www.cselectric.co.in

We touch
your electricity
everyday!

CE RoHS Compliant

C&S electric

Moulded Case Circuit Breakers

WiNbreak1

C&S Electric Ltd. is a leading manufacturer of electrical and electronic equipment in India. It is one of India's largest exporters of industrial switchgear & power busbar products. C&S Electric products are used in applications ranging from power generation, transmission and distribution, protection and final consumption.

C&S Electric has the following product verticals:

- LV Switchgear
- LV Switchboards
- LV & MV Busducts
- LV Bustrunking
- Protection and Measurement Devices

MARKET LEADER

C&S is one of the leading supplier in the LV Switchgear business segment and a market leader in the busbar business with more than 50% share in Indian market.

11 MANUFACTURING PLANTS

C&S Electric have 11 state-of-the-art manufacturing facilities in Noida, Haridwar & Guwahati, which are equipped with latest tools and systems to ensure highest level of quality and services.

600+ STOCKISTS

A dedicated network of channel partners, ensuring access to the farthest corners of India, with an obsession for customer services. In addition C&S products are available in 8000+ retail counters nationally.

EXPORTS TO OVER 85 COUNTRIES

C&S exports the entire range of products across all 7 continents, thus reaffirming its position as one of India's largest exporters of industrial electrical products.

5000+ WORKFORCE

5000+ Workforce including over 371 engineers, dedicated sales team of 424 people & millions of satisfied customers.

R&D

4 Govt. approved labs/centres, over 20,000 sqft. space dedicated to R&D, 70 R&D engineers, state of the art testing & design facilities ... & most of the all a passion for innovation & excellence.

MANUFACTURING FACILITIES

C&S Controlgear Plant at Noida

C&S Switchgear Plant at Noida

World-Class Manufacturing Plants at SIDCUL, Haridwar

CONTENTS

Quality Assurance

ISO 14001:2015

ISO 9001:2015

ISO 45001:2018

Global Certifications

IEC

intertek
Total Quality. Assured.

CE

RoHS Compliant

REACh

IEC IECEE CB SCHEME

Ref. Certif. No.
SE-104997

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

CB TEST CERTIFICATE

Product	Moulded Case Circuit Breaker (MCCB)
Name and address of the applicant	C&S Electric Ltd. A7&8, Sector-8, Gautam Budh Nagar, Noida, Uttar Pradesh India- 201301
Name and address of the manufacturer	Same as applicant
Name and address of the factory Note: When more than one factory, please report on page 2	Same as applicant
Ratings and principal characteristics	See page 2
Trademark (if any)	
Customer's Testing Facility (CTF) Stage used	-
Model / Type Ref.	CSE1TX, CSE1NN, CSE1NNX, CSE1M, CSE1MX, CSE1L, CSE1LX
Additional information (if necessary may also be reported on page 2)	See page 2
A sample of the product was tested and found to be in conformity with	IEC 60947-2:2016+A1
As shown in the Test Report Ref. No. which forms part of this Certificate	210100309SHA-001

This CB Test Certificate is issued by the National Certification Body

Intertek Semko AB
Torshamnsgatan 43
Box 1103
SE-164 22 Kista, Sweden

intertek
Signature:
Leif Mattsson

Date: 28 May, 2021

Selection of MCCBs

As per IEC 60947-2, when it comes to the selection of appropriate MCCB, we need to consider many factors such as:

- **Rated Current (In)**
  The rated uninterrupted current of an equipment is a value of current, stated by the manufacturer, which the equipment can carry in uninterrupted duty

- **Rated ultimate short-circuit breaking capacity (Icu)**
  The rated ultimate short-circuit breaking capacity of a circuit-breaker is the value of ultimate short-circuit breaking capacity assigned to that circuit-breaker by the manufacturer for the corresponding rated operational voltage. It is expressed as the value of the prospective breaking current, in kA (r.m.s. value of the a.c. component in the case of a.c.)

- **Rated service short-circuit breaking capacity (Ics)**
  The rated service short-circuit breaking capacity of a circuit-breaker is the value of service short-circuit breaking capacity assigned to that circuit-breaker by the manufacturer for the corresponding rated operational voltage. It is expressed as a value of prospective breaking current, in kA, corresponding to one of the specified percentages of the rated ultimate short-circuit breaking capacity, It may be expressed as a% of Icu (for example Ics = 25% Icu).

- **Rated operational voltage (Ue)**
  A rated operational voltage of an equipment is a value of voltage which, combined with a rated operational current, determines the application of the equipment and to which the relevant tests and the utilization categories are referred. For single-pole equipment, the rated operational voltage is generally stated as the voltage across the pole. For multipole equipment, it is generally stated as the voltage between phases.

- **Rated insulation voltage (Ui)**
  The rated insulation voltage of an equipment is the value of voltage to which dielectric tests and creepage distances are referred. In no case shall the maximum value of the rated operational voltage exceed that of the rated insulation voltage.

- **Release / Trip Unit**
  i) **Thermal Magnetic:** Bimetal or overload & electromagnet for Short Circuit
  ii) **Microprocessor:** Tripping is achieved through electronic signals

- **IP Protection**
  IP protection is a code assigned to the equipment which provides info regarding the level of protection offered by the equipment against solids & liquids.

WiNbreak1

Moulded Case Circuit Breakers

Conforms
IEC60947-2

CE | RoHS Compliant | REACh

Optimized Selection
Multiple Frames and Rating Available

Reliability Upgraded
Ui upto 1000V AC

Total Selectivity
Suitable for total discrimination

Best of Accuracy
Microprocessor Release Offers in-Built LSING Protection with Default Current Metering & Trip History

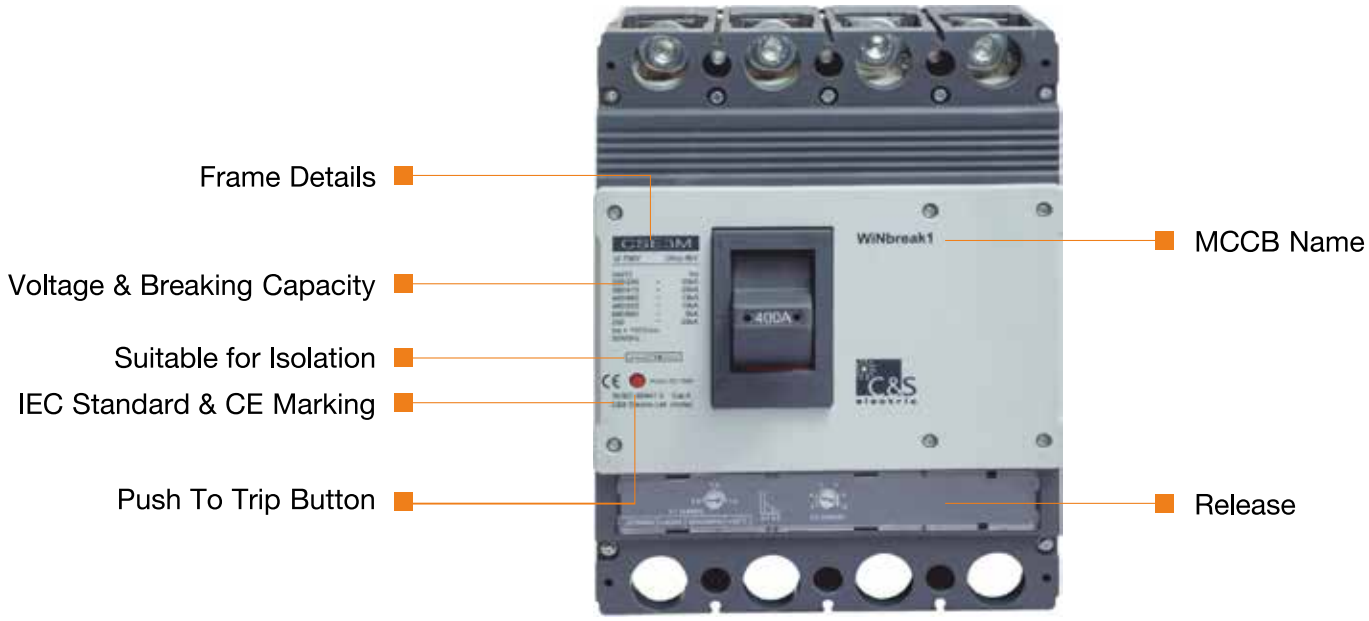
Swift
Reseve Trip assembly quickly trips the MCCB in <10 ms. sec. superceding the magnetic settings

Quick Installation
Option Available with Box Clamps for Unprepared Cable Connection

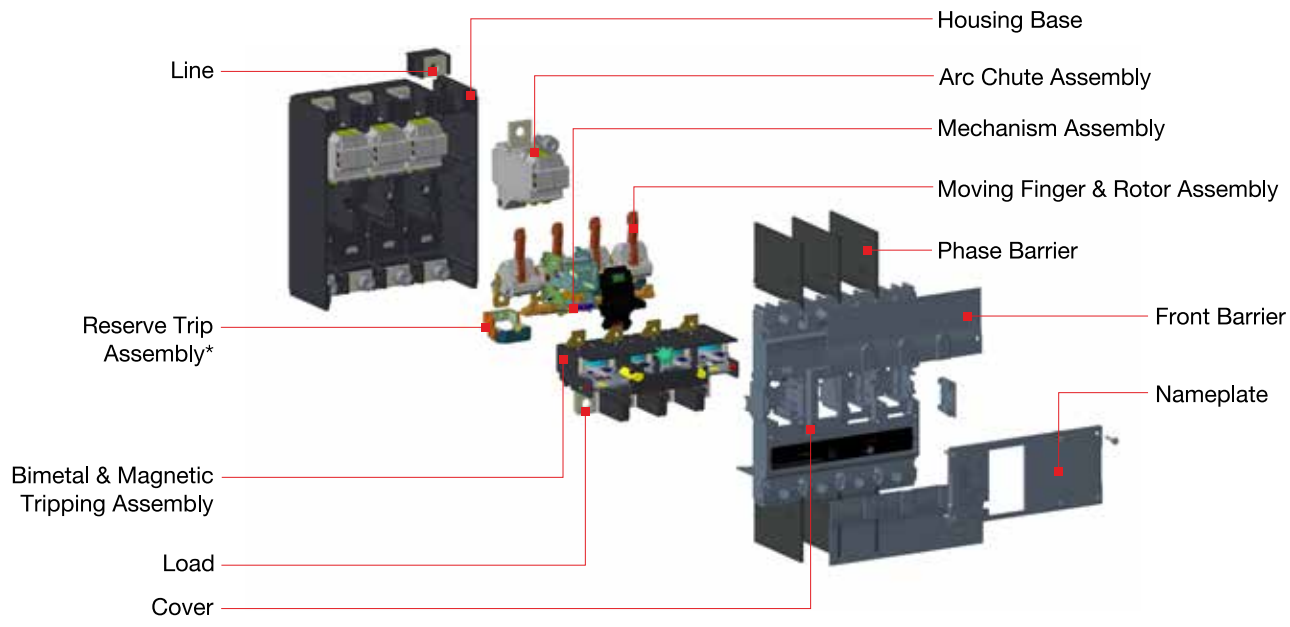
Communication Capable
Communication capability through MODBUS

Safe & Reliable
- Finger Protection
- Absolute Isolation

PRODUCT MARKING



EXPLODED VIEW



*Available in Frame 1, 2, 3 & 4 only
Simplified Representation only

ORDERING INFORMATION

CSE2	SX			250	ATM	3P	-	200A
Frame Size	Breaking Capacity Icu at 415V AC for 2P, 3P, 4P / 240V AC for 1 pole			Frame Ampere	Trip Units	Poles	Connections	Current Rating
Code	**Code**	**Icu in kA**	**Ics in % Icu**	**Code**	**Code**	**Code**	**Code**	**Code**
CSES	K	10	100	125	FTM	1P	Front Connection	16A, 20A, 25A, 32A, 40A, 50A, 63A, 80A, 100A, 125A
	KX	10	75					
	KY	10	50					
	L	18	100					
	LX	18	75					
	MX	25	75					
CSES	K	10	100	125	FTM FMU	2P / 3P / 4P	Front Connection	16A, 20A, 25A, 32A, 40A, 50A, 63A, 80A, 100A, 125A
	KX	10	75					
	KY	10	50					
	L	18	100					
	LX	18	75					
	MX	25	75					
CSE1	L	18	100	125	FTM FMU FMTU ATM MTU ETM ETM-M ETM-C ETM-MC	2P / 3P / 4P	Front Connection	16A, 20A, 25A, 32A, 40A, 50A, 63A, 80A, 100A, 125A
	M	25	100					
	NN	36	100					
	S	50	100					
CSE2	L	18	100	250	FTM FMU ATM MTU ETM ETM-M ETM-C ETM-MC	2P / 3P / 4P	Front Connection	125A, 160A, 200A, 250A
	M	25	100					
	NN	36	100					
	S	50	100					
	SX	50	75					
CSE3	L	18	100	400	FTM FMU ATM MTU ETM ETM-M ETM-C ETM-MC	3P / 4P	Front Connection	250A, 320A, 350A, 400A
	M	25	100					
	NN	36	100					
	S	50	100					
CSE4	L	18	100	630	FTM FMU ATM MTU ETM ETM-M ETM-C ETM-MC	3P / 4P	Front Connection	500A, 630A
	M	25	100					
	NN	36	100					
	NNX	36	75					
	S	50	100					

Note: For More detailed selection of Breaker ratings and Trip Units, refer Technical specifications and respective TCC curves, Cut off Current and Let Through Energy Curves

TECHNICAL INFORMATION

Frame Designation	[ID]	CSES						
Frame Size	**[AF]**	**125**			**125**			
Rated Current - In	[A]	16, 20, 25, 32, 40, 50, 63, 80, 100, 125			16, 20, 25, 32, 40, 50, 63, 80, 100, 125			
Number of Poles - P	[Nr]	1			2 / 3 / 4			
Rated Operational Maximum Voltage - Ue in AC	[V]	240			690			
Rated Operational frequency	Hz	50 / 60			50 / 60			
Rated Operational Maximum Voltage - Ue in DC	[V]	125V			250V			
Rated Impulse Withstand Voltage - Uimp	[kV]	6			6			
Rated Insulation Voltage - Ui	[V]	800			800			
Utilization Catagory		A			A			
Reference Temperature	°C	+45			+45			
Operating Temperature	°C	-5 to +50			-5 to +50			
Storage Temperature	°C	-30 to +70			-30 to +70			
Rated ultimate short-circuit breaking capacity in AC - Icu		K	L	MX	K	L	MX	
220 / 240V AC	[kA]	**10**	**18**	**25**	14	22	28	
380 / 415V AC	**[kA]**	**-**	**-**	**-**	**10**	**18**	**25**	
440 / 460V AC	[kA]	-	-	-	7.5	12	15	
480 / 500V AC	[kA]	-	-	-	6	8	10	
600 / 690V AC	[kA]	-	-	-	4	4	4	
Rated service short-circuit breaking capacity in AC - Ics	[% Icu]	100	100	75	100	100	75	
Reference Standard	IEC	IEC 60947-2			IEC 60947-2			
Trip Unit Types		FTM			FTM / FMU			
FTM Fixed Thermal and Fixed Magnetic		✓			✓			
FMU Adjustable Thermal and Fixed Magnetic		×			✓			
ATM Adjustable Thermal and Adjustable Magnetic		×			×			
FMTU Fixed Magnetic Trip Unit		×			×			
MTU Adjustable Magnetic Trip Unit		×			×			
ETM Electronic Trip Module		×			×			
ETM-M Electronic Trip module with Motor Protection		×			×			
ETM-C Electronic Trip module with Communication (Communication module shall be available as factory fitted only)		×			×			
ETM-MC Electronic Trip module with Motor Protection & Communication		×			×			
Total Opening Time (without fault condition)	[msec]	≤10			≤10			
Suitable for Isolation		✓			✓			
Pollution Degree		3			3			
Maximum Terminal Capacity (without spreaders)	mm^2	35			35			
Maximum Terminal Capacity (with spreaders)	mm^2	50			50			
Neutral position (with Thermal Magnetic and Magnetic Trip Units) at 100%		×			R-Y-B-N / N-R-Y-B			
Neutral position (with Electronic Trip Units) at 50% & 100%		×			R-Y-B-N			
Power Loss (Max Watt / Pole)	Watt	10.5			10.5			
IP (with Front Barrier)		IP 40			IP 40			
IP (without Front Barrier)		IP 20			IP 20			
Mechanical Life - Total Number of Operations	Cycles	20000			20000			
Electrical Life - Total Number of Operations	Cycles	7000			7000			
Dimensions - (W x H x D) - Single Pole Breaker	[mm]	35 x 186 x 73			×			
Dimensions - (W x H x D) - Two Pole Breaker	[mm]	×			80 x 126 x 69			
Dimensions - (W x H x D) - Three Pole Breaker	[mm]	×			80 x 126 x 69			
Dimensions - (W x H x D) - Four Pole Breaker	[mm]	×			103.5 x 126 x 69			
Weight - Single Pole Breaker	[Kg]	0.44			×			
Weight - Two Pole Breaker	[Kg]	×			0.7			
Weight - Three Pole Breaker	[Kg]	×			0.8			
Weight - Four Pole Breaker	[Kg]	×			1.1			
Mounting Position(Vertical, Horizontal, Reverse Horizontal)		✓			✓			
Internal Accessories								
Auxiliary Switch Left		×			✓			
Auxiliary Switch Right		×			×			
Alarm Switch Left		×			✓			
Alarm Switch Right		×			×			
Combination of Auxiliary and Alarm Switch Left		×			✓			
Combination of Auxiliary and Alarm Switch Right		×			×			
Shunt Release		×			24V DC, 48V DC, 110V AC, 110V DC, 220V AC, 220V DC, 415V AC			
UVT Release		×			×			
External Accessories								
Front Barrier		✓			✓			
Rotary Operating Mechanism		×			✓			
Key Lock		×			×			
Extended Key Lock		×			✓			
Mechanical Interlock		×			×			
Direct Pad Lock		×			×			
Extended Terminal		✓			✓			
Cage Terminal / Terminal Block		✓			✓			
Steel Enclosure		×			✓			
Earth Fault Relay		×			✓			

NOTE: For information of Breaking Capacites not availavle in above table, please contact the nearest Branch Office.

	CSE1			CSE2				CSE3			CSE4		
	125			250				400			630		
	16, 20, 25, 32, 40, 50, 63, 80, 100, 125			125, 160, 200, 250				250, 320, 350, 400			500, 630		
	2 / 3 / 4			2 / 3 / 4				3 / 4			3 / 4		
	690			690				690			690		
	50 / 60			50 / 60				50 / 60			50 / 60		
	500V			500V				500V			500V		
	8			8				8			8		
	1000			1000				1000			1000		
	A			A				A			A		
	+45			+45				+45			+50		
	-5 to +50			-5 to +50				-5 to +50			-5 to +50		
	-30 to +70			-30 to +70				-30 to +70			-30 to +70		
	M	NN	S	M	NN	S	SX	M	NN	S	M	NN	S
	35	50	75	35	50	75	75	35	50	75	35	50	75
	25	**36**	**50**	**25**	**36**	**50**	**50**	**25**	**36**	**50**	**25**	**36**	**50**
	22	30	44	22	30	44	44	22	30	44	22	30	44
	18	28	42	18	28	42	42	18	28	42	18	28	42
	15	20	30	15	20	30	30	15	20	30	15	20	30
	100	100	100	100	100	100	75	100	100	100	100	100	100
	IEC 60947-2			IEC 60947-2				IEC 60947-2			IEC 60947-2		
	FTM/FMU/ATM/FMTU/MTU/ETM/ ETM-M/ ETM-C/ETM-MC			FTM/FMU/ATM/FMTU/MTU/ETM/ ETM-M/ETM-C/ ETM-MC				FTM/FMU/ATM/FMTU/MTU/ETM/ ETM-M/ ETM-C/ETM-MC			FTM/FMU/ATM/FMTU/MTU/ETM/ ETM-M/ETM-C/ETM-MC		
	✓			✓				✓			✓		
	✓			✓				✓			✓		
	✓			✓				✓			✓		
	✓			✓				✓			✓		
	✓			✓				✓			✓		
	✓			✓				✓			✓		
	✓			✓				✓			✓		
	✓			✓				✓			✓		
	✓			✓				✓			✓		
	≤10			≤10				≤12			≤15		
	✓			✓				✓			✓		
	3			3				3			3		
	50			70				150			150		
	50			120				240			370		
	R-Y-B-N / N-R-Y-B			R-Y-B-N / N-R-Y-B				R-Y-B-N / N-R-Y-B			R-Y-B-N / N-R-Y-B		
	R-Y-B-N			R-Y-B-N				R-Y-B-N			R-Y-B-N		
	9.5			19.5				28.5			59.5		
	IP 40			IP 40				IP 40			IP 40		
	IP 20			IP 20				IP 20			IP 20		
	20000			20000				15000			10000		
	7000			7000				5000			4500		
	×			×				×			×		
	92 x 150 x 81			108 x 165.8 x 81				×			×		
	92 x 150 x 81			108 x 165.8 x 81				150 x 260 x 110			150 x 260 x 110		
	122.5 x 150 x 81			142.5 x 165.8 x 81				198 x 260 x 110			198 x 260 x 110		
	×			×				×			×		
	1.15			1.57				×			×		
	1.65			2.2				4.8			6		
	1.98			2.65				5.8			7		
	✓			✓				✓			✓		
	✓			✓				✓					
	✓			✓				✓					
	✓			✓				✓					
	✓			✓				✓					
	✓			✓				✓					
	✓			✓				✓					
	24V DC, 48V DC, 110V AC, 110V DC, 220V AC, 220V DC, 415V AC"			24V DC, 48V DC, 110V AC, 110V DC, 220V AC, 220V DC, 415V AC				24V DC, 48V DC, 110V AC / DC, 220V AC / DC, 415V AC					
	24V DC, 48V DC, 110V AC / DC, 220V AC / DC, 415V AC			24V DC, 48V DC, 110V AC / DC, 220V AC / DC, 415V AC				24V DC, 48V DC, 110V AC / DC, 220V AC / DC, 415V AC					
	✓			✓				✓			✓		
	✓			✓				✓			✓		
	✓			✓				✓			✓		
	✓			✓				✓			✓		
	✓			✓				✓			✓		
	✓			✓				✓			✓		
	✓			✓				✓			✓		
	✓			✓				×			×		
	✓			✓				×			×		
	✓			✓				✓			✓		

Main Incomer

Towards Load

Towards Load

WiNbreak1

An Absolute Solution for
Distribution & Protection

As per IEC 60947-2:

Total Selectivity
Over-current discrimination where, in the presence of two over-current protective devices in series, the protective device on the load side affects the protection without causing the other protective device to operate

Suitable for Total Selectivity

MCCB (THERMAL MAGNETIC) COORDINATION TABLE - CSES, CSE1

MCCB Model (Downstream MCCB →)	Trip Unit Model	Icu at 415V AC	Rate Current	Upstream MCCB → CSES FTM; FMU																																	
				10kA										18kA										25kA																
				16A	20A	25A	32A	40A	50A	63A	80A	100A	125A	16A	20A	25A	32A	40A	50A	63A	80A	100A	125A	16A	20A	25A	32A	40A	50A	63A	80A	100A	125A						
CSES	FTM; FMU	10 kA	16A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	18	-	-	-	-	-	-	-	-	25	25						
			20A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	18	-	-	-	-	-	-	-	-	25	25						
			25A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	18	-	-	-	-	-	-	-	-	25	25						
			32A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-	-	-	-	-	-	25						
			40A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-	-	-	-	-	-	25						
			50A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
			63A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
			80A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
			100A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
			125A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
		18 kA	16A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	25						
			20A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	25						
			25A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	25						
			32A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25						
			40A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25						
			50A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
			63A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
			80A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
			100A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
			125A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
		25 kA	16A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
			20A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
			25A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
			32A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
			40A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
			50A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
			63A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
			80A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
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NOTE: The Numerical Values in above table represents Back up Protection limit in kA

	CSE1																													
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MCCB (THERMAL MAGNETIC) COORDINATION TABLE - CSE2, CSE3 & CSE4

MCCB Model (Downstream MCCB →)	Trip Unit Model	Icu at 415V AC	Rate Current	Upstream MCCB → CSE2 FTM; FMU											
				18 kA			25 kA			36 kA			55 kA		
				160A	200A	250A	160A	200A	250A	160A	200A	250A	160A	200A	250A
CSES	FTM; FMU	10 kA	16A	18	18	18	25	25	25	36	36	36	55	55	55
			20A	18	18	18	25	25	25	36	36	36	55	55	55
			25A	18	18	18	25	25	25	36	36	36	55	55	55
			32A	18	18	18	25	25	25	36	36	36	55	55	55
			40A	18	18	18	25	25	25	36	36	36	55	55	55
			50A	18	18	18	25	25	25	36	36	36	55	55	55
			63A	-	18	18	-	25	25	-	36	36	-	55	55
			80A	-	18	18	-	25	25	-	36	36	-	55	55
			100A	-	-	18	-	-	25	-	-	36	-	-	55
			125A	-	-	18	-	-	25	-	-	36	-	-	55
		18 kA	16A	-	-	-	25	25	25	36	36	36	55	55	55
			20A	-	-	-	25	25	25	36	36	36	55	55	55
			25A	-	-	-	25	25	25	36	36	36	55	55	55
			32A	-	-	-	25	25	25	36	36	36	55	55	55
			40A	-	-	-	25	25	25	36	36	36	55	55	55
			50A	-	-	-	25	25	25	36	36	36	55	55	55
			63A	-	-	-	-	25	25	-	36	36	-	55	55
			80A	-	-	-	-	25	25	-	36	36	-	55	55
			100A	-	-	-	-	-	25	-	-	36	-	-	55
			125A	-	-	-	-	-	25	-	-	36	-	-	55
		25 kA	16A	-	-	-	25	25	25	36	36	36	55	55	55
			20A	-	-	-	25	25	25	36	36	36	55	55	55
			25A	-	-	-	25	25	25	36	36	36	55	55	55
			32A	-	-	-	25	25	25	36	36	36	55	55	55
			40A	-	-	-	25	25	25	36	36	36	55	55	55
			50A	-	-	-	25	25	25	36	36	36	55	55	55
			63A	-	-	-	-	25	25	-	36	36	-	55	55
			80A	-	-	-	-	25	25	-	36	36	-	55	55
			100A	-	-	-	-	-	25	-	-	36	-	-	55
			125A	-	-	-	-	-	25	-	-	36	-	-	55
CSE1	FTM; FMU	25 kA	16A	-	-	-	-	-	-	36	36	36	55	55	55
			20A	-	-	-	-	-	-	36	36	36	55	55	55
			25A	-	-	-	-	-	-	36	36	36	55	55	55
			32A	-	-	-	-	-	-	36	36	36	55	55	55
			40A	-	-	-	-	-	-	36	36	36	55	55	55
			50A	-	-	-	-	-	-	36	36	36	55	55	55
			63A	-	-	-	-	-	-	36	36	36	55	55	55
			80A	-	-	-	-	-	-	-	-	36	-	-	55
			100A	-	-	-	-	-	-	-	-	-	-	-	-
			125A	-	-	-	-	-	-	-	-	-	-	-	-
		36 kA	16A	-	-	-	-	-	-	-	-	-	55	55	55
			20A	-	-	-	-	-	-	-	-	-	55	55	55
			25A	-	-	-	-	-	-	-	-	-	55	55	55
			32A	-	-	-	-	-	-	-	-	-	55	55	55
			40A	-	-	-	-	-	-	-	-	-	55	55	55
			50A	-	-	-	-	-	-	-	-	-	55	55	55
			63A	-	-	-	-	-	-	-	-	-	55	55	55
			80A	-	-	-	-	-	-	-	-	-	-	-	55
			100A	-	-	-	-	-	-	-	-	-	-	-	-
			125A	-	-	-	-	-	-	-	-	-	-	-	-
		55 kA	16A	-	-	-	-	-	-	-	-	-	55	55	55
			20A	-	-	-	-	-	-	-	-	-	55	55	55
			25A	-	-	-	-	-	-	-	-	-	55	55	55
			32A	-	-	-	-	-	-	-	-	-	55	55	55
			40A	-	-	-	-	-	-	-	-	-	55	55	55
			50A	-	-	-	-	-	-	-	-	-	55	55	55
			63A	-	-	-	-	-	-	-	-	-	55	55	55
			80A	-	-	-	-	-	-	-	-	-	-	-	55
			100A	-	-	-	-	-	-	-	-	-	-	-	-
			125A	-	-	-	-	-	-	-	-	-	-	-	-
CSE2	FTM; FMU	18 kA	160A	-	-	-	-	-	-	-	-	-	-	-	-
			200A	-	-	-	-	-	-	-	-	-	-	-	-
			250A	-	-	-	-	-	-	-	-	-	-	-	-
		25 kA	160A	-	-	-	-	-	-	-	-	-	-	-	-
			200A	-	-	-	-	-	-	-	-	-	-	-	-
			250A	-	-	-	-	-	-	-	-	-	-	-	-
		36 kA	160A	-	-	-	-	-	-	-	-	-	-	-	-
			200A	-	-	-	-	-	-	-	-	-	-	-	-
			250A	-	-	-	-	-	-	-	-	-	-	-	-
		55 kA	160A	-	-	-	-	-	-	-	-	-	-	-	-
			200A	-	-	-	-	-	-	-	-	-	-	-	-
			250A	-	-	-	-	-	-	-	-	-	-	-	-
CSE3	FTM; FMU	25 kA	320A	-	-	-	-	-	-	-	-	-	-	-	-
			400A	-	-	-	-	-	-	-	-	-	-	-	-
		36 kA	320A	-	-	-	-	-	-	-	-	-	-	-	-
			400A	-	-	-	-	-	-	-	-	-	-	-	-
		55 kA	320A	-	-	-	-	-	-	-	-	-	-	-	-
			400A	-	-	-	-	-	-	-	-	-	-	-	-
CSE4	FTM; FMU	25 kA	500A	-	-	-	-	-	-	-	-	-	-	-	-
			630A	-	-	-	-	-	-	-	-	-	-	-	-
		36 kA	500A	-	-	-	-	-	-	-	-	-	-	-	-
			630A	-	-	-	-	-	-	-	-	-	-	-	-
		55 kA	500A	-	-	-	-	-	-	-	-	-	-	-	-
			630A	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: The Numerical Values in above table represents Back up Protection limit in kA

	CSE3						CSE4					
	FTM; FMU						FTM; FMU					
	25 kA		36 kA		55 kA		25 kA		36 kA		55 kA	
	320A	400A	320A	400A	320A	400A	500A	630A	500A	630A	500A	630A
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
	25	25	36	36	55	55	25	25	36	36	55	55
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	-	-	36	36	55	55	-	-	36	36	55	55
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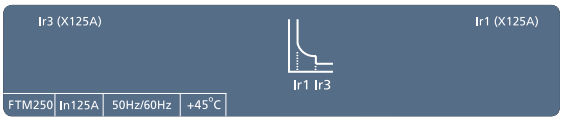
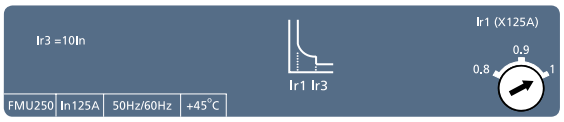
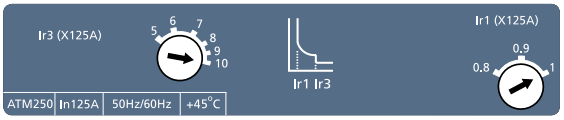
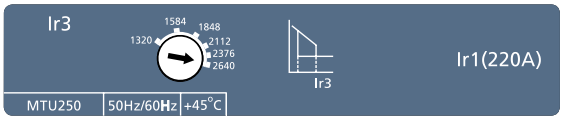
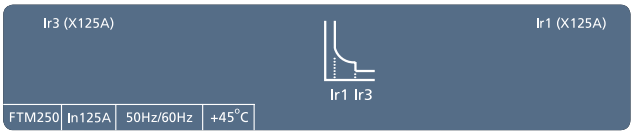
WiNbreak1 Trip Units

Fixed Thermal & Fixed Magnetic Trip Unit	FTM	
Adjustable Thermal & Fixed Magnetic Trip Unit	FMU	
Adjustable Thermal & Adjustable Magnetic Trip Unit	ATM	
Fixed Magnetic only Trip Unit (for Motor Protection)	FMTU	
Magnetic only Trip Unit (for Motor Protection)	MTU	
WB1 Microprocessor Release (LSING Protection)	ETM	
WB1 Microprocessor Release (LSING Protection with Communication)	ETM-C	
WB1 Microprocessor Release (for Motor Protection)	ETM-M	
WB1 Microprocessor Release (for Motor Protection with Communication)	ETM-MC	

NOTE: For Communication add-on module shall be required for release with communication capability.

