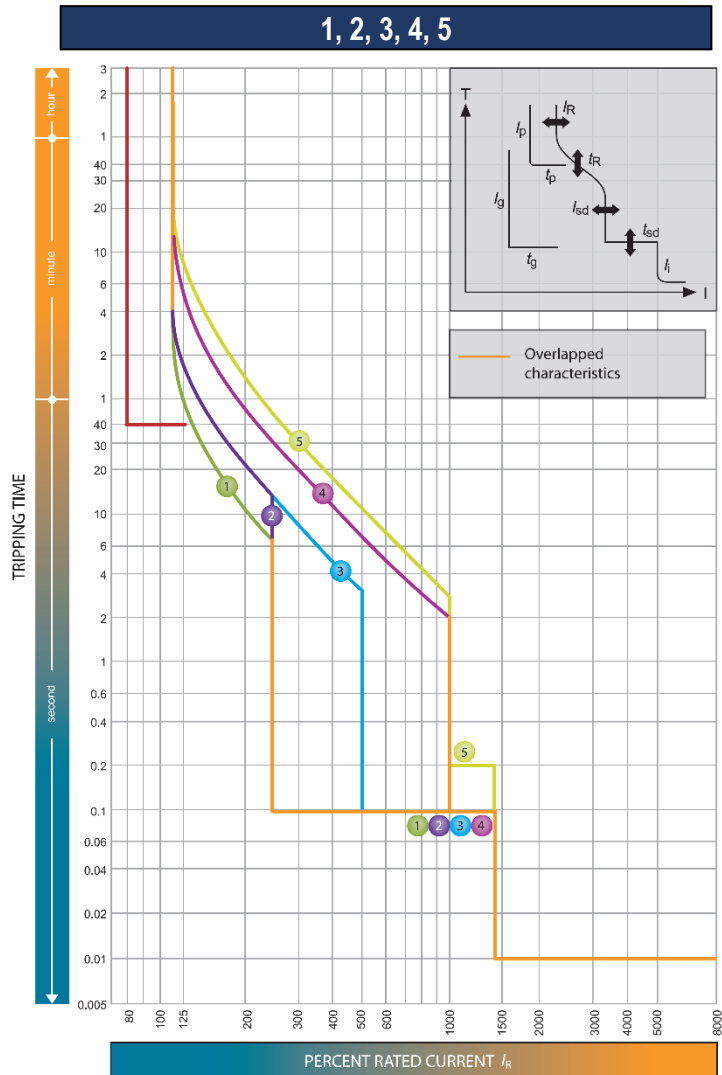


#### T2GBX6



# Annex B - Time Current Curves

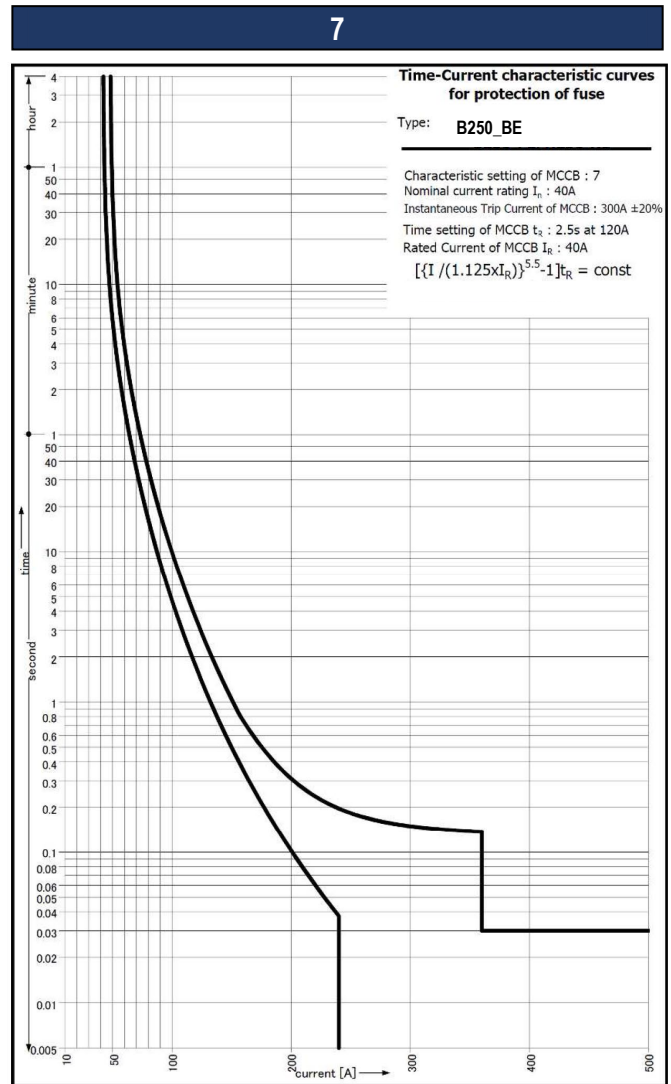
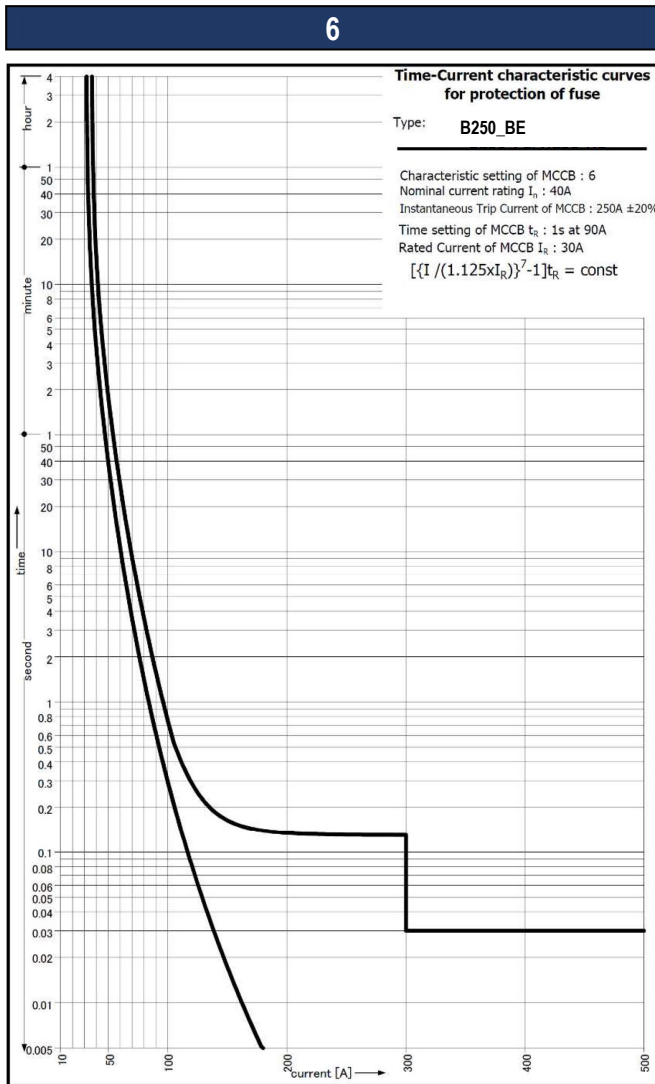
B250\_BE – I<sub>n</sub> 40 A



LTD pick up current I <sub>r</sub>		16 – 20 – 25 – 32 – 36 – 38 – 40 A (7 steps)					30A (fixed)	40A (fixed)	Instantaneous only
		Standard curves 1 - 5					Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8
LTD	t <sub>r</sub> (s)	11	21	21	5	7.5	1	2.5	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>		@ 90A	@ 120A	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	-	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	0.2	-	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 13 x I <sub>n</sub> )					250A	300A	520A
<b>OCR options</b>									
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>					0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40					40		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 x I <sub>r</sub>					1.0		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>					t <sub>N</sub> = t <sub>r</sub>		

# Annex B - Time Current Curves

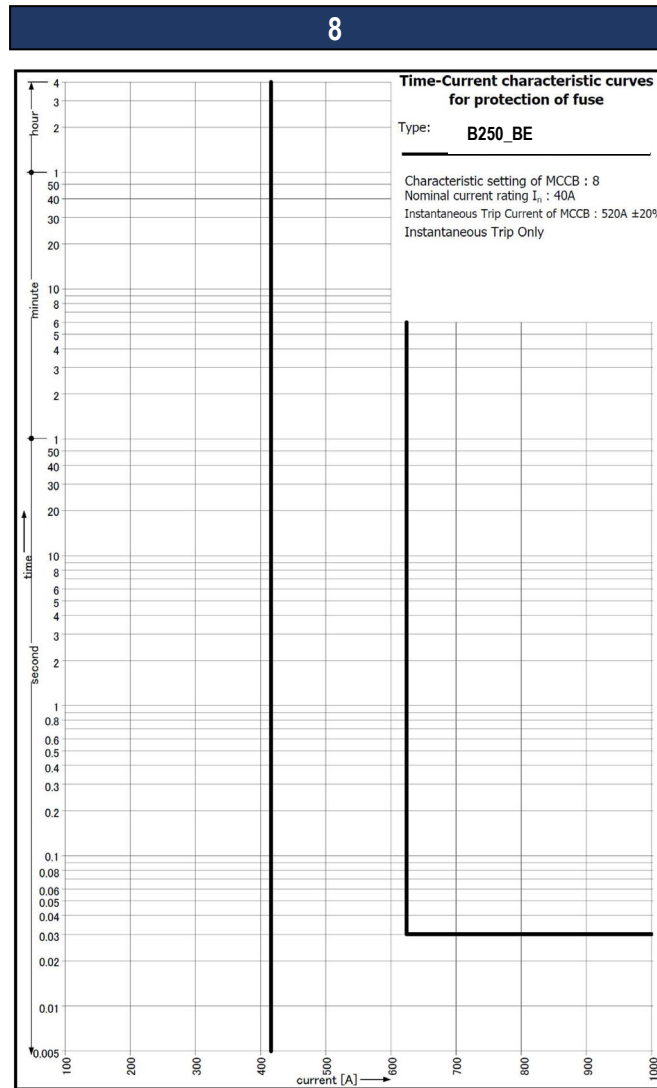
## B250\_BE – I<sub>n</sub> 40 A



LTD pick up current I <sub>r</sub>		16 – 20 – 25 – 32 – 36 – 38 – 40 A (7 steps)					30A (fixed)	40A (fixed)	Instantaneous only
Characteristic dial setting		Standard curves 1 - 5					Additional special application curves next pages		
		1	2	3	4	5	6	7	8
LTD	t <sub>r</sub> (s)	11	21	21	5	7.5	1	2.5	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>		@ 90A	@ 120A	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	-	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	0.2	-	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 13 x I <sub>n</sub> )					250A	300A	520A
OCR options									
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>					0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40					40		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 x I <sub>r</sub>					1.0		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>					t <sub>N</sub> = t <sub>r</sub>		

## Annex B - Time Current Curves

B250\_BE – I<sub>n</sub> 40 A

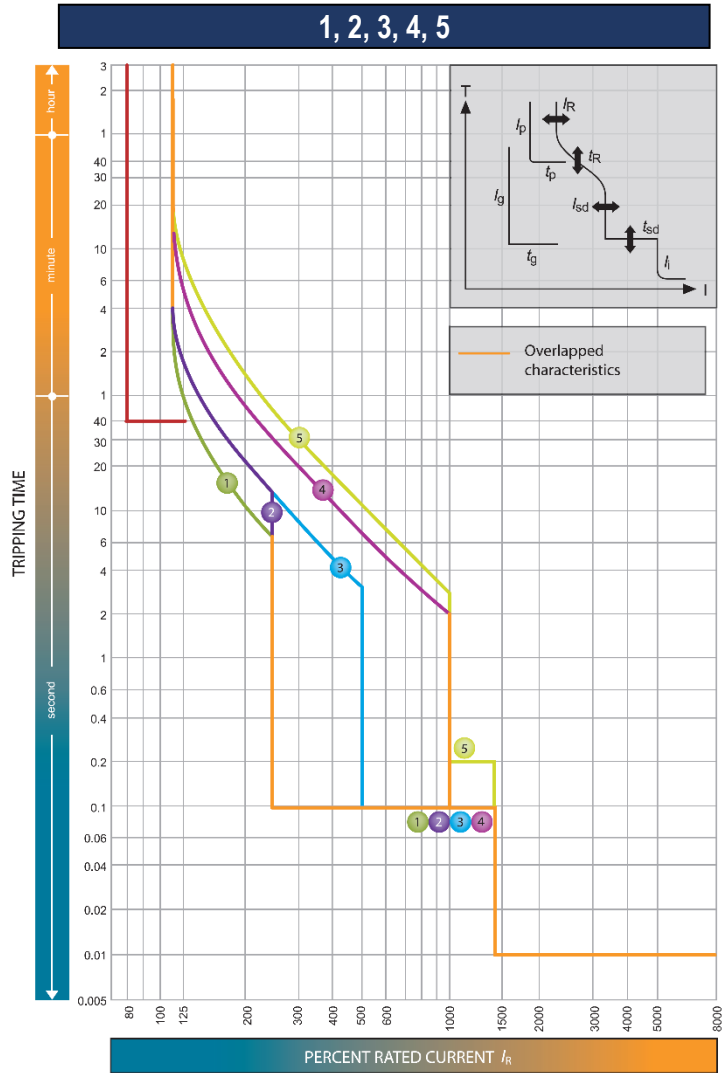


LTD pick up current I <sub>r</sub>		16 – 20 – 25 – 32 – 36 – 38 – 40 A (7 steps)					30A (fixed)	40A (fixed)	Instantaneous only
Characteristic dial setting		Standard curves 1 - 5					Additional special application curves next pages		
		1	2	3	4	5	6	7	8
LTD	t <sub>r</sub> (s)	11	21	21	5	7.5	1	2.5	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>		@ 90A	@ 120A	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	-	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	0.2	-	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 13 x I <sub>n</sub> )					250A	300A	520A
OCR options									
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>					0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40					40		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 x I <sub>r</sub>					1.0		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>					t <sub>N</sub> = t <sub>r</sub>		



# Annex B - Time Current Curves

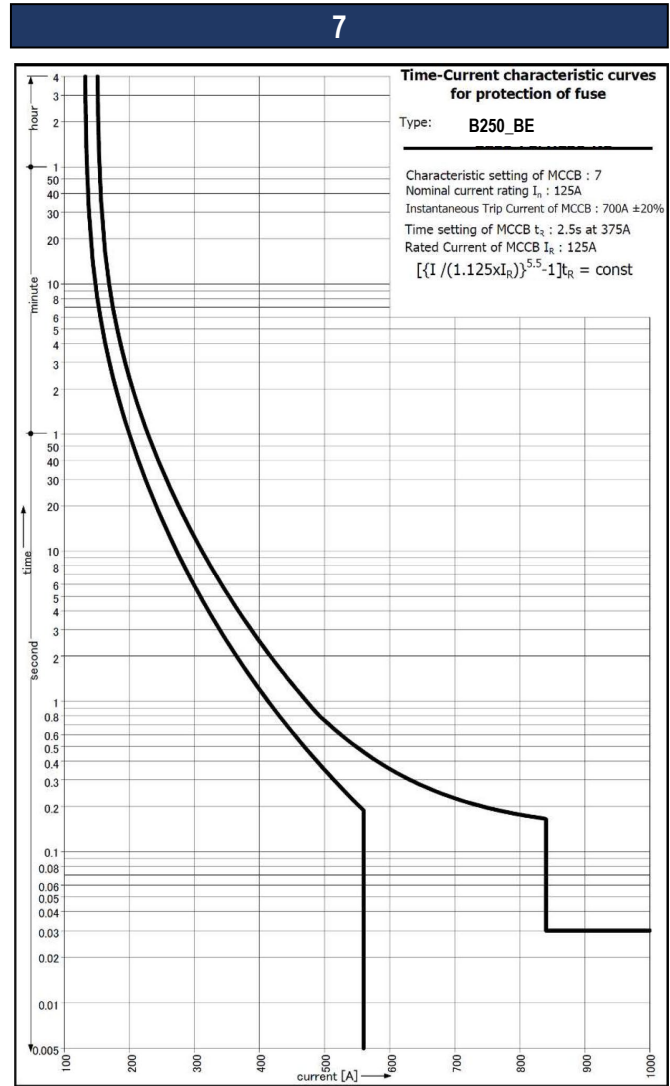
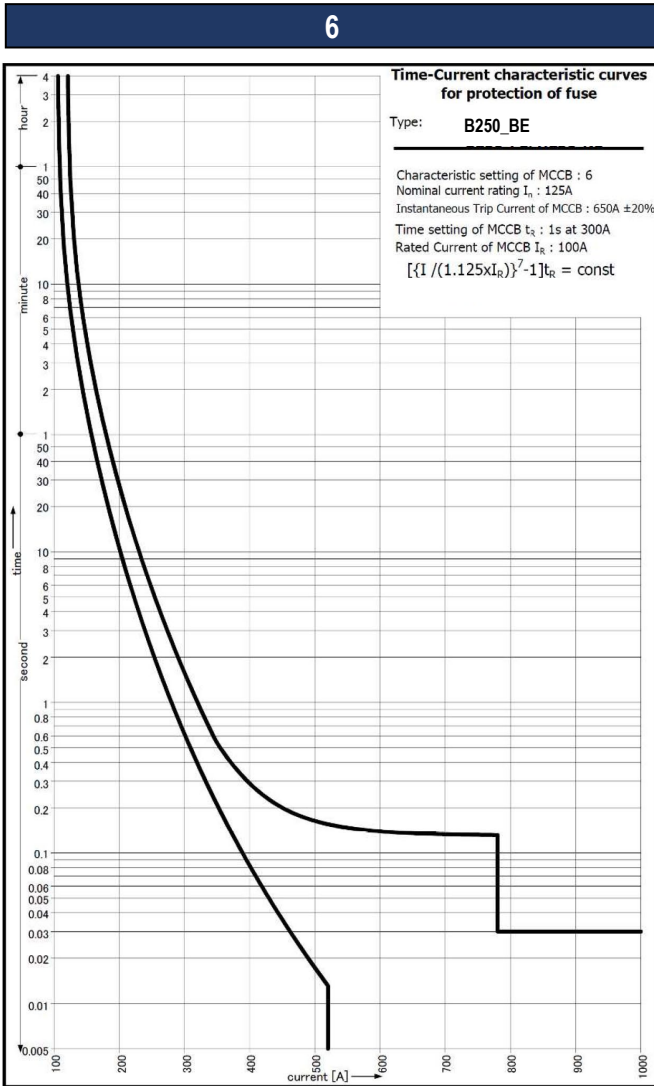
B250\_BE – I<sub>n</sub> 125 A



LTD pick up current I <sub>r</sub>		50 – 62 – 78 – 100 – 112 – 118 – 125 A (7 steps)					100A (fixed)	125A (fixed)	Instantaneous only
		Standard curves 1 - 5					Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8
LTD	t <sub>r</sub> (s)	11	21	21	5	7.5	1	2.5	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>		@ 300A	@ 375A	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	-	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	0.2	-	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 13 x I <sub>n</sub> )					650A	700A	1625A
<b>OCR options</b>									
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>					0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40					40		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 x I <sub>r</sub>					1.0		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>					t <sub>N</sub> = t <sub>r</sub>		

# Annex B - Time Current Curves

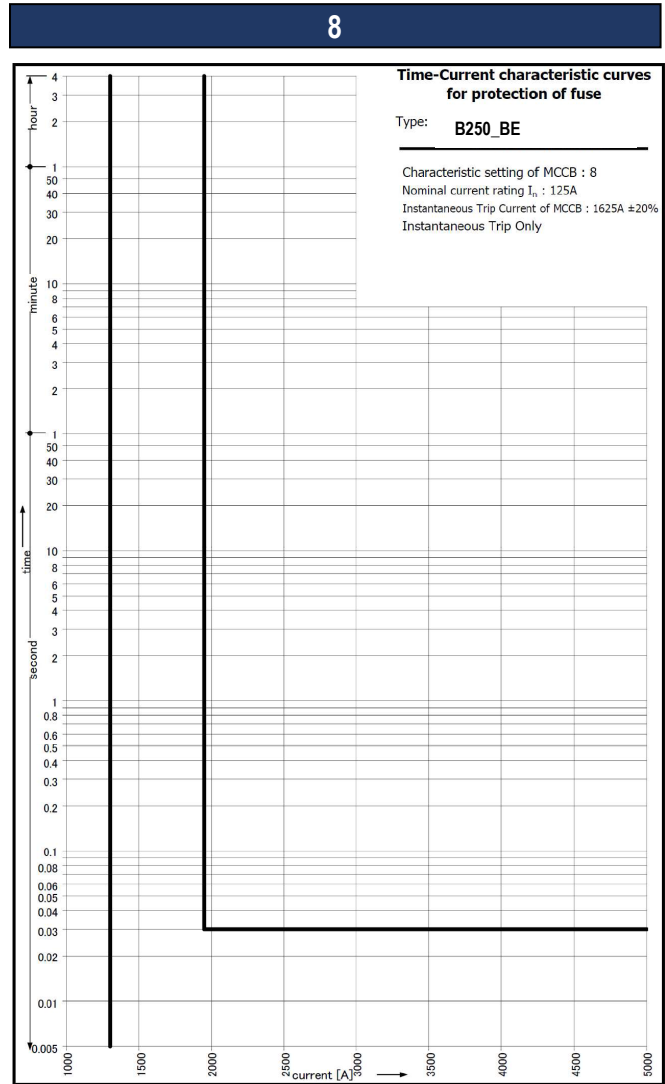
## B250\_BE – I<sub>n</sub> 125 A



LTD pick up current I <sub>r</sub>		50 – 62 – 78 – 100 – 112 – 118 – 125 A (7 steps)					100A (fixed)	125A (fixed)	Instantaneous only
Characteristic dial setting		Standard curves 1 - 5					Additional special application curves next pages		
LTD	t <sub>r</sub> (s)	11	21	21	5	7.5	1	2.5	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>		@ 300A	@ 375A	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	-	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	0.2	-	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 13 x I <sub>n</sub> )					650A	700A	1625A
<b>OCR options</b>									
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>					0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40					40		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 x I <sub>r</sub>					1.0		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>					t <sub>N</sub> = t <sub>r</sub>		