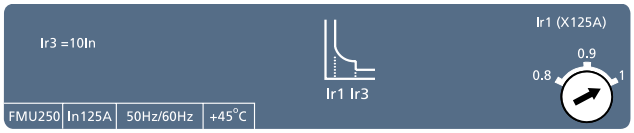
Fixed Thermal &
Fixed Magnetic Trip Unit

FTM



Adjustable Thermal &
Fixed Magnetic Trip Unit

FMU

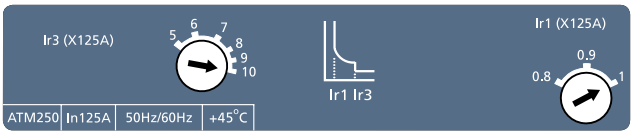


RELEASE SETTINGS

Frame Size	Current Rating	FTM Release Settings			FMU Release Settings	
		Magnetic Settings			Thermal Settings	Magnetic Current Settings (2P/ 3P/ 4P)
		Thermal Settings	1 Pole	(2P/ 3P/ 4P)		
CSES	16A	Fixed at 1.0 In	600	500	Adjustable 0.8, 0.9, 1.0 In	500
	20A		500	500		500
	25A		500	500		500
	32A		900	550		550
	40A		900	550		550
	50A		1000	600		600
	63A		1150	850		850
	80A		1050	850		850
	100A		1300	1250		1250
	125A		1600	x10In		x10In
CSE1	16A	Fixed at 1.0 In	-	350	Adjustable 0.8, 0.9, 1.0 In	350
	20A		-	450		450
	25A		-	450		450
	32A		-	600		600
	40A		-	600		600
	50A		-	600		600
	63A		-	-		-
	80A		-	-		-
	100A		-	-		-
	125		-	-		-
CSE2	125A	Fixed at 1.0 In	-	Fixed at 10In	Adjustable 0.8, 0.9, 1.0 In	Fixed at 10In
	160A		-			
	200A		-			
	250A		-			
CSE3	250A	Fixed at 1.0 In	-	Fixed at 10In	Adjustable 0.8, 0.9, 1.0 In	Fixed at 10In
	320A		-			
	350A		-			
	400A		-			
CSE4	500A	Fixed at 1.0 In	-	Fixed at 10In	Adjustable 0.8, 0.9, 1.0 In	Fixed at 10In
	630A		-			

Adjustable Thermal &
Adjustable Magnetic Trip Unit

ATM

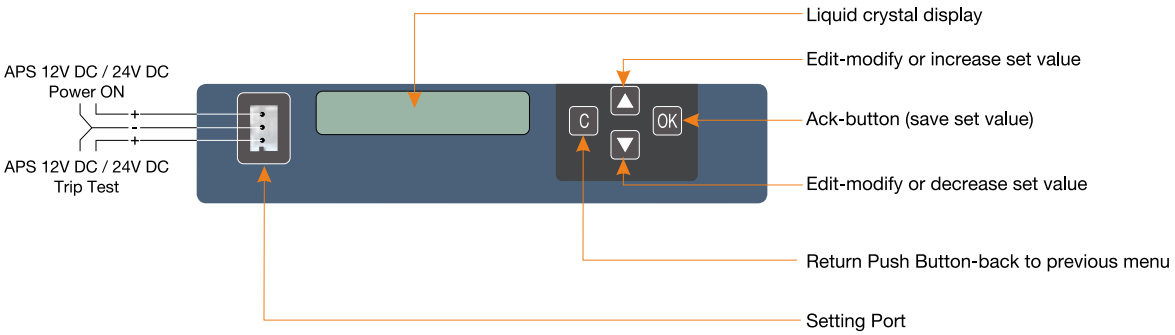


RELEASE SETTINGS			
Frame Size	**Current Rating**	**ATM Release Settings**	
		Current Settings (2P/ 3P/ 4P)	
		Thermal Settings (Ir1)	**Magnetic Settings (Ir3)**
CSE1	63A	Adjustable 0.8, 0.9, 1.0 xIn	Adjustable 5, 6, 7, 8, 9, 10 x In
	80A		
	100A		
	125		
CSE2	125A	Adjustable 0.8, 0.9, 1.0 xIn	Adjustable 5, 6, 7, 8, 9, 10 x In
	160A		
	200A		
	250A		
CSE3	250A	Adjustable 0.8, 0.9, 1.0 xIn	Adjustable 5, 6, 7, 8, 9, 10 x In
	320A		
	350A		
	400A		
CSE4	500A	Adjustable 0.8, 0.9, 1.0 xIn	Adjustable 5, 6, 7, 8, 9, 10 x In
	630A		

ETM-MICROPROCESSOR TRIP UNIT CSE1, CSE2, CSE3 & CSE4

Features:

- Adjustable Over Load from 0.4~1.0 In
- Adjustable Short Circuit from 2~12 Ir
- Instantaneous Protection available (4~14) Ir
- Inbuilt Ground fault protection available 20% to 100% of In
- Adjustable Neutral imbalance protection available: 50% to 100%
- Adjustable Current imbalance protection available: (30%~70%)
- Thermal Memory: ON/OFF
- Communication: ModBus Protocol
- View Last Trip Information
- Default display Line Current+Ground current, Line current + N Phase current
- Wide Range of internal and External Accessories
- LCD display
- Version available: ETM, ETM-C, ETM-M, ETM-MC

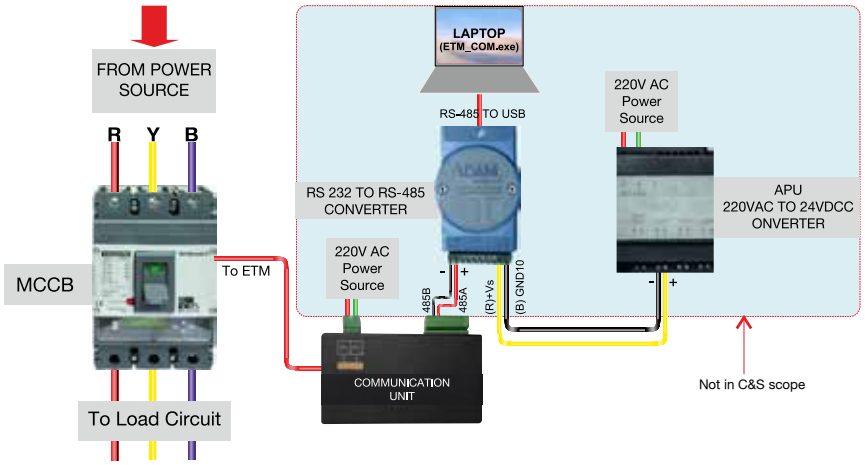


For Release Backup: Provide 12V / 24V DC through external battery bank to access below info in event of power failure:

(i) All 3 Phase & Neutral current

(ii) Last trip info

Microprocessor (LSIGN) multi function Trip Unit ETM (MicroPro WB)																		
Trip Unit Rating, In (A)		16	20	25	32	40	50	63	80	100	125	160	200	250	320	350	400	500	630
MCCB Model	CSE1			✓		✓		✓		✓	✓								
	CSE2											✓	✓	✓					
	CSE3													✓	✓		✓		
	CSE4																		✓



Winbreak1-Communication Architecture

Release ETM / ETM-C

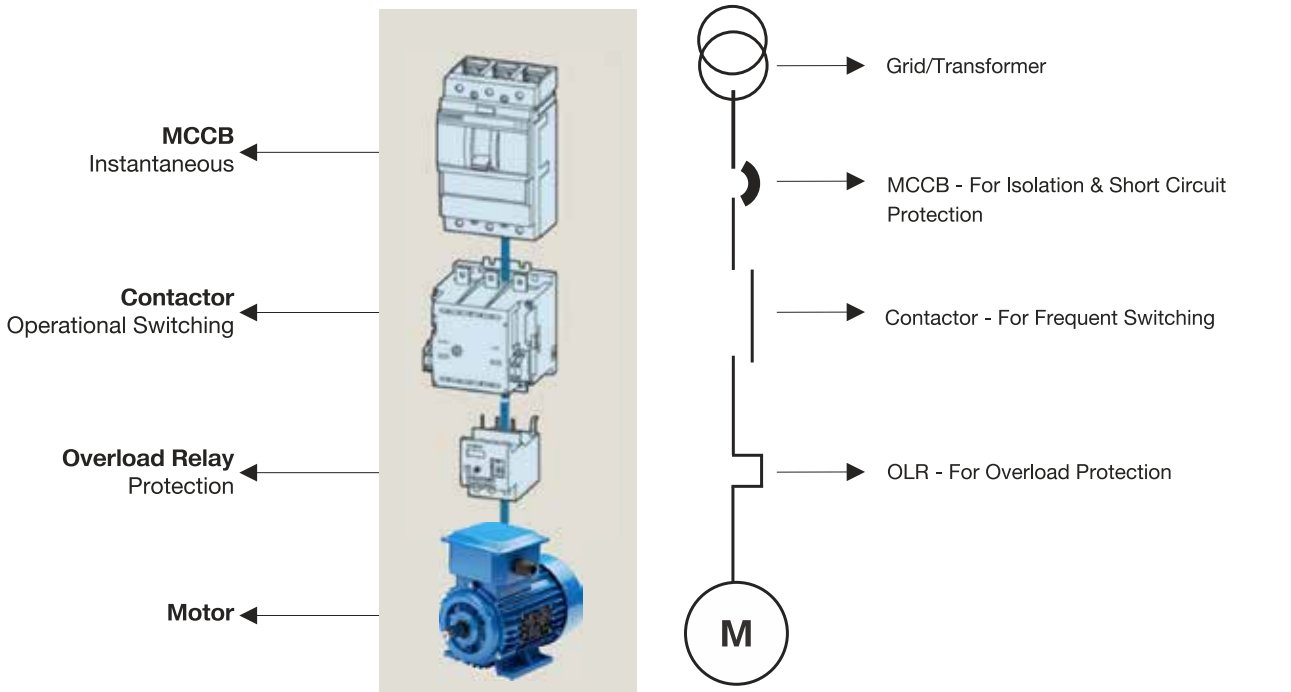
PRODUCT INFORMATION	Specifications
Auxiliary Power Suply (APS) Mode*	12V DC with Three Pin Connector on Front side of Trip Unit.
Trip Test (TT) Mode*	12V DC with Three Pin Connector on Front side of Trip Unit.
Display	LCD
Measurement Currents	L1, L2, L3, Ig, In
PROTECTION	
Long Time Protection (L)	**ON / OFF**
Long Time Current Pick up Settings	Ir = 0.4 to 1.0 x In with step of 1A & OFF
Long Time Delay Settings	tr = 12 - 60 - 80 - 100 sec at 2 x Ir
Long Time Thermal Memory	Thermal ON (at-30 Min) / OFF
Short Time Protection (S)	**ON / OFF**
Short Time Current Pick up Settings (When LT = ON)	Isd = 2 to 12 x Ir with step of 1A & OFF
Short Time Current Pick up Settings (When LT = OFF)	Isd = 2 to 12 x In with step of 1A & OFF
Short Time Delay Settings	tsd = 0.1 - 0.2 - 0.3 - 0.4 sec at 1.5 x Isd
Short Time Delay - I2t Curve	Options: Curve / Fixed
Short Time Thermal Memory	Thermal ON (at 15 Min) / OFF
Instantaneous Protection (I)	**ON / OFF**
Instantaneous Current Pick up Settings (When LT = ON)	Ii = 4 to 14 x Ir with step of 1A & OFF
Instantaneous Current Pick up Settings (When LT = OFF)	Ii = 4 to 14 x In with step of 1A & OFF
CURRENT UNBALANCE PROTECTION	
Current Unbalance Pick up Settings	Imb = 30% to 70% with step of 1% & OFF
Inbuilt Current Unbalance Time Delay	Fixed at 10 sec
Neutral Protection (N)	**ON / OFF**
Neutral Current Pick up Settings	50% & 100% of LSI
Ground Protection (G)	**ON / OFF**
Ground Current Pick up Settings	Ig = 0.2 to 1.0 x In with step of 1A & OFF
Ground Time Delay Settings	tg = 0.1 - 0.2 - 0.3 - 0.4 sec at 6 x Ig
Trip History	Yes
SELF DIAGNOSIS TEST MODE	
Current Pick up Settings for LSI	Test - Ia / Ib / Ic / In = 0A to 65,535A with step of 1A
Communication	MODBUS Protocol (with ETM-C / ETM-MC)
SELF POWERED MODE**	
Single Pole Application	at 40% of In
Three Pole Application	at 20% of In

NOTE:

- *Auxiliary Power Supply (APS) Mode should be followed by Trip Test Mode (Not simultaneously).
- **12V DC auxiliary power supply recommended to ETM for application of Thermal Memory and when Self Powered is less than specified value at above.
- Auxiliary Power Supply - 220V AC is mandatory for Communication Unit (Add on Module - Optional and Factory Fitted; Not supplied as standard / spare).
- Optional Features needs to be specified at the time of Order request which is configured at factory.
- Current Rating and Poles classifications needs to be specified at the time of Order request which are configured at factory.
- Software Version reserved by C&S.

MCCB FOR MOTOR APPLICATIONS

The motor contributes to approximately 75-80% load of the industries. The induction motor, as we all know is one of the most complicated but a vital load of the industry, that's why it requires caution.



A Typical Motor Circuit illustrating MCCB is required for Motor Protection

Motor Circuit Protector for starter protection are used to protect three-phase motors.
Starter combinations consist of:

- Motor Circuit Protector (MCP) for starter protection
- Contactor
- Overload relay

In this case, the motor circuit protector provides the short-circuit protection and the dis-connector function. The contactor is responsible for operational switching of the feeder. The overload relay provides the overload protection. It is therefore equipped with either one of the trip unit variants as listed below:

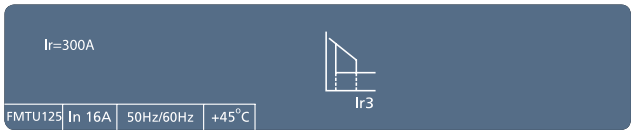
FMTU: Fixed Magnetic Trip Unit

MTU: Magnetic only Trip Unit

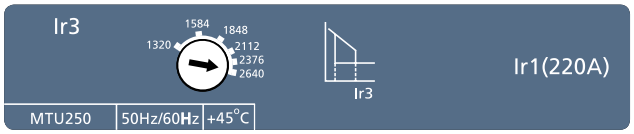
ETM-M: Adjustable Instantaneous Microprocessor Trip Unit with Motor Protection Circuit

ETM-MC: Adjustable Instantaneous Microprocessor Trip Unit with Motor Protection Circuit & Communication Module

Fixed Magnetic only trip Unit (for Motor Protection) | FMTU



Magnetic only trip Unit (for Motor Protection) | MTU



WB1 Microprocessor Release (for Motor Protection) | ETM-M

WB1 Microprocessor Release (for Motor Protection with Communication) | ETM-MC

FMTU Release Settings						
Current Rating	16A	20A	25A	32A	40A	50A
Magnetic Settings-Fixed	350	450	450	600	600	600

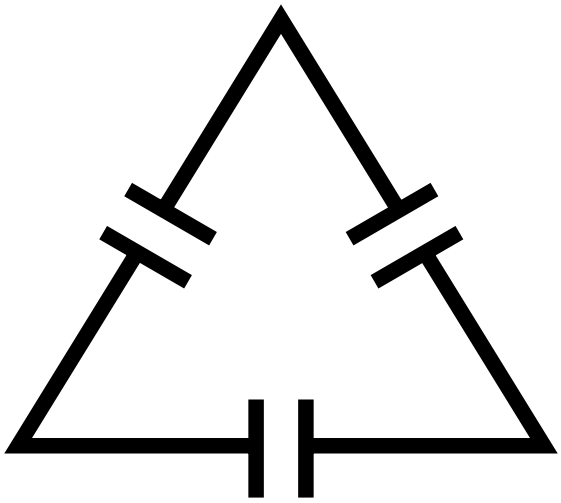
MTU Release Settings		
Frame Size	**Current Rating**	**Magnetic Settings**
CSE1	63A	400, 480, 560, 640, 720, 800
	80A	480, 576, 672, 768, 864, 960
	100A	600, 720, 840, 960, 1080, 1200
	125A	750, 900, 1050, 1200, 1350, 1500
CSE2	125A	750, 900, 1050, 1200, 1350, 1500
	160A	960, 1152, 1344, 1536, 1728, 1920
	200A	1200, 1440, 1680, 1920, 2160, 2400
	250A	1500, 1800, 2100, 2400, 2700, 3000
CSE3	250A	1500, 1800, 2100, 2400, 2700, 3000
	320A	1920, 2304, 2688, 3072, 3456, 3840
	350A	2100, 2520, 2940, 3360, 3780, 4200
	400A	2400, 2880, 3360, 3840, 4320, 4800
CSE4	500A	3000, 3600, 4200, 4800, 5400, 6000
	630A	3780, 4536, 5292, 6048, 6804, 7560

Release ETM-M & ETM-MC

PRODUCT INFORMATION	**Specifications**
Auxiliary Power Suply (APS) Mode*	12V DC with Three Pin Connector on Front side of Trip Unit.
Trip Test (TT) Mode*	12V DC with Three Pin Connector on Front side of Trip Unit.
Display	LCD
Measurement Currents	L1, L2, L3, Ig, In
PROTECTION	
Instantaneous Protection	ON / OFF
Instantaneous Current Pick up Settings (When LT = ON)	Ii = 4 to 14 x Ir with step of 1A & OFF
Instantaneous Current Pick up Settings (When LT = OFF)	Ii = 4 to 14 x In with step of 1A & OFF
Trip History	Yes
SELF DIAGNOSIS TEST MODE	
Current Pick up Settings for I	Test - Ia / Ib / Ic = 0A to 65,535A with step of 1A
Communication	MODBUS Protocol (with ETM-MC / ETM-C)
SELF POWERED MODE **	
Single Pole Application	at 40% of In
Three Pole Application	at 20% of In

NOTE:
- *Auxiliary Power Supply (APS) Mode should be followed by Trip Test Mode (Not simultaneously).
- **12V DC auxiliary power supply recommended to ETM for application of Thermal Memory and when Self Powered is less than specified value at above.
- Auxiliary Power Supply - 220V AC is mandatory for Communication Unit (Add on Module - Optional and Factory Fitted; Not supplied as standard / spare).
- Optional Features needs to be specified at the time of Order request which is configured at factory.
- Current Rating and Poles classifications needs to be specified at the time of Order request which are configured at factory.
- Software Version reserved by C&S.

MCCB For Capacitor Applications



Power Quality improvement even today stands as an aching area for the industries. Requirement of capacitors thus, is very essential. Capacitor supplies the reactive power to the system, enabling the user to utilize the power efficiently but, it is also required to be cautious while switching on the capacitor select the right MCCB for with respect to the 'KVAR' rating of the capacitor.

Whenever a capacitor is switched on it may draw an inrush current which is very high, it can be of the value up to 12In. Thus in this application we have to be very careful in order to select the right circuit breaker, as the inrush current not only is harmful to the system but also it can be so high that even the switchgear contacts can get welded.

C&S Winbreak1 Series MCCBs are capable enough, in fact are tailor made for such applications. The chart below will help the user to select the right MCCB for with respect to the 'KVAR' rating of the capacitor.

WiNbreak 1 MCCB - Selection Chart for Capacitor Application

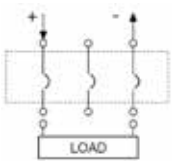
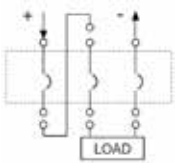
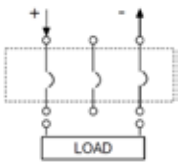
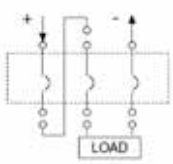
415V, 50/60Hz Circuit, 3P/4P

Capacitor Rating kVAR	Single Phase Circuit		Three Phase Circuit	
	Capacitor Rated Current (A)	MCCB Rated Current (A)	Capacitor Rated Current (A)	MCCB Rated Current (A)
5	12.1	25	7	16
10	24.1	50	14	25
15	36.2	63	20.9	40
20	48.2	80	27.9	50
25	60.3	100	34.8	63
30	72.3	125	41.8	80
40	96.4	160	55.7	100
50	120.5	200	69.6	125
75	180.8	320	104.4	160
100	241	400	139.2	250
120	289.2	500	167	320
140	337.4	630	194.8	320

NOTES:

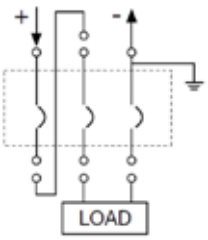
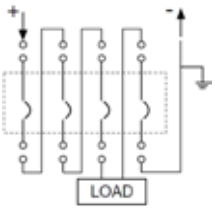
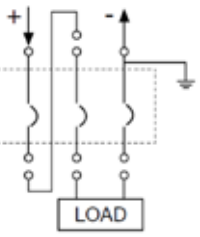
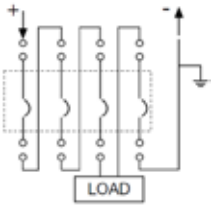
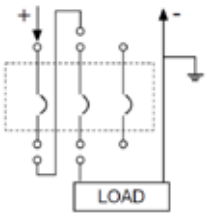
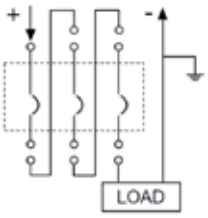
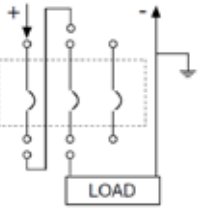
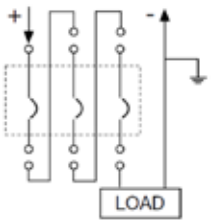
1. The MCCB rated current should be approx. 150% of the capacitor rated current.
2. The MCCB short-circuit capacity should be adequate for the circuit short-circuit capacity.

MCCB for DC Applications

Type of Network		UNGROUNDED NETWORK							
Rated Voltage		<= 250V DC		<= 250V DC		<=500V DC		<=500V DC	
Poles Configuration		2 Pole in Series		3 Pole in Series		2 Pole in Series		3 Pole in Series	
Protection + Isolation Function									
Icu and Ics Ratings	**Icu in kA at 415V AC**	**Icu in kA**	**Ics=% of Icu in kA**	**Icu in kA**	**Ics=% of Icu in kA**	**Icu in kA**	**Ics=% of Icu in kA**	**Icu in kA**	**Ics=% of Icu in kA**
CSES	10	8	100	10	75	NA	NA	NA	NA
	18	14	75	16	75	NA	NA	NA	NA
	25	16	75	20	75	NA	NA	NA	NA
CSE1	18	14	75	16	75	8	100	14	75
	25	20	75	22	75	10	75	18	75
	36	28	75	32	75	14	75	32	75
	50	36	75	42	75	18	75	32	75
	55	42	75	50	75	20	75	42	75
CSE2	18	14	75	16	75	8	100	14	75
	25	20	75	22	75	10	75	18	75
	36	28	75	32	75	14	75	32	75
	50	36	75	42	75	18	75	32	75
	55	42	75	50	75	20	75	42	75
CSE3	18	14	75	16	75	8	100	14	75
	25	20	75	22	75	8	100	18	75
	36	28	75	32	75	15	75	32	75
	50	36	75	42	75	18	75	32	75
	55	42	75	50	75	20	75	42	75
CSE4	18	14	75	16	75	8	100	14	75
	25	20	75	22	75	8	100	18	75
	36	28	75	32	75	15	75	32	75
	50	36	75	42	75	18	75	32	75
	55	42	75	50	75	20	75	42	75

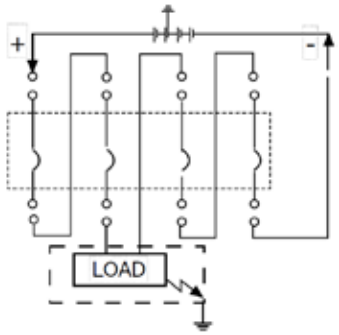
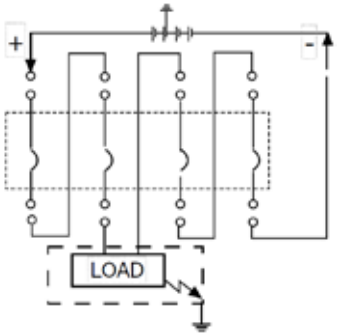
NOTE: In case of Two pole in Series - 2P MCCB can be used for above specified voltage levels. **NA:** Not Applicable

MCCB FOR DC APPLICATIONS

Type of Network		NETWORK WITH ONE TERMINAL GROUNDED							
Rated Voltage		<= 250V DC		<= 250V DC		<=500V DC		<=500V DC	
Poles Configuration		3 Pole in Series		4 Pole in Series		3 Pole in Series		4 Pole in Series	
Protection + Isolation Function									
Poles Configuration		2 Pole in Series		3 Pole in Series		2 Pole in Series		3 Pole in Series	
Protection Function									
Icu and Ics Ratings	**Icu in kA at 415V AC**	**Icu in kA**	**Ics = % of Icu in kA**	**Icu in kA**	**Ics = % of Icu in kA**	**Icu in kA**	**Ics = % of Icu in kA**	**Icu in kA**	**Ics = % of Icu in kA**
CSES	10	8	100	10	75	NA	NA	NA	NA
	18	14	75	16	75	NA	NA	NA	NA
	25	16	75	20	75	NA	NA	NA	NA
CSE1	18	14	75	16	75	8	100	14	75
	25	20	75	22	75	10	75	18	75
	36	28	75	32	75	14	75	32	75
	50	36	75	42	75	18	75	32	75
	55	42	75	50	75	20	75	42	75
CSE2	18	14	75	16	75	8	100	14	75
	25	20	75	22	75	10	75	18	75
	36	28	75	32	75	14	75	32	75
	50	36	75	42	75	18	75	32	75
	55	42	75	50	75	20	75	42	75
CSE3	18	14	75	16	75	8	100	14	75
	25	20	75	22	75	8	100	18	75
	36	28	75	32	75	15	75	32	75
	50	36	75	42	75	18	75	32	75
	55	42	75	50	75	20	75	42	75
CSE4	18	14	75	16	75	8	100	14	75
	25	20	75	22	75	8	100	18	75
	36	28	75	32	75	15	75	32	75
	50	36	75	42	75	18	75	32	75
	55	42	75	50	75	20	75	42	75

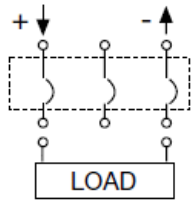
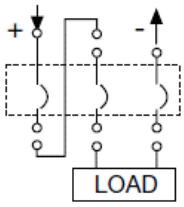
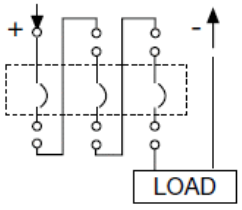
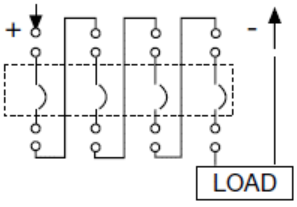
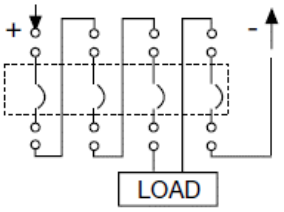
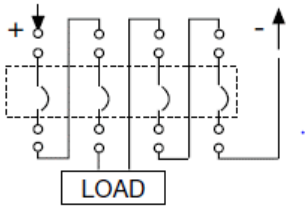
NOTE: In case of Two pole in Series - 2P MCCB can be used for above specified voltage levels (Only for Protection function with One Terminal Grounded Network) **NA:** Not Applicable

MCCB FOR DC APPLICATIONS

Type of Network		NETWORK WITH MID POINT GROUNDED			
Rated Voltage		<= 250V DC		<=500V DC	
Poles Configuration		4 Pole in Series		4 Pole in Series	
Protection + Isolation Function					
Icu and Ics Ratings	**Icu in kA at 415V AC**	**Icu in kA**	**Ics = % of Icu in kA**	**Icu in kA**	**Ics = % of Icu in kA**
CSES	10	8	100	NA	NA
	18	14	75	NA	NA
	25	18	75	NA	NA
CSE1	18	14	75	8	75
	25	20	75	10	75
	36	28	75	14	75
	50	36	75	18	75
	55	42	75	20	75
CSE2	18	14	75	8	75
	25	20	75	10	75
	36	28	75	14	75
	50	36	75	18	75
	55	42	75	20	75
CSE3	18	14	75	8	75
	25	20	75	8	100
	36	28	75	14	75
	50	36	75	18	75
	55	42	75	20	75
CSE4	18	14	75	8	75
	25	20	75	8	100
	36	28	75	14	75
	50	36	75	18	75
	55	42	75	20	75

NA: Not Applicable

CORRECTION FACTOR FOR DC MCCB

Type of Connections	CSES	CSE1	CSE2	CSE3	CSE4	Instantaneous Pick up Current
	1.3	1.3	1.3	1.3	1.3	The LI protection (or thermal magnetic protection) trip units fitted to AC circuit breakers are also suitable for DC breakers. The time current characteristics curves for the L protection (or thermal protection) do not change. Due to ferromagnetic phenomena, the instantaneous tripping in DC breakers occurs at a different value than in alternating current. Correction factor is considered based on circuit breaker type and poles connection type. Instantaneous Pick up Current=(Instantaneous Setting x In x Correction Factor for DC) Amperes Applied Tolerance=± 20%
	1	1.15	1.15	1.15	1.15	
	1	1.15	1.15	1.15	1.15	
	-	-	-	1	1	
	-	-	-	1	1	
	-	-	-	1	1	

Derating Factor when poles are connected in parallel			
In = In x nos. of Poles in parallel x Derating Coefficient			
Nos. of Poles in Parallel	2	3	4 (Neutral pole at 100%)
Derating Coefficient	**0.9**	**0.8**	**0.7**

NOTES: CSES & CSE1 Series with Single Pole can be provided with Icu=20kA, Ics=75% of Icu at 125V DC

Internal Accessories

Electrical Accessories

- Shunt Trip
- Under Voltage Trip
- Auxiliary Switch
- Alarm Switch
- Combination Switch

ELECTRICAL ACCESSORIES

Shunt Trip

The shunt trip opens the mechanism in response to an externally applied voltage signal. Shunt trips include clearing contacts that automatically clear the signal circuit when the mechanism has tripped.

Under Voltage Trip

The under voltage trip coil automatically opens a circuit breaker when voltage drops to a value ranging between 35% to 70% of the line voltage. The operation is instantaneous and the circuit breaker cannot be re-closed until the voltage returns to 85% of line voltage. Continuously energized, the under voltage trip must be operating before the breaker can be closed.

Auxiliary Switch

Auxiliary switch is for applications requiring remote **ON** and **OFF** indication. Each switch contains two contacts having a common connection. One is open and the other closed when the circuit breaker is open and vice-versa.

Alarm Switch

Alarm switches offer provisions for immediate audio or visual indication of a tripped breaker due to overload, short-circuit, operation of shunt trip or under voltage trip conditions, operation of push button. They are particularly useful in automated plants where operators must be signaled about changes in the electrical distribution system. This switch features a closed contact when the circuit breaker is operated manually. Its contact is open when the circuit breaker is reset.

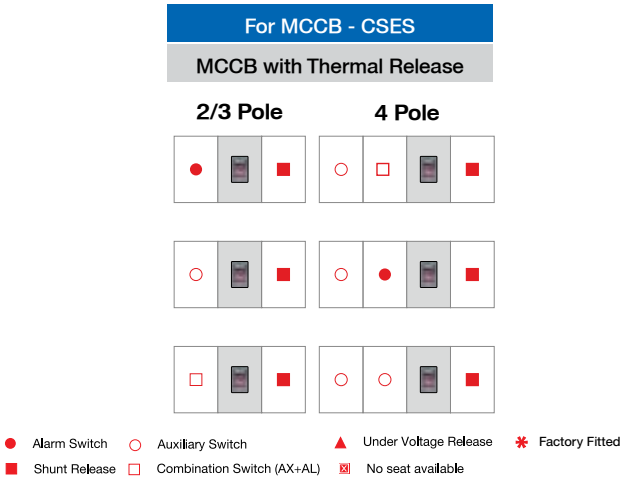
Combination Switch (AX+AL)

It consists of one Auxiliary Switch (AX) and Alarm Switch (AL) in a body to connect into the same position in the breaker

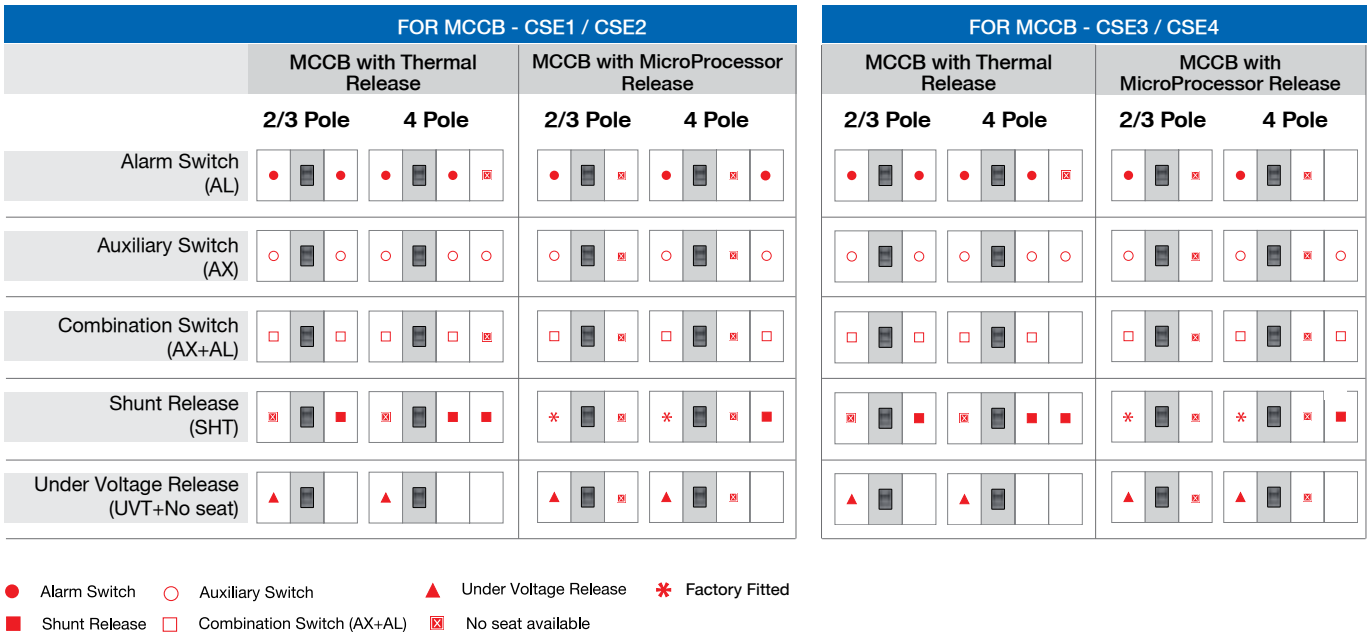
ELECTRICAL ACCESSORIES - OFFERING

MCCB Model		CSES	CSE1	CSE2	CSE3	CSE4
Shunt	24V DC	☑	☑	☑	☒	☒
	24V AC/DC	☒	☒	☒	☑	☑
	48V DC	☑	☑	☑	☒	☒
	48V AC/DC	☒	☒	☒	☑	☑
	110V DC	☑	☑	☑	☒	☒
	110V AC	☑	☑	☑	☒	☒
	110V AC/DC	☒	☒	☒	☑	☑
	220V DC	☑	☑	☑	☒	☒
	220V AC	☑	☑	☑	☒	☒
	220V AC/DC	☒	☒	☒	☑	☑
	415V AC	☑	☑	☑	☑	☑
Under Voltage Trip (UVT)	24V DC	☒	☑	☑	☒	☒
	48V DC	☒	☑	☑	☒	☒
	110V DC	☒	☑	☑	☒	☒
	110V AC	☒	☒	☒	☑	☑
	220V DC	☒	☑	☑	☒	☒
	220V AC	☒	☑	☑	☑	☑
	415V AC	☒	☑	☑	☑	☑

MAXIMUM POSSIBILITIES FOR INTERNAL ACCESSORIES



MAXIMUM POSSIBILITIES FOR INTERNAL ACCESSORIES



Alarm Switch ○ Auxiliary Switch ▲ Under Voltage Release ✱ Factory Fitted
■ Shunt Release □ Combination Switch (AX+AL) ⊠ No seat available

NOTES:

i) 3Pole, MCCB with Thermal Release, Any two accessories can be fitted at one time

ii) 4Pole, MCCB with Thermal Release, Any Three accessories can be fitted at one time

iii) 3Pole MCCB with Microprocessor Release, Right hand seat is not available. Hence, one accessory can be fitted at one time.

iv) 4Pole MCCB with Microprocessor Release, Any two accessories can be fitted at one time.

v) UVT can be fitted only in left hand seat.

EARTH FAULT PROTECTION

Introduction

Earth Fault / Ground Fault Protection relay, is an electronic trip unit, designed to protect the installation in case of earth faults or leakage currents beyond a preset level. The trip delay is adjustable. The potential free contacts output of this unit is wired into the user system for interlocks & protection

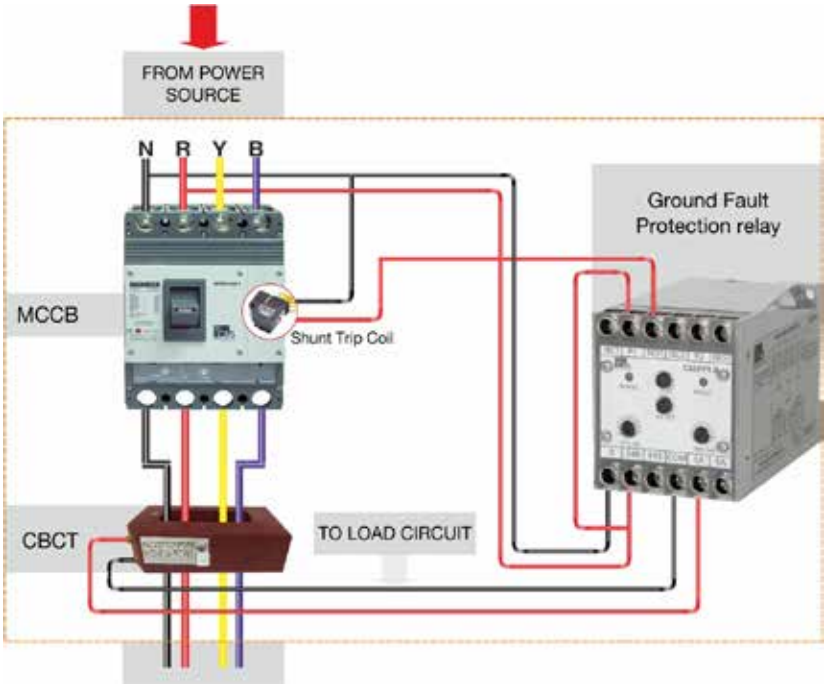
Trip Time delay

- Trip time delay setting is from 100 milli-seconds to 1 second (field settable)
- Select 100 milli-second time delay for instant tripping

Current Sensitivity

- Current sensitivity can be set from 10% to 100% of the selected full-scale current input through CT (1 Amp or 5 Amp)
- Select 10% current sensitivity for instant tripping

Technical Specifications	
Auxiliary Supply Voltage	240/415 VAC
Frequency	50/60 Hz +-3 %
Power Consumption	3VA
Output Relay Contact	2CO
Output Contact Rating	5A, 240 V AC (Resistive)
Life Expectancy	0.5 x 10^6 operations at 100% rating
Sensitivity Setting	10% to 100% of Rated Current Input
Earth Fault Trip Time Setting	100 Milli - Seconds to 1 Second
Reset	Manual
Indications	Mains: Green
	Fault: Red
Enclosure	ABS
Overall Dimensions in (MM)	71 x 61 x 111
Weight in gms. (approx)	450



Winbreak 1 - Connection Diagram with EFR

External Accessories

- Extended Terminals
- Mechanical Interlocking Device
- Extended Rotary Handle
- SS Enclosure
- Cage Clamp
- Front Barrier
- Key Lock
- Pad Lock
- Extended Handle Key Lock

EXTERNAL ACCESSORIES

Extended Terminals
It is recommended to use extended terminals for enhancing terminal capacity and phase clearance.

Mechanical Interlocking Device
The Mechanical Interlock (MIT) can be applied on the front of two breakers mounted side by side, in either the 3-Pole or 4 Pole version and prevents simultaneous closing of the two breakers. Fixing is carried out directly on the cover of the breakers.

Extended Rotary Handle
This device is used to operate (ON/OFF) the MCCB when it is mounted inside the switchboard

Cage Clamp
Terminal connections for unprepared cable applications.

Front Barrier
Front barrier provide protection from frontal access to terminals and offers IP40 protection

Key Lock
Key lock provides protection for unintended operation to reset the MCCB with removeable key.

Pad Lock
Pad lock provides protection against unintended operation to switch ON the MCCB

Extended Handle Key Lock
This device provides protection against unintended operation of rotary extended handle in a panel

SS Enclosure
MCCB with enclosure is suitable for use in outdoor applications.

ACCESSORIES OFFERING

MCCB Model		CSES	CSE1	CSE2	CSE3	CSE4
Extended Terminals	1P	☑	☑	☒	☒	☒
	2P	☑	☑	☑	☒	☒
	3P	☑	☑	☑	☑	☑
	4P	☑	☑	☑	☑	☑
Mechanical Interlocking Device	2P / 3P	☒	☑	☑	☑	☑
	4P	☒	☑	☑	☑	☑
Extended Rotary Handle	2P / 3P / 4P	☑	☑	☑	☑	☑
SS Enclosure	2P / 3P	☑	☑	☑	☒	☒
	4P	☑	☑	☑	☒	☒
Cage Clamp	2P	☑	☑	☑	☒	☒
	3P	☑	☑	☑	☒	☒
	4P	☑	☑	☑	☒	☒
Front Barrier	2P / 3P	☑	☑	☑	☑	☑
	4P	☑	☑	☑	☑	☑
Key Lock	2P / 3P	☒	☑	☑	☑	☑
	4P	☒	☑	☑	☑	☑
Pad Lock	2P / 3P /4P	☒	☑	☑	☑	☑
Extended Handle Key Lock	2P / 3P / 4P	☑	☑	☑	☑	☑

Circuit Breaker Derating Information

Temperature based Derating Factor for WiNbreak1 MCCB

Frame Size	CSES	CSE1	CSE2	CSE3	CSE4
Current Compensation factor, k (A/^{O}C)	0.55	0.57	0.42	0.44	0.48
Reference Temperature, T_{ref} (^{O}C)	45	45	45	45	50

Compensation formula : { $((T_{ref} - T_{amb}) * k) + In$ }

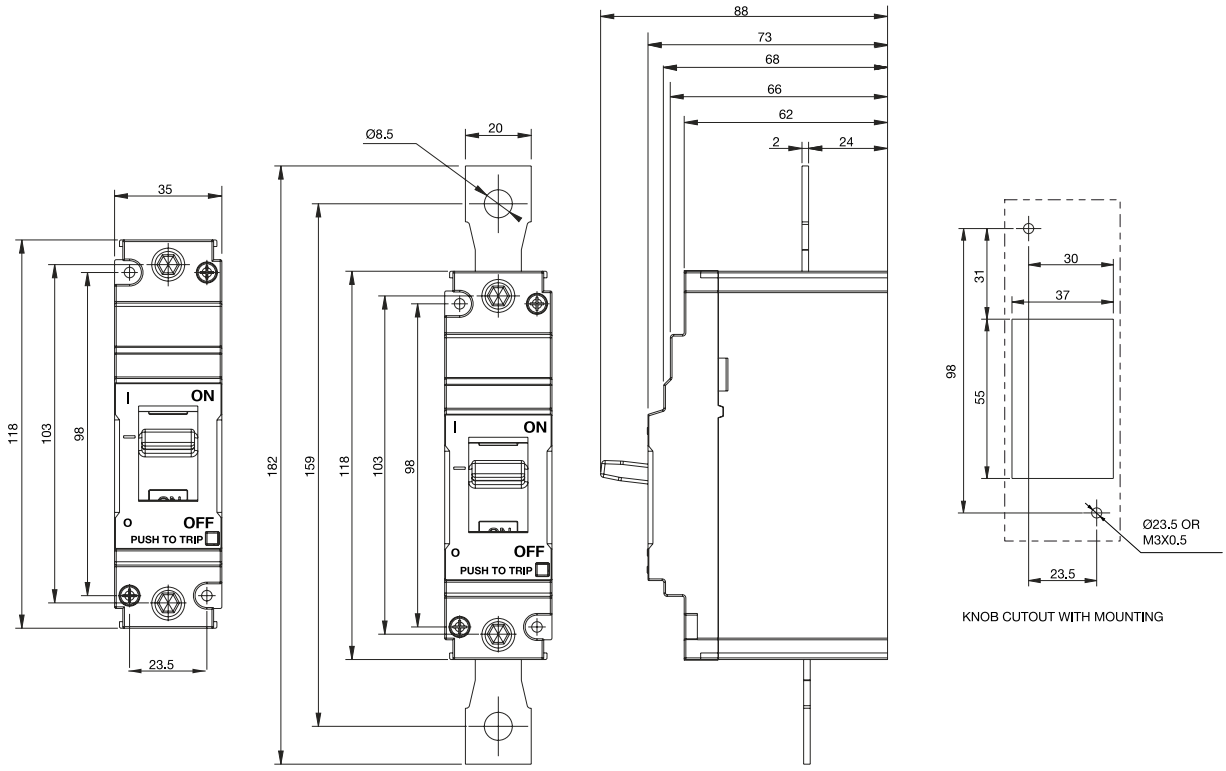
Altitude based Derating for WiNbreak1 MCCB

Elevation	<=2000	3000	4000	5000
Power frequency withstand voltage (V)	3000	2500	2000	1800
Correction factor of operational current	1	0.94	0.88	0.83
Correction factor of short circuit breaking capacity	1	0.83	0.71	0.63