# Annex B - Time Current Curves

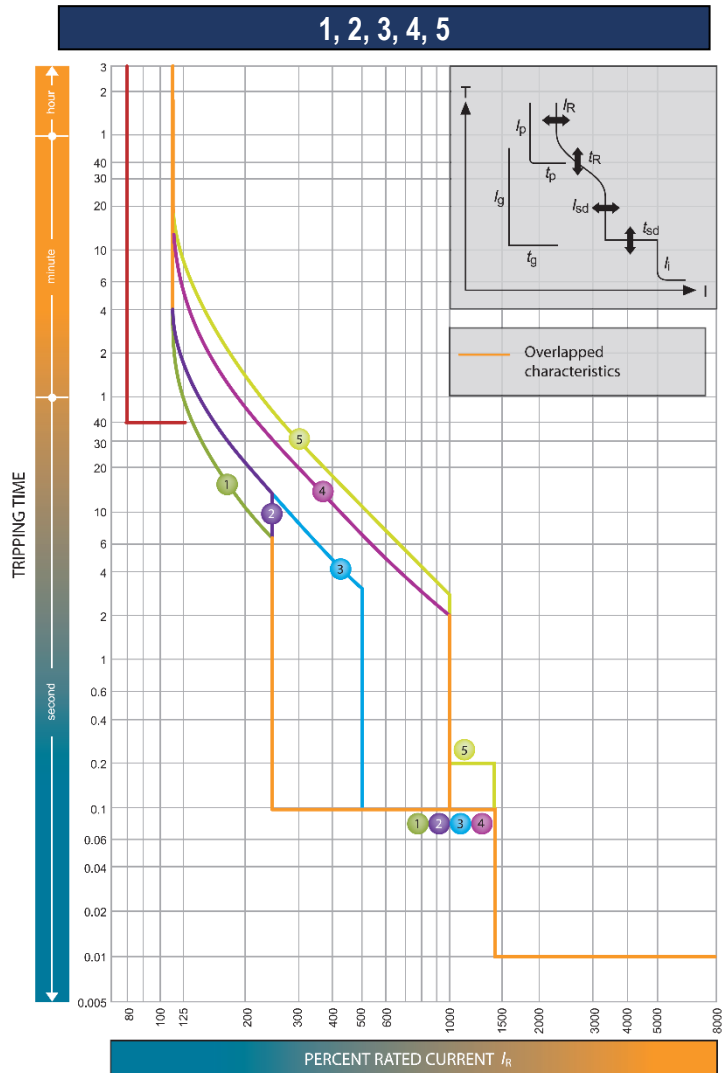
B250\_BE – I<sub>n</sub> 125 A



LTD pick up current I <sub>r</sub>		50 – 62 – 78 – 100 – 112 – 118 – 125 A (7 steps)					100A (fixed)	125A (fixed)	Instantaneous only
Characteristic dial setting		Standard curves 1 - 5					Additional special application curves next pages		
		1	2	3	4	5	6	7	8
LTD	t <sub>r</sub> (s)	11	21	21	5	7.5	1	2.5	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>		@ 300A	@ 375A	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	-	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	0.2	-	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 13 x I <sub>n</sub> )					650A	700A	1625A
OCR options									
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>					0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40					40		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 x I <sub>r</sub>					1.0		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>					t <sub>N</sub> = t <sub>r</sub>		

## Annex B - Time Current Curves

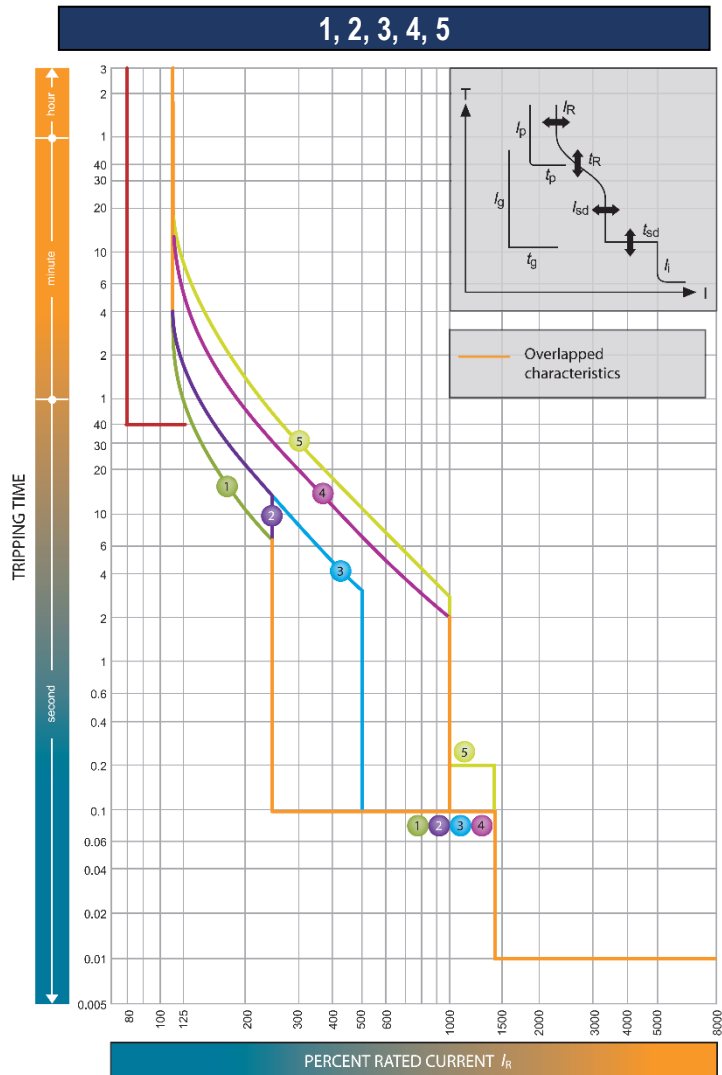
B250\_BE – I<sub>n</sub> 160 A



LTD pick up current $I_r$		64 – 80 – 100 – 128 – 144 – 152 – 160 A (7 steps)				
		<i>Standard curves 1 - 5</i>				
Characteristic dial setting		1	2	3	4	5
LTD	$t_r$ (s)	11	21	21	5	7.5
		@ 2 x $I_r$			@ 6 x $I_r$	
STD	$I_{sd}$	2.5 x $I_r$	2.5 x $I_r$	5 x $I_r$	10 x $I_r$	10 x $I_r$
	$t_{sd}$ (s)	0.1	0.1	0.1	0.1	0.2
INST	$I_i$	14 x $I_r$ (Maximum of 13 x $I_n$ )				
<b>OCR options</b>						
Pre-Trip Alarm (PTA)	$I_p$	0.8 x $I_r$				
	$t_p$ (s)	40				
Neutral Pole Protection (NP)	$I_N$	1.0 x $I_r$				
	$t_N$ (s)	$t_N = t_r$				

# Annex B - Time Current Curves

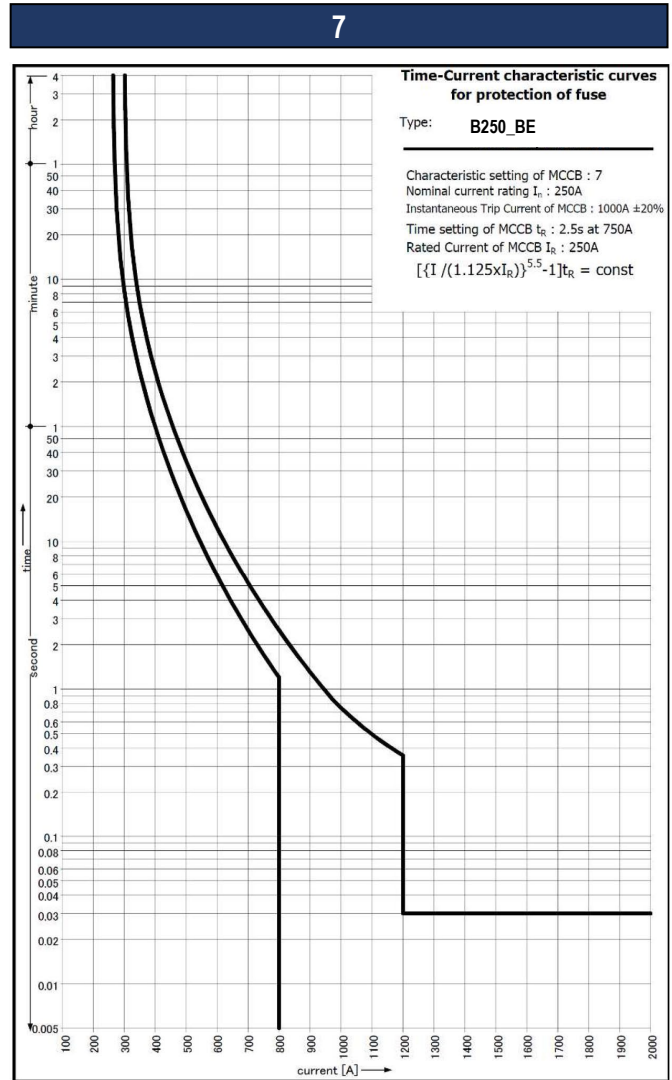
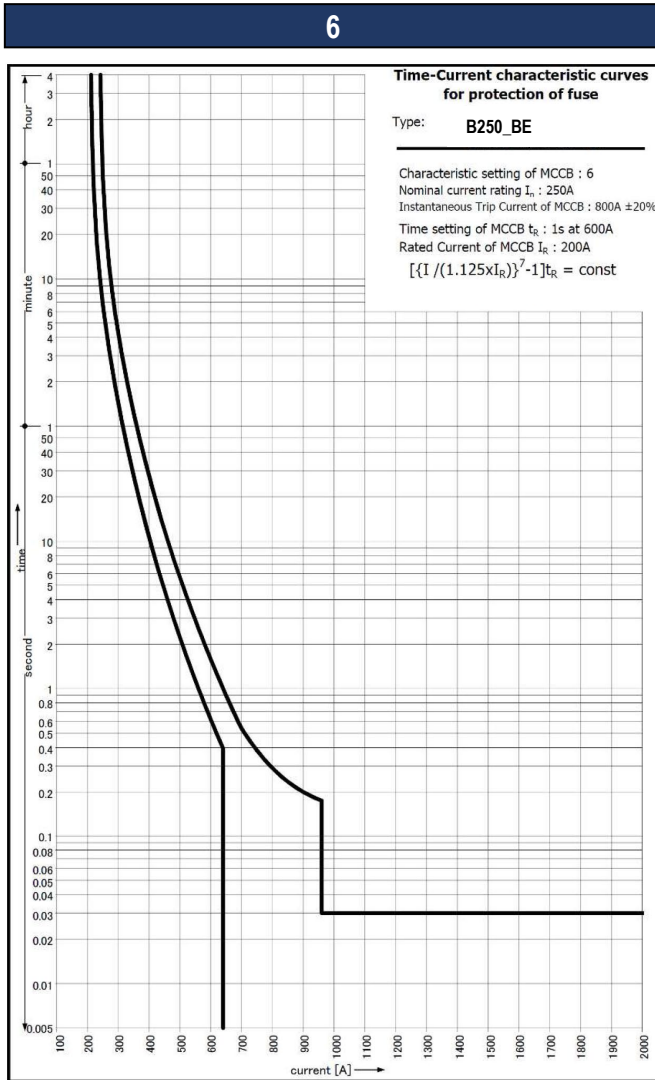
B250\_BE – I<sub>n</sub> 250 A



LTD pick up current I <sub>r</sub>		100 – 125 – 157 – 200 – 225 – 237 – 250 A (7 steps)					200A (fixed)	250A (fixed)	Instantaneous only
		Standard curves 1 - 5					Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8
LTD	t <sub>r</sub> (s)	11	21	21	5	7.5	1	2.5	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>		@ 600A	@ 750A	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	-	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	0.2	-	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 13 x I <sub>n</sub> )					800A	1000A	3250A
OCR options									
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>					0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40					40		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 x I <sub>r</sub>					1.0		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>					t <sub>N</sub> = t <sub>r</sub>		

# Annex B - Time Current Curves

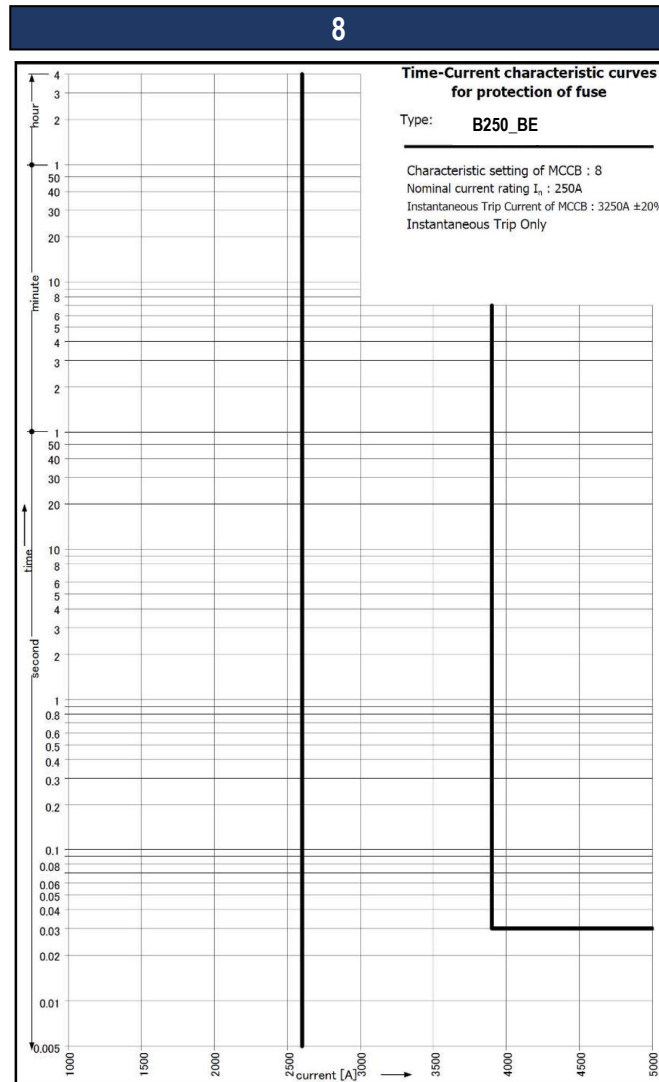
## B250\_BE – I<sub>n</sub> 250 A



LTD pick up current I <sub>r</sub>		100 – 125 – 157 – 200 – 225 – 237 – 250 A (7 steps)					200A (fixed)	250A (fixed)	Instantaneous only
Characteristic dial setting		Standard curves 1 - 5					Additional special application curves next pages		
		1	2	3	4	5	6	7	8
LTD	t <sub>r</sub> (s)	11	21	21	5	7.5	1	2.5	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>		@ 600A	@ 750A	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	-	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	0.2	-	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 13 x I <sub>n</sub> )					800A	1000A	3250A
<b>OCR options</b>									
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>					0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40					40		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 x I <sub>r</sub>					1.0		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>					t <sub>N</sub> = t <sub>r</sub>		

## Annex B - Time Current Curves

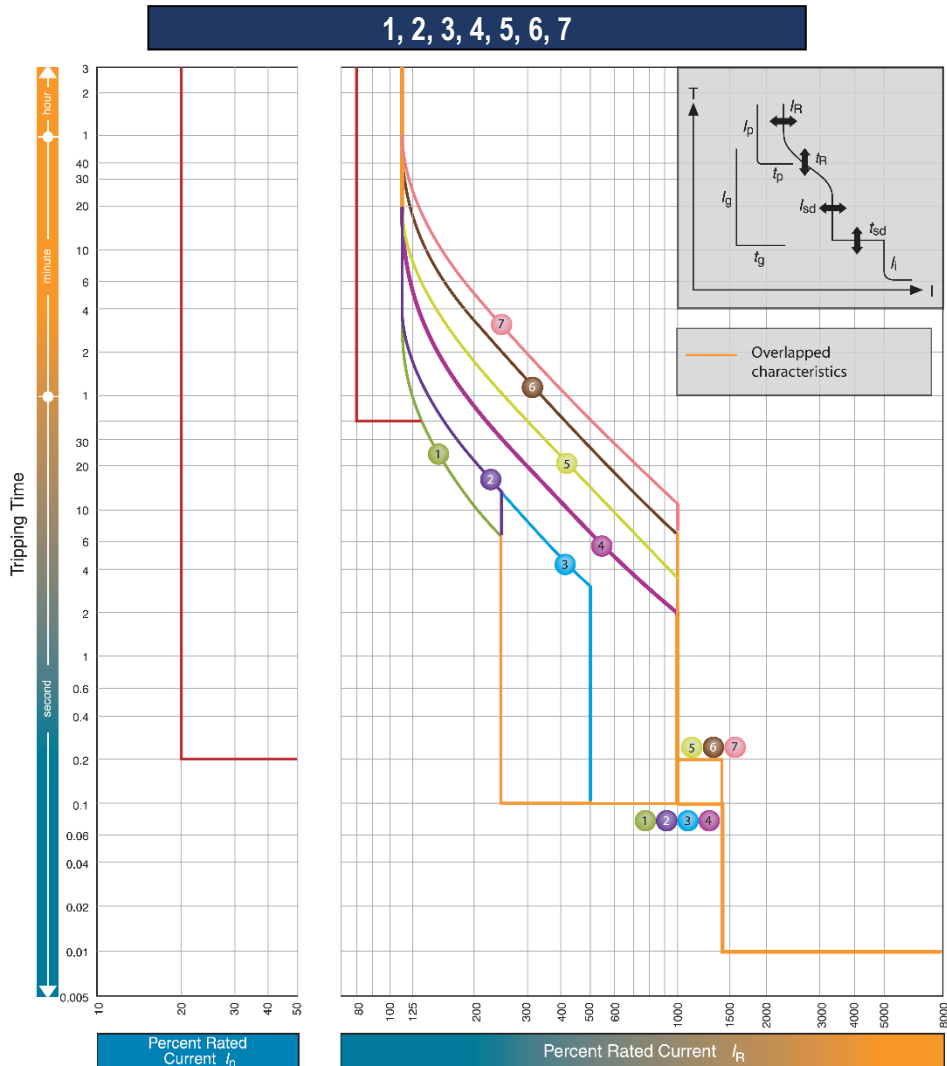
B250\_BE – I<sub>n</sub> 250 A



LTD pick up current I <sub>r</sub>		100 – 125 – 157 – 200 – 225 – 237 – 250 A (7 steps)					200A (fixed)	250A (fixed)	Instantaneous only
Characteristic dial setting		Standard curves 1 - 5					Additional special application curves next pages		
		1	2	3	4	5	6	7	8
LTD	t <sub>r</sub> (s)	11	21	21	5	7.5	1	2.5	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>		@ 600A	@ 750A	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	-	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	0.2	-	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 13 x I <sub>n</sub> )					800A	1000A	3250A
OCR options									
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>					0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40					40		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 x I <sub>r</sub>					1.0		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>					t <sub>N</sub> = t <sub>r</sub>		

# Annex B - Time Current Curves

B400\_BE – I<sub>n</sub> 250 A

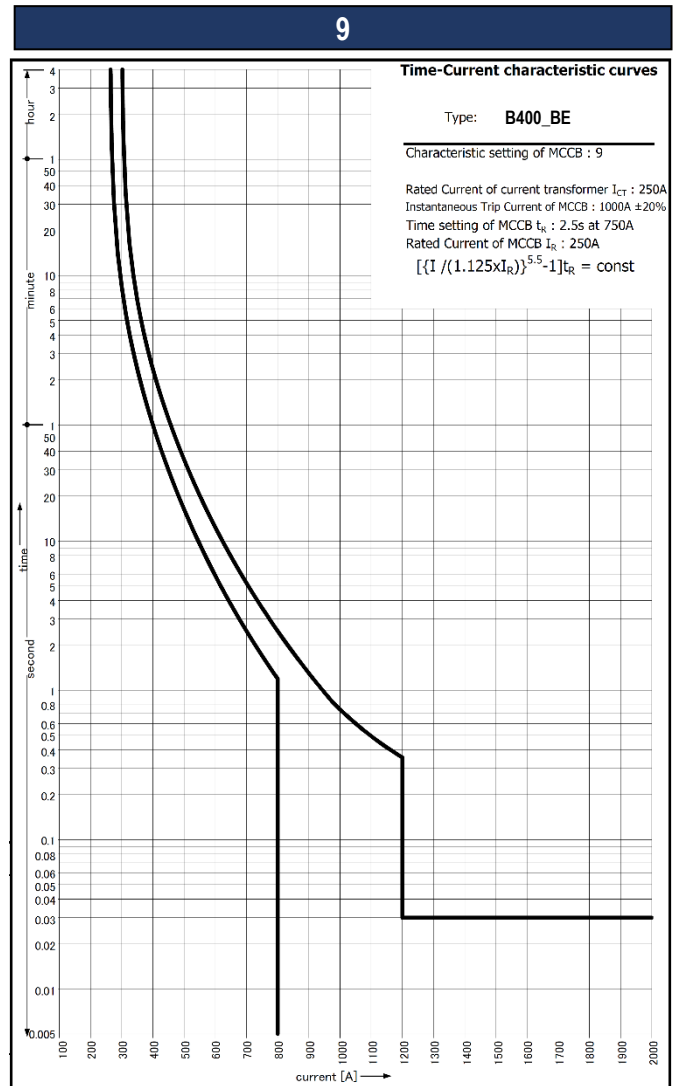
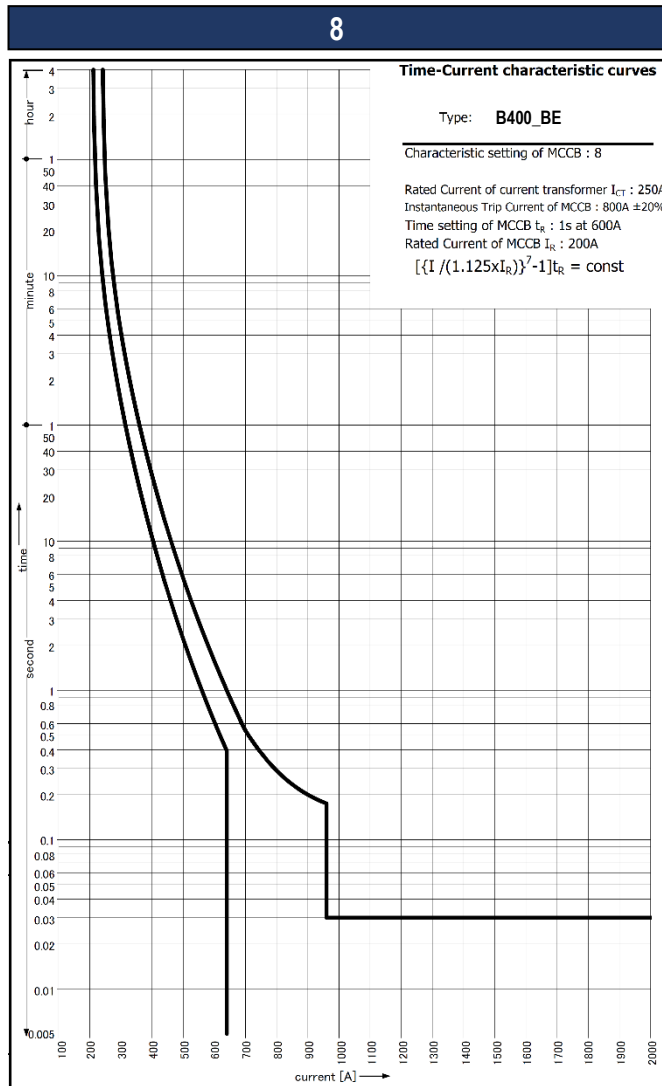


LTD pick up current I <sub>r</sub>		100 – 125 – 157 – 200 – 225 – 237 – 250 A (7 steps)							200A (fixed)	250A (fixed)	Instantaneous only
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	10	19	29	1	2.5	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>				@ 600A	@ 750A	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	-	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	0.2	0.2	0.2	-	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 13 x I <sub>n</sub> )							800A	1000A	3250A
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	N/A							N/A		
	t <sub>g</sub> (s)	N/A							N/A		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		



## Annex B - Time Current Curves

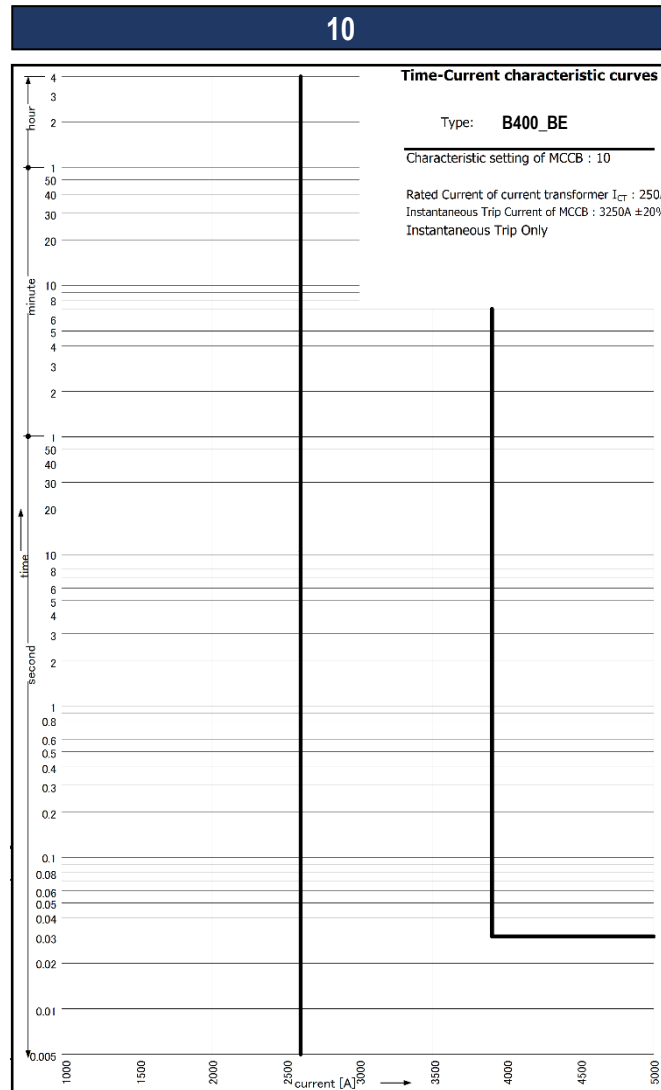
### B400\_BE – I<sub>n</sub> 250 A



LTD pick up current I <sub>r</sub>		100 – 125 – 157 – 200 – 225 – 237 – 250 A (7 steps)							200A (fixed)	250A (fixed)	Instantaneous only
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	10	19	29	1	2.5	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>				@ 600A	@ 750A	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	-	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	0.2	0.2	0.2	-	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 13 x I <sub>n</sub> )							800A	1000A	3250A
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	N/A							N/A		
	t <sub>g</sub> (s)	N/A							N/A		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		

## Annex B - Time Current Curves

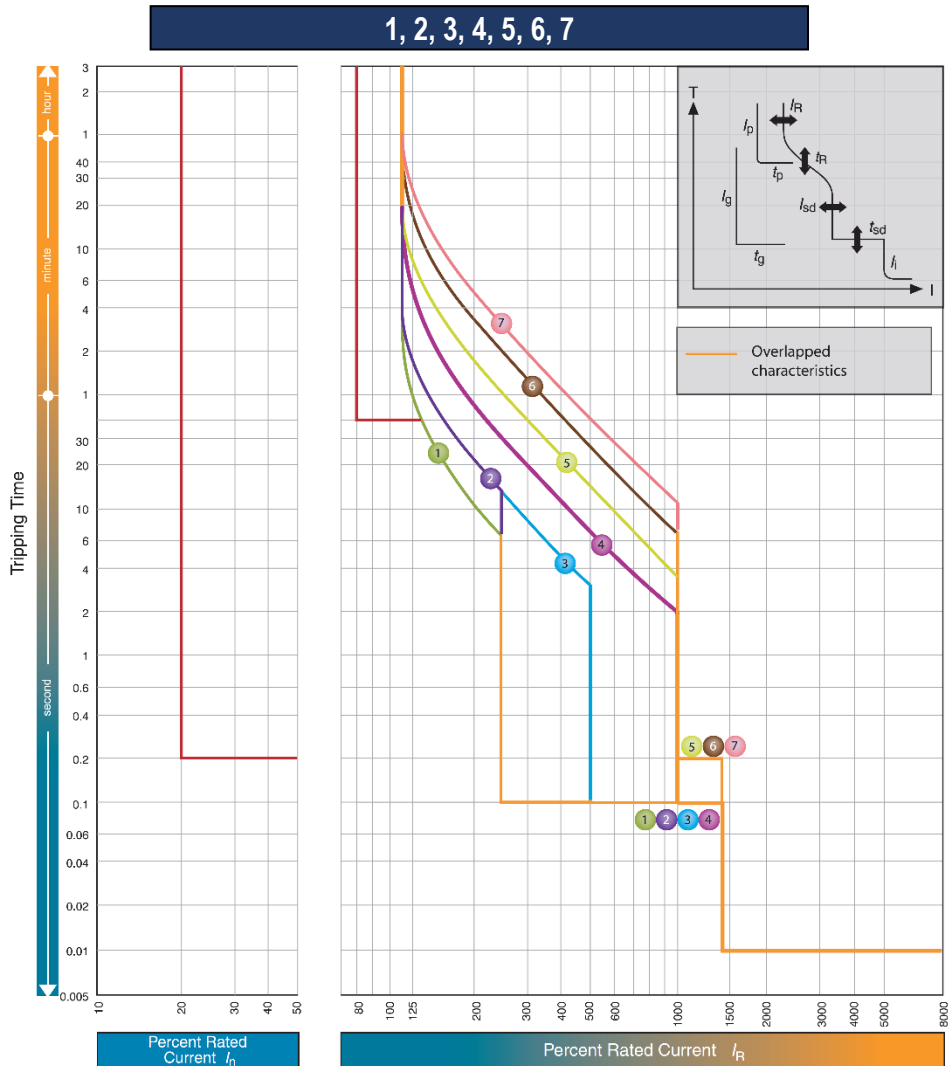
B400\_BE – I<sub>n</sub> 250 A



LTD pick up current I <sub>r</sub>		100 – 125 – 157 – 200 – 225 – 237 – 250 A (7 steps)						200A (fixed)	250A (fixed)	Instantaneous only	
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	10	19	29	1	2.5	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>				@ 600A	@ 750A	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	-	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	0.2	0.2	0.2	-	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 13 x I <sub>n</sub> )						800A	1000A	3250A	
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>						0.8 x I <sub>r</sub>			
	t <sub>p</sub> (s)	40						40			
Ground Fault (GF)	I <sub>g</sub>	N/A						N/A			
	t <sub>g</sub> (s)	N/A						N/A			
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>						1.0 / 0.5 x I <sub>r</sub>			
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>						t <sub>N</sub> = t <sub>r</sub>			

# Annex B - Time Current Curves

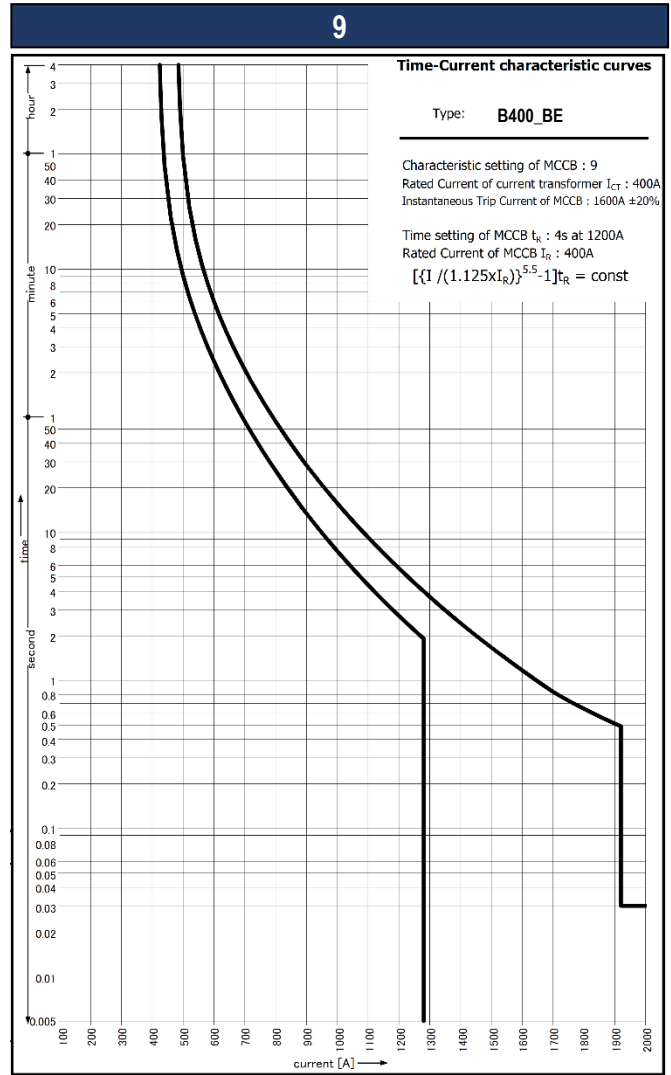
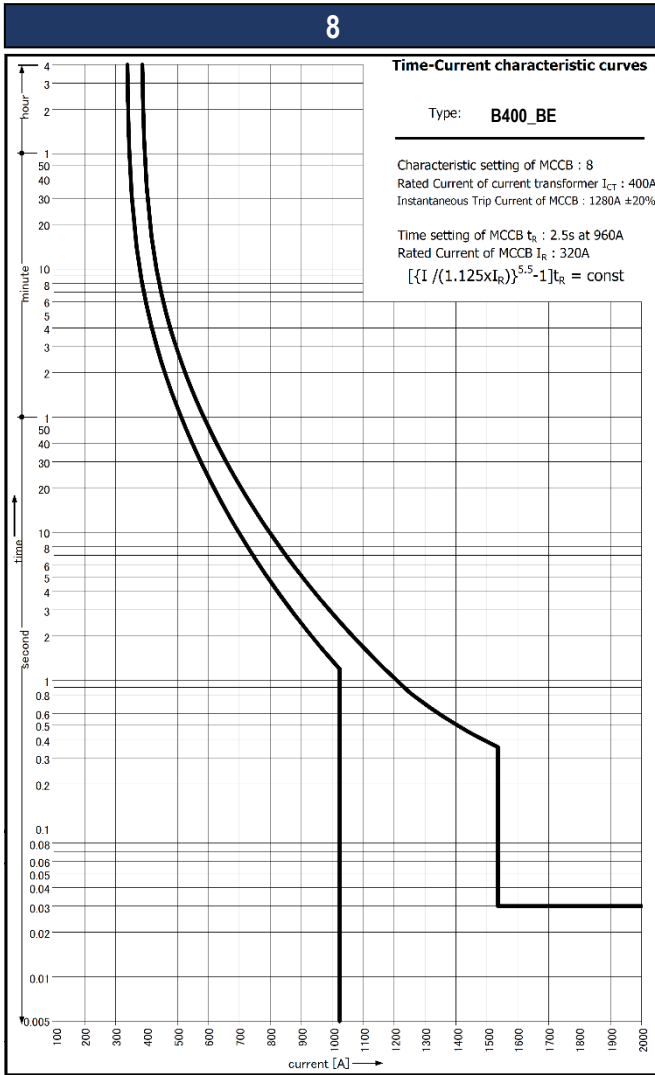
B400\_BE – I<sub>n</sub> 400A



LTD pick up current I <sub>r</sub>		160 – 200 – 252 – 320 – 360 – 380 – 400 A (7 steps)						320A (fixed)	400A (fixed)	Instantaneous only		
		Standard curves 1 - 7							Additional special application curves next pages			
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10	
LTD	t <sub>r</sub> (s)	11	21	21	5	10	19	29	2.5	4	-	
		@ 2 x I <sub>r</sub>									@ 960A	@ 1200A
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	-	-	-	
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	0.2	0.2	0.2	-	-	-	
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 13 x I <sub>n</sub> )							1280A	1600A	5200A	
OCR options												
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>			
	t <sub>p</sub> (s)	40							40			
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>			
	t <sub>g</sub> (s)	0.2							0.2			
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>			
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>			

# Annex B - Time Current Curves

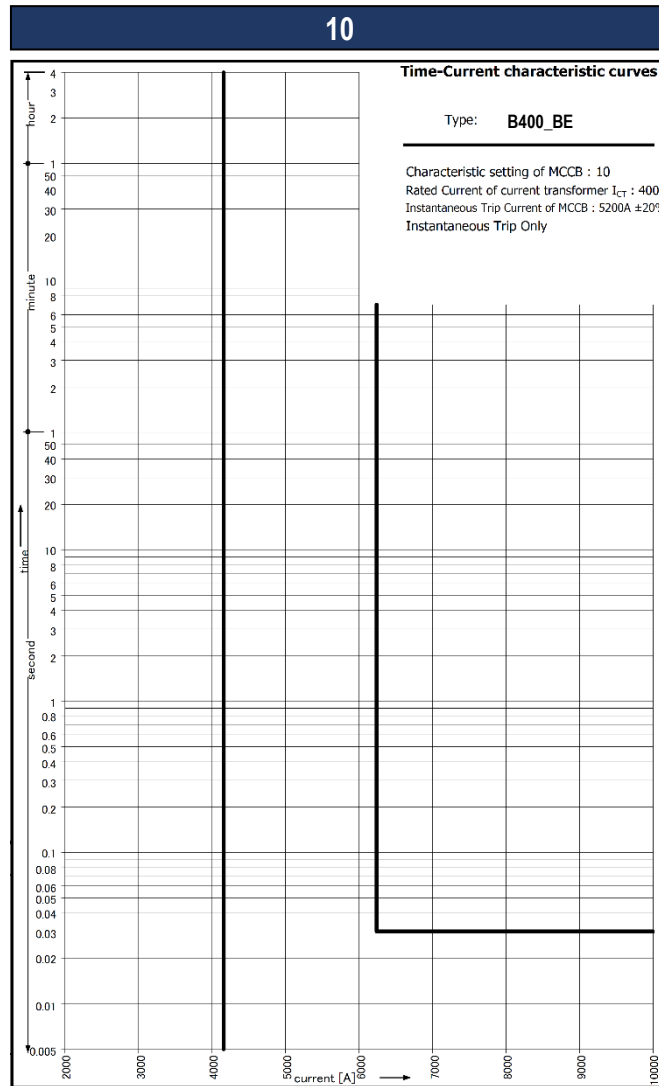
## B400\_BE – I<sub>n</sub> 400A



LTD pick up current I <sub>r</sub>		160 – 200 – 252 – 320 – 360 – 380 – 400 A (7 steps)							320A (fixed)	400A (fixed)	Instantaneous only
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	10	19	29	2.5	4	-
	I <sub>sd</sub>	@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>				@ 960A	@ 1200A	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	-	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	0.2	0.2	0.2	-	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 13 x I <sub>n</sub> )							1280A	1600A	5200A
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		

# Annex B - Time Current Curves

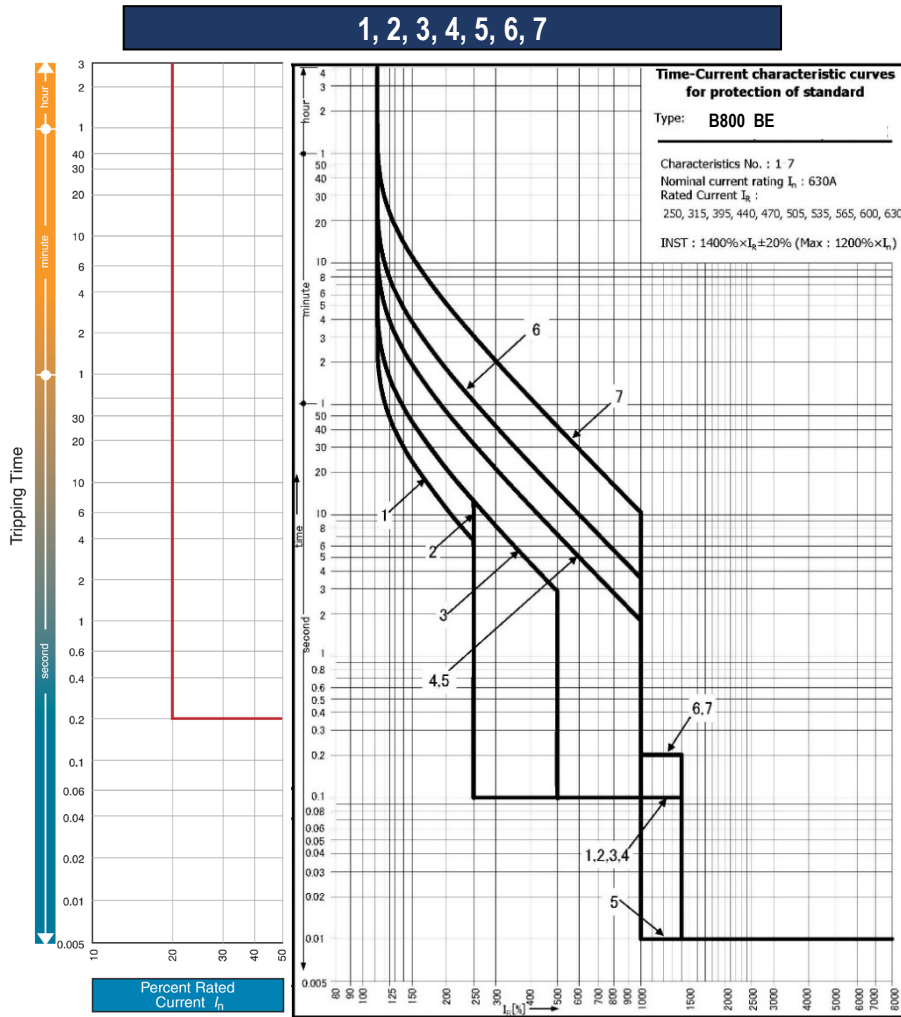
B400\_BE – I<sub>n</sub> 400A



LTD pick up current I <sub>r</sub>		160 – 200 – 252 – 320 – 360 – 380 – 400 A (7 steps)							320A (fixed)	400A (fixed)	Instantaneous only
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	10	19	29	2.5	4	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>				@ 960A	@ 1200A	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>	-	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	0.2	0.2	0.2	-	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 13 x I <sub>n</sub> )							1280A	1600A	5200A
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		

# Annex B - Time Current Curves

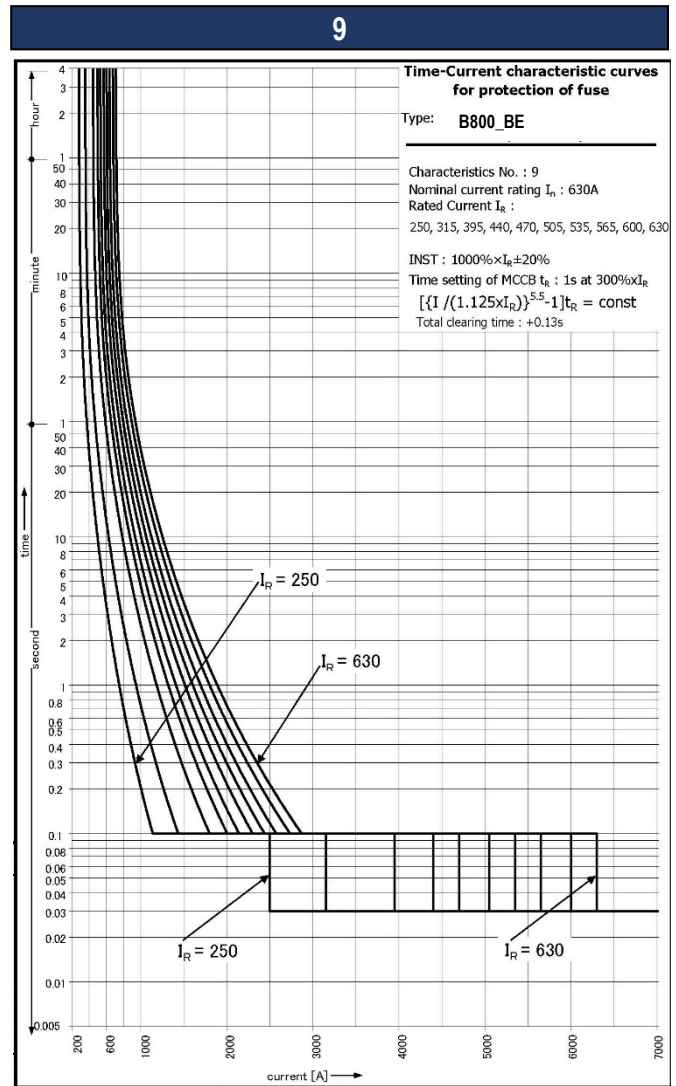
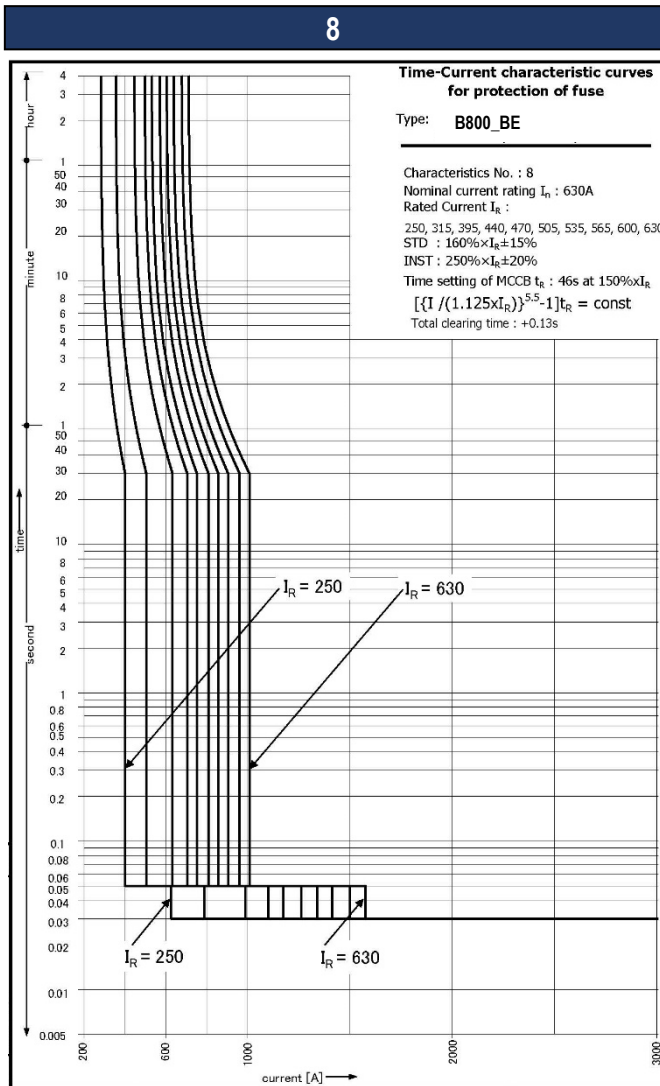
B800\_BE – I<sub>n</sub> 630 A



LTD pick up current I <sub>r</sub>		250 – 315 – 395 – 440 – 470 – 505 – 535 – 565 – 600 – 630 A (10 steps)									
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	5	10	29	46	1	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>				1.5 x I <sub>r</sub>	@ 3 x I <sub>r</sub>	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	-	10 x I <sub>r</sub>	10 x I <sub>r</sub>	1.6 x I <sub>r</sub>	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	-	0.2	0.2	0.05	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )				10 x I <sub>r</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )		2.5 x I <sub>r</sub>	10 x I <sub>r</sub>	12 x I <sub>r</sub>
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		