WiNbreak1

Dimensional Details

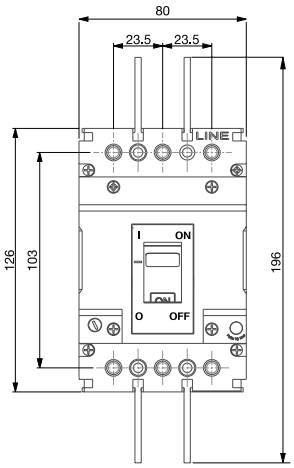
Single Pole (CSES) - 16A~125A



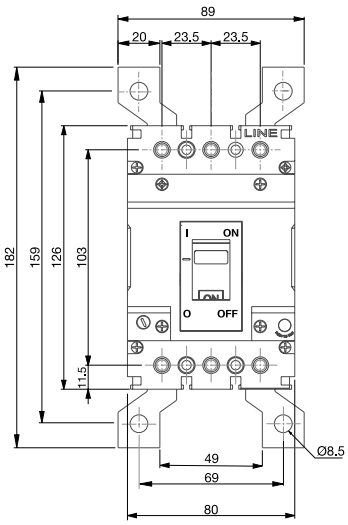
KNOB CUTOUT WITH MOUNTING

*EXTENDED TERMINALS NOT IN SCOPE OF STANDARD SUPPLY

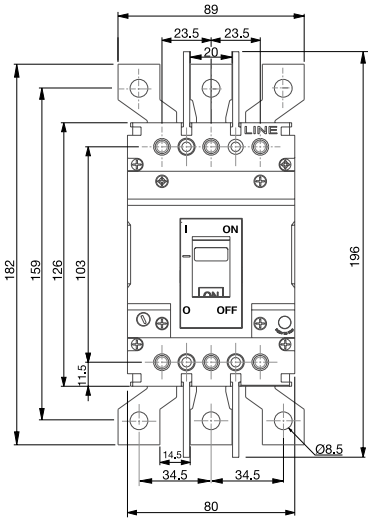
2, 3 Pole **(CSES)** - 16A~125A



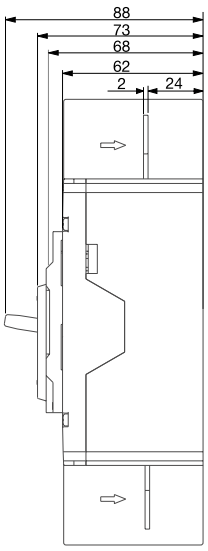
2 / 3 POLE



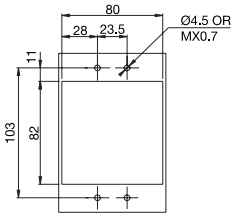
2 POLE



3 POLE



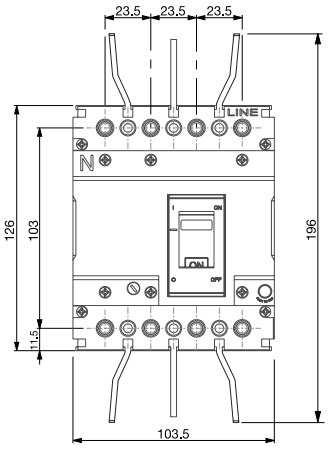
2/3/4 POLE



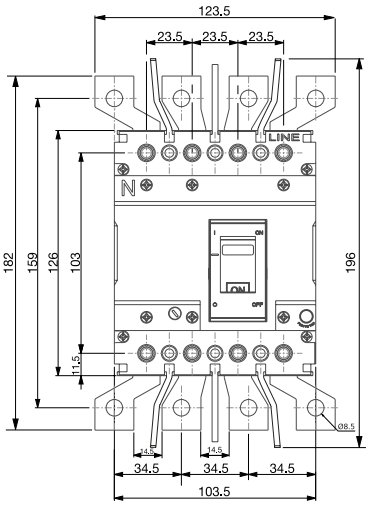
NAME PLATE CUTOUT WITH MOUNTING-3P

*EXTENDED TERMINALS NOT IN SCOPE OF STANDARD SUPPLY

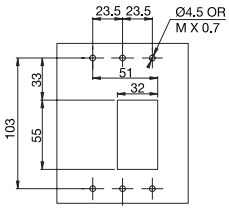
4 Pole (CSES) - 16A~125A



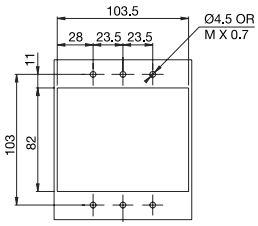
4 POLE



4 POLE



KNOB CUTOUT WITH MOUNTING-4P

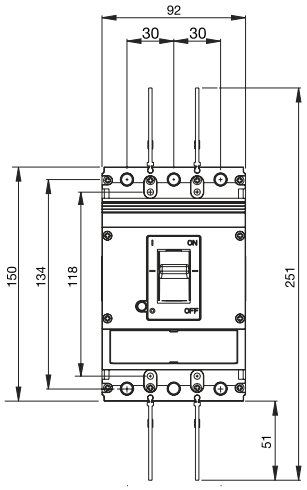


NAME PLATE CUTOUT WITH MOUNTING-4P

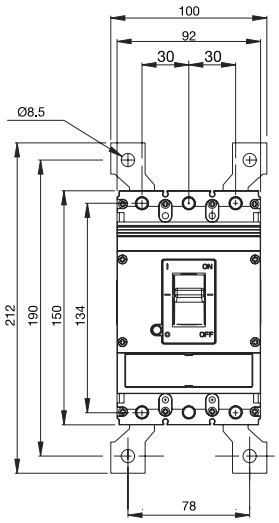
*EXTENDED TERMINALS NOT IN SCOPE OF STANDARD SUPPLY

All dimensions are in mm

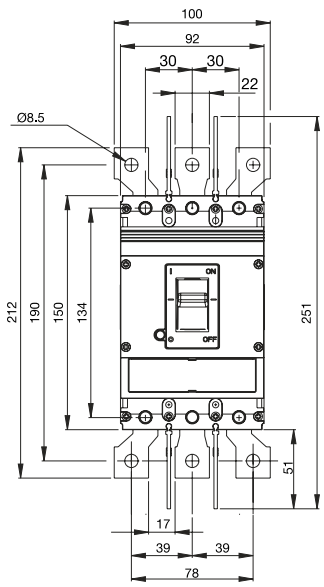
2, 3 Pole (CSE1)- 16A~125A



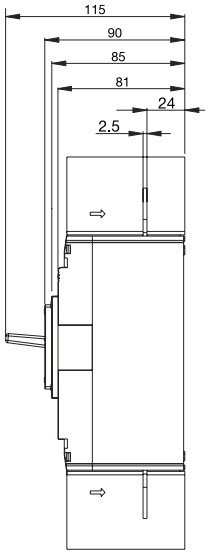
2 / 3 POLE



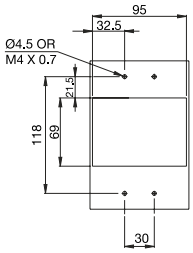
2 POLE



3 POLE



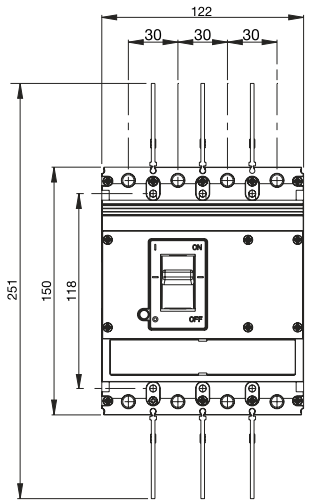
2/3/4 POLE



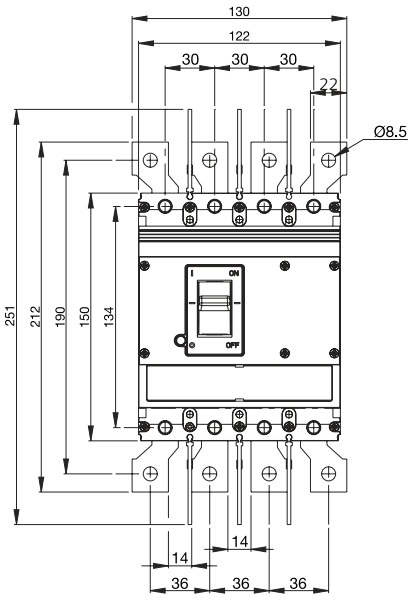
NAME PLATE CUTOUT WITH MOUNTING

*EXTENDED TERMINALS NOT IN SCOPE OF STANDARD SUPPLY

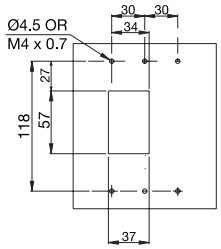
4 Pole (CSE1) - 16A~125A



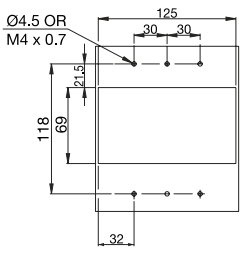
4 POLE



4 POLE



KNOB CUTOUT WITH MOUNTING

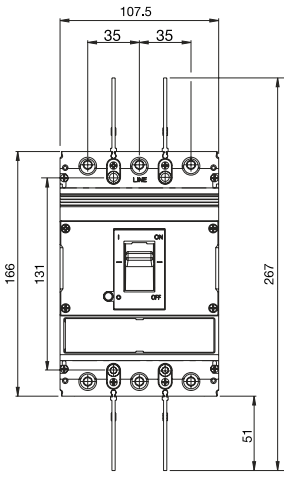


NAME PLATE CUTOUT WITH MOUNTING

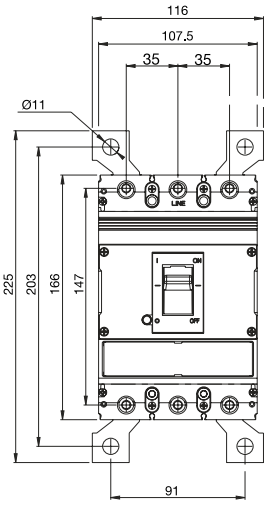
*EXTENDED TERMINALS NOT IN SCOPE OF STANDARD SUPPLY

All dimensions are in mm

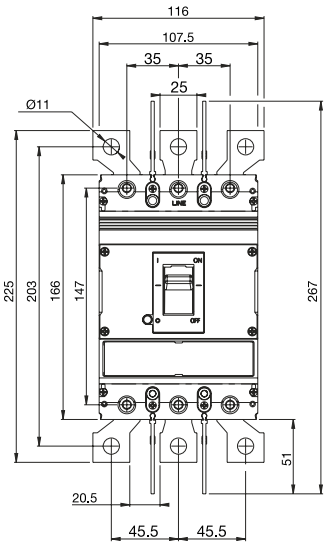
2, 3 Pole (CSE2) - 160A~250A



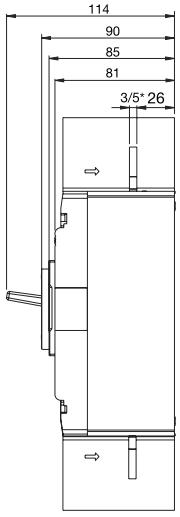
2 / 3 POLE



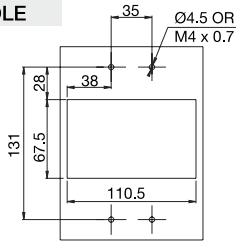
2 POLE



3 POLE



2/3/4 POLE

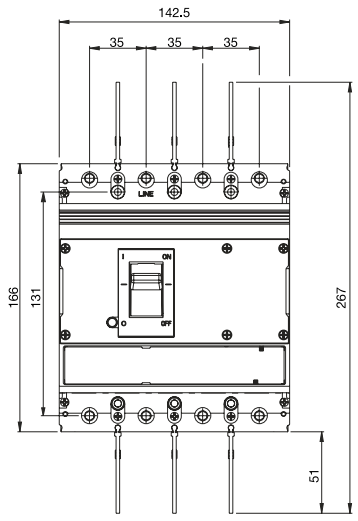


NAME PLATE CUTOUT
WITH MOUNTING

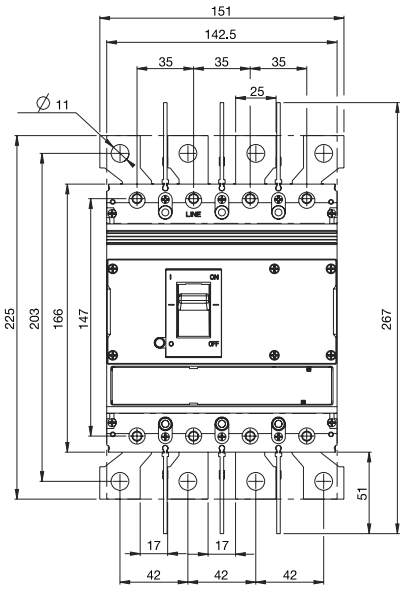
*EXTENDED TERMINALS NOT IN SCOPE OF STANDARD SUPPLY
#5-APPLICABLE FOR 250A ONLY

*CSET 2503 & CSET 2504 SHALL BE AVAILABLE
WITH 5MM THICKNESS

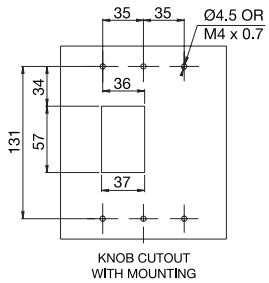
4 Pole (CSE2) - 160A~250A



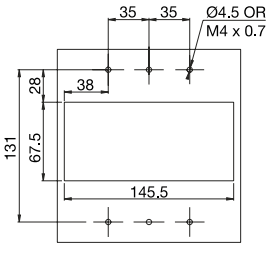
4 POLE



4 POLE



KNOB CUTOUT
WITH MOUNTING

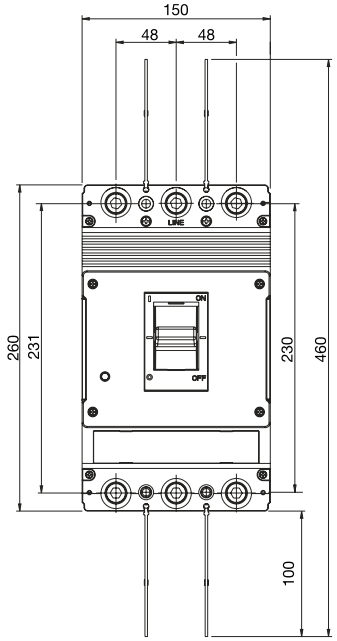


NAME PLATE CUTOUT
WITH MOUNTING

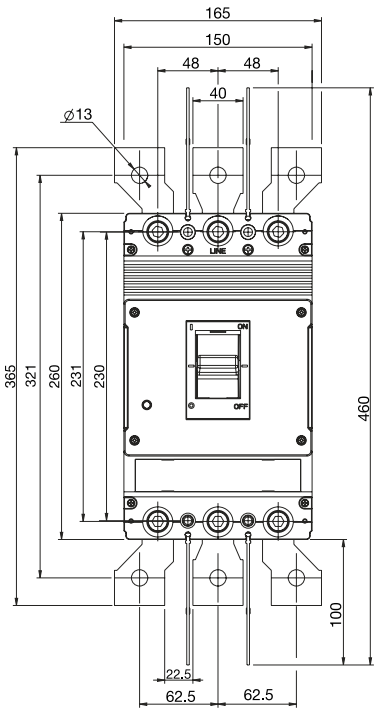
*EXTENDED TERMINALS NOT IN SCOPE OF STANDARD SUPPLY

All dimensions are in mm

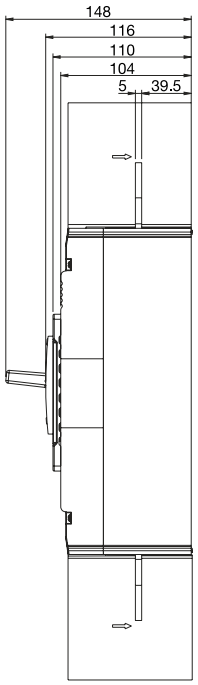
3 Pole (CSE3) - 320A~400A



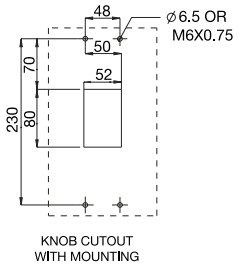
3 POLE



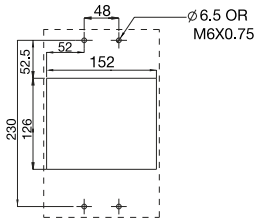
3 POLE



3/4 POLE



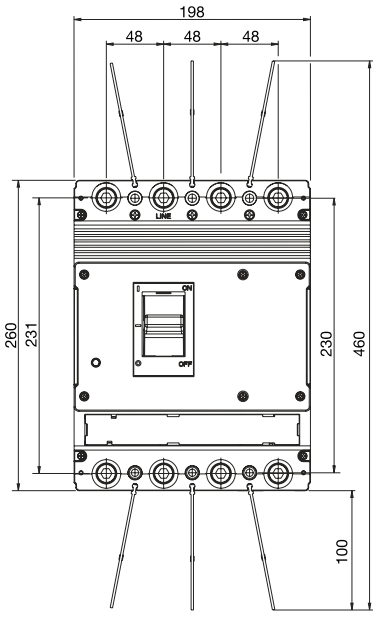
KNOB CUTOUT
WITH MOUNTING



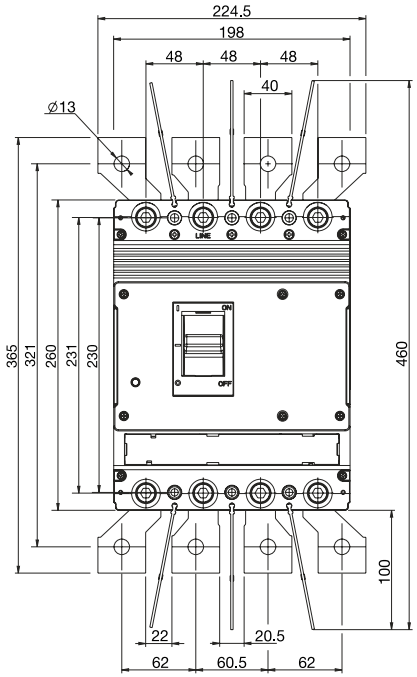
NAME PLATE CUTOUT
WITH MOUNTING

*EXTENDED TERMINALS NOT IN SCOPE OF STANDARD SUPPLY

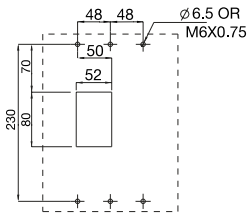
4 Pole (CSE3) - 320A~400A



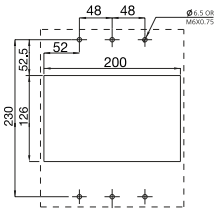
4 POLE



4 POLE



KNOB CUTOUT WITH MOUNTING

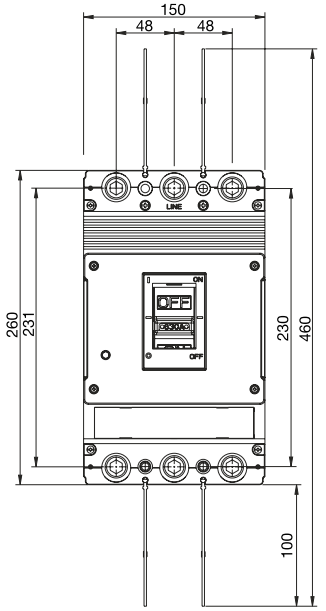


NAME PLATE CUTOUT WITH MOUNTING

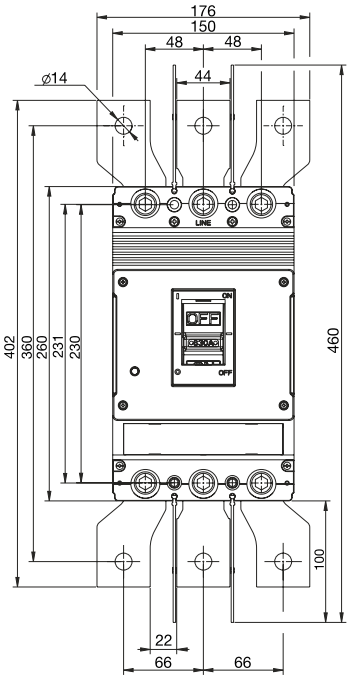
*EXTENDED TERMINALS NOT IN SCOPE OF STANDARD SUPPLY

All dimensions are in mm

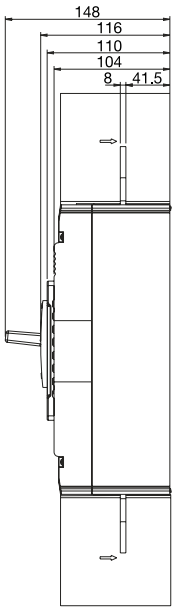
3 Pole (CSE4) - 500A~630A



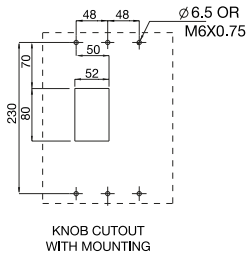
3 POLE



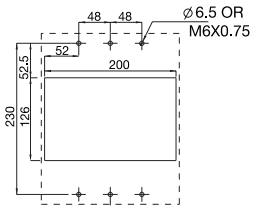
3 POLE



3 POLE



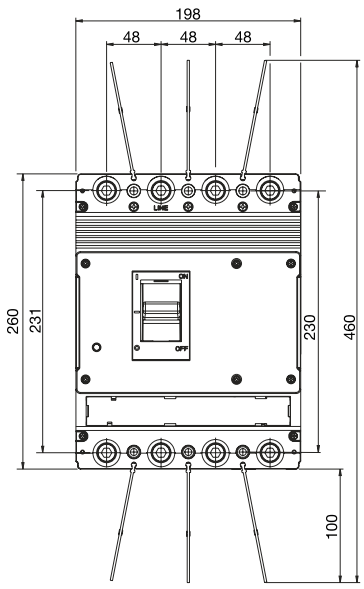
KNOB CUTOUT
WITH MOUNTING



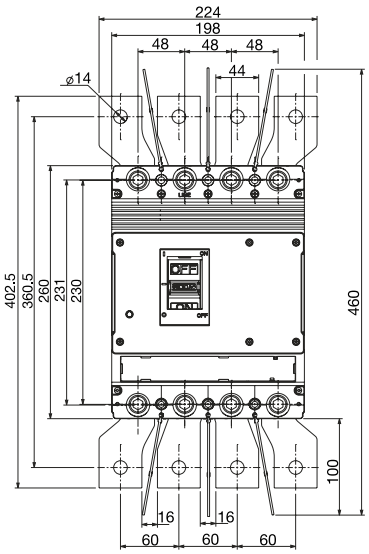
NAME PLATE CUTOUT
WITH MOUNTING

*EXTENDED TERMINALS NOT IN SCOPE OF STANDARD SUPPLY

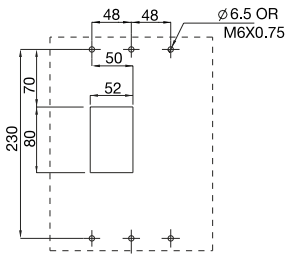
4 Pole (CSE4) - 500A~630A



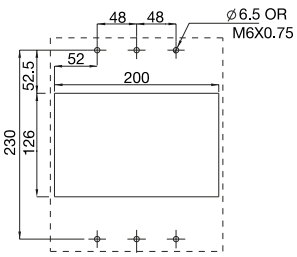
4 POLE



4 POLE



KNOB CUTOUT
WITH MOUNTING



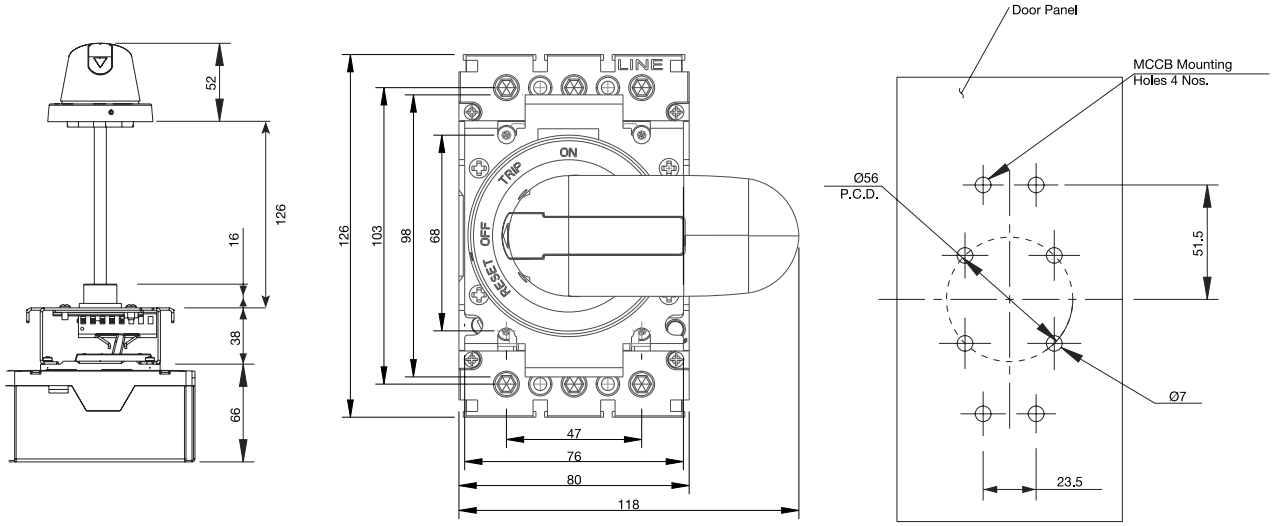
NAME PLATE CUTOUT
WITH MOUNTING

*EXTENDED TERMINALS NOT IN SCOPE OF STANDARD SUPPLY

All dimensions are in mm

Rotary Handle for CSES - 16A~125A

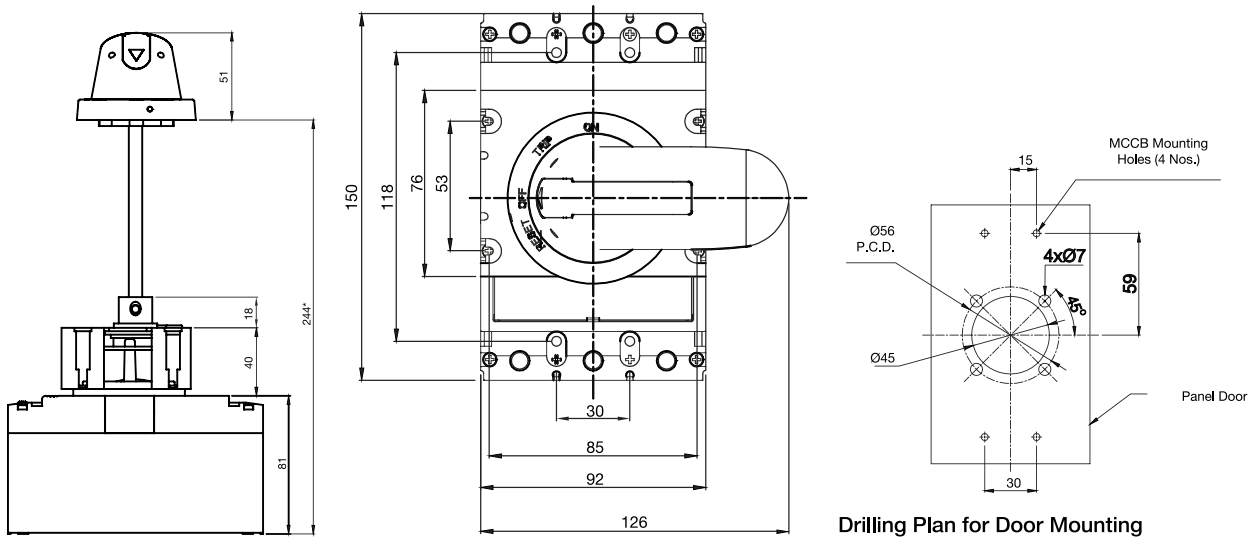
EHW1-125-0T



*STANDARD SHAFT LENGTH - 150MM
*OPTIONAL SHAFT LENGTH - 300MM

Rotary Handle for CSE1 - 16A~125A

EHW1-125



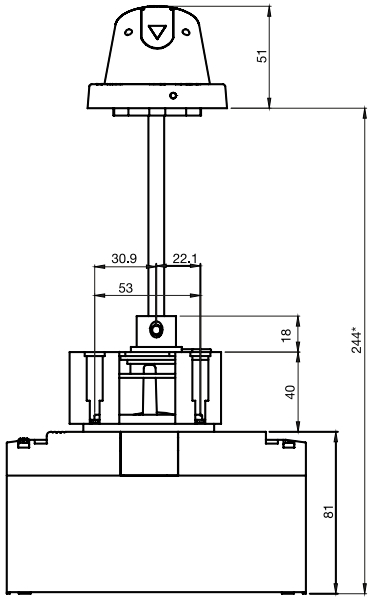
Drilling Plan for Door Mounting

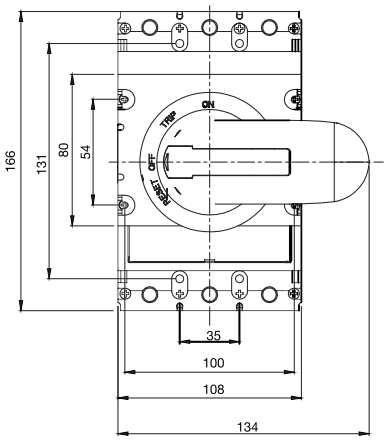
*STANDARD SHAFT LENGTH- 150MM
*OPTIONAL SHAFT LENGTH- 300MM

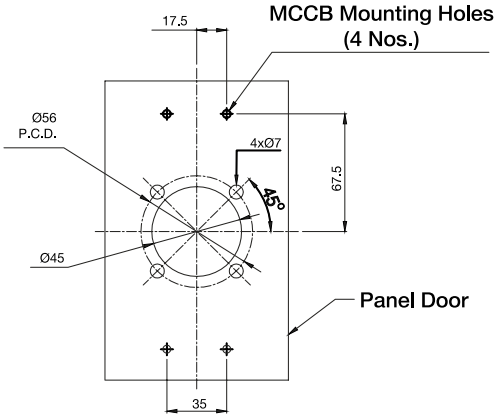
All dimensions are in mm

Rotary Handle for CSE2 - 160A~250A

EHW1-250





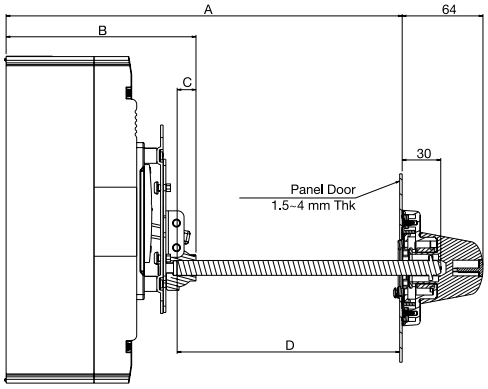


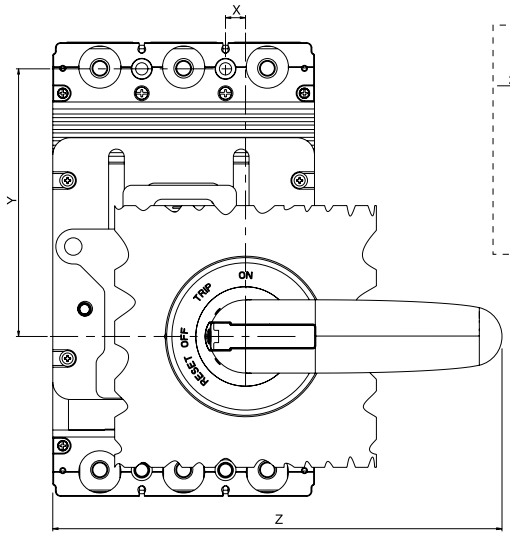
Drilling Plan for Door Mounting

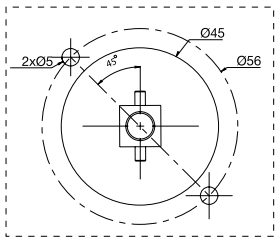
*STANDARD SHAFT LENGTH- 150MM
*OPTIONAL SHAFT LENGTH- 300MM

Rotary Handle for CSE3 (320A~400A), CSE4 (500A~630A)