# Annex B - Time Current Curves

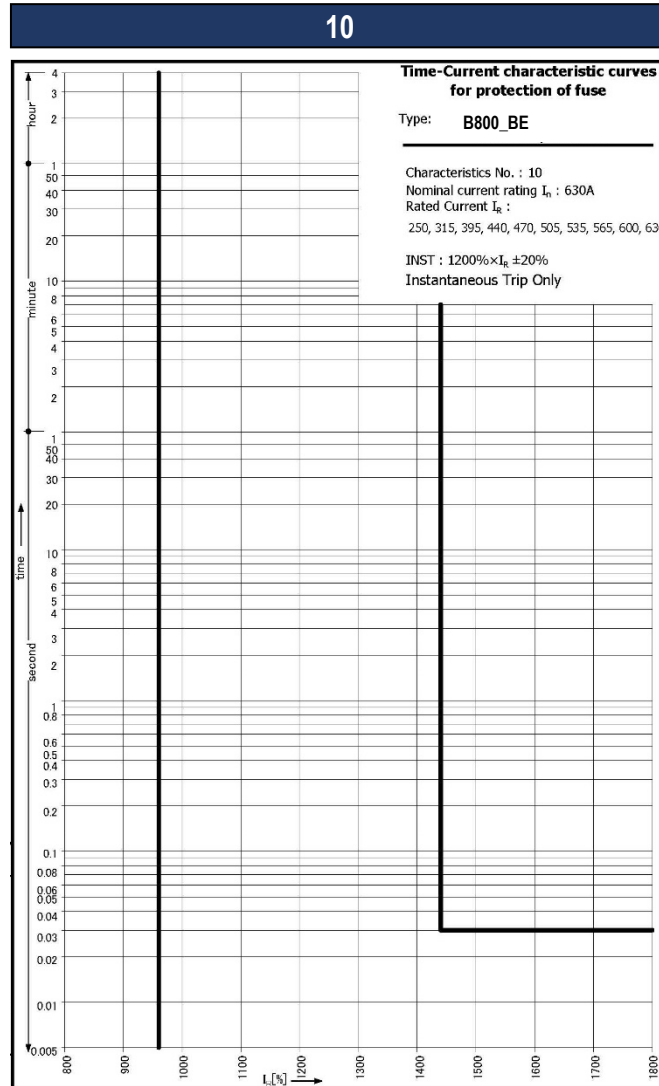
## B800\_BE – I<sub>n</sub> 630 A



LTD pick up current I <sub>r</sub>		250 – 315 – 395 – 440 – 470 – 505 – 535 – 565 – 600 – 630 A (10 steps)									
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	10	29	46	1	-	-
		@ 2 x I <sub>r</sub>				@ 6 x I <sub>r</sub>			1.5 x I <sub>r</sub>	@ 3 x I <sub>r</sub>	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	-	10 x I <sub>r</sub>	10 x I <sub>r</sub>	1.6 x I <sub>r</sub>	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	-	0.2	0.2	0.05	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )				10 x I <sub>r</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )		2.5 x I <sub>r</sub>	10 x I <sub>r</sub>	12 x I <sub>r</sub>
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		

# Annex B - Time Current Curves

B800\_BE – I<sub>n</sub> 630 A

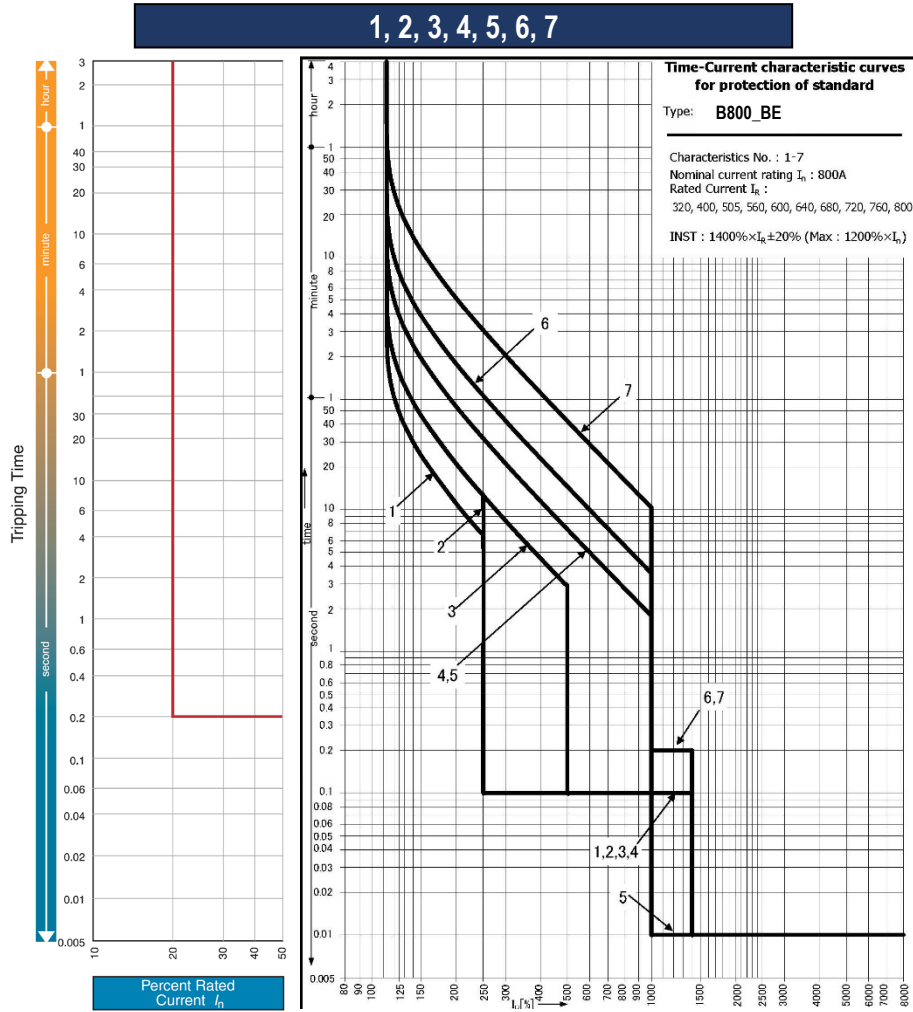


LTD pick up current I <sub>r</sub>		250 – 315 – 395 – 440 – 470 – 505 – 535 – 565 – 600 – 630 A (10 steps)									
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	5	10	29	46	1	-
		@ 2 x I <sub>r</sub>				@ 6 x I <sub>r</sub>			1.5 x I <sub>r</sub>	@ 3 x I <sub>r</sub>	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	-	10 x I <sub>r</sub>	10 x I <sub>r</sub>	1.6 x I <sub>r</sub>	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	-	0.2	0.2	0.05	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )				10 x I <sub>r</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )		2.5 x I <sub>r</sub>	10 x I <sub>r</sub>	12 x I <sub>r</sub>
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		



# Annex B - Time Current Curves

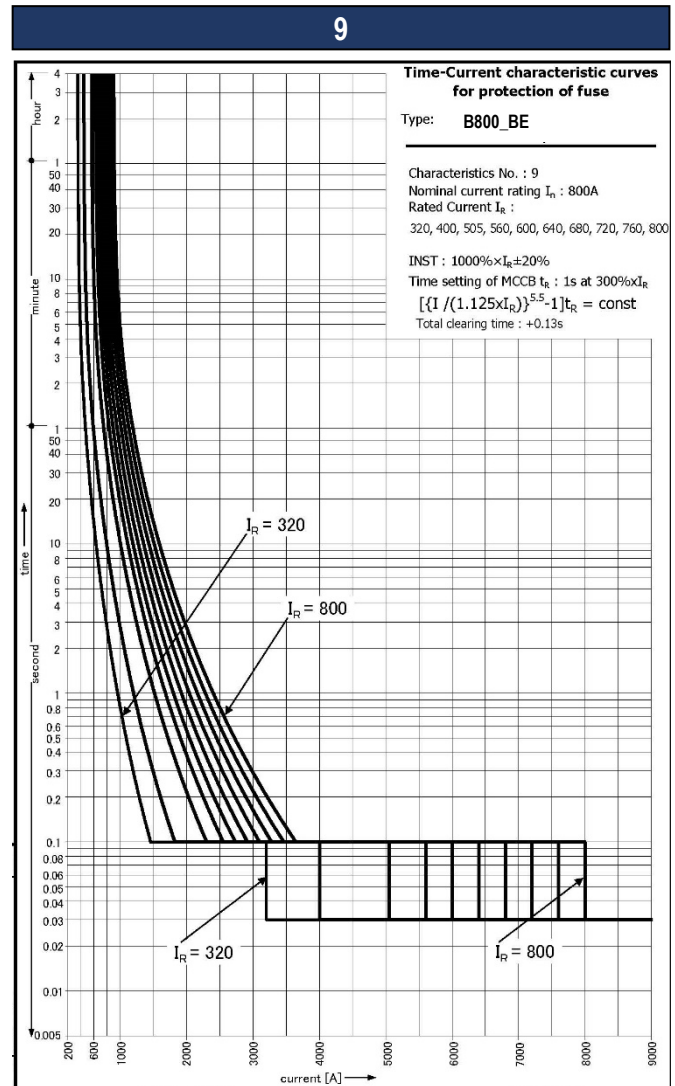
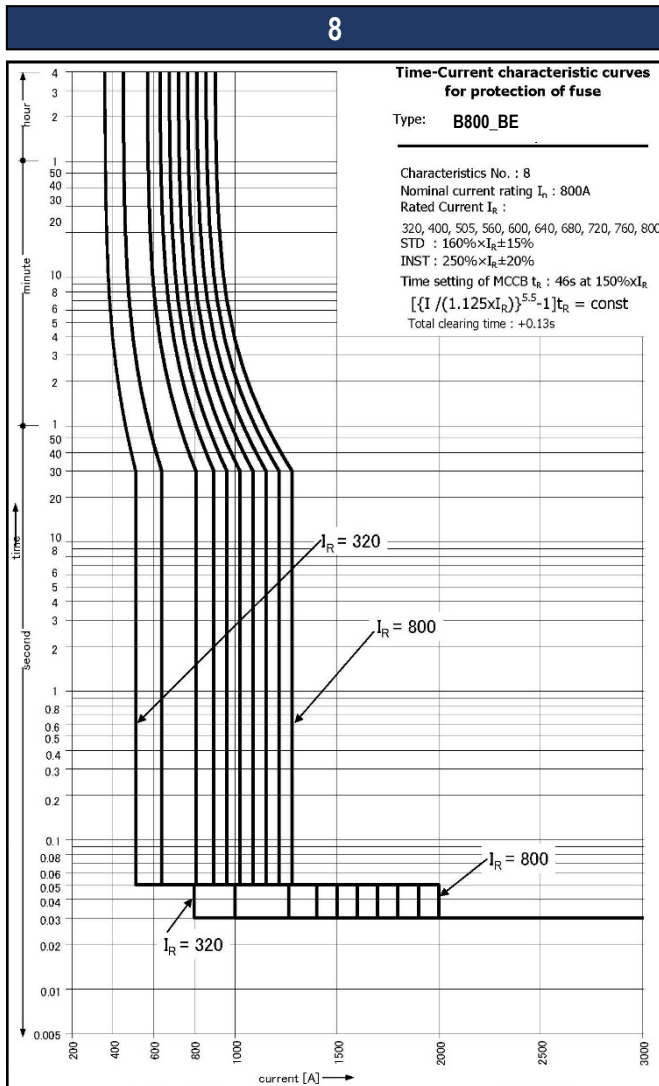
B800\_BE – I<sub>n</sub> 800 A



LTD pick up current I <sub>r</sub>		320 – 400 – 505 – 560 – 600 – 640 – 680 – 720 – 760 – 800 A (10 steps)										
		Standard curves 1 - 7							Additional special application curves next pages			
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10	
LTD	t <sub>r</sub> (s)	11	21	21	5	5	10	29	46	1	-	
		@ 2 x I <sub>r</sub>				@ 6 x I <sub>r</sub>			1.5 x I <sub>r</sub>	@ 3 x I <sub>r</sub>	-	
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	-	10 x I <sub>r</sub>	10 x I <sub>r</sub>	1.6 x I <sub>r</sub>	-	-	
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	-	0.2	0.2	0.05	-	-	
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )				10 x I <sub>r</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )			2.5 x I <sub>r</sub>	10 x I <sub>r</sub>	12 x I <sub>r</sub>
OCR options												
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>			
	t <sub>p</sub> (s)	40							40			
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>			
	t <sub>g</sub> (s)	0.2							0.2			
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>			
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>			

# Annex B - Time Current Curves

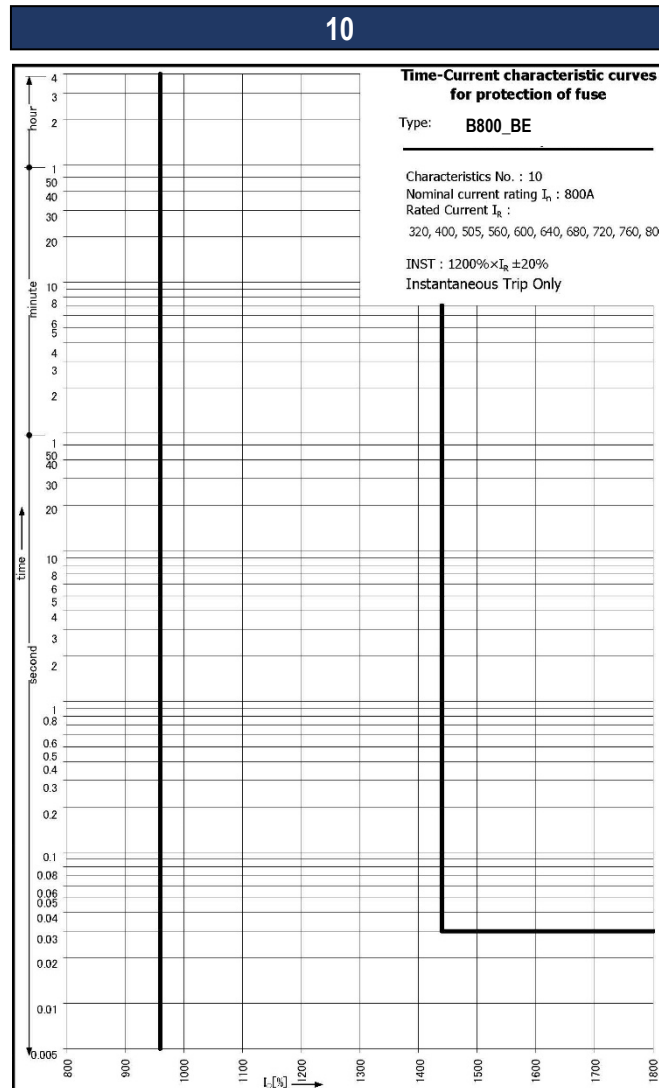
## B800\_BE – I<sub>n</sub> 800 A



LTD pick up current I <sub>r</sub>		320 – 400 – 505 – 560 – 600 – 640 – 680 – 720 – 760 – 800 A (10 steps)									
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	5	10	29	46	1	-
		@ 2 × I <sub>r</sub>			@ 6 × I <sub>r</sub>				1.5 × I <sub>r</sub>	@ 3 × I <sub>r</sub>	-
STD	I <sub>sd</sub>	2.5 × I <sub>r</sub>	2.5 × I <sub>r</sub>	5 × I <sub>r</sub>	10 × I <sub>r</sub>	-	10 × I <sub>r</sub>	10 × I <sub>r</sub>	1.6 × I <sub>r</sub>	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	-	0.2	0.2	0.05	-	-
INST	I <sub>i</sub>	14 × I <sub>r</sub> (Maximum of 12 × I <sub>n</sub> )				10 × I <sub>r</sub>	14 × I <sub>r</sub> (Maximum of 12 × I <sub>n</sub> )		2.5 × I <sub>r</sub>	10 × I <sub>r</sub>	12 × I <sub>r</sub>
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 × I <sub>r</sub>							0.8 × I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 × I <sub>r</sub>							0.2 × I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 × I <sub>r</sub>							1.0 / 0.5 × I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		

## Annex B - Time Current Curves

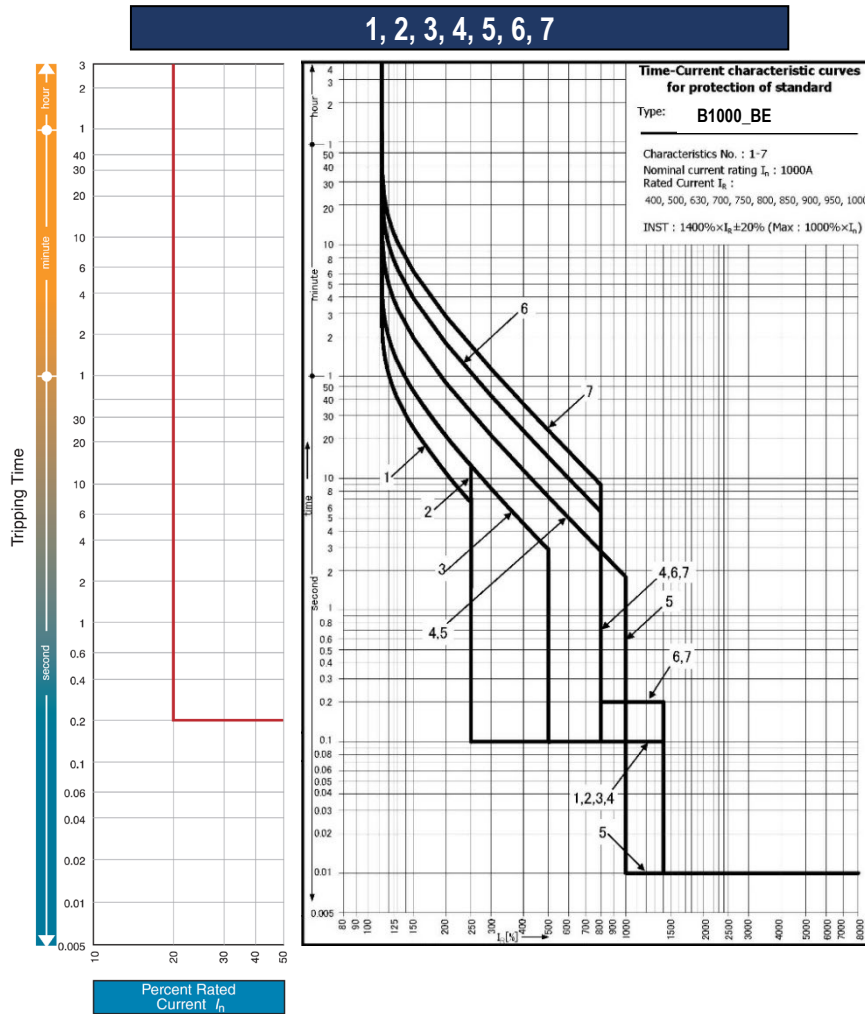
B800\_BE – I<sub>n</sub> 800 A



LTD pick up current I <sub>r</sub>		320 – 400 – 505 – 560 – 600 – 640 – 680 – 720 – 760 – 800 A (10 steps)									
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	5	10	29	46	1	-
		@ 2 x I <sub>r</sub>				@ 6 x I <sub>r</sub>			1.5 x I <sub>r</sub>	@ 3 x I <sub>r</sub>	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	-	10 x I <sub>r</sub>	10 x I <sub>r</sub>	1.6 x I <sub>r</sub>	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	-	0.2	0.2	0.05	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )				10 x I <sub>r</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )		2.5 x I <sub>r</sub>	10 x I <sub>r</sub>	12 x I <sub>r</sub>
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		

# Annex B - Time Current Curves

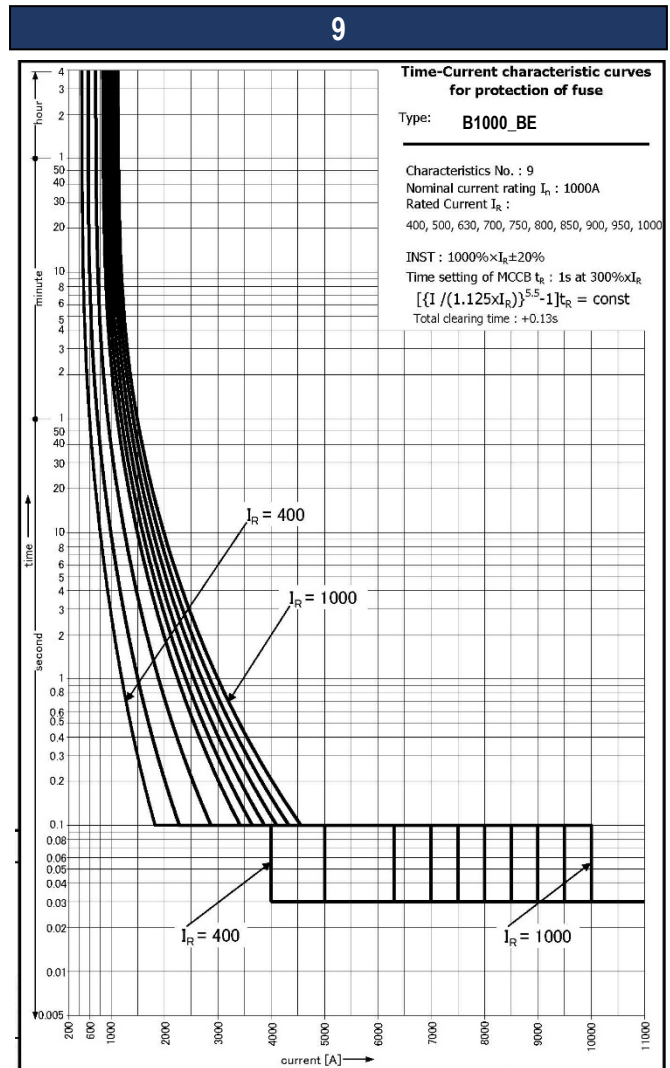
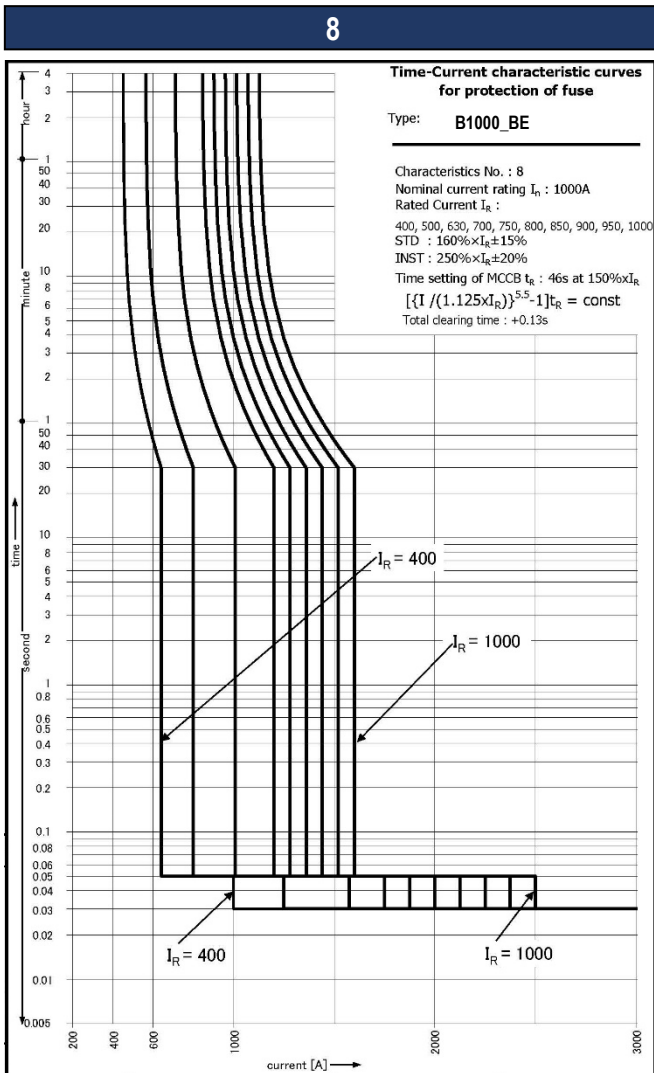
B1000\_BE – I<sub>n</sub> 1000 A



LTD pick up current I <sub>r</sub>		400 – 500 – 630 – 700 – 750 – 800 – 850 – 900 – 950 – 1000 A (10 steps)									
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	5	10	29	46	1	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>				1.5 x I <sub>r</sub>	@ 3 x I <sub>r</sub>	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	-	10 x I <sub>r</sub>	10 x I <sub>r</sub>	1.6 x I <sub>r</sub>	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	-	0.2	0.2	0.05	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 10 x I <sub>n</sub> )				10 x I <sub>r</sub>	14 x I <sub>r</sub> (Maximum of 10 x I <sub>n</sub> )		2.5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>
<b>OCR options</b>											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		