EHW1-400~630







Cut and past for
drilling locations

EHW1-400~630	
Amax	316
B	151
C	15
D	A-B+C

EHW1-400~630	
X	11.5
Y	153
Z	257.5

*STANDARD SHAFT LENGTH - 210MM
*OPTIONAL SHAFT LENGTH - 300MM

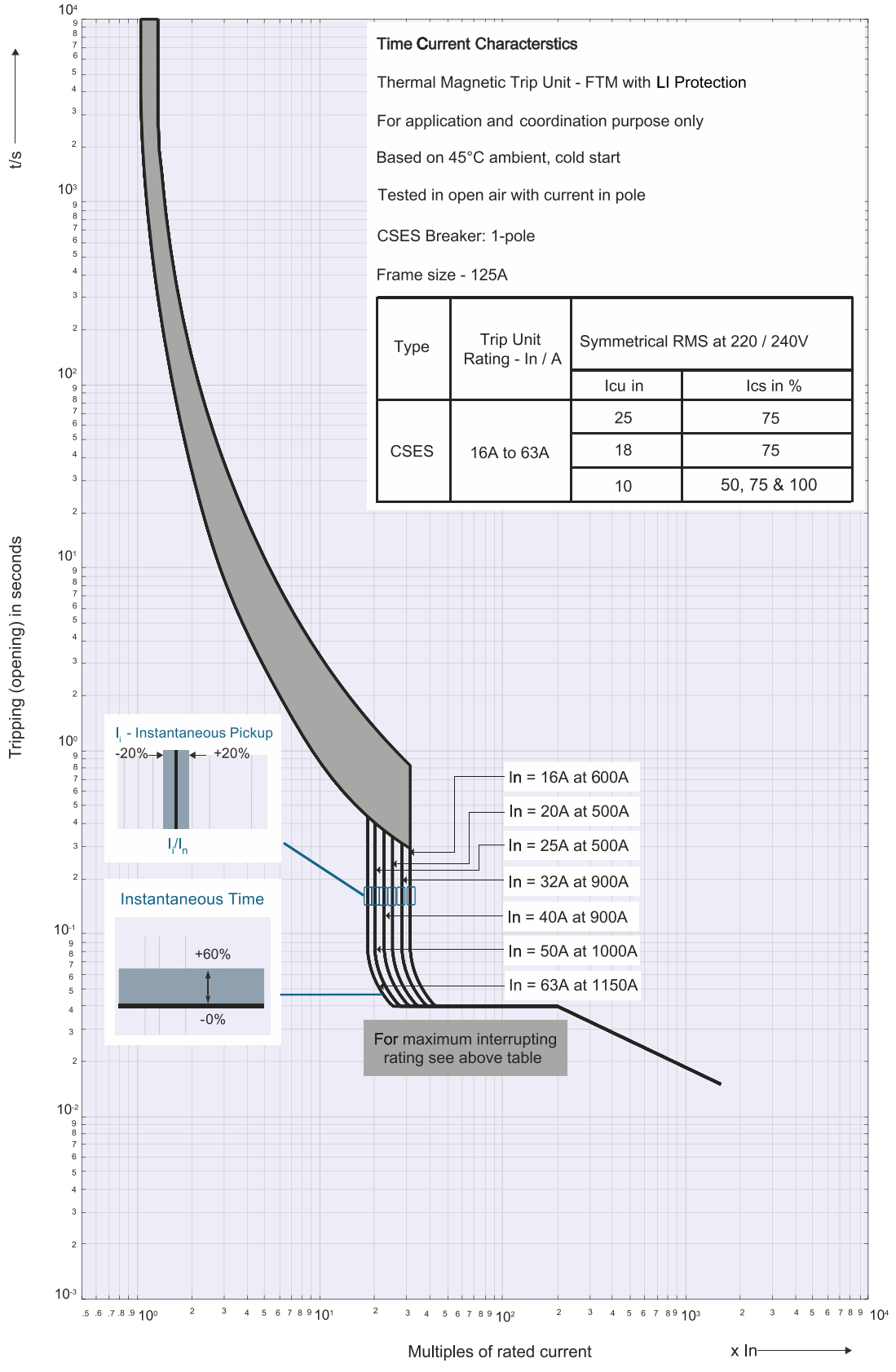
All dimensions are in mm

WiNbreak1

Tripping Characteristics

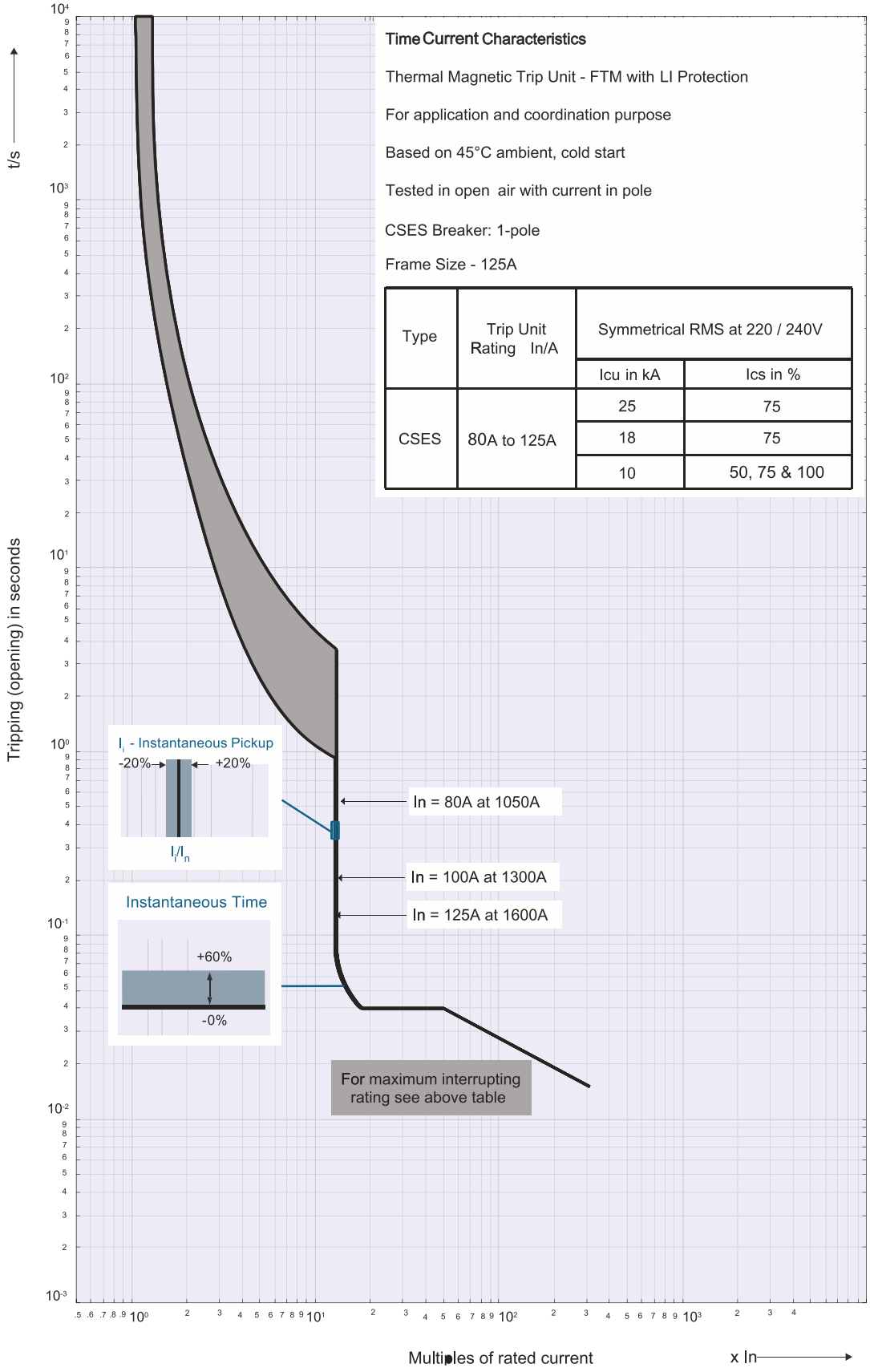
Type / Model

Tripping Curves for CSES with FTM Trip Unit



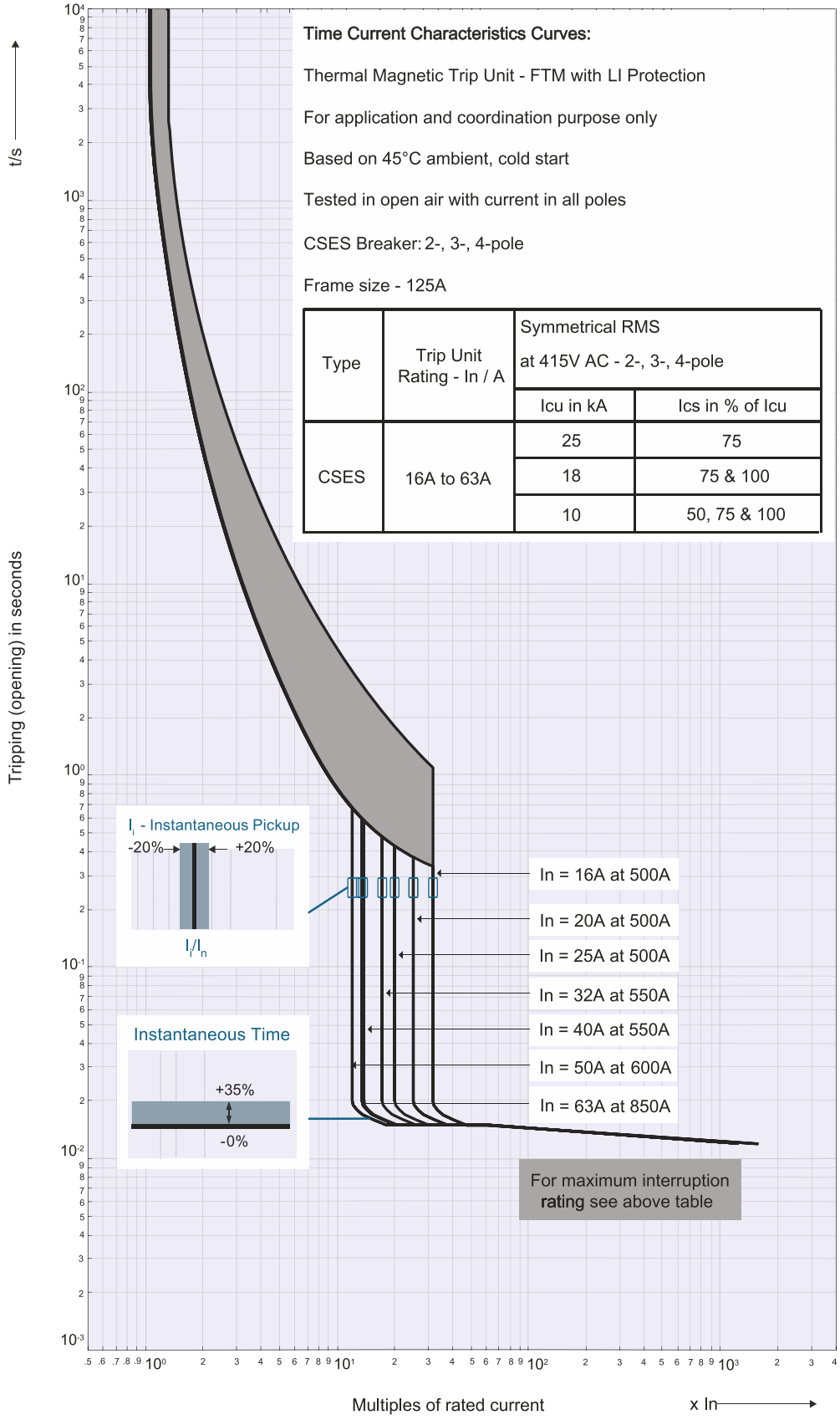
Type / Model

Tripping Curves for CSES with FTM Trip Unit



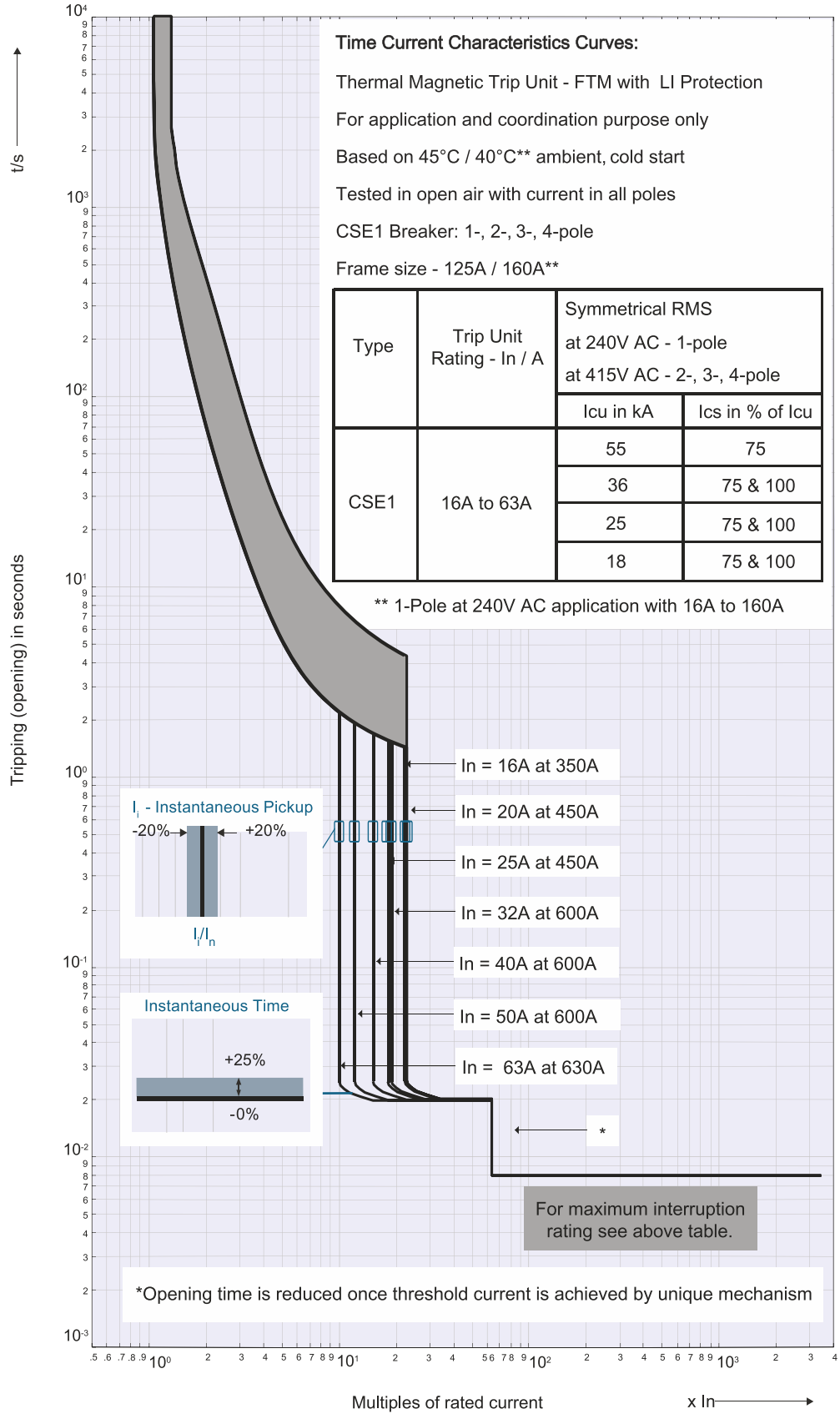
Type / Model

Tripping Curves for CSES with FTM Trip Unit



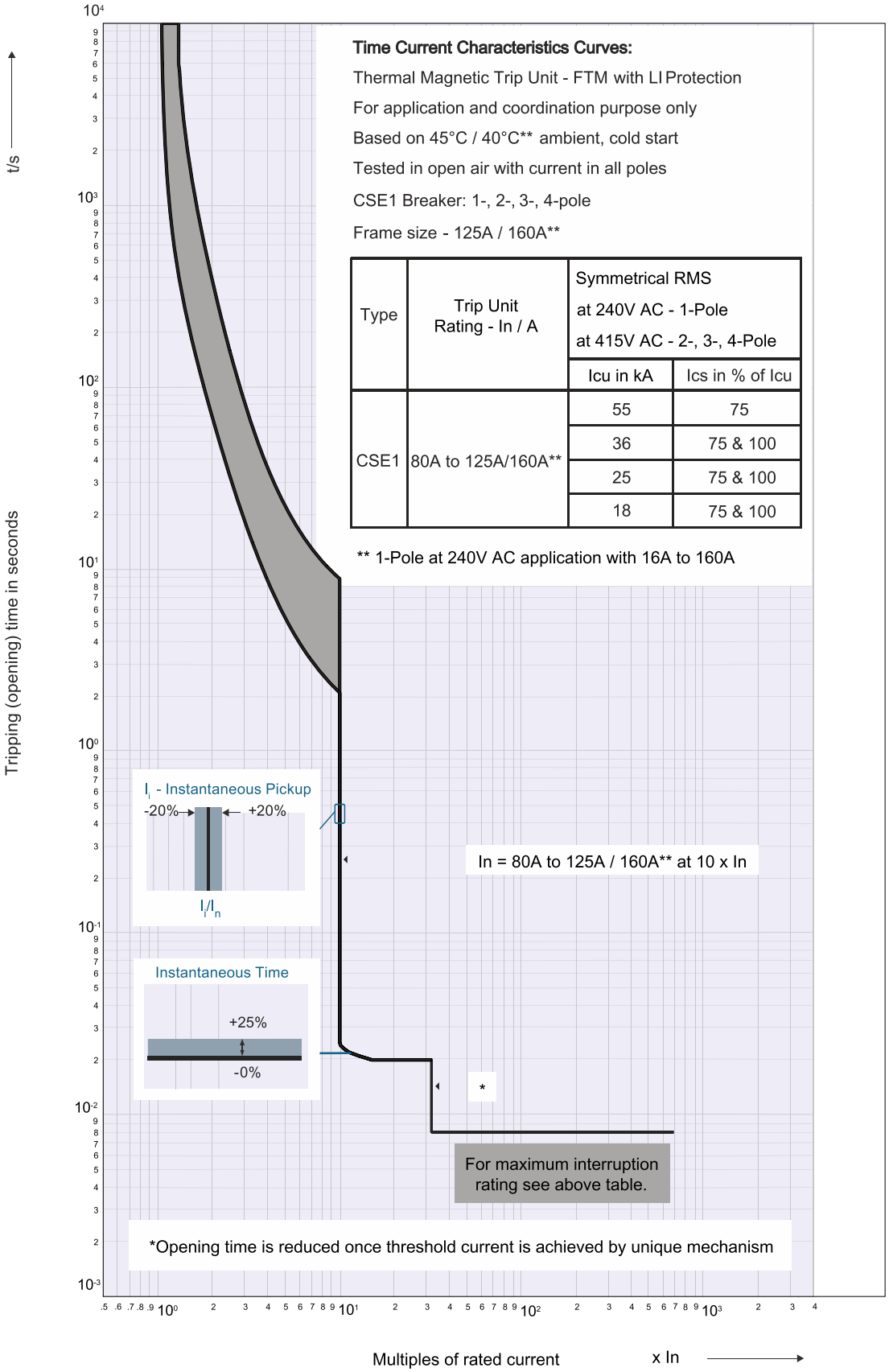
Type / Model

Tripping Curves for CSE1 with FTM Trip Unit



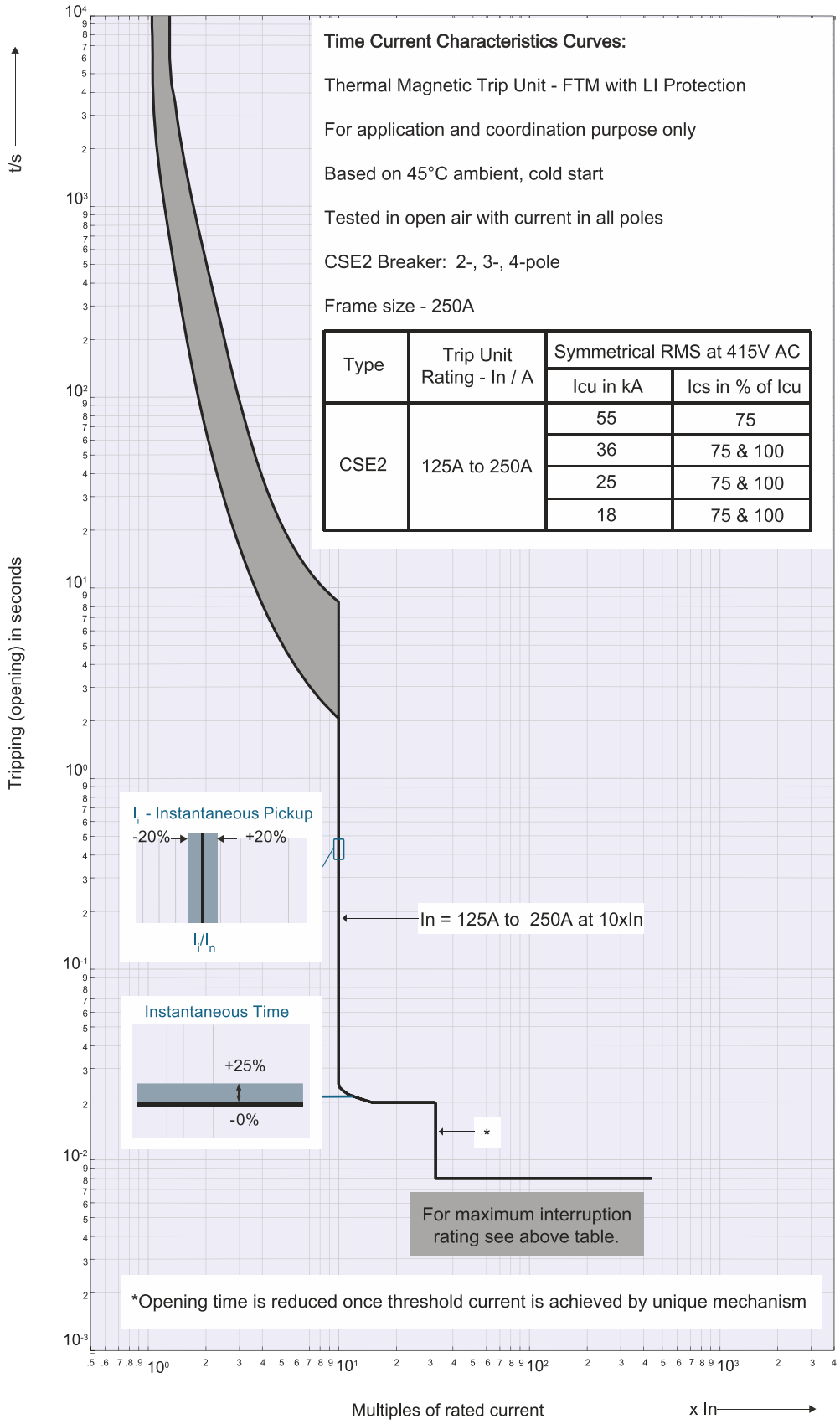
Type / Model

Tripping Curves for CSE1 with FTM Trip Unit

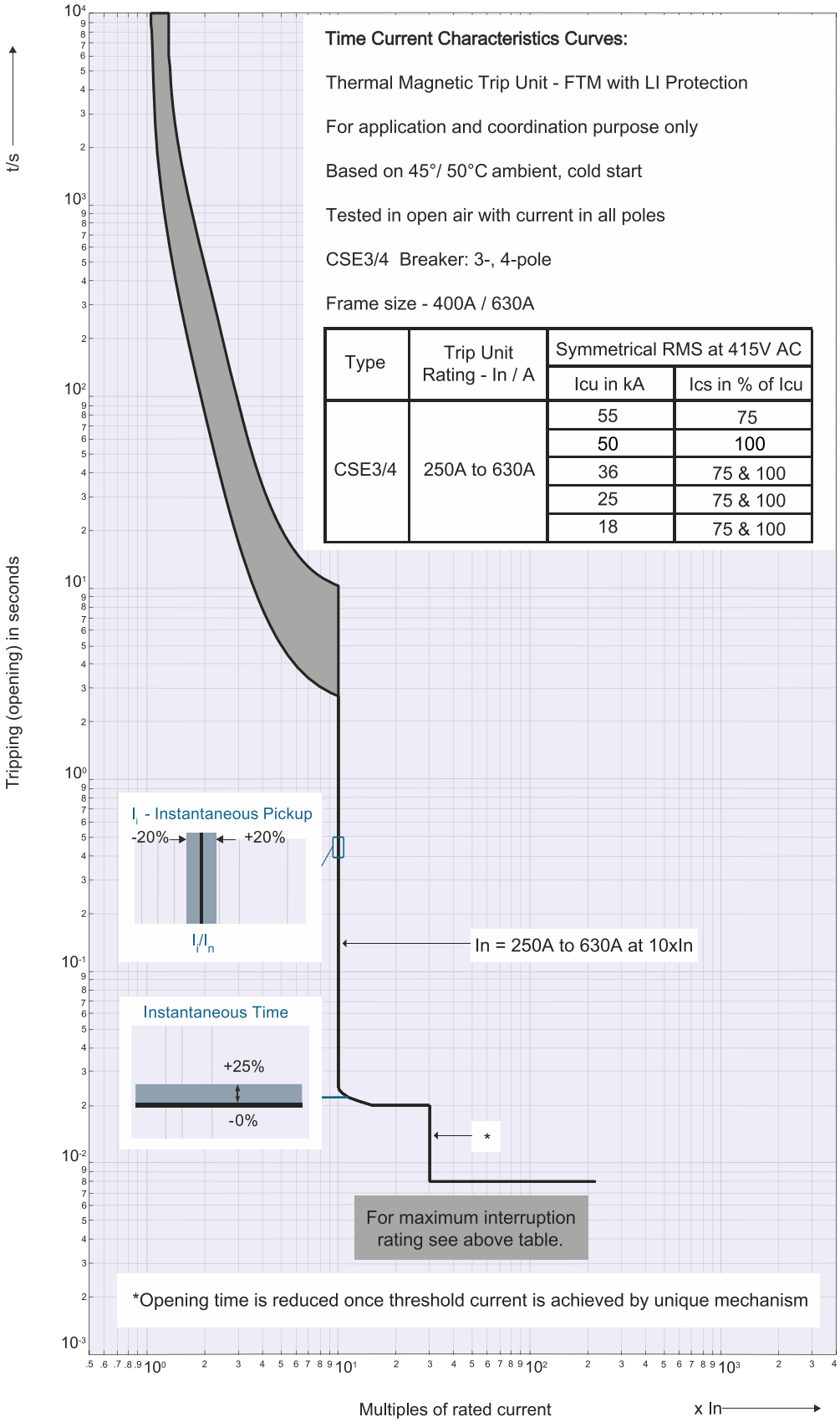


Type / Model

Tripping Curves for CSE2 with FTM Trip Unit

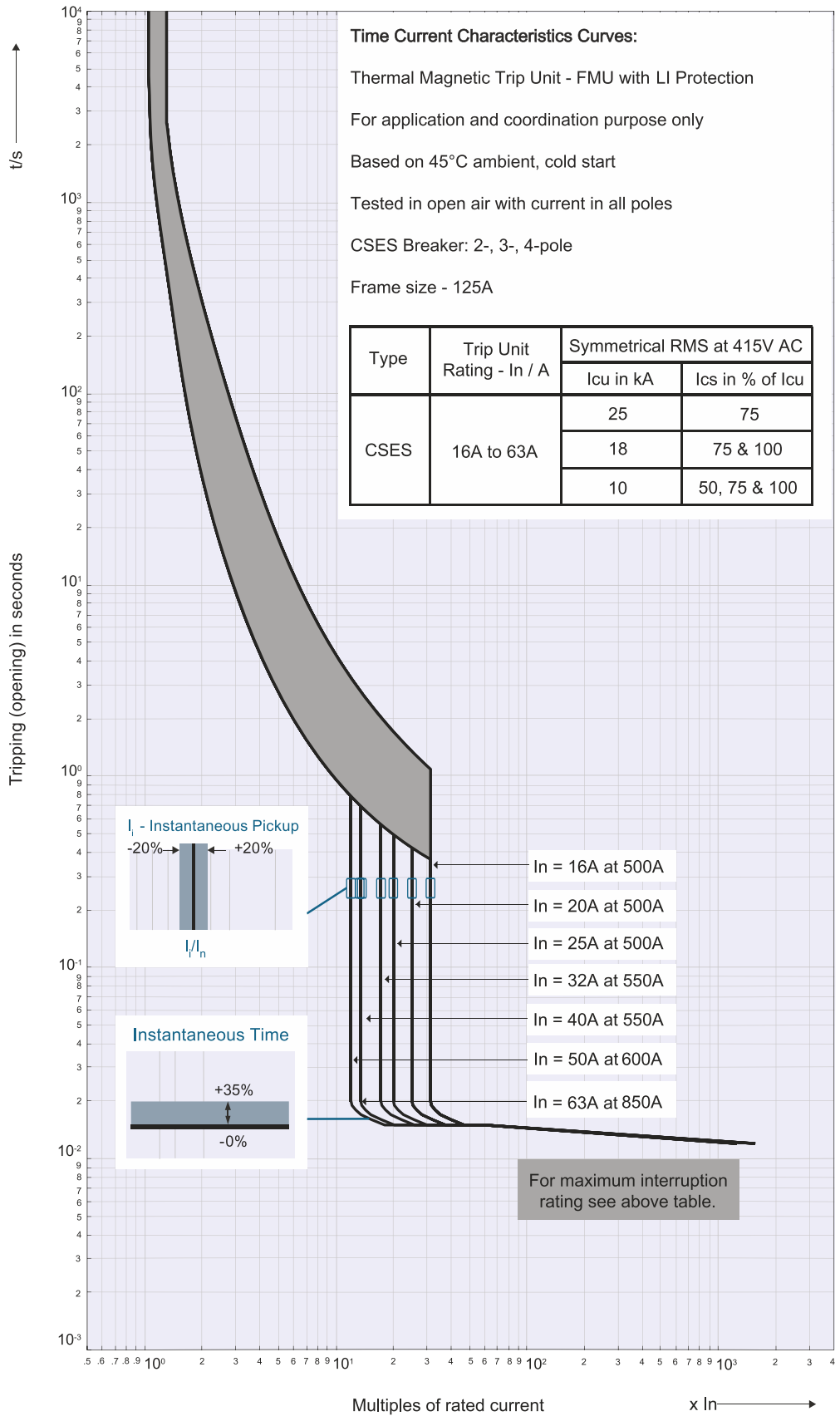


Type / Model
Tripping Curves for CSE3/4 with FTM Trip Unit



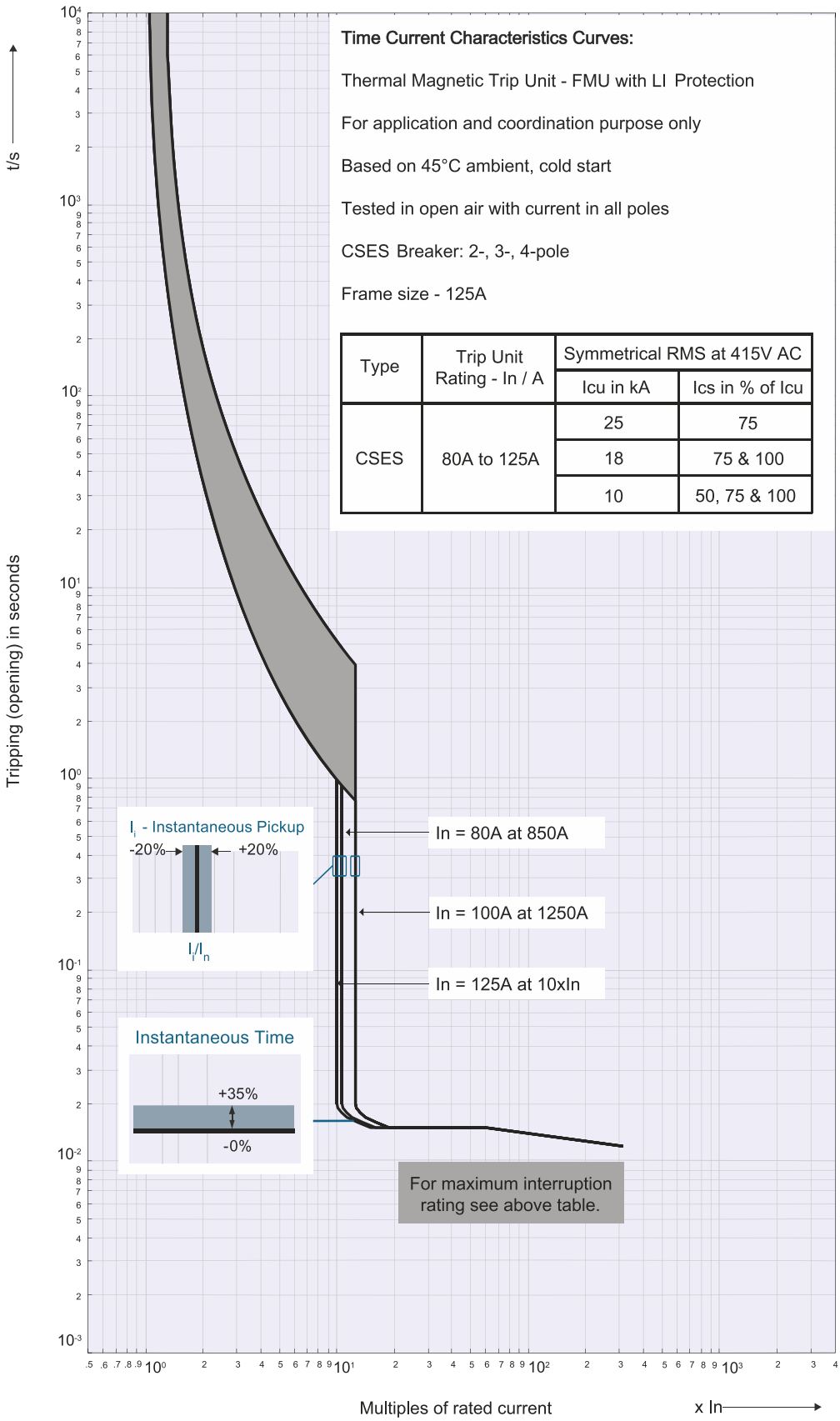
Type / Model

Tripping Curves for CSES with FMU Trip Unit



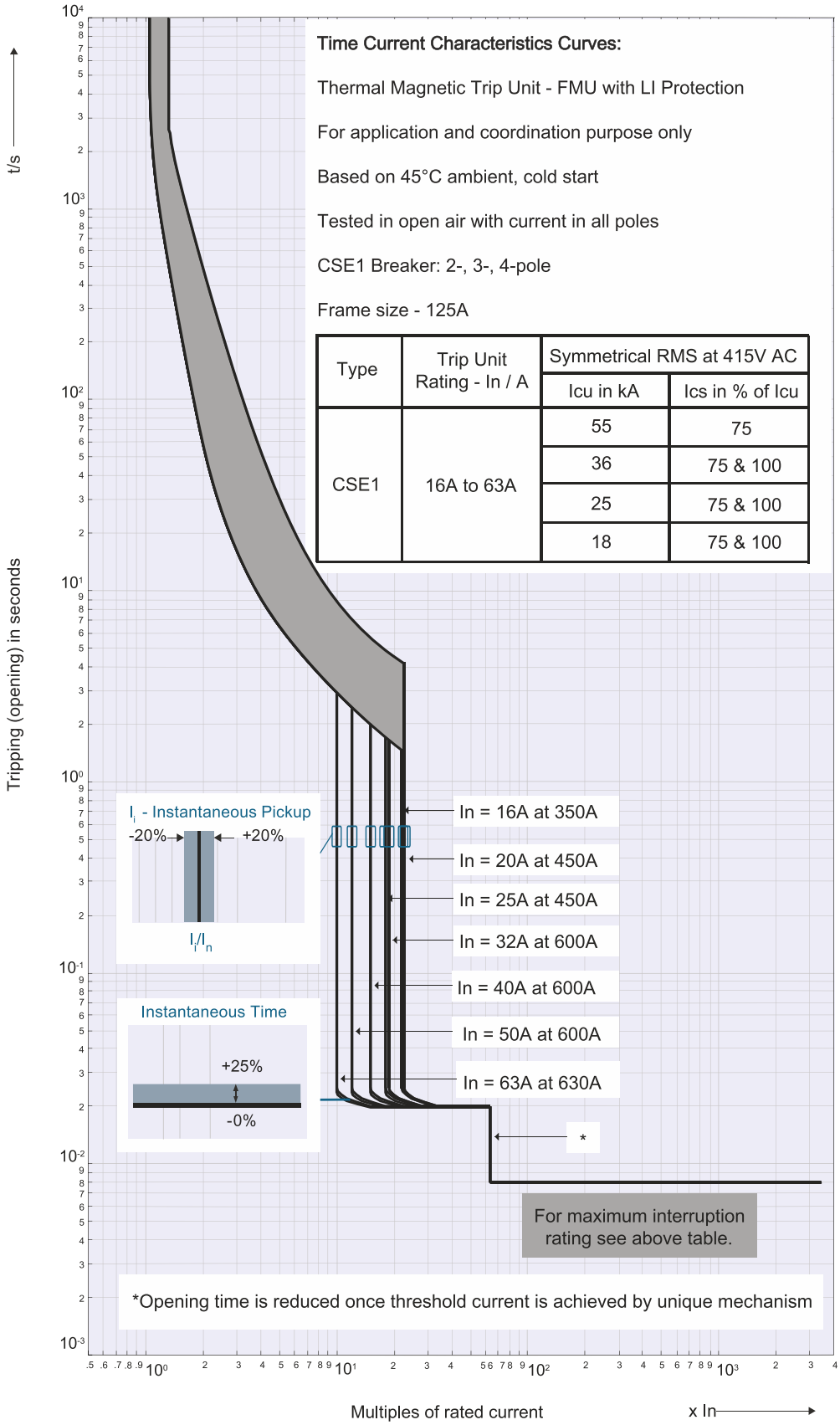
Type / Model

Tripping Curves for CSES with FMU Trip Unit



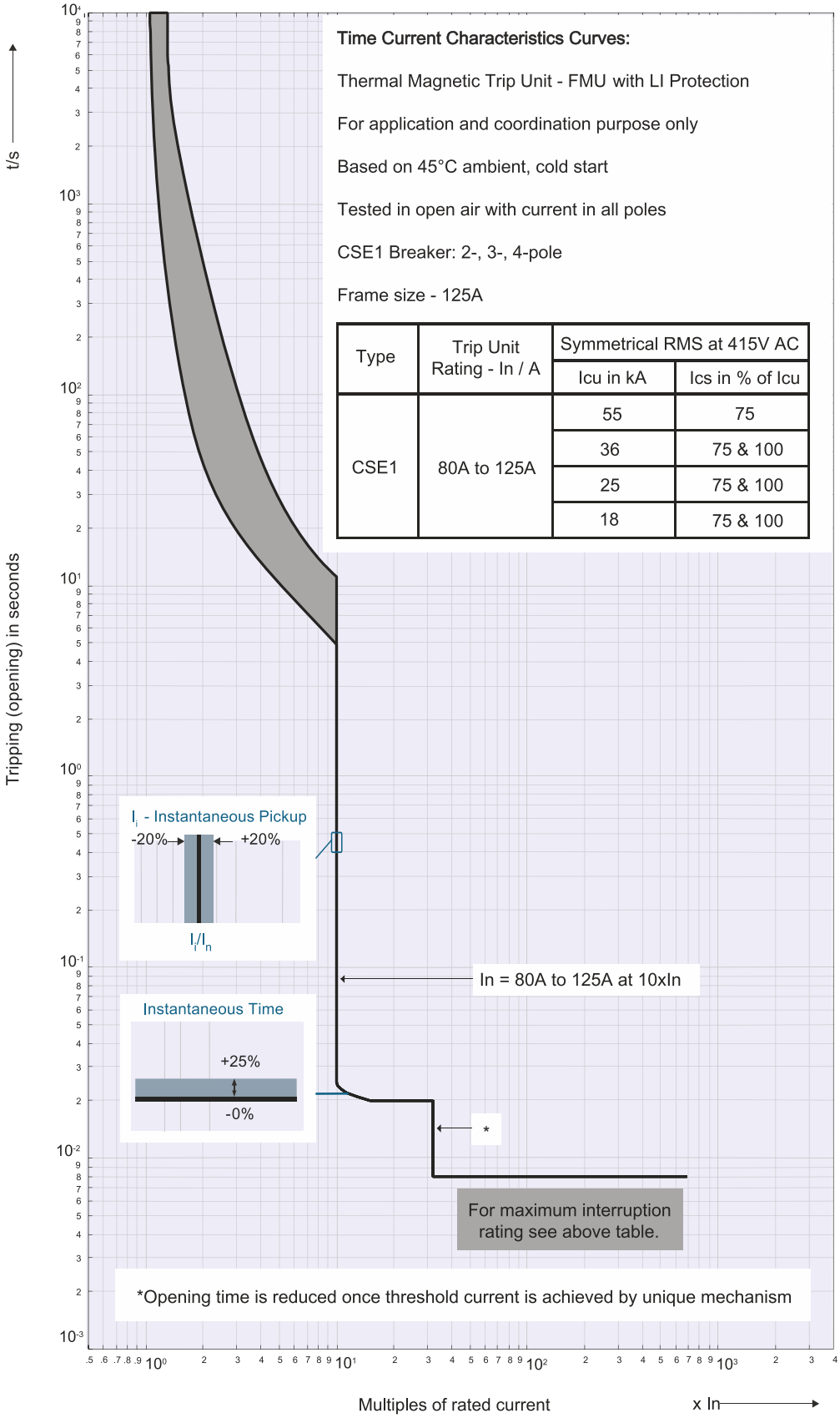
Type / Model

Tripping Curves for CSE1 with FMU Trip Unit



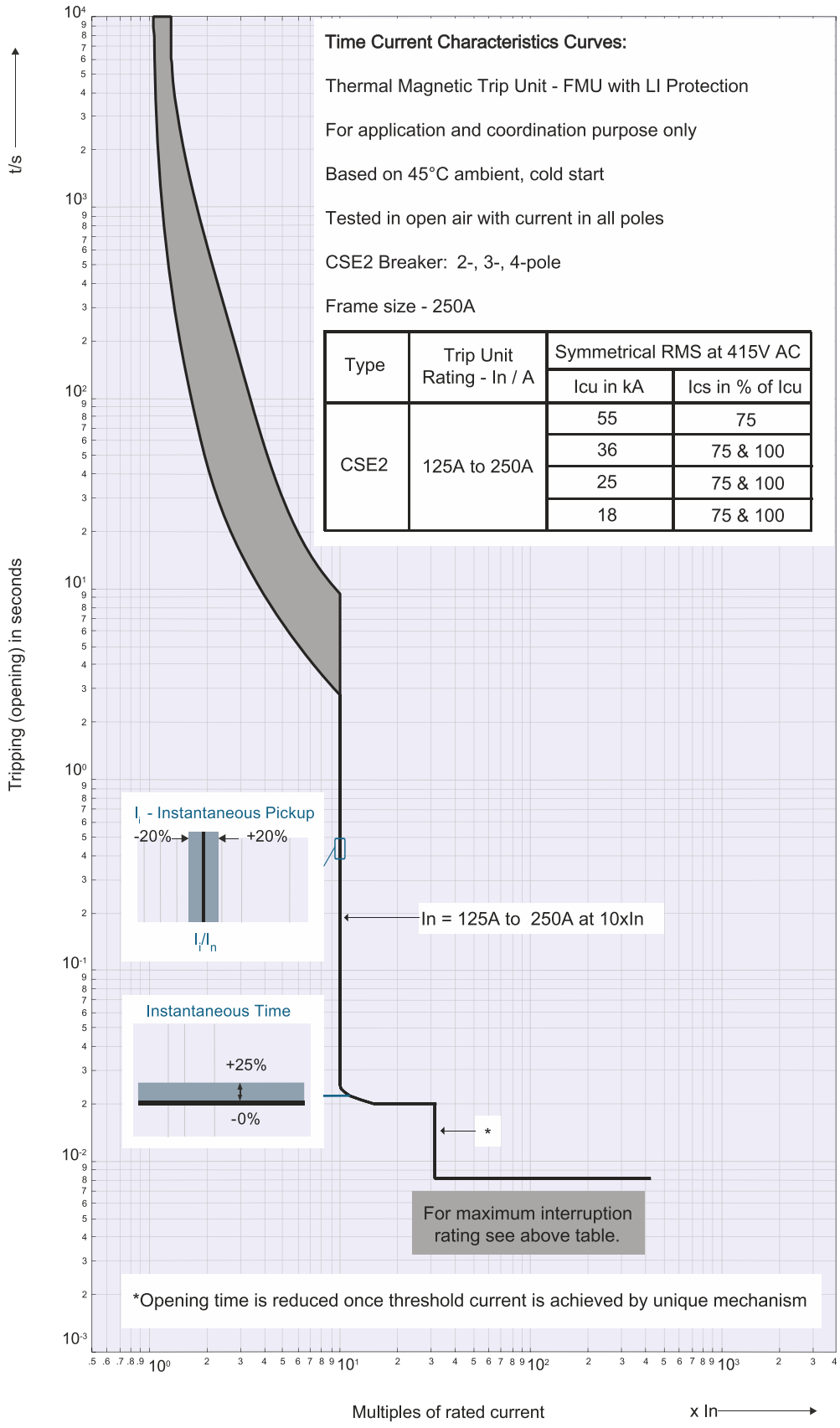
Type / Model

Tripping Curves for CSE1 with FMU Trip Unit

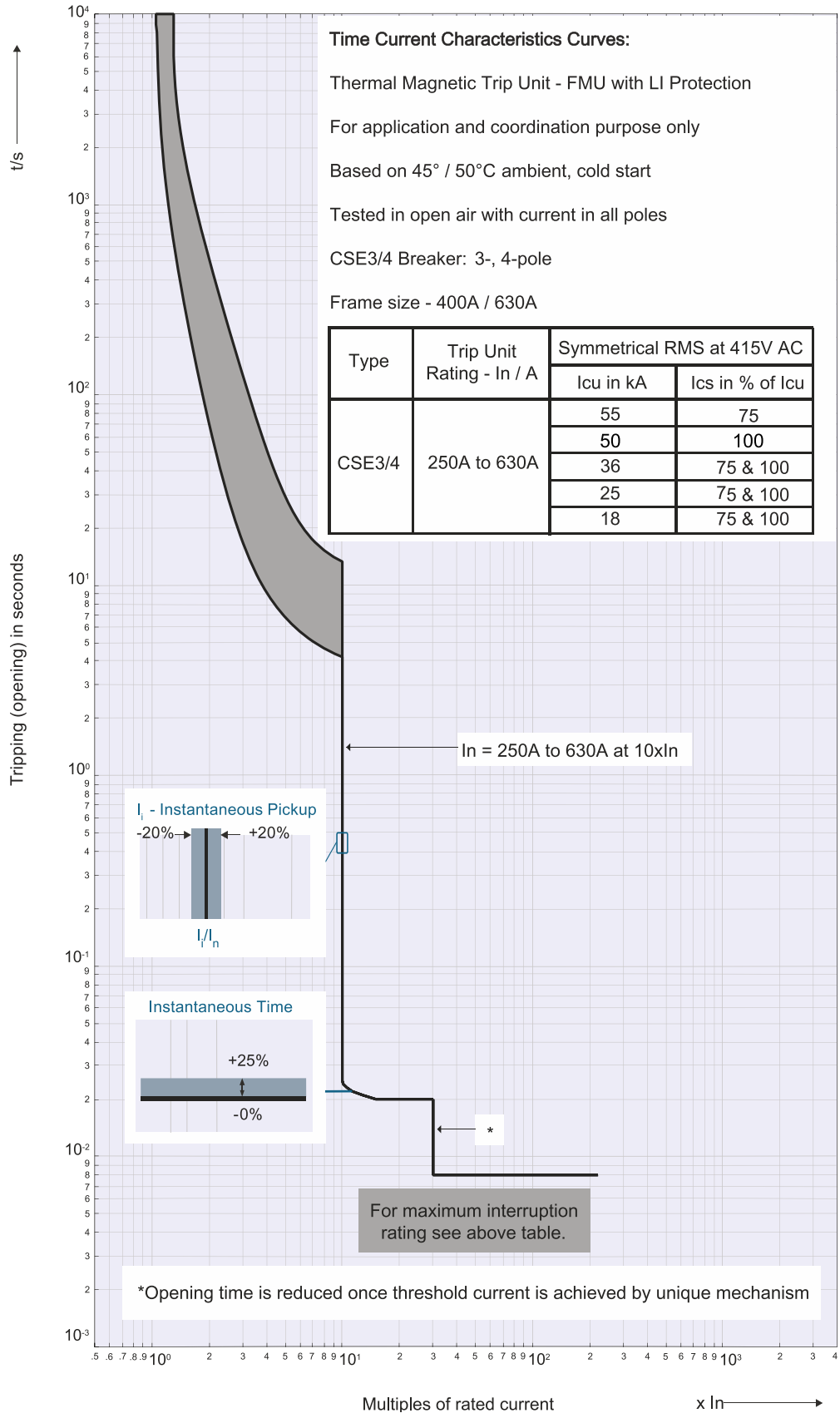


Type / Model

Tripping Curves for CSE2 with FMU Trip Unit

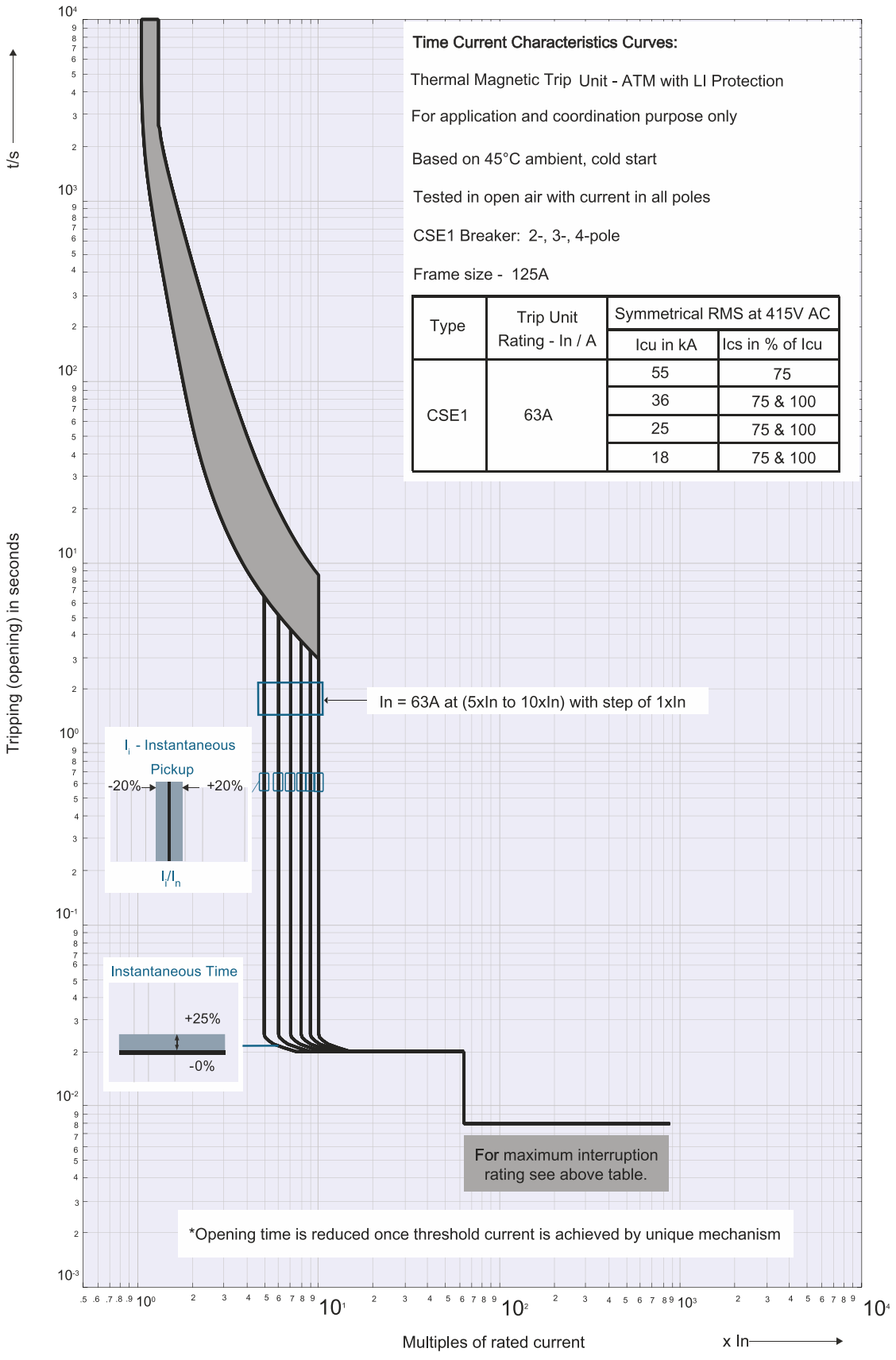


Type / Model
Tripping Curves for CSE3/4 with FMU Trip Unit



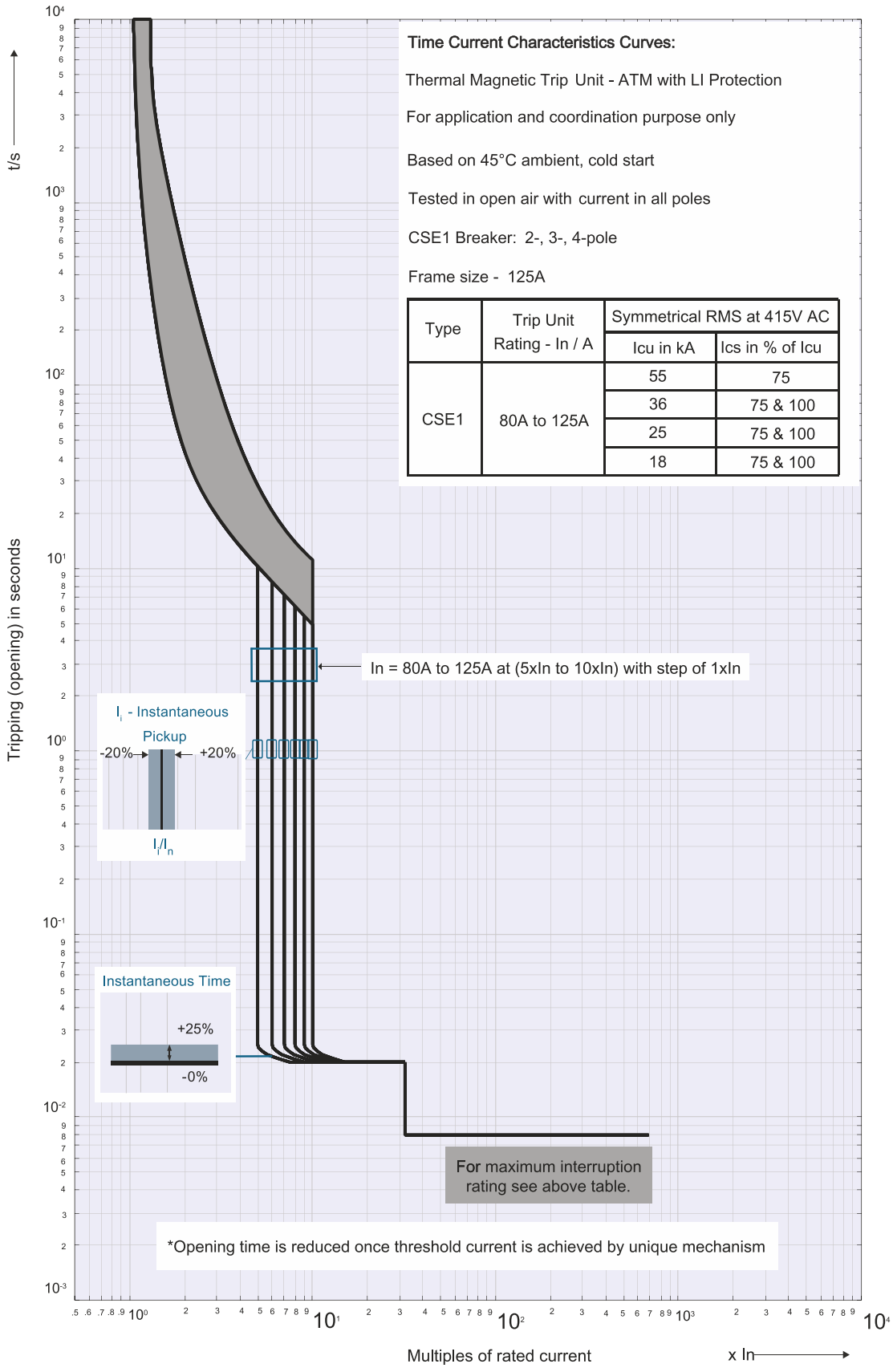
Type / Model

Tripping Curves for CSE1 with ATM Trip Unit



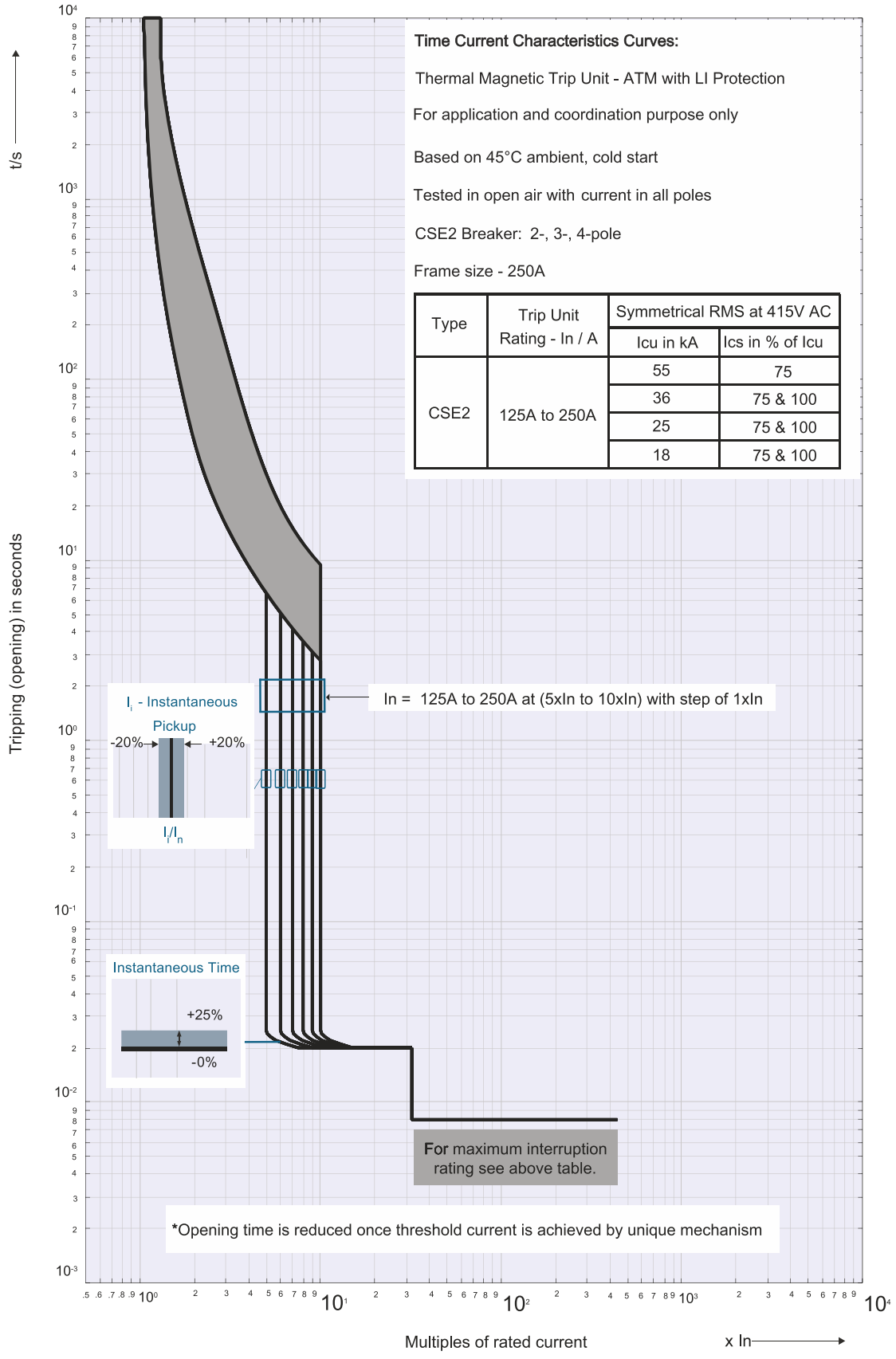
Type / Model

Tripping Curves for CSE1 with ATM Trip Unit

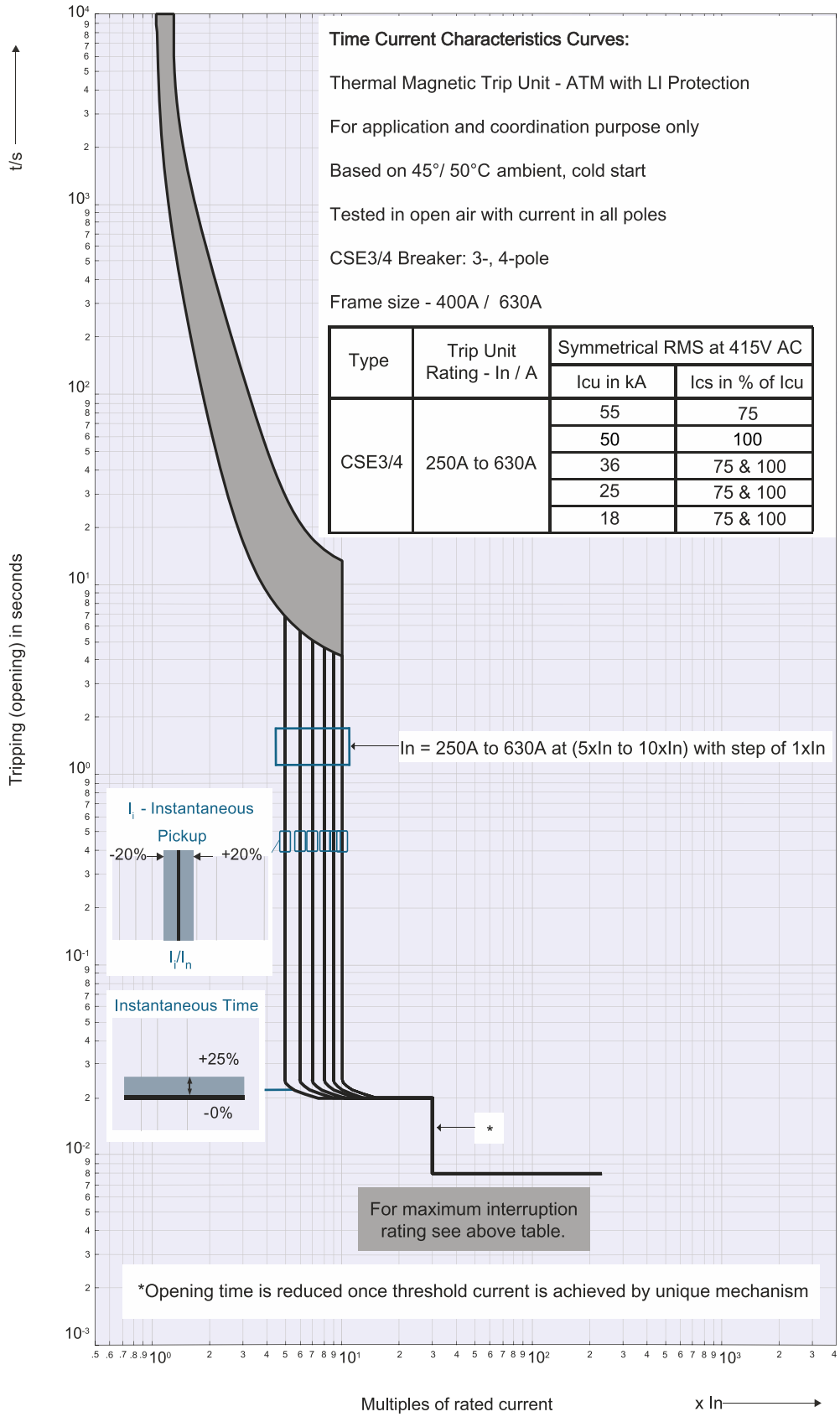


Type / Model

Tripping Curves for CSE2 with ATM Trip Unit