## Annex B - Time Current Curves

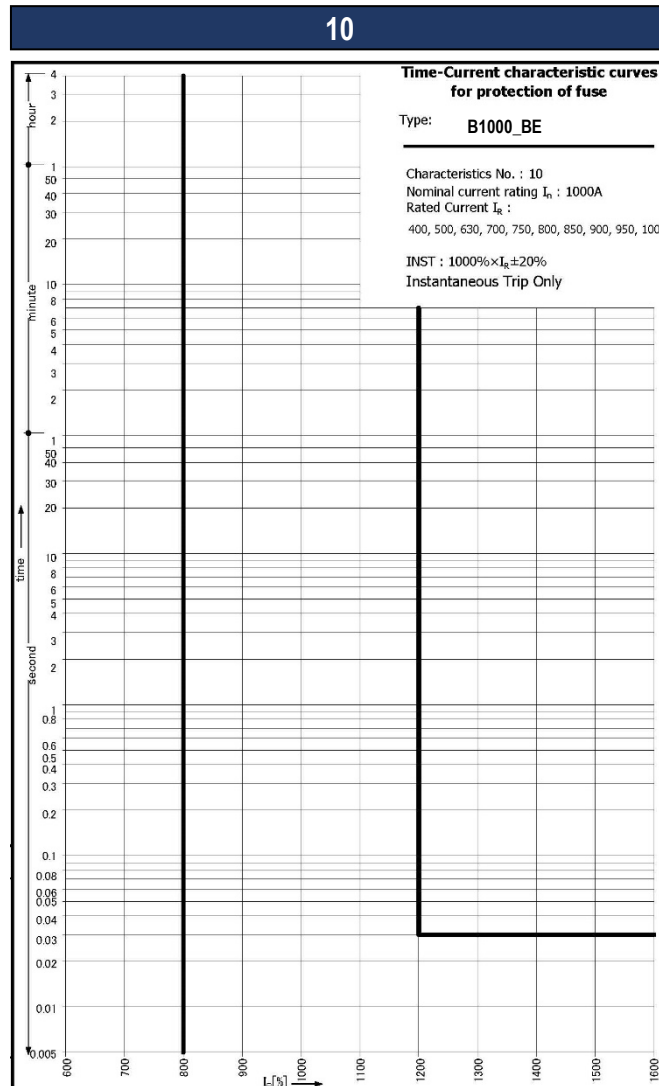
### B1000\_BE – I<sub>n</sub> 1000 A



LTD pick up current I <sub>r</sub>		400 – 500 – 630 – 700 – 750 – 800 – 850 – 900 – 950 – 1000 A (10 steps)									
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	5	10	29	46	1	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>				1.5 x I <sub>r</sub>	@ 3 x I <sub>r</sub>	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	-	10 x I <sub>r</sub>	10 x I <sub>r</sub>	1.6 x I <sub>r</sub>	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	-	0.2	0.2	0.05	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 10 x I <sub>n</sub> )				10 x I <sub>r</sub>	14 x I <sub>r</sub> (Maximum of 10 x I <sub>n</sub> )		2.5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		

# Annex B - Time Current Curves

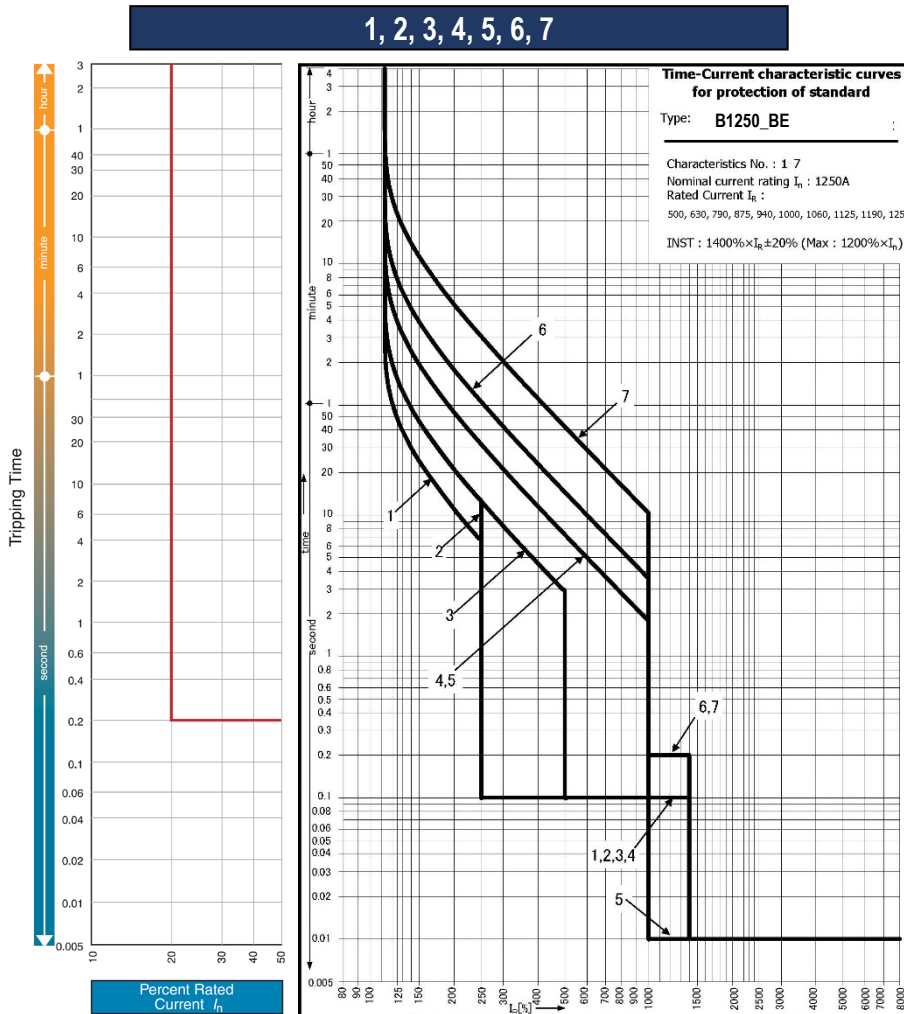
B1000\_BE – I<sub>n</sub> 1000 A



LTD pick up current I <sub>r</sub>		400 – 500 – 630 – 700 – 750 – 800 – 850 – 900 – 950 – 1000 A (10 steps)									
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	5	10	29	46	1	-
		@ 2 x I <sub>r</sub>				@ 6 x I <sub>r</sub>			1.5 x I <sub>r</sub>	@ 3 x I <sub>r</sub>	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	-	10 x I <sub>r</sub>	10 x I <sub>r</sub>	1.6 x I <sub>r</sub>	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	-	0.2	0.2	0.05	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 10 x I <sub>n</sub> )				10 x I <sub>r</sub>	14 x I <sub>r</sub> (Maximum of 10 x I <sub>n</sub> )		2.5 x I <sub>r</sub>	10 x I <sub>r</sub>	10 x I <sub>r</sub>
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		

# Annex B - Time Current Curves

B1250\_BE – I<sub>n</sub> 1250 A

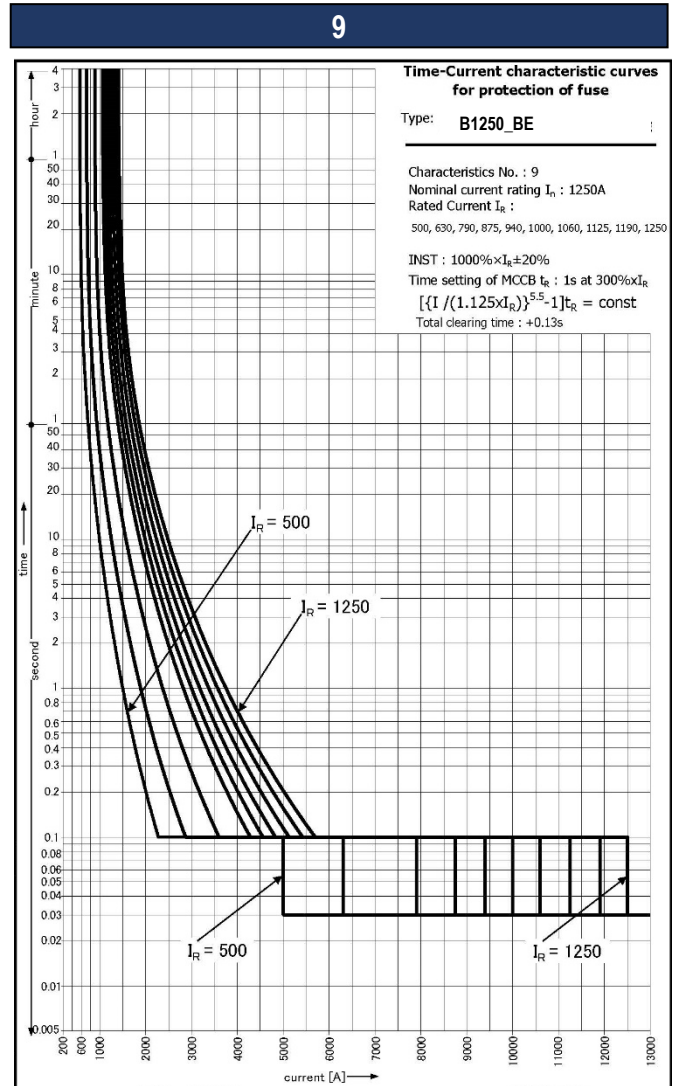
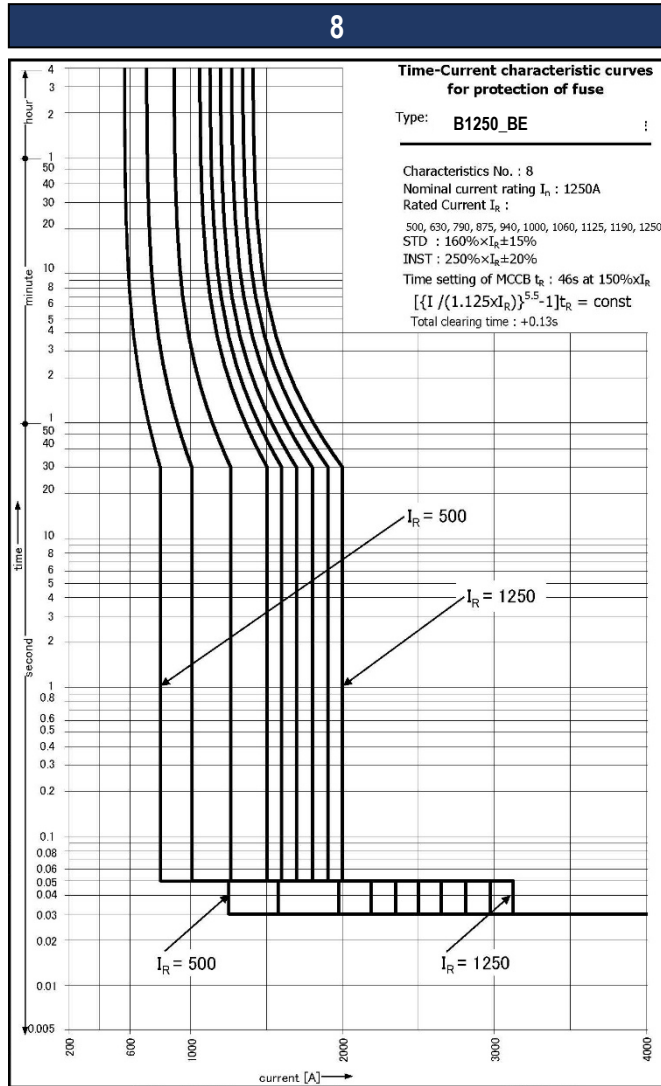


LTD pick up current I <sub>r</sub>		500 – 630 – 790 – 875 – 940 – 1000 – 1060 – 1125 – 1190 – 1250 A (10 steps)									
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	5	10	29	46	1	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>				1.5 x I <sub>r</sub>	@ 3 x I <sub>r</sub>	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	-	10 x I <sub>r</sub>	10 x I <sub>r</sub>	1.6 x I <sub>r</sub>	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	-	0.2	0.2	0.05	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )				10 x I <sub>r</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )		2.5 x I <sub>r</sub>	10 x I <sub>r</sub>	12 x I <sub>r</sub>
<b>OCR options</b>											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		



# Annex B - Time Current Curves

## B1250\_BE – I<sub>n</sub> 1250 A

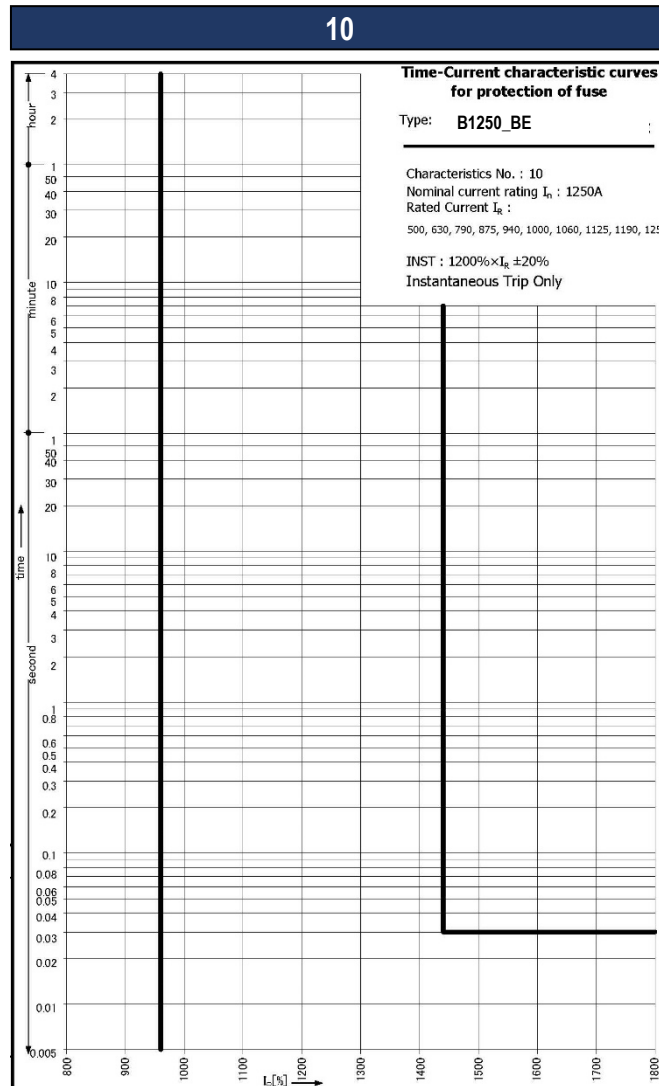


LTD pick up current I <sub>r</sub>		500 – 630 – 790 – 875 – 940 – 1000 – 1060 – 1125 – 1190 – 1250 A (10 steps)									
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	5	10	29	46	1	-
		@ 2 x I <sub>r</sub>				@ 6 x I <sub>r</sub>			1.5 x I <sub>r</sub>	@ 3 x I <sub>r</sub>	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	-	10 x I <sub>r</sub>	10 x I <sub>r</sub>	1.6 x I <sub>r</sub>	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	-	0.2	0.2	0.05	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )				10 x I <sub>r</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )		2.5 x I <sub>r</sub>	10 x I <sub>r</sub>	12 x I <sub>r</sub>
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		



## Annex B - Time Current Curves

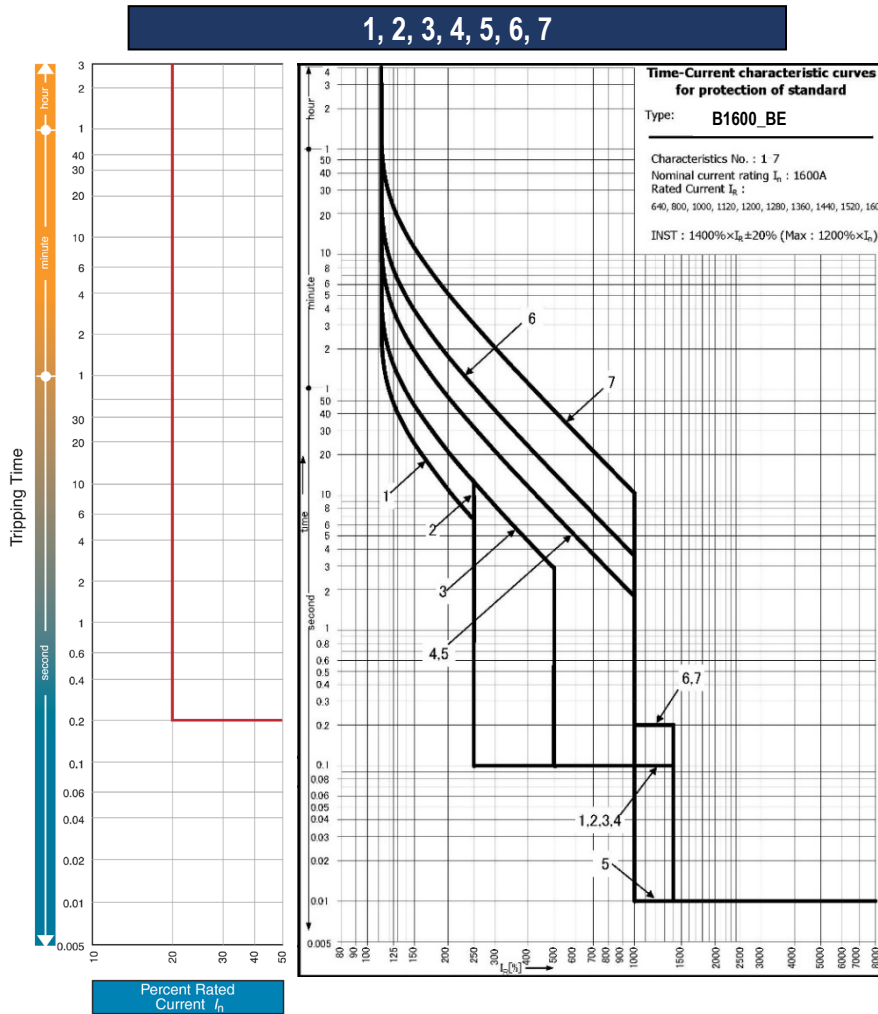
B1250\_BE – I<sub>n</sub> 1250 A



LTD pick up current I <sub>r</sub>		500 – 630 – 790 – 875 – 940 – 1000 – 1060 – 1125 – 1190 – 1250 A (10 steps)									
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	5	10	29	46	1	-
		@ 2 x I <sub>r</sub>				@ 6 x I <sub>r</sub>			1.5 x I <sub>r</sub>	@ 3 x I <sub>r</sub>	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	-	10 x I <sub>r</sub>	10 x I <sub>r</sub>	1.6 x I <sub>r</sub>	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	-	0.2	0.2	0.05	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )				10 x I <sub>r</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )		2.5 x I <sub>r</sub>	10 x I <sub>r</sub>	12 x I <sub>r</sub>
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		

# Annex B - Time Current Curves

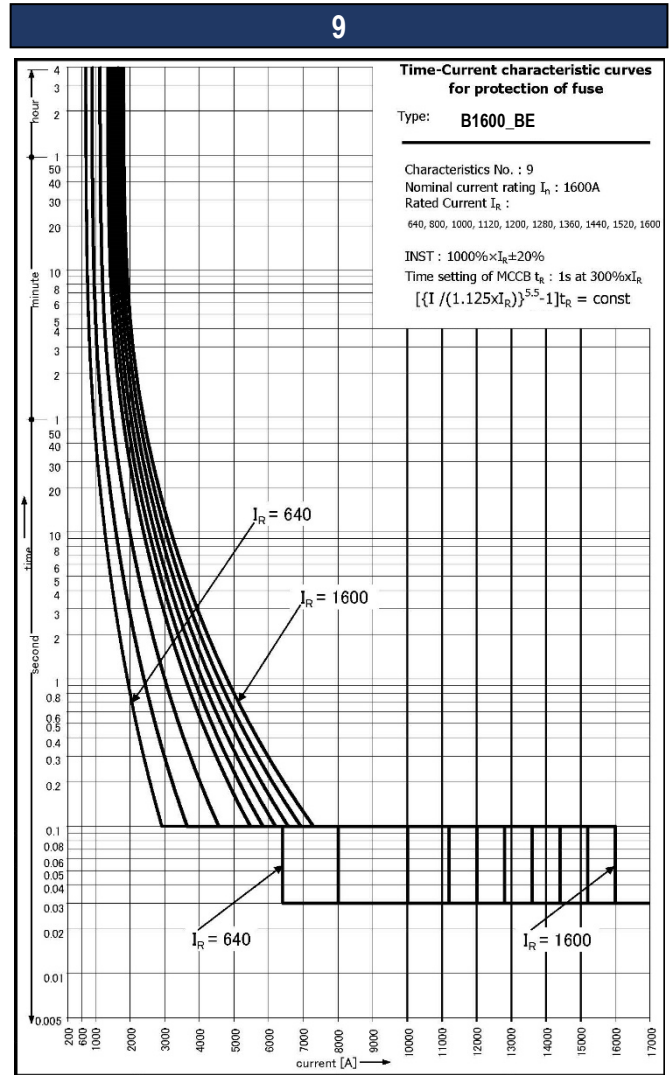
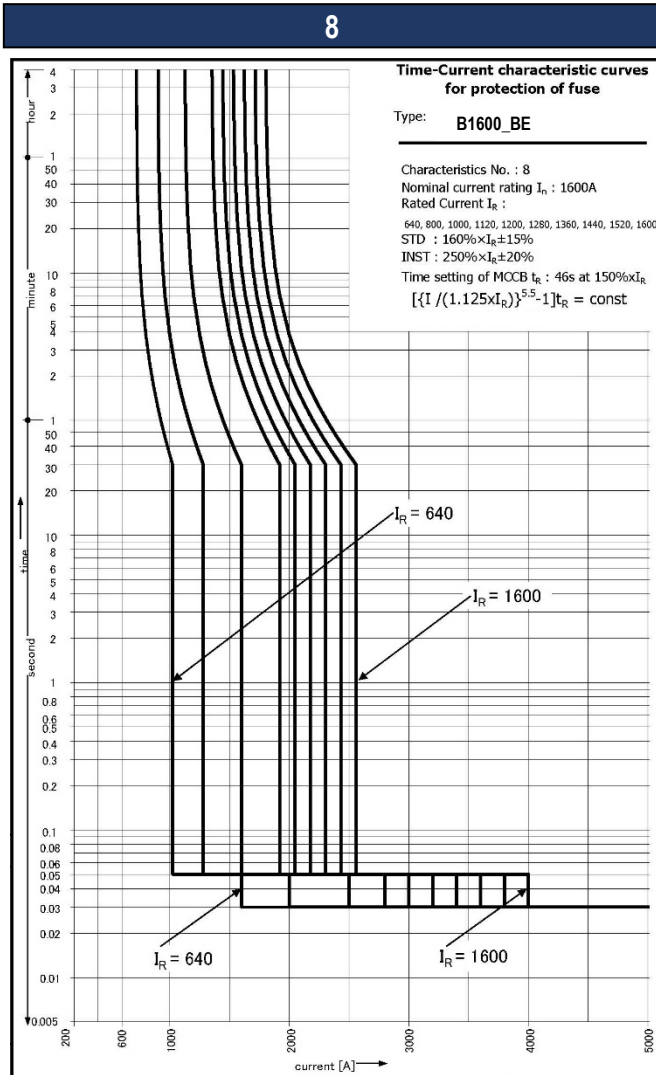
B1600\_BE – I<sub>n</sub> 1600 A



LTD pick up current I <sub>r</sub>		640 – 800 – 1000 – 1120 – 1200 – 1280 – 1360 – 1440 – 1520 – 1600 A (10 steps)									
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	5	10	29	46	1	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>				1.5 x I <sub>r</sub>	@ 3 x I <sub>r</sub>	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	-	10 x I <sub>r</sub>	10 x I <sub>r</sub>	1.6 x I <sub>r</sub>	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	-	0.2	0.2	0.05	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )				10 x I <sub>r</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )		2.5 x I <sub>r</sub>	10 x I <sub>r</sub>	12 x I <sub>r</sub>
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		

## Annex B - Time Current Curves

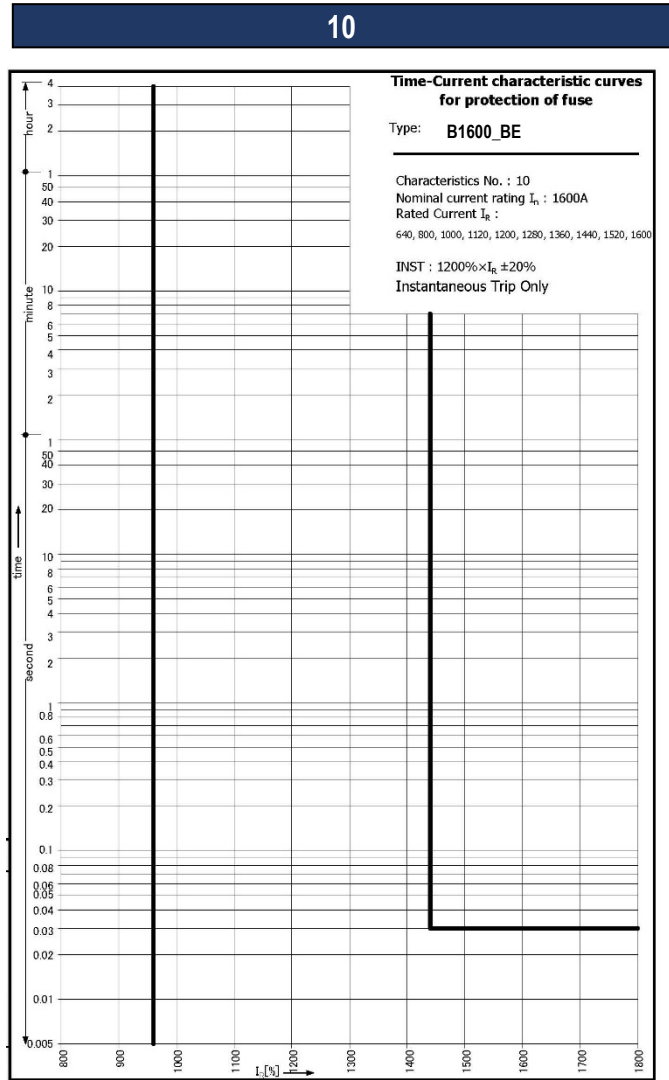
### B1600\_BE – I<sub>n</sub> 1600 A



LTD pick up current I <sub>r</sub>		640 – 800 – 1000 – 1120 – 1200 – 1280 – 1360 – 1440 – 1520 – 1600 A (10 steps)									
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	5	10	29	46	1	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>				1.5 x I <sub>r</sub>	@ 3 x I <sub>r</sub>	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	-	10 x I <sub>r</sub>	10 x I <sub>r</sub>	1.6 x I <sub>r</sub>	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	-	0.2	0.2	0.05	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )				10 x I <sub>r</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )		2.5 x I <sub>r</sub>	10 x I <sub>r</sub>	12 x I <sub>r</sub>
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		

# Annex B - Time Current Curves

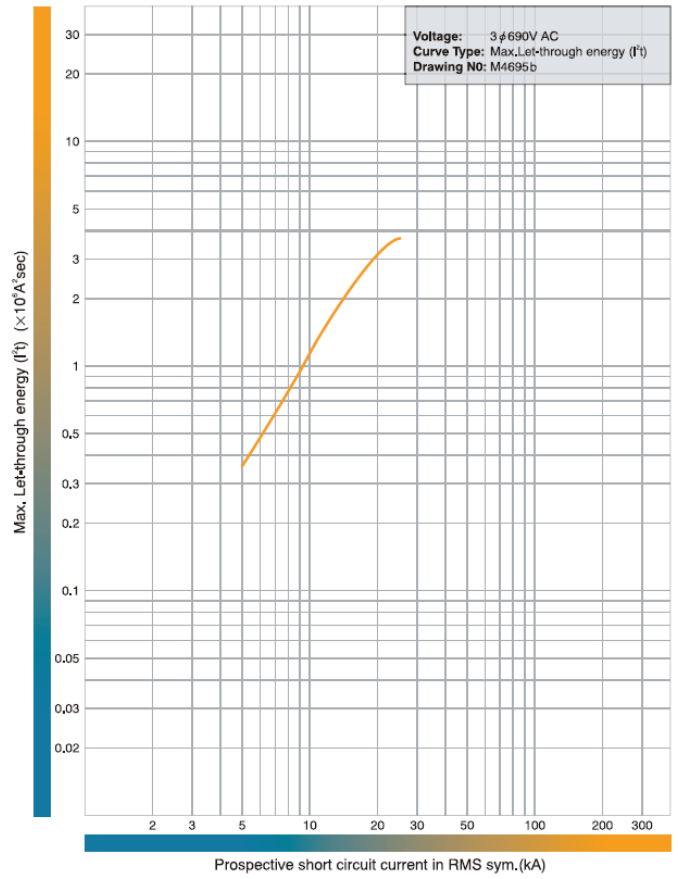
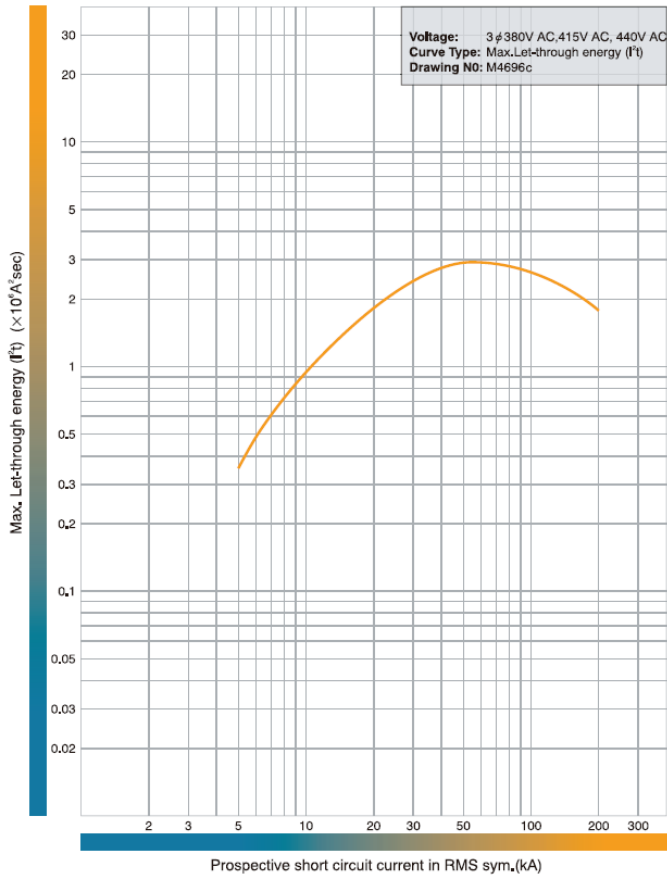
B1600\_BE – I<sub>n</sub> 1600 A



LTD pick up current I <sub>r</sub>		640 – 800 – 1000 – 1120 – 1200 – 1280 – 1360 – 1440 – 1520 – 1600 A (10 steps)									
		Standard curves 1 - 7							Additional special application curves next pages		
Characteristic dial setting		1	2	3	4	5	6	7	8	9	10
LTD	t <sub>r</sub> (s)	11	21	21	5	5	10	29	46	1	-
		@ 2 x I <sub>r</sub>			@ 6 x I <sub>r</sub>				1.5 x I <sub>r</sub>	@ 3 x I <sub>r</sub>	-
STD	I <sub>sd</sub>	2.5 x I <sub>r</sub>	2.5 x I <sub>r</sub>	5 x I <sub>r</sub>	10 x I <sub>r</sub>	-	10 x I <sub>r</sub>	10 x I <sub>r</sub>	1.6 x I <sub>r</sub>	-	-
	t <sub>sd</sub> (s)	0.1	0.1	0.1	0.1	-	0.2	0.2	0.05	-	-
INST	I <sub>i</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )				10 x I <sub>r</sub>	14 x I <sub>r</sub> (Maximum of 12 x I <sub>n</sub> )		2.5 x I <sub>r</sub>	10 x I <sub>r</sub>	12 x I <sub>r</sub>
OCR options											
Pre-Trip Alarm (PTA)	I <sub>p</sub>	0.8 x I <sub>r</sub>							0.8 x I <sub>r</sub>		
	t <sub>p</sub> (s)	40							40		
Ground Fault (GF)	I <sub>g</sub>	0.2 x I <sub>r</sub>							0.2 x I <sub>r</sub>		
	t <sub>g</sub> (s)	0.2							0.2		
Neutral Pole Protection (NP)	I <sub>N</sub>	1.0 / 0.5 x I <sub>r</sub>							1.0 / 0.5 x I <sub>r</sub>		
	t <sub>N</sub> (s)	t <sub>N</sub> = t <sub>r</sub>							t <sub>N</sub> = t <sub>r</sub>		

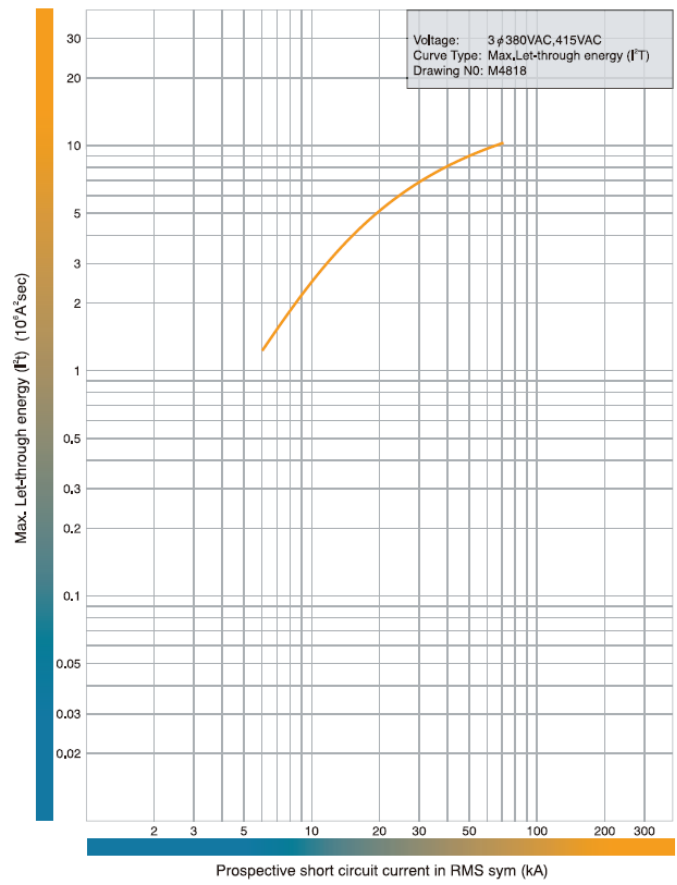
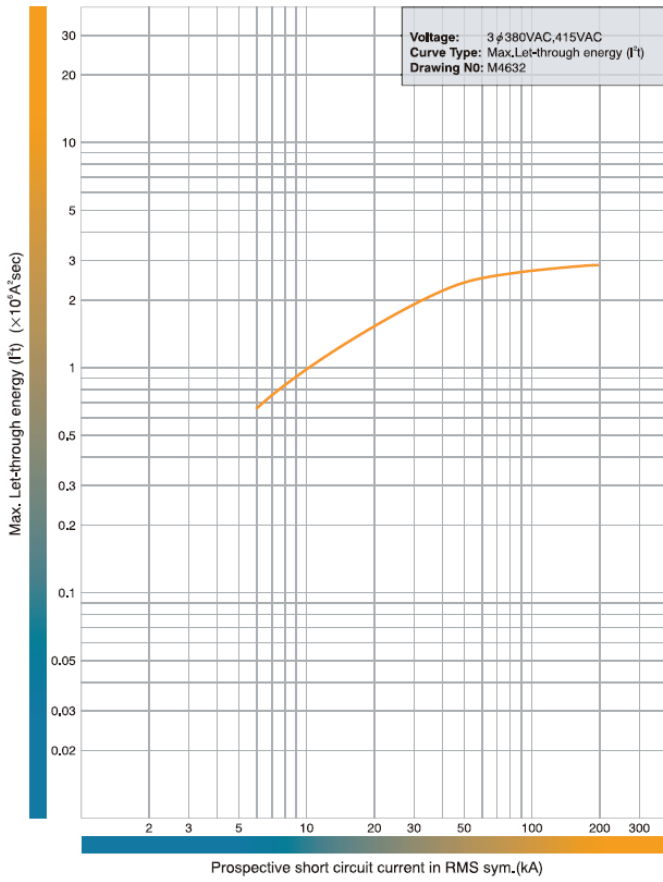
# Annex C - I<sup>2</sup>t Let-Through Curves

## B250P



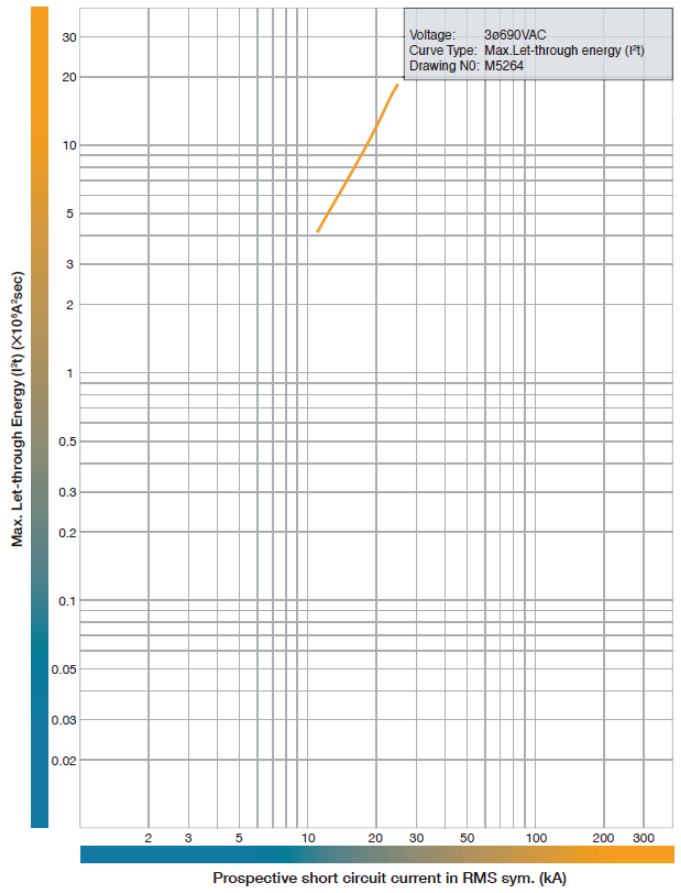
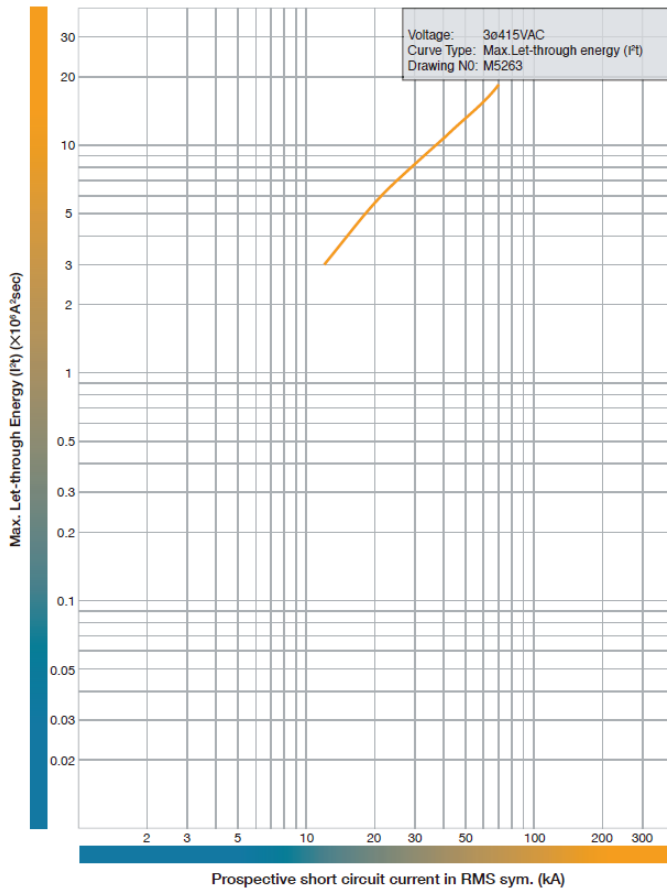
## Annex C - I<sup>2</sup>t Let-Through Curves

B400P / R



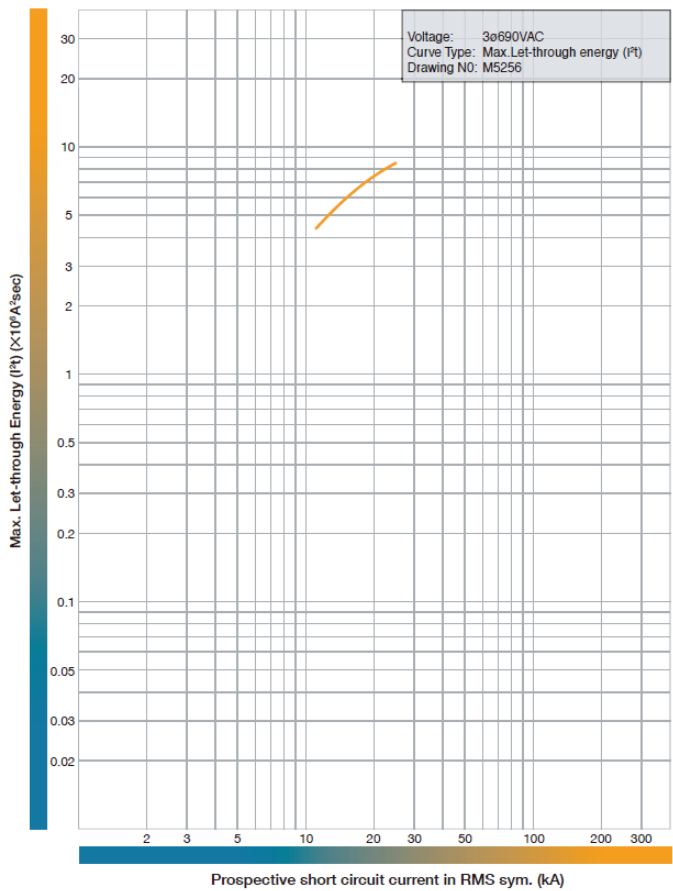
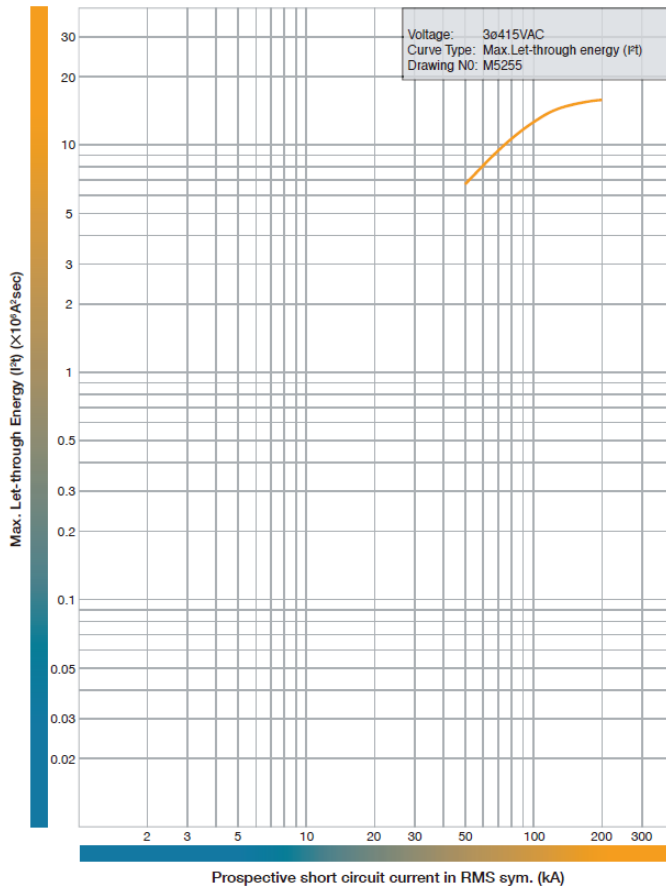
## Annex C - I<sup>2</sup>t Let-Through Curves

B800N / H



## Annex C - I<sup>2</sup>t Let-Through Curves

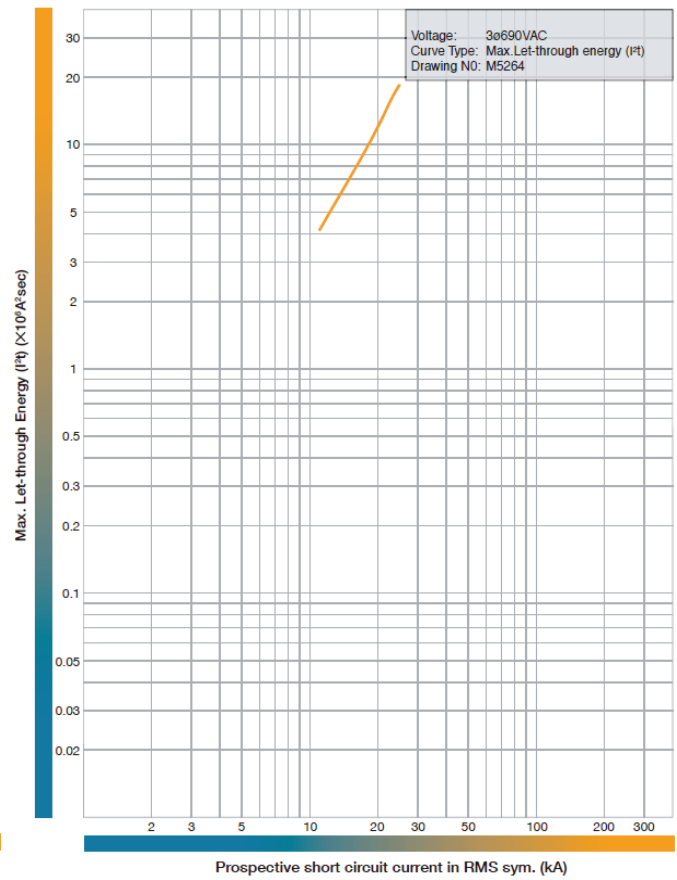
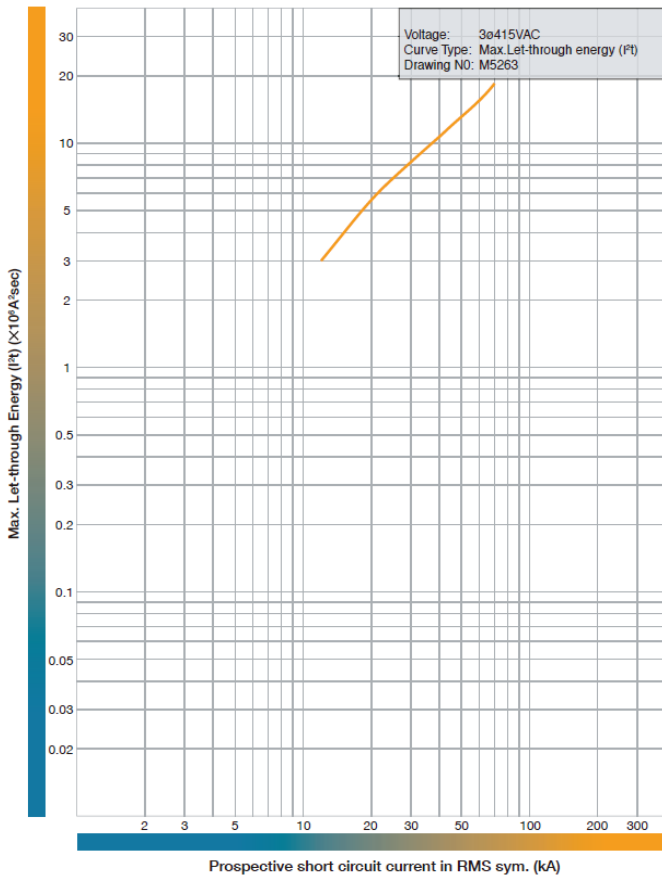
B800P / R