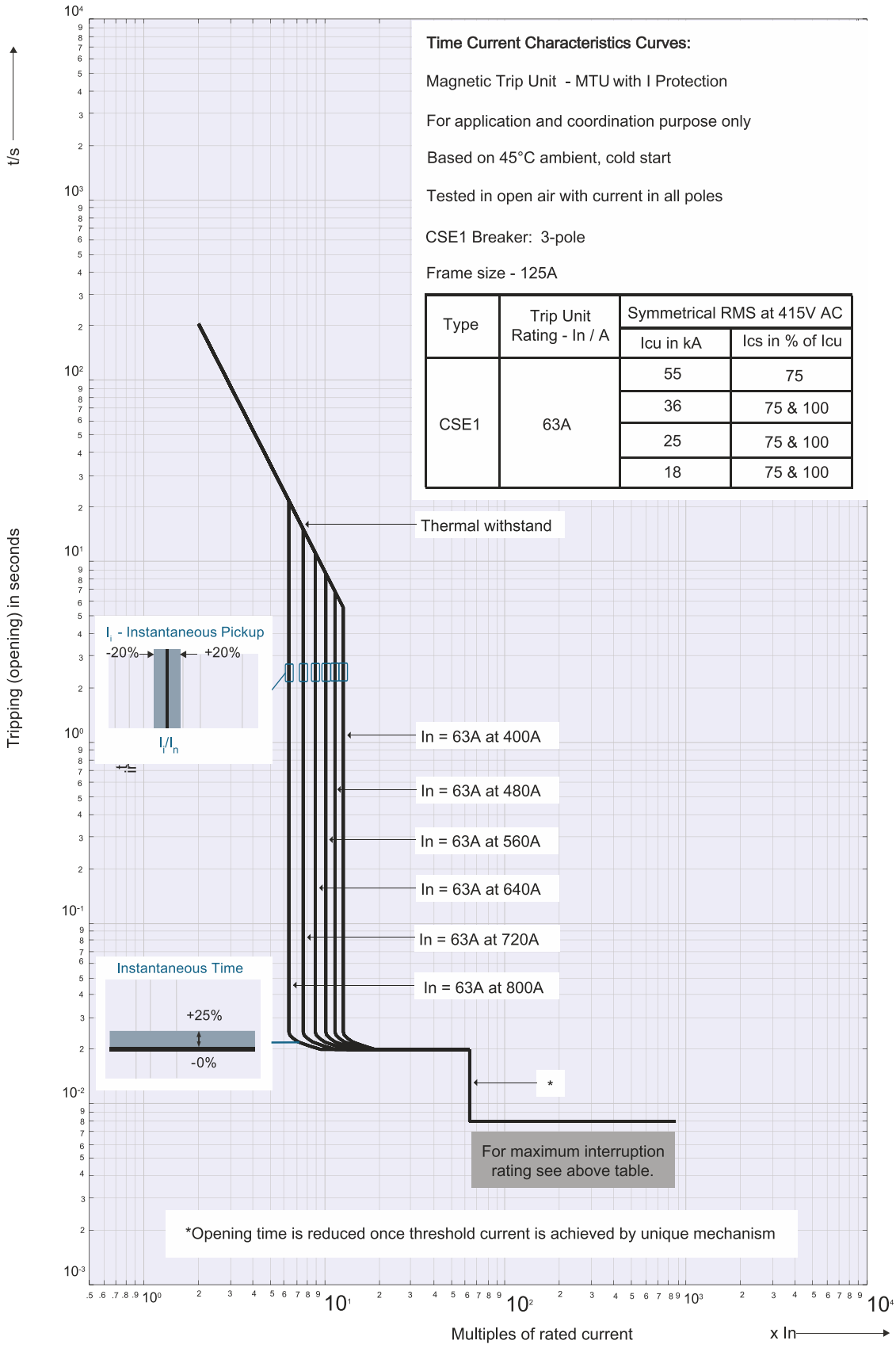


Type / Model
Tripping Curves for CSE3/4 with ATM Trip Unit



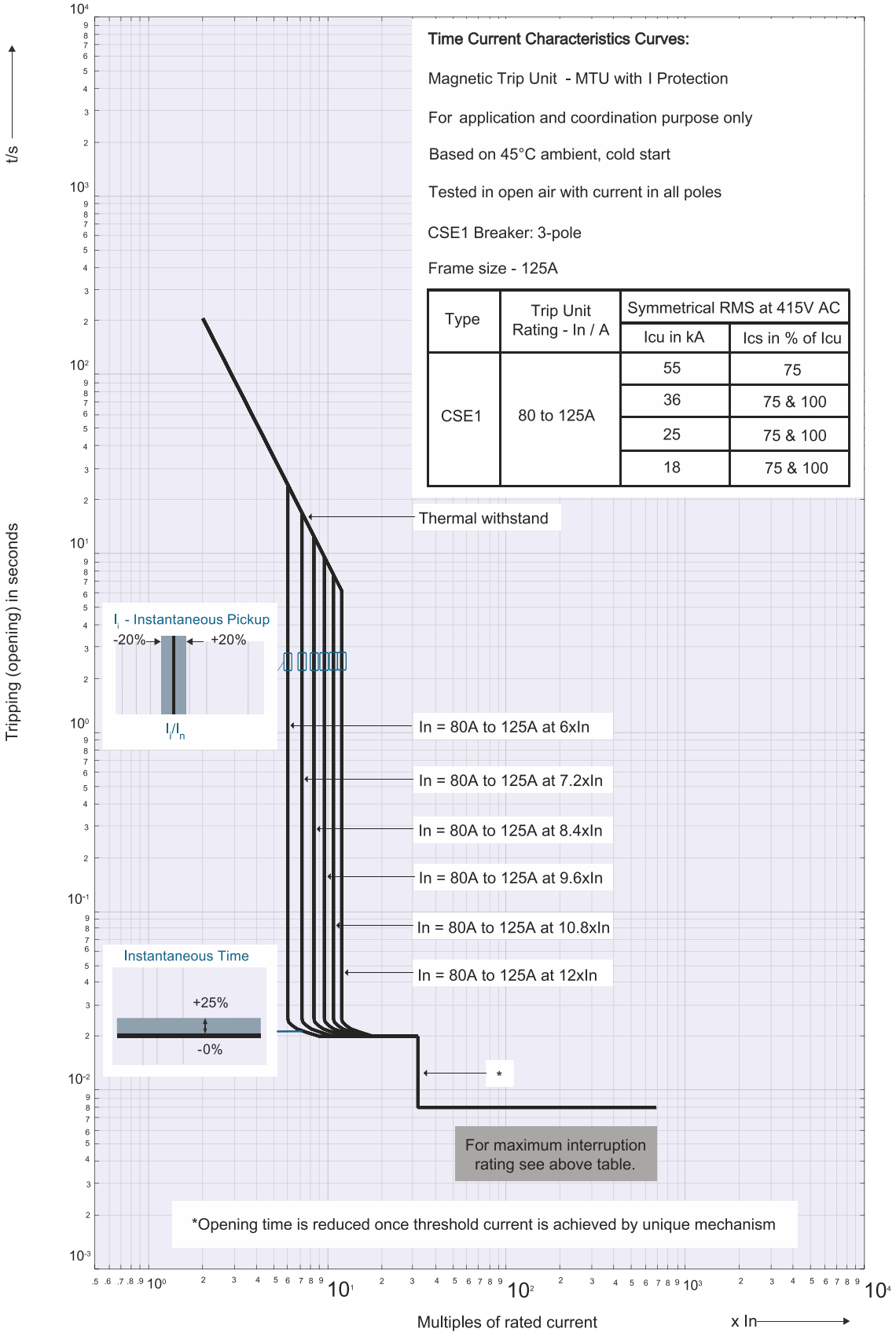
Type / Model

Tripping Curves for CSE1 with MTU Trip Unit



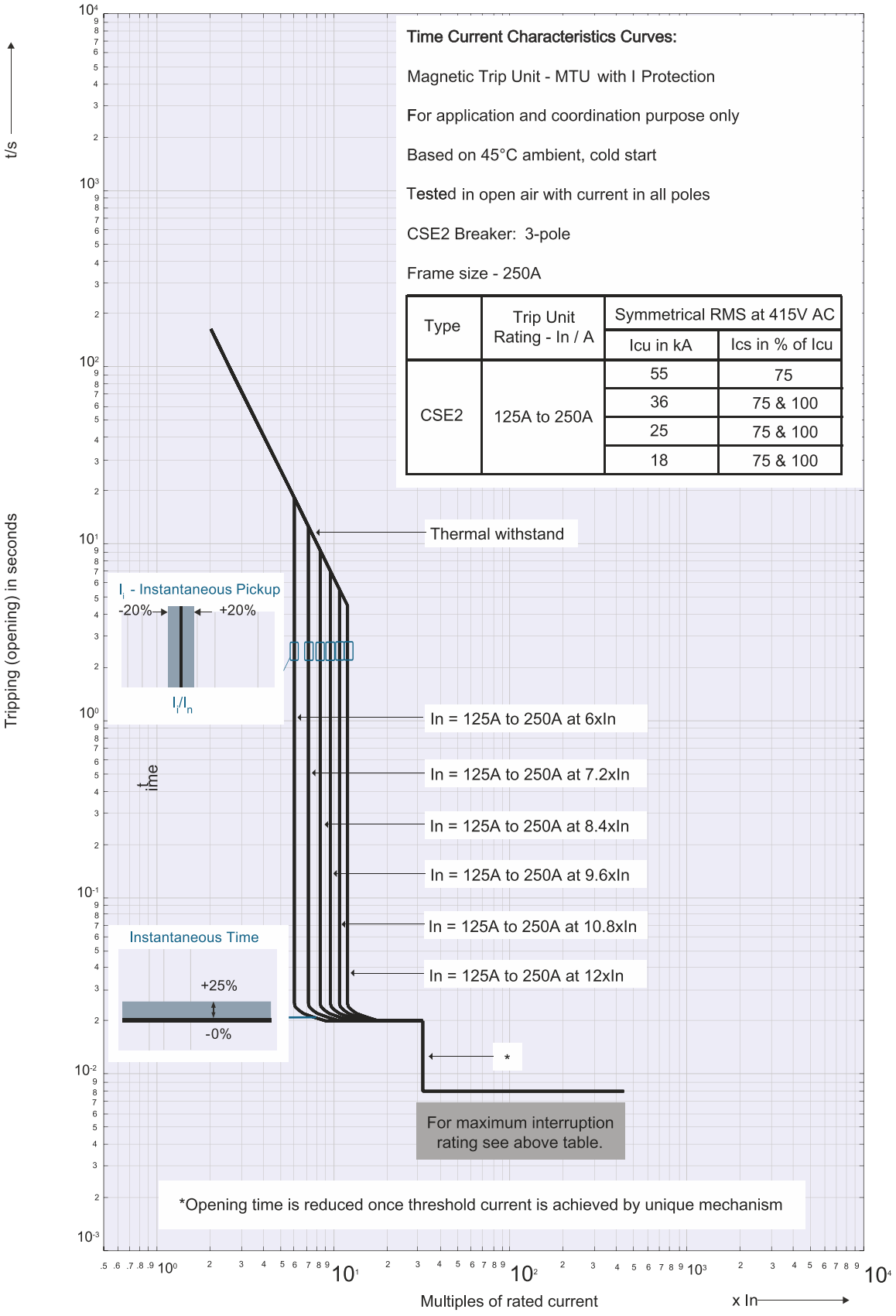
Type / Model

Tripping Curves for CSE1 with MTU Trip Unit



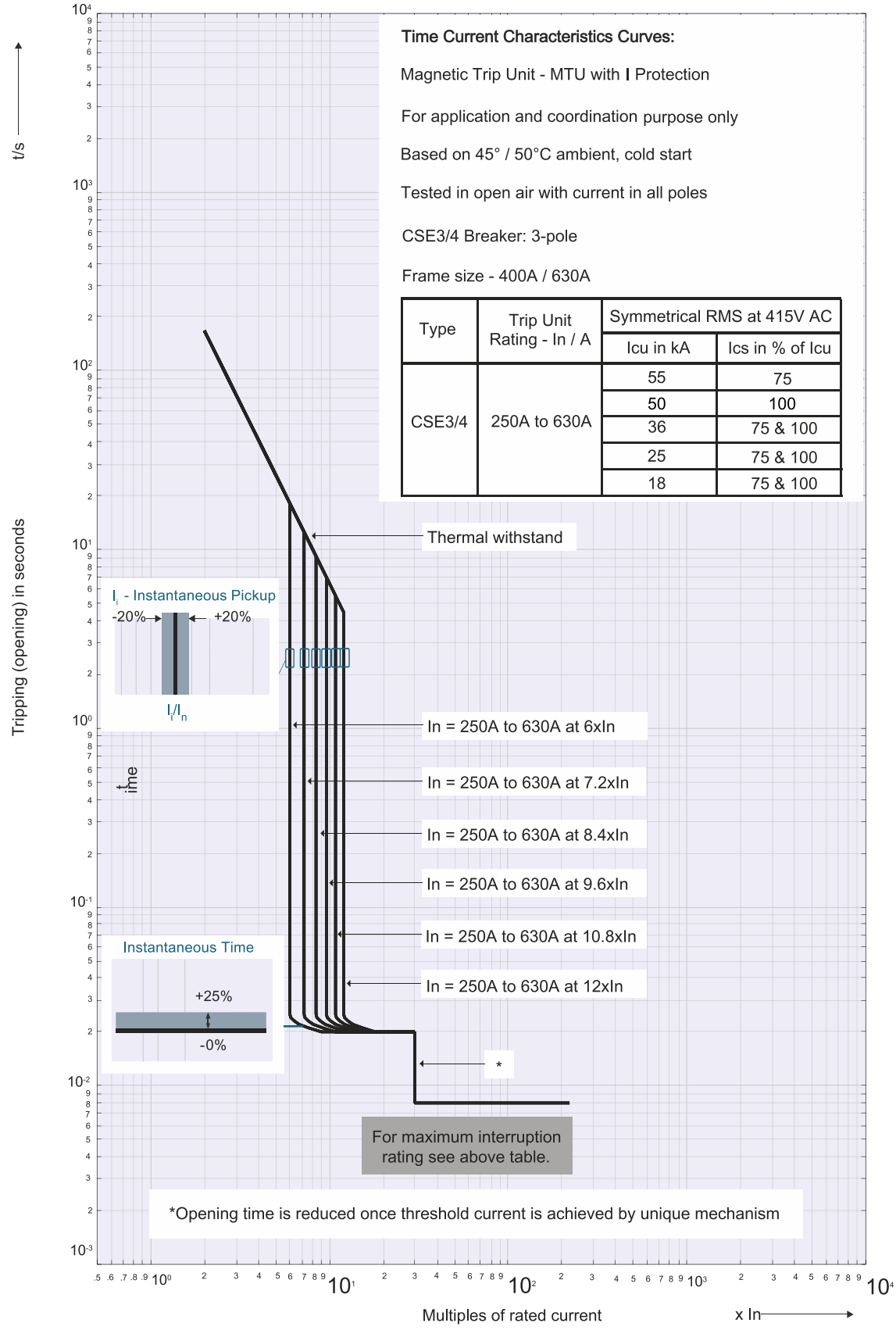
Type / Model

Tripping Curves for CSE2 with MTU Trip Unit



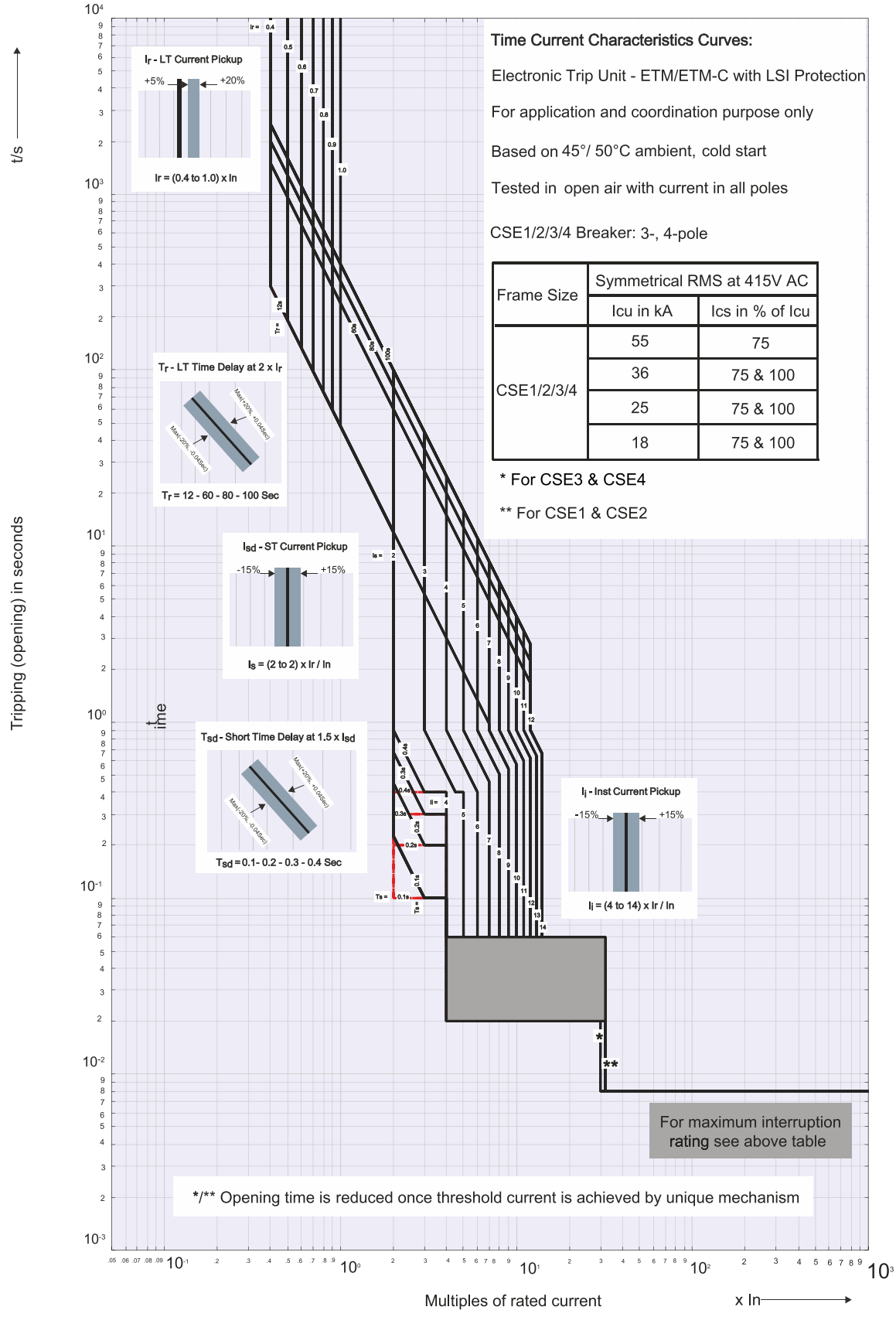
Type / Model

Tripping Curves for CSE3/4 with MTU Trip Unit



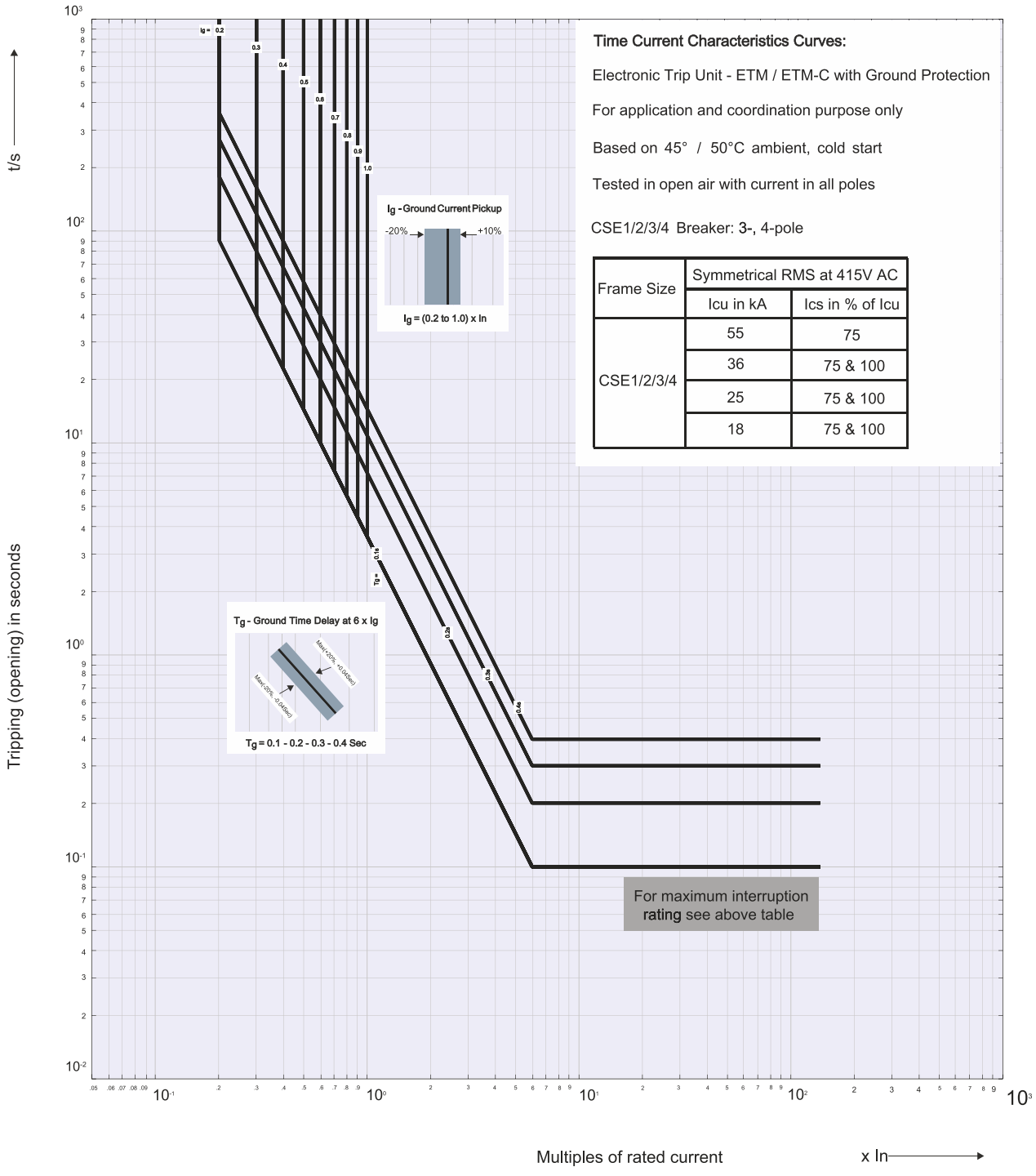
Type / Model

Tripping Curves for CSE1/2/3/4 with ETM / ETM-C Trip Unit



Type / Model

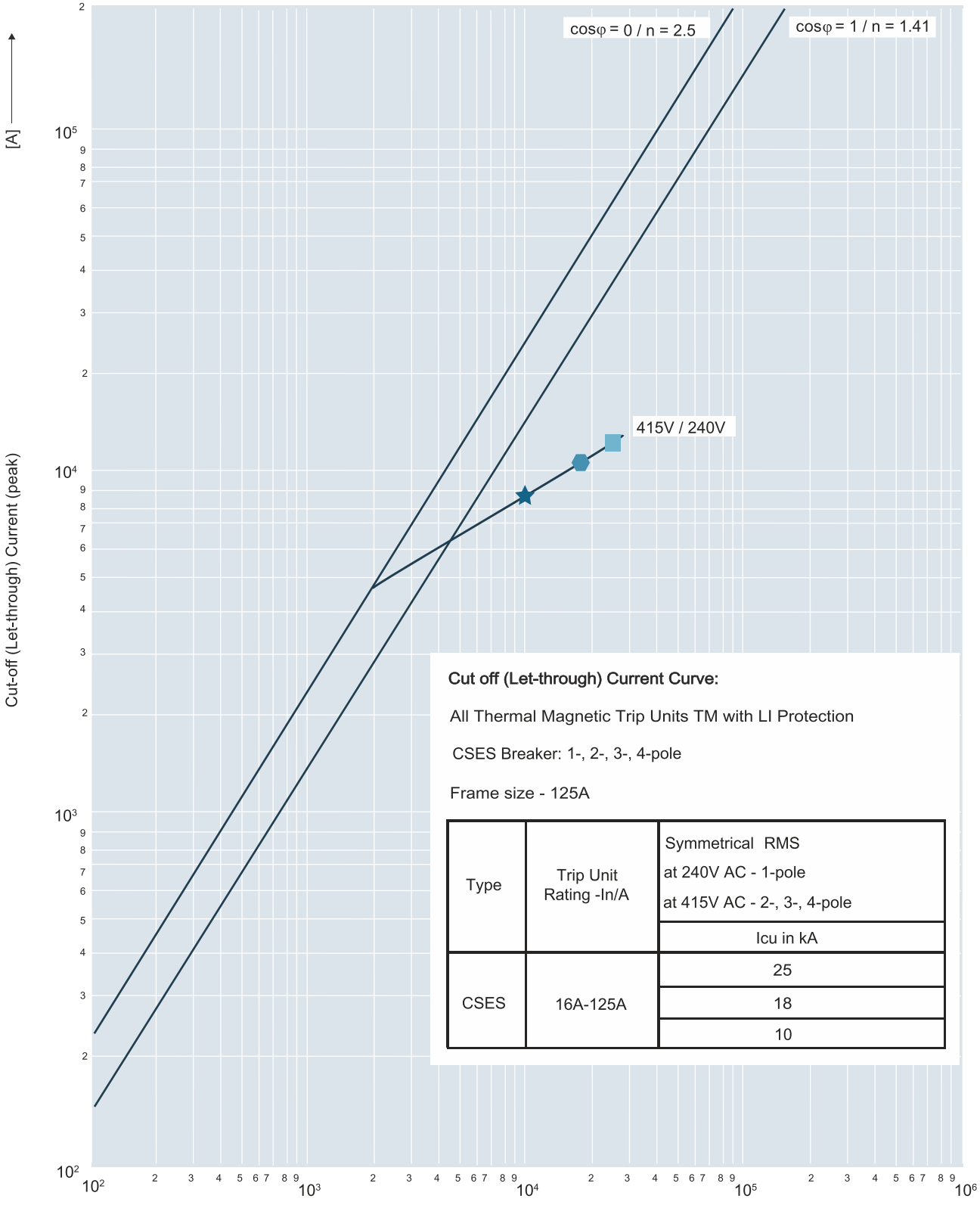
Tripping Curves for CSE1/2/3/4 with ETM / ETM-C Trip Unit



Frame Size	Symmetrical RMS at 415V AC	
	Icu in kA	Ics in % of Icu
CSE1/2/3/4	55	75
	36	75 & 100
	25	75 & 100
	18	75 & 100

Type / Model

Cut-off (Let-through) Current Curve "CSES"



Cut off (Let-through) Current Curve:

All Thermal Magnetic Trip Units TM with LI Protection

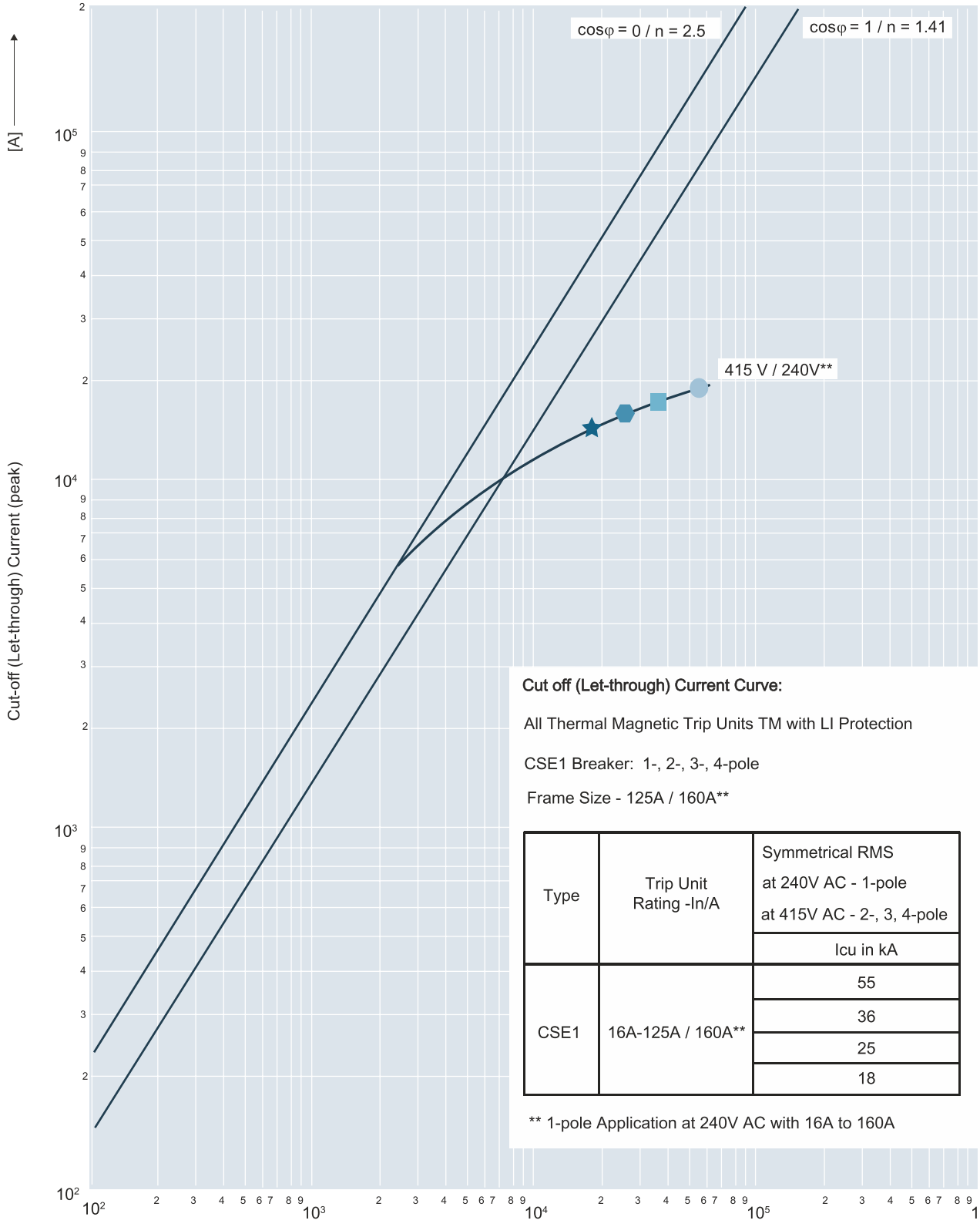
CSES Breaker: 1-, 2-, 3-, 4-pole

Frame size - 125A

Type	Trip Unit Rating -In/A	Symmetrical RMS at 240V AC - 1-pole at 415V AC - 2-, 3-, 4-pole
		Icu in kA
CSES	16A-125A	25
		18
		10

Type / Model

Cut-off (Let-through) Current Curve "CSE1"



Cut off (Let-through) Current Curve:

All Thermal Magnetic Trip Units TM with LI Protection

CSE1 Breaker: 1-, 2-, 3-, 4-pole

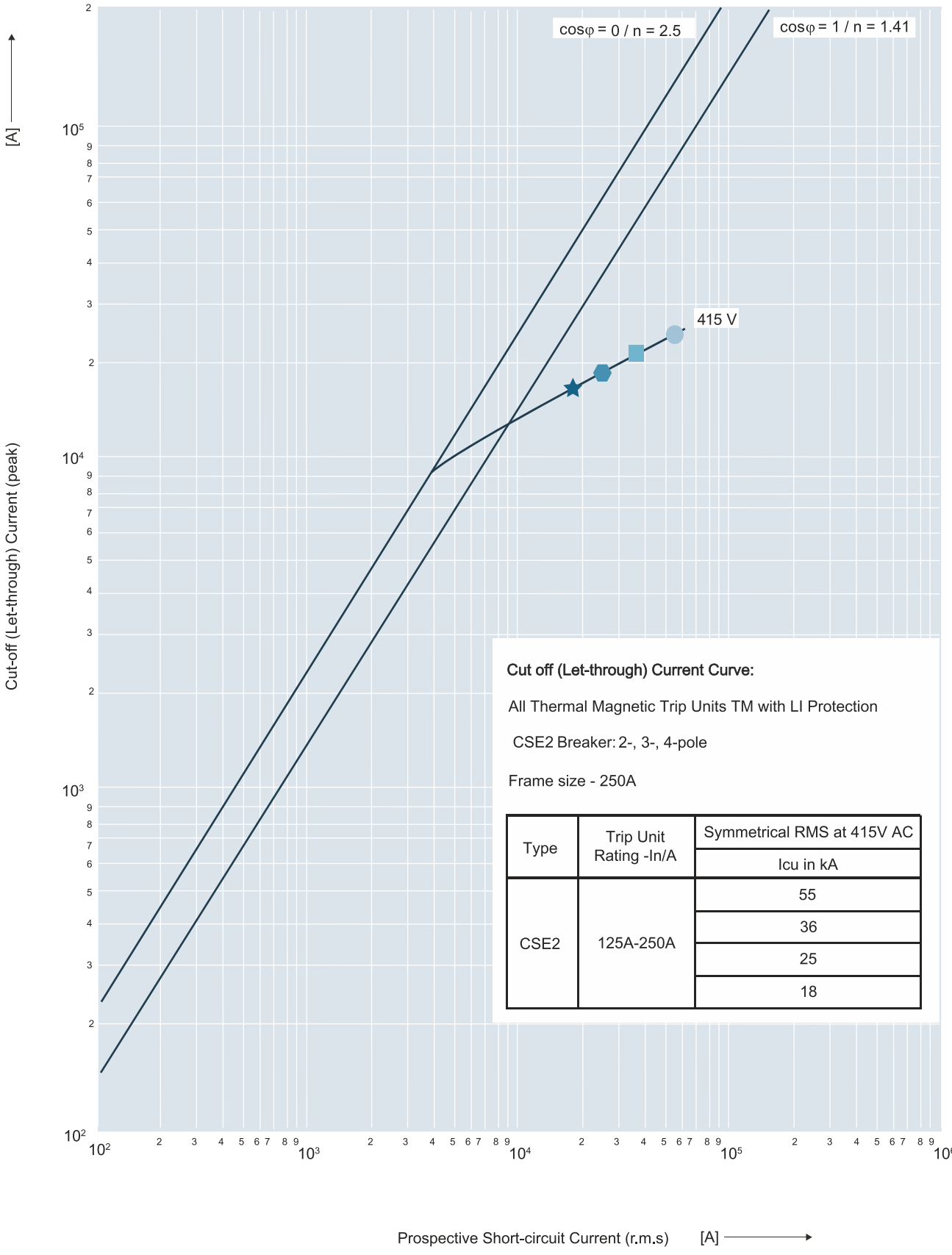
Frame Size - 125A / 160A**

Type	Trip Unit Rating -In/A	Symmetrical RMS at 240V AC - 1-pole at 415V AC - 2-, 3, 4-pole
		Icu in kA
CSE1	16A-125A / 160A**	55
		36
		25
		18

** 1-pole Application at 240V AC with 16A to 160A

Type / Model

Cut-off (Let-through) Current Curve "CSE2"



Cut off (Let-through) Current Curve:

All Thermal Magnetic Trip Units TM with LI Protection

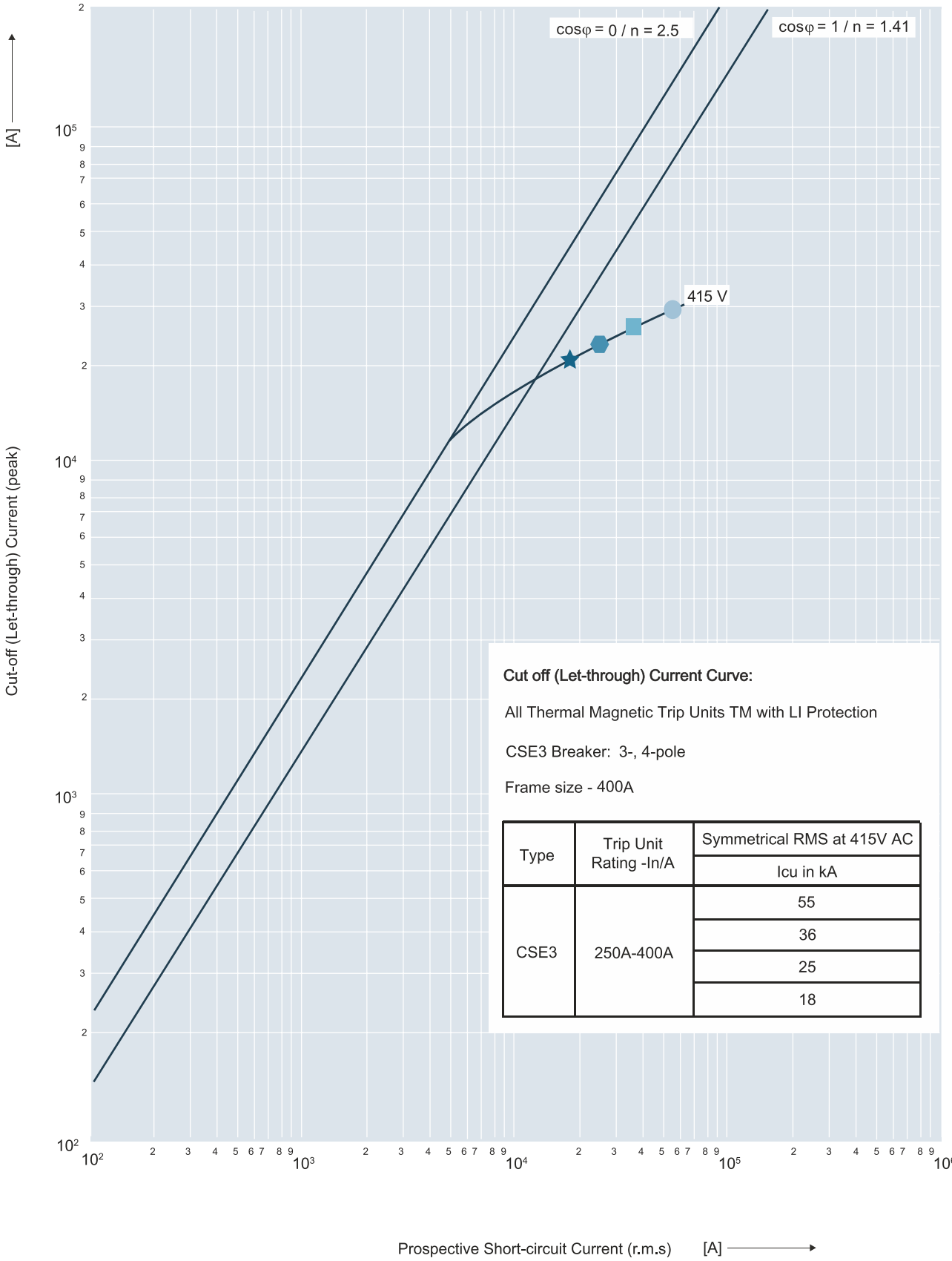
CSE2 Breaker: 2-, 3-, 4-pole

Frame size - 250A

Type	Trip Unit Rating -In/A	Symmetrical RMS at 415V AC
		Icu in kA
CSE2	125A-250A	55
		36
		25
		18

Type / Model

Cut-off (Let-through) Current Curve "CSE3"



Cut off (Let-through) Current Curve:

All Thermal Magnetic Trip Units TM with LI Protection

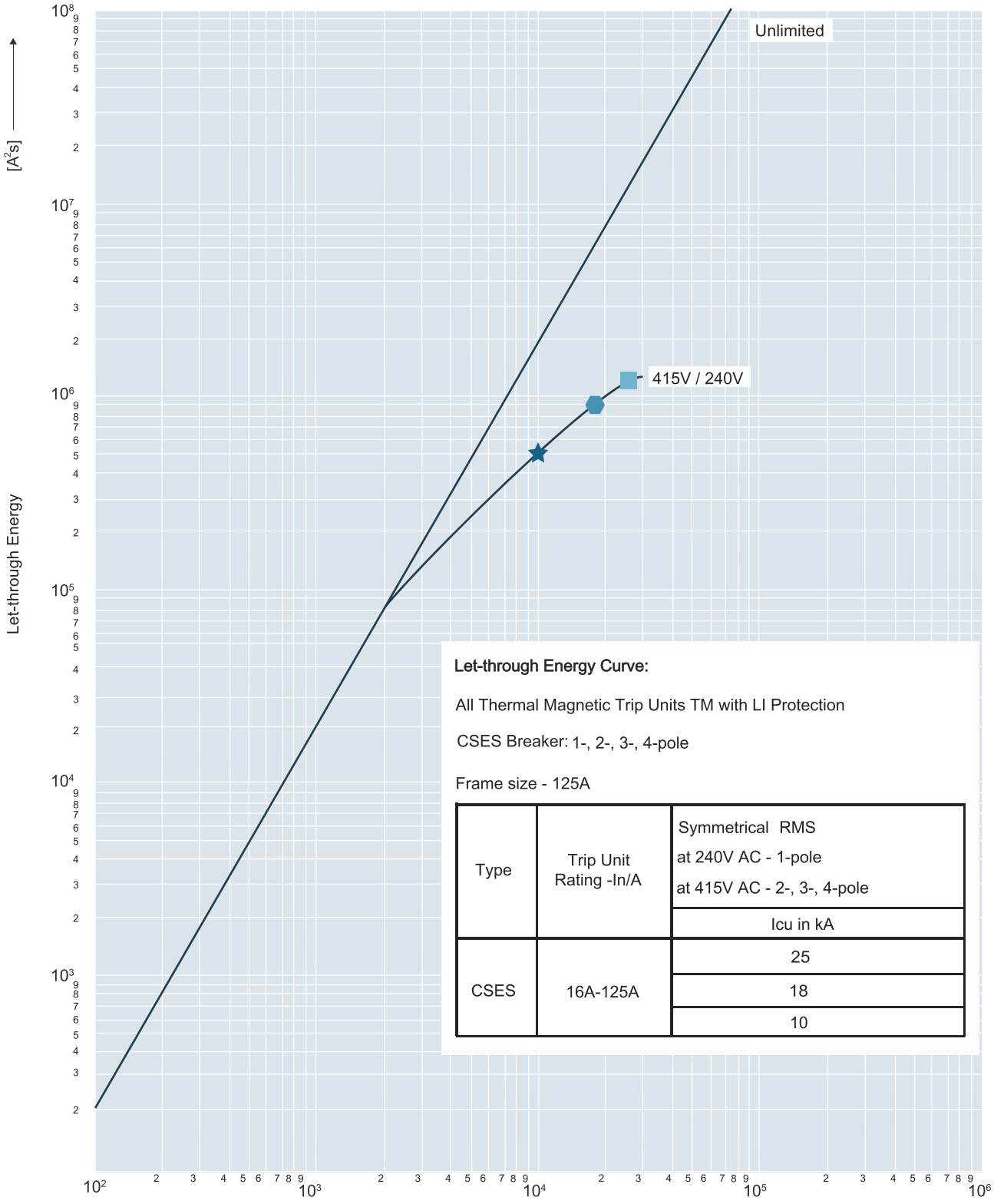
CSE3 Breaker: 3-, 4-pole

Frame size - 400A

Type	Trip Unit Rating -In/A	Symmetrical RMS at 415V AC
		Icu in kA
CSE3	250A-400A	55
		36
		25
		18

Type / Model

Let-through Energy Curve "CSES"



Let-through Energy Curve:

All Thermal Magnetic Trip Units TM with LI Protection

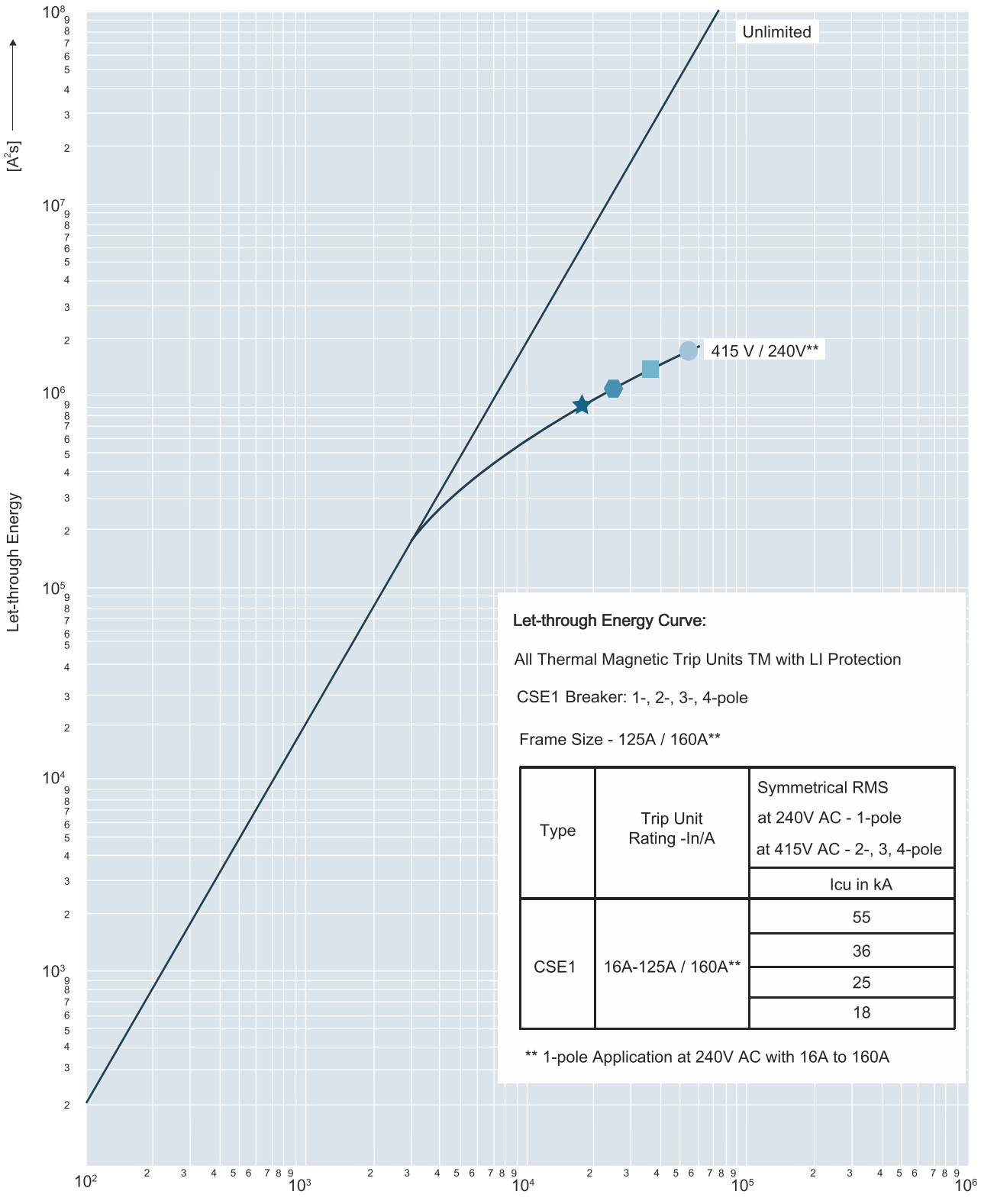
CSES Breaker: 1-, 2-, 3-, 4-pole

Frame size - 125A

Type	Trip Unit Rating -In/A	Symmetrical RMS at 240V AC - 1-pole at 415V AC - 2-, 3-, 4-pole
		Icu in kA
CSES	16A-125A	25
		18
		10

Type / Model

Let-through Energy Curve "CSE1"



Let-through Energy Curve:

All Thermal Magnetic Trip Units TM with LI Protection

CSE1 Breaker: 1-, 2-, 3-, 4-pole

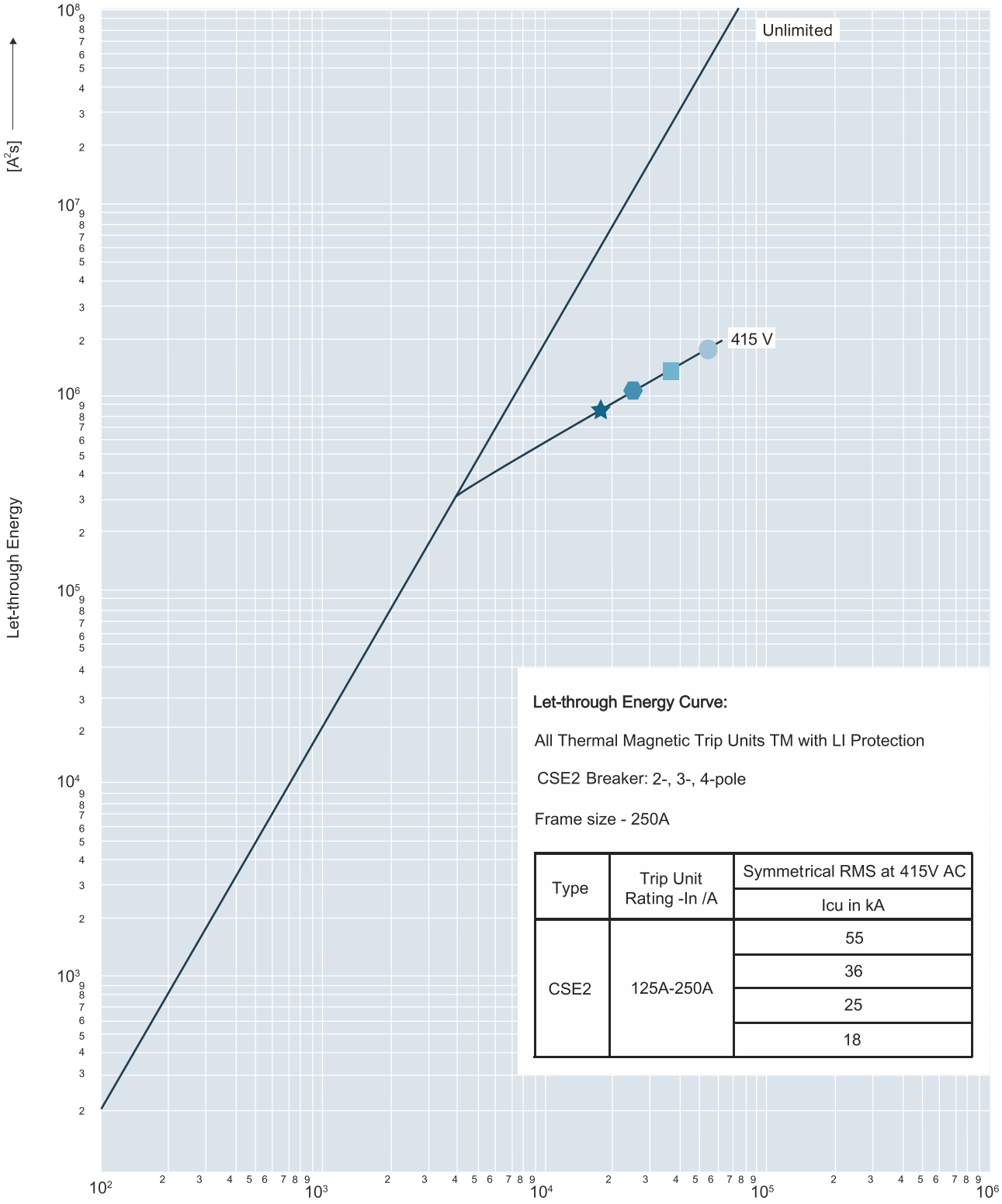
Frame Size - 125A / 160A**

Type	Trip Unit Rating -In/A	Symmetrical RMS at 240V AC - 1-pole at 415V AC - 2-, 3, 4-pole
		Icu in kA
CSE1	16A-125A / 160A**	55
		36
		25
		18

** 1-pole Application at 240V AC with 16A to 160A

Type / Model

Let-through Energy Curve "CSE2"



Let-through Energy Curve:

All Thermal Magnetic Trip Units TM with LI Protection

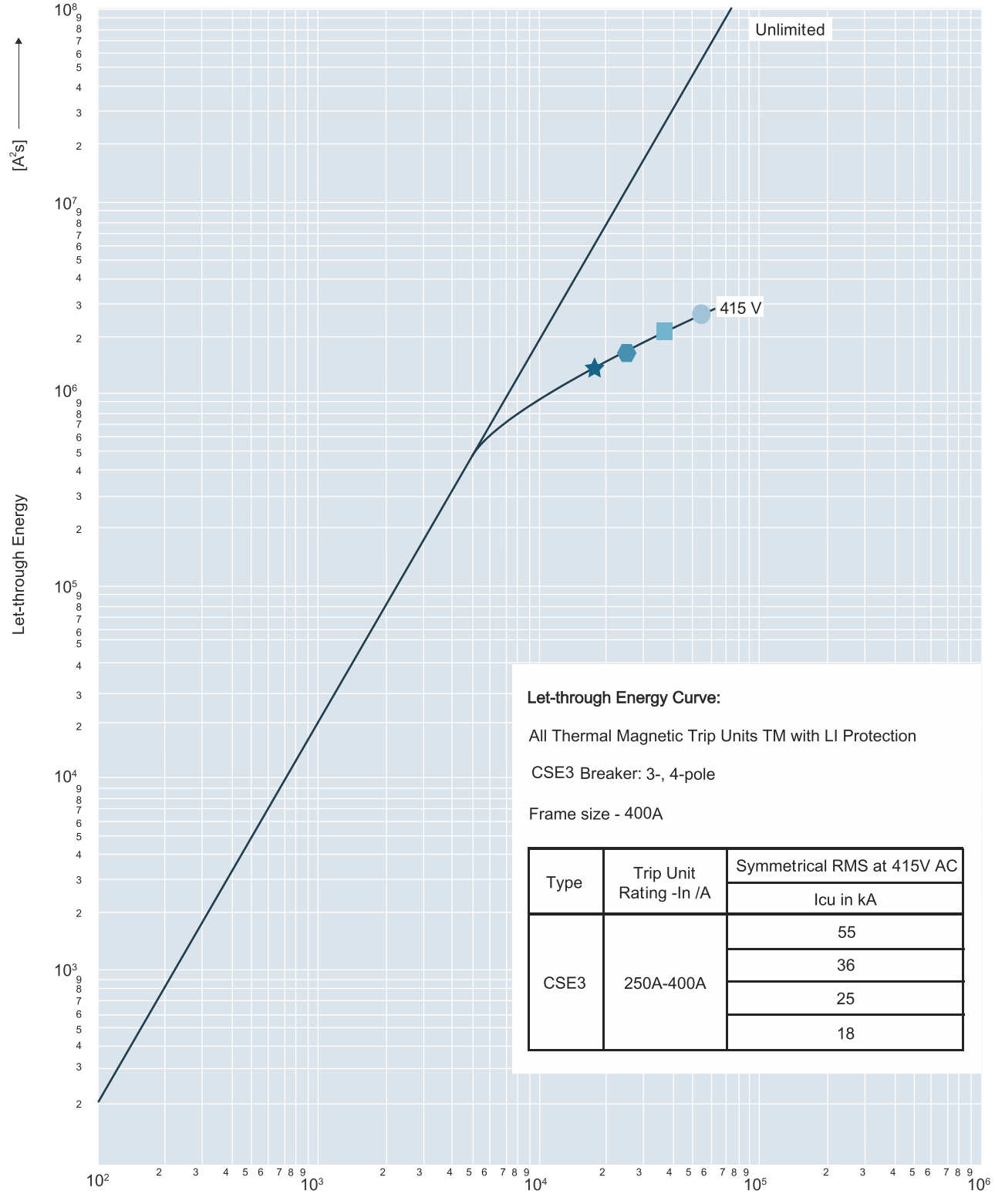
CSE2 Breaker: 2-, 3-, 4-pole

Frame size - 250A

Type	Trip Unit Rating -In /A	Symmetrical RMS at 415V AC Icu in kA
CSE2	125A-250A	55
		36
		25
		18

Type / Model

Let-through Energy Curve "CSE3"



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