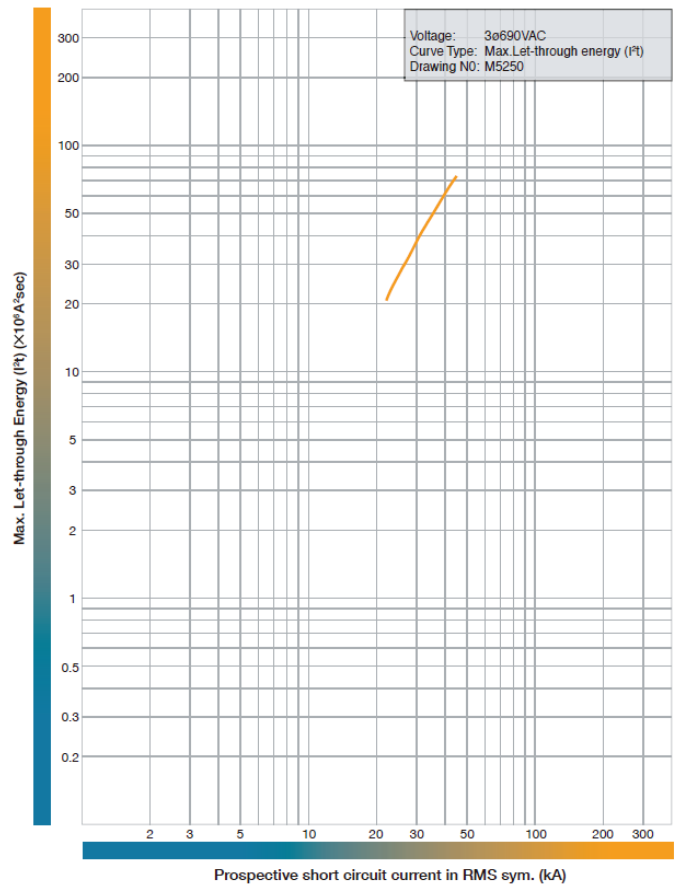
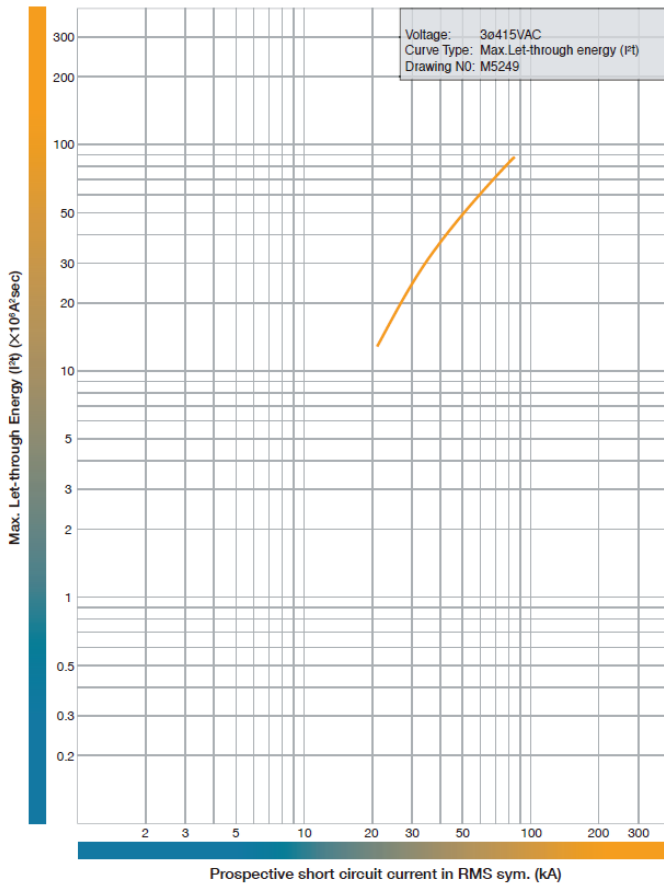
## Annex C - I<sup>2</sup>t Let-Through Curves

B1000N / H



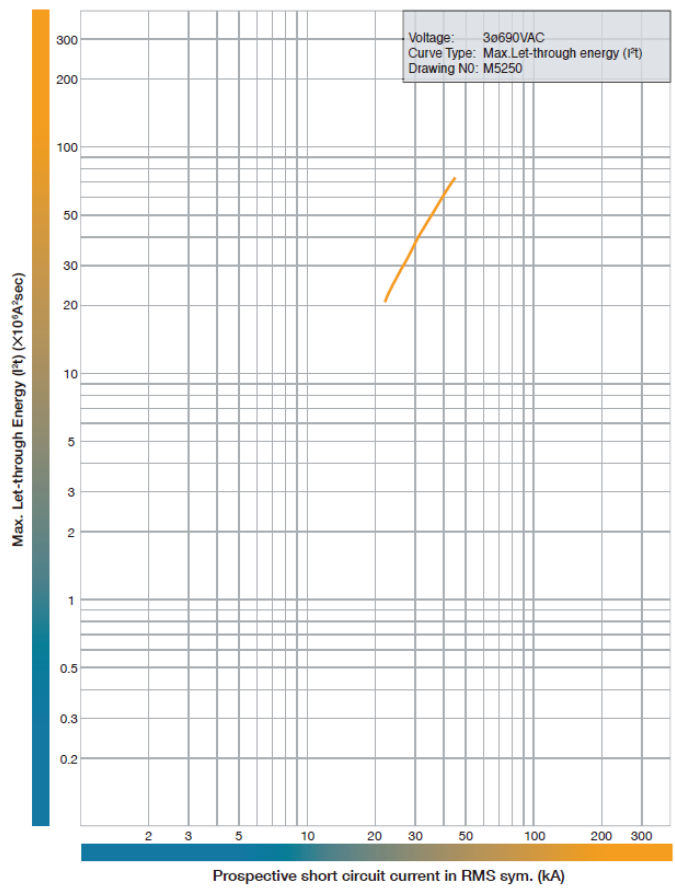
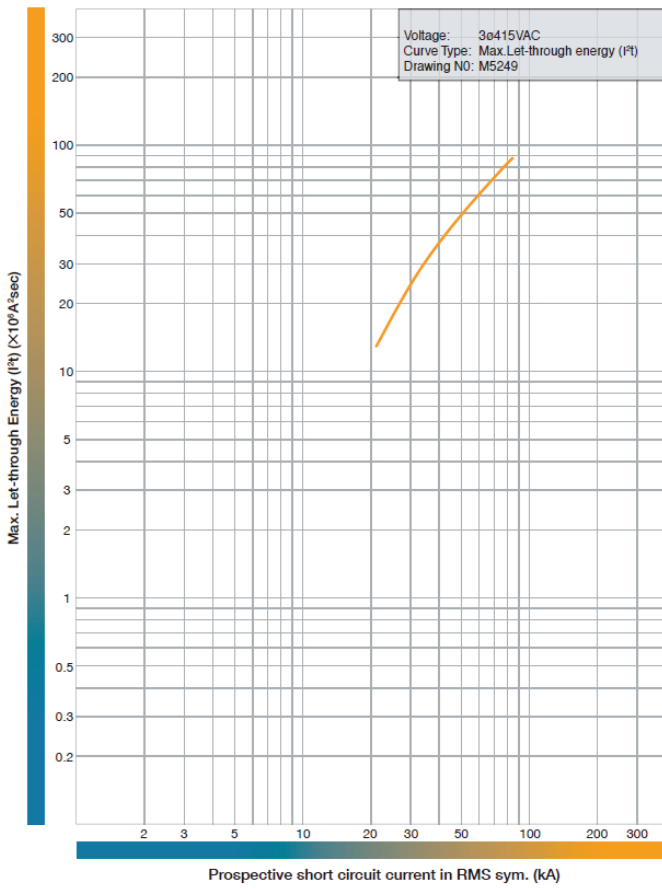
## Annex C - I<sup>2</sup>t Let-Through Curves

B1250N / H / HL



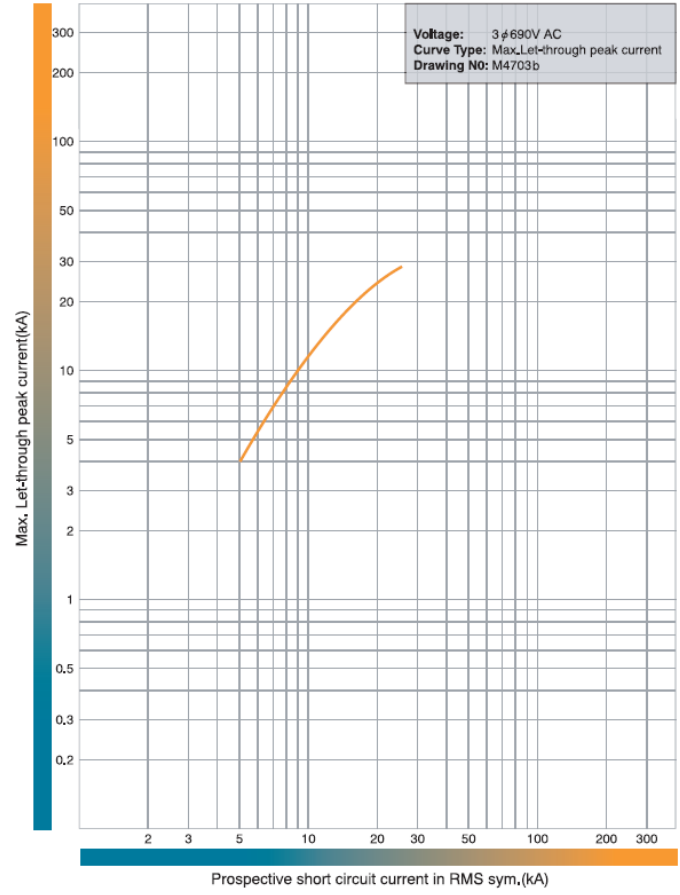
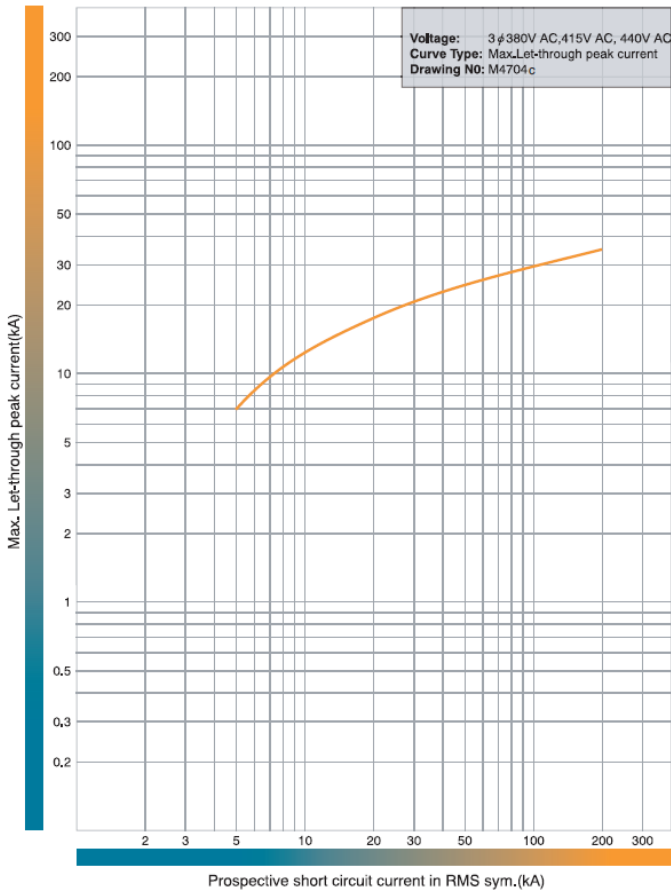
## Annex C - I<sup>2</sup>t Let-Through Curves

B1600N / HL



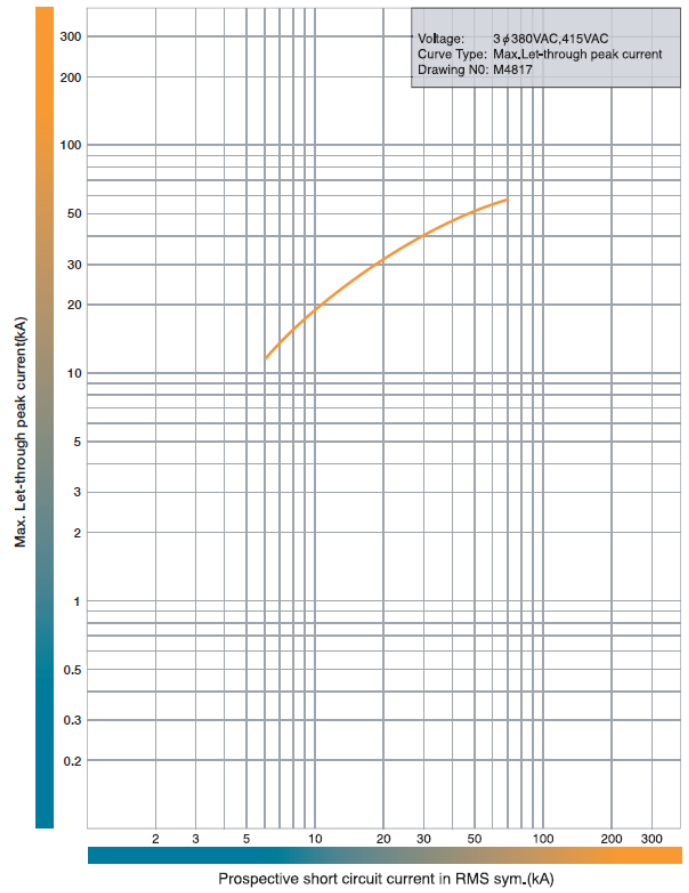
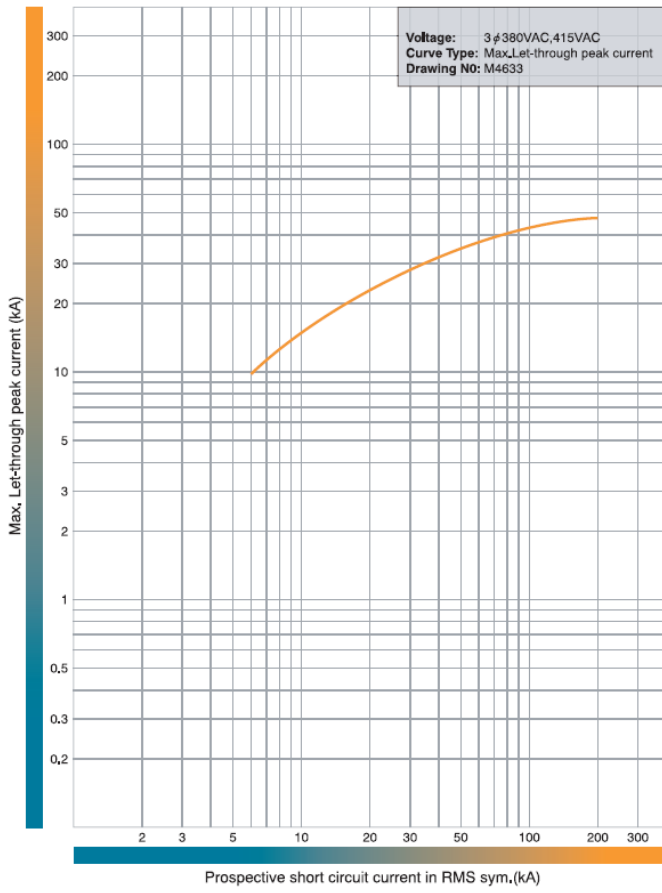
## Annex D - Peak Let-through Curves

### B250P



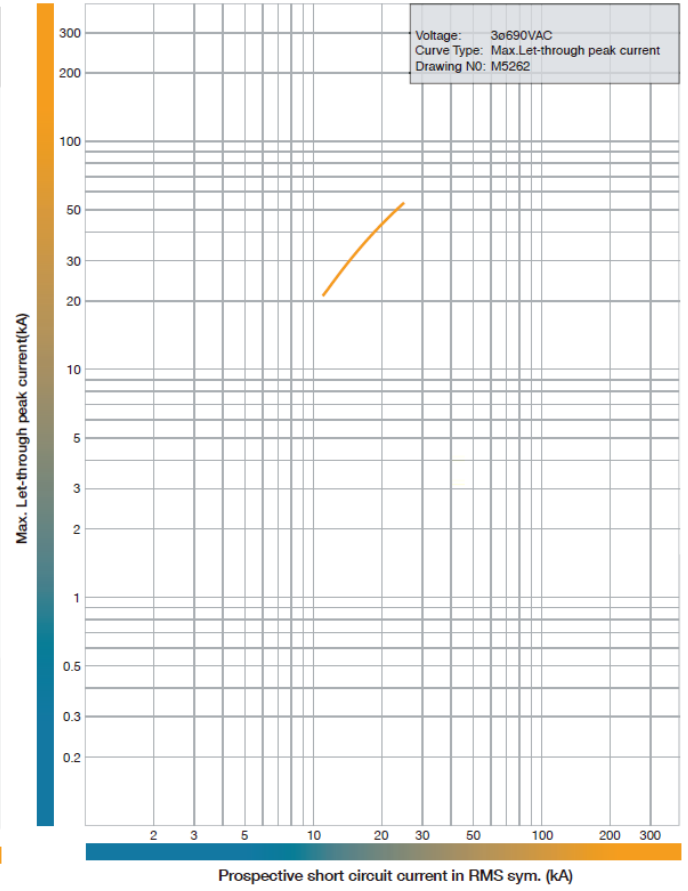
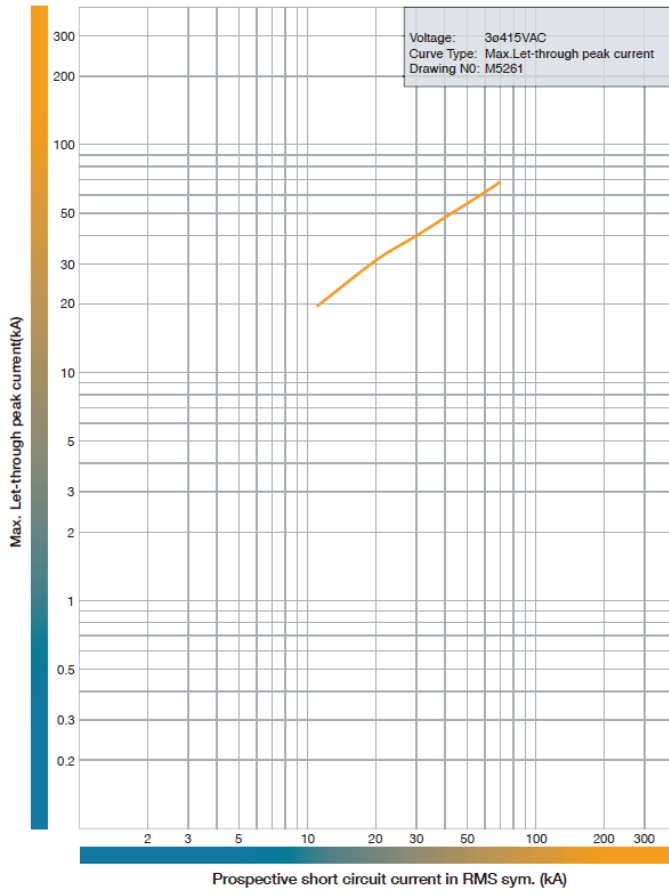
## Annex D - Peak Let-through Curves

B400P / R



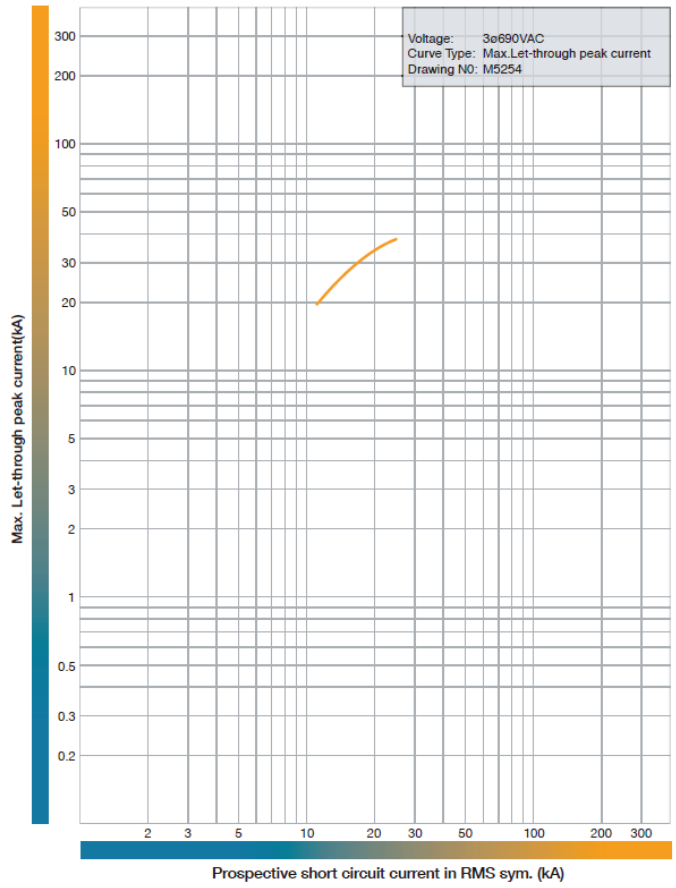
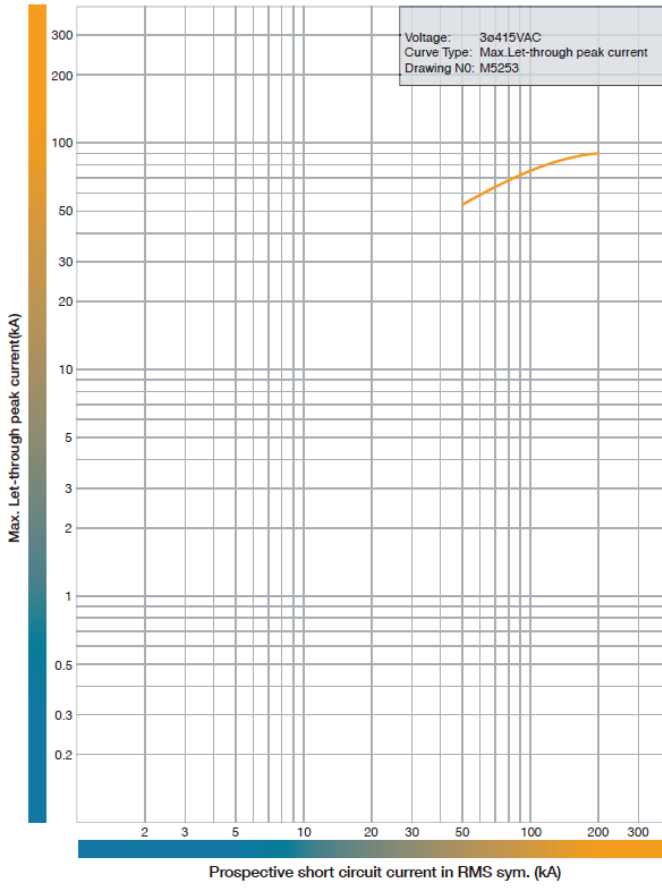
## Annex D - Peak Let-through Curves

B800N / H



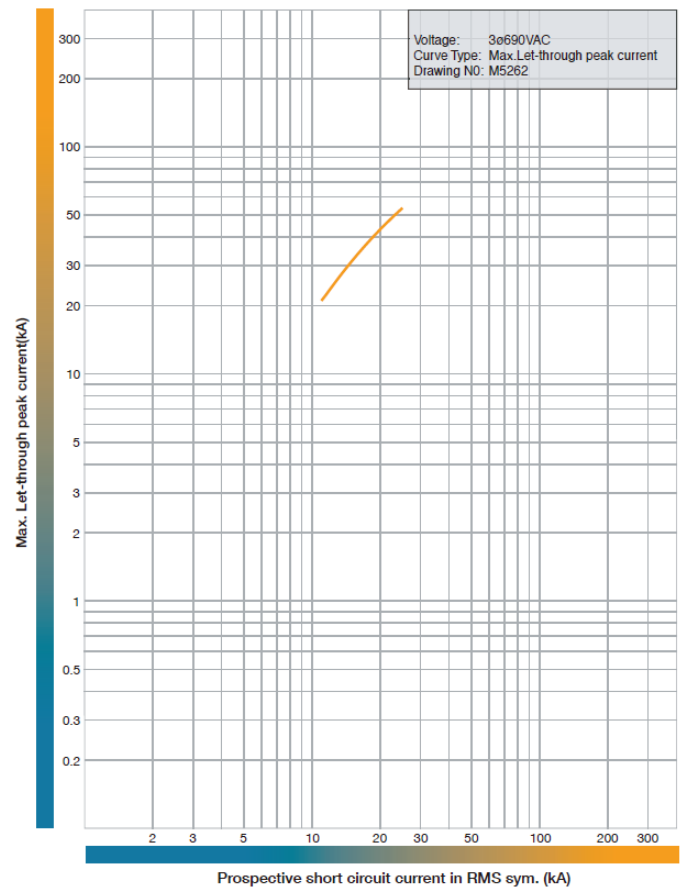
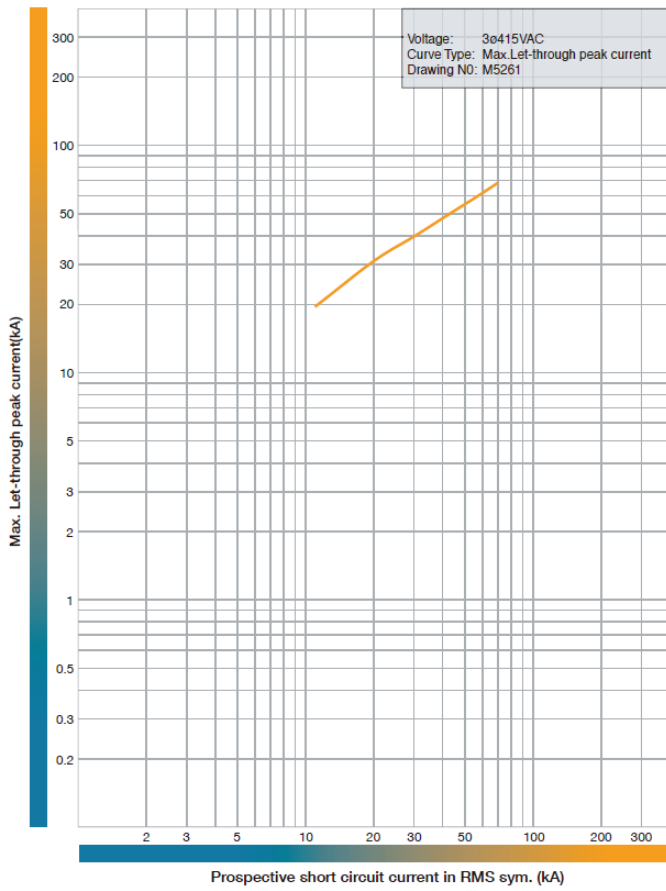
## Annex D - Peak Let-through Curves

B800P / R



## Annex D - Peak Let-through Curves

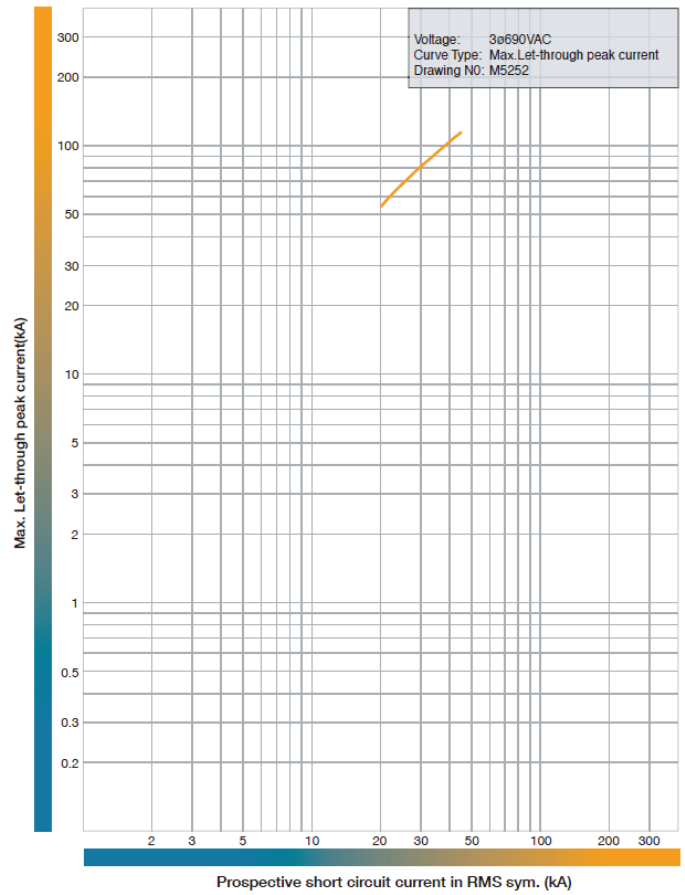
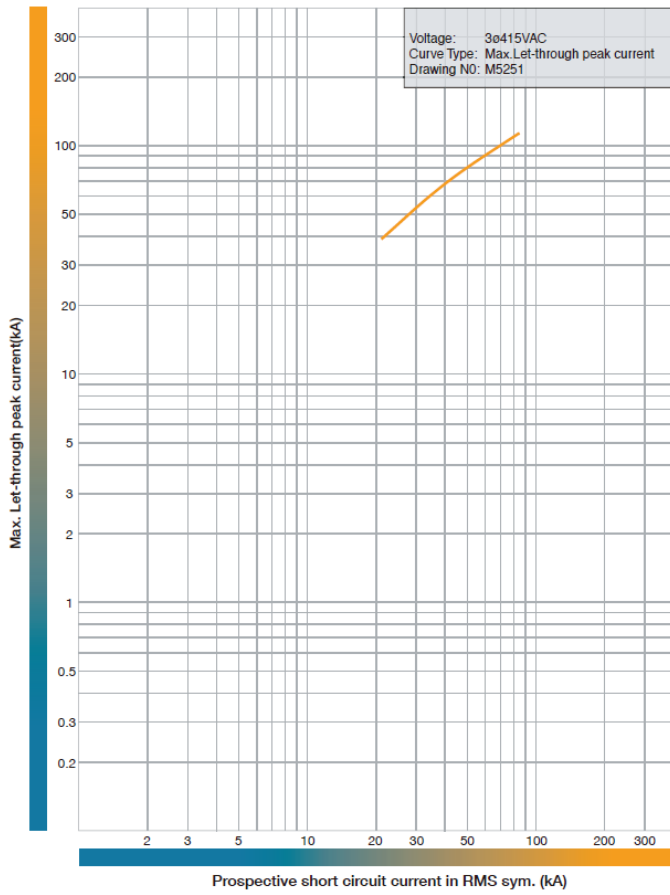
B1000N / H





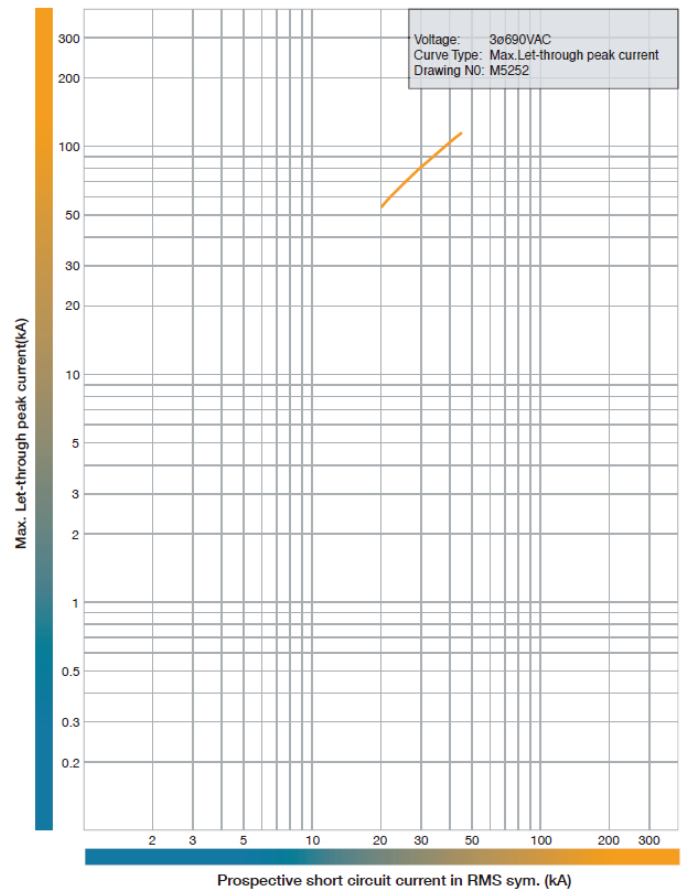
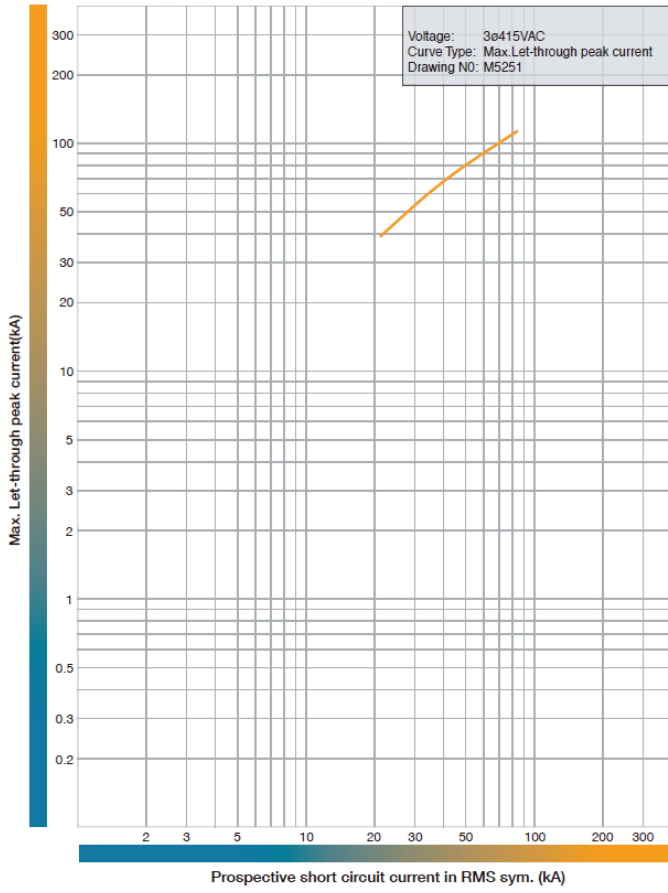
## Annex D - Peak Let-through Curves

B1250N / H / HL



## Annex D - Peak Let-through Curves

B1600N / HL



## Annex E – Watts Loss

### Impedance Watts Loss

Ampere Frame	Rating In (A)	Impedance per pole (mΩ)	Watts Loss per pole Based from Impedance (W)	Pole numbers	Watts Loss per product Based from Impedance (W)
B250P	40	0.40	0.64	3P / 4P	1.92
	125	0.40	6.24		18.73
	160	0.40	10.23		30.68
	250	0.40	25.00		75.00
B400P / R	250	0.29	18.23	3P / 4P	54.69
	400	0.29	46.67		140.00
B800N / H	630A	0.13	51.45	3P / 4P	154.34
	800A	0.15	93.33		280.00
B800G	630A	0.13	51.45	3P / 4P	154.34
	800A	0.15	93.33		280.00
B800P / R	630A	0.16	64.31	3P / 4P	192.94
	800A	0.15	93.33		280.00
B1000N / H	1000A	0.11	106.67	3P / 4P	320.00
B1250N / H / HL	1250A	0.06	90.00	3P / 4P	270.00
B1600N / HL	1600A	0.05	133.33	3P / 4P	400.00

### Resistance Watts Loss

Ampere Frame	Rating In (A)	Resistance per pole (mΩ)	Watts Loss per pole Based from Resistance (W)	Pole numbers	Watts Loss per product Based from Resistance (W)
B250P	40	0.39	0.62	3P / 4P	1.87
	125	0.39	6.01		18.28
	160	0.39	9.98		29.95
	250	0.39	24.38		73.13
B400P / R	250	0.2	12.5	3P / 4P	37.5
	400	0.2	32		96
B800N / H	630A	0.08	31.75	3P / 4P	95.26
	800A	0.08	51.2		153.6
B800G	630A	0.08	31.75	3P / 4P	95.26
	800A	0.08	51.2		153.6
B800P / R	630A	0.1	39.69	3P / 4P	119.07
	800A	0.1	64		192
B1000N / H	1000A	0.07	70	3P / 4P	210
B1250N / H / HL	1250A	0.04	62.5	3P / 4P	187.5
B1600N / HL	1600A	0.022	56.32	3P / 4P	168.96

## Annex F – Temperature Ratings Tables

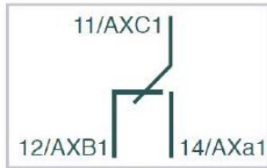
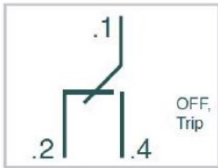
Maximum setting of the Ir dial/s at the nominated current at the specified ambient.

Rated Temperature											
MCCB Type	Connection type	Rated I <sub>n</sub>	Rated Current (A)								
			30°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
B250P	Front Conn. Rear Conn.	250 A	250	250	250	250	237.5	225	200	200	200
B400P / R	Front Conn. Rear Conn.	250 A	250	250	250	250	250	250	225	200	158
		400 A	400	400	400	400	400	380	360	320	158
	Plug-in Conn.	250 A	250	250	250	250	250	250	225	200	252
		400 A	400	400	400	400	400	360	340	320	252
B800N / H	Front Conn. Rear Conn. Plug-in Conn.	630 A	630	630	630	630	630	598.5	567	504	397
	Front Conn.	800 A	800	800	800	800	800	720	640	504	397
	Rear Conn. Plug-in Conn.	800 A	800	800	800	800	760	720	640	504	397
B800G / P / R	Front Conn. Rear Conn. Plug-in Conn.	630 A	630	630	630	630	630	598.5	567	504	397
		800 A	800	800	800	800	720	640	504	504	397
B1000N / H	Front Conn. Rear Conn.	1000 A	1000	1000	1000	1000	900	800	630	630	500
B1250N / H / HL	Front Conn.	1250 A	1250	1250	1250	1250	1250	1000	787	787	787
	Rear Conn. Plug-in Conn.	1250 A	1250	1250	1250	1250	1125	1000	787	787	787
B1600N / HL	Front Conn.	1600 A	1600	1600	1600	1600	1600	1440	1280	1008	1008
	Rear Conn.	1600 A	1600	1600	1600	1600	1520	1440	1280	1008	1008

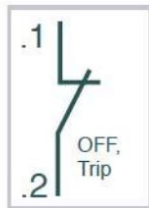
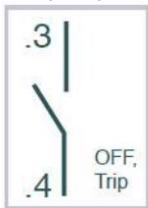
## Annex G – Wiring Diagrams & Terminal Designations

### Auxiliaries

#### General Purpose

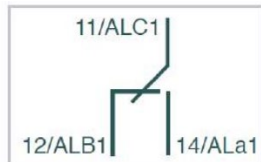
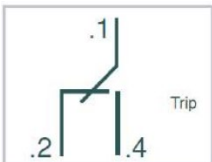


#### Heavy-duty

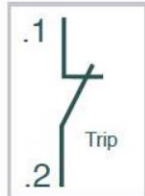
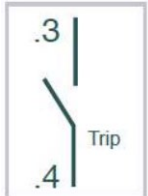


### Alarms

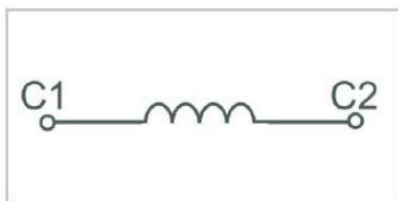
#### General Purpose



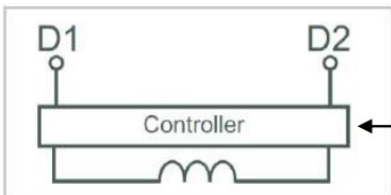
#### Heavy-duty



### Shunts



### UVTs

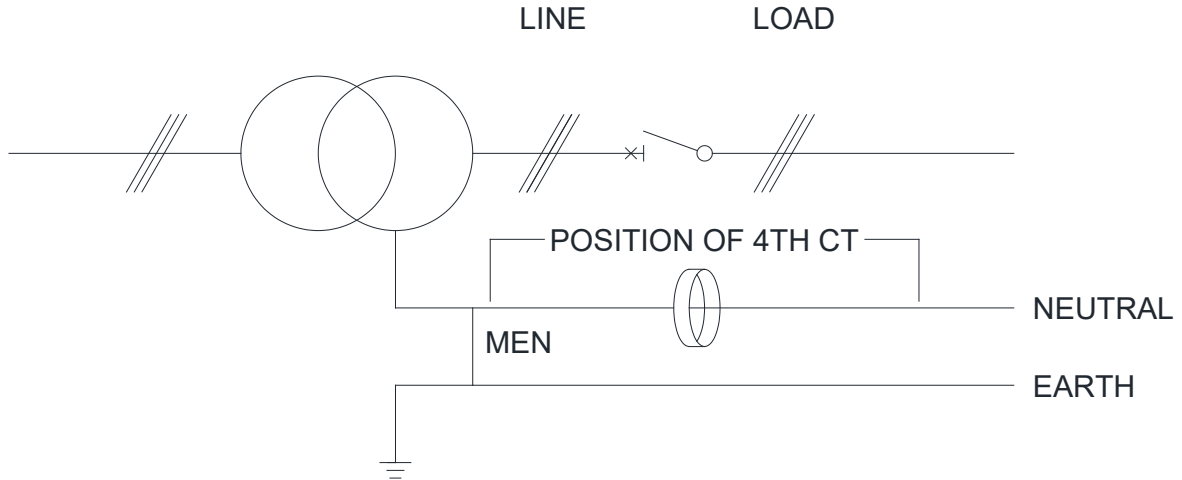


## Annex G – Wiring Diagrams & Terminal Designations

### Ground Fault 4<sup>th</sup> CT

#### Application Location

The 4<sup>th</sup> CT is required to be installed on the neutral inline with the MCCB and after the MEN Link.

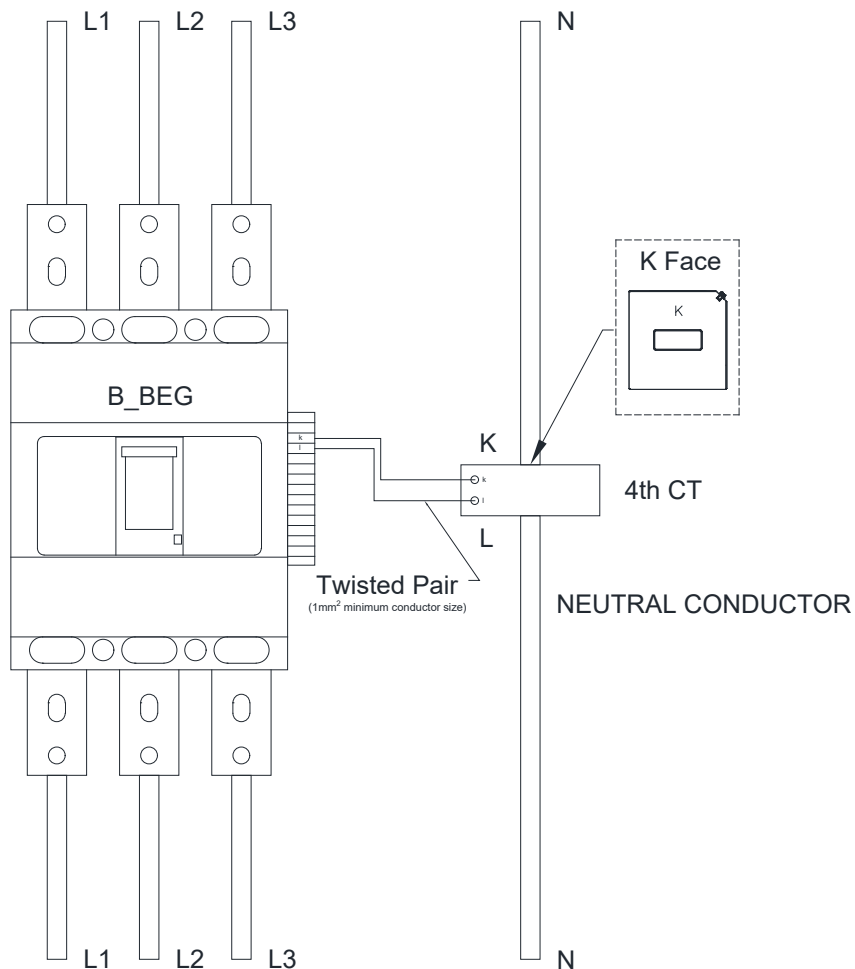


#### CT Orientation

To ensure that the CT is orientated correctly for current flow.

The CT needs to match the same orientation of the MCCB, regardless of the direction of current flow through the MCCB.

Attention to the CT face labelling **K** and **L**.



## Annex G – Wiring Diagrams & Terminal Designations

### Ground Fault CT

#### Wiring

B400BEG – B1600\_BEG MCCB will have a terminal block mounted to the right-hand side with the connection terminals for the Ground Fault CT.

These terminals will be labelled *k* and *l*. Connect the *k* terminal of the CT to the *k* terminal of the terminal box and repeat for *l*.

Terminal block on the side of the MCCB comes when the MCCB is ordered as a B\_BEG.



**Notice:** It is recommended that a twisted pair is used for wiring between the 4<sup>th</sup> CT and MCCB at a minimum conductor size of 1mm<sup>2</sup>.

Device	Terminals	Required Connection
MCCB		<p><i>k</i> terminal connected to the <i>k</i> terminal of the CT</p> <p><i>l</i> terminal connected to the <i>l</i> terminal of the CT</p>
CT		<p><i>k</i> terminal connected to the <i>k</i> terminal of the MCCB</p> <p><i>l</i> terminal connected to the <i>l</i> terminal of the MCCB</p>

Terminals	Type	Minimum Conductor Size (mm <sup>2</sup> )	Maximum Conductor Size (mm <sup>2</sup> )	Minimum Torque (N)	Maximum Torque (N)
MCCB	Screw Clamp	1	2.5	0.9	1.2
CT					

The NHP logo consists of the letters 'NHP' in a bold, white, sans-serif font, centered within a solid blue square.

B\_BE-UM-001-EN

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