

Type: **NZMN2-M125** Article No.: **265723** 

Sales text Circuit-breaker 3p 125A motor protection



Ordering information					
Number of poles			3-pole		
Description			Terminal screws standard, terminals as accessories		
Rated current = rated uninterrupted current	<i>I</i> <sub>u</sub>	Α	125		
Setting range					
Overload releases	<i>I</i> <sub>r</sub>	Α	100125		
Non-delayed short-circuit release		Α	10001750		
Motor rating AC-3 at 400 V 50/60 Hz	Р	kW	55		
Rated operational current AC-3 at 400 V 50/60 Hz	l <sub>e</sub>	Α	99		
Switching capacity					
Switching capacity		kA	50		
Release system			Thermomagnetic release		
Frame size			NZM2		

# Notes concerning the product group

IEC/EN 60947-4-1 and IEC/EN 60947-2

The circuit-breaker fulfills all requirements for AC 3 switching category

Adjustable overload releases  $I_r$ 

- NZM...1-M...: with single phasing sensitivity
- Tripping class 10 A

Adjustable short-circuit releases Ii

• 8 ... 14 × 
$$I_n$$
 (ex-works 12 ×  $I_n$ )

– NZMH2–M32: 10 ... 14 × 
$$I_n$$
 (ex–works 12 ×  $I_n$ )

- NZM...1-M100: 8 ... 12.5 × 
$$I_n$$
 (ex-works 12 ×  $I_n$ )

Fixed short-circuit release Ii

• 350 A at 
$$I_n = 20 \dots 25 \text{ A}$$

Tripping class	Tripping time <i>T</i> p with load on all poles of 7.2 times current setting value
250 A	$2 s < T_p \stackrel{\leq}{=} 10 s$
10	$2 s < T_p \stackrel{\leq}{=} 10 s$
20	$6 \text{ s} < T_p \stackrel{\leq}{=} 20 \text{ s}$
30	9 s < <i>T</i> <sub>p</sub> <sup>≤</sup> 30 s

# Notes concerning the product group

Notes for terminals 262240

General		
Standards		IEC/EN 60947
Protection against direct contact		Finger and back of hand proof to VDE 0106 Part 100
Climatic proofing		Damp heat, constant, according to IEC 60068–2–78 Damp heat, cyclical to IEC 60068–2–30
Ambient temperature		
Ambient temperature, Storage	°C	25+70
Operation	°C	25+70
Mechanical shock resistance (IEC/EN 60068-2-27)		

Shock resistance		g	20 (half-sinusoidal shock 20 ms)
Safe isolation to VDE 0106 Part 101 and Part 101/A1			
Between auxiliary contacts and main contacts		V AC	500
between the auxiliary contacts		V AC	300
Dimensions			
Weight			
Weight		kg	2,345
Mounting position			
Direction of incoming supply			As required
Degree of protection			
Device			In the operating controls area: IP20 (basic degree of protection)
Enclosures			With insulating surround: IP40, with door coupling rotary handle: IP66
Terminations			Tunnel terminal: IP10 Phase isolator and strip terminal: IP00
Lifespan			
Releases			
Electrical lifespan at 8 A/230 V AC/70 °C	Operations		7500
Circuit-breakers			
Rated impulse with stand voltage $U_{\rm imp}$			
Main contacts		V	8000
Auxiliary contacts		V	6000
Rated operational voltage	<i>U</i> e	V AC	690
Overvoltage category/pollution degree			III/3
Rated insulation voltage	<i>U</i> i	V	1000
For use in IT electrical power networks		V	690
Switching capacity			
Rated short-circuit making capacity			
240 V	<i>I</i> <sub>cm</sub>	kA	187
400/415 V	<i>I</i> <sub>cm</sub>	kA	105
440 V	<i>I</i> <sub>cm</sub>	kA	74
440 V 525 V	I <sub>cm</sub>	kA kA	74 53

Rated short-circuit breaking capacity lon loud to Ite C/EN 60947 operating sequence O-I-CO  ### 15 V 80/60 Hz  ### 15 V 80/60 H	000.1/	•		40
Icn         Icn <td>690 V</td> <td><i>I</i><sub>cm</sub></td> <td>kA</td> <td>40</td>	690 V	<i>I</i> <sub>cm</sub>	kA	40
sequence O-t-CO       240 V 50/60 Hz       Icu       kA       85         400/415 V 50/60 Hz       Icu       kA       50         415 V AC       Icu       kA       50         440 V 50/60 Hz       Icu       kA       35         525 V 50/60 Hz       Icu       kA       25         690 V 50/60 Hz       Icu       kA       20         500 V DC       Icu       kA       30         750 V DC       Icu       kA       30         Icu       to IEC/EN 60947 operating sequence O-t-CO-t-CO       lcs       kA       85         400/415 V 50/60 Hz       Ics       kA       50         415 V AC       Ics       kA       50         400/415 V 50/60 Hz       Ics       kA       35         525 V 50/60 Hz       Ics       kA       25         400 V 50/60 Hz       Ics       kA       5         690 V AC       Ics       kA       10         Maximum low-voltage h.b.c. fuse       A       A <t< td=""><td></td><td></td><td></td><td></td></t<>				
400/415 V 50/60 Hz				
415 V AC  440 V 50/60 Hz  440 V 50/60 Hz  525 V 50/60 Hz  690 V 60 Hz	240 V 50/60 Hz	<i>I</i> cu	kA	85
440 V 50/60 Hz   lou	400/415 V 50/60 Hz	<i>I</i> cu	kA	50
525 V 50/60 Hz	415 V AC	<i>I</i> cu	kA	50
690 V 50/60 Hz	440 V 50/60 Hz	<i>I</i> cu	kA	35
Soo V DC	525 V 50/60 Hz	<i>I</i> <sub>cu</sub>	kA	25
750 V DC	690 V 50/60 Hz	<i>I</i> <sub>cu</sub>	kA	20
I <sub>cu</sub> to IEC/EN 60947 operating sequence O-t-CO-t-CO       sequence O-t-CO-t-CO         240 V 50/60 Hz       I <sub>cs</sub> kA       85         400/415 V 50/60 Hz       I <sub>cs</sub> kA       50         415 V AC       I <sub>cs</sub> kA       50         up to 440 V 50/60 Hz       I <sub>cs</sub> kA       35         525 V 50/60 Hz       I <sub>cs</sub> kA       25         up to 690 V 50/60 Hz       I <sub>cs</sub> kA       5         690 V AC       I <sub>cs</sub> kA       10         Maximum low-voltage h.b.c. fuse       AgG/gL       355         Technical data, divergent from the products for the IEC         marketSwitching capacity NA switches (UL489, CSA 22.2 No. 5.1)       kA       85         240 V 60 Hz       kA       35         480V 60Hz       kA       25         Utilization category to IEC/EN 60947-2       A         Rated short-time withstand current       L         t = 0.3 s       I <sub>cw</sub> kA       1,9         Lifespan, mechanical       Operations       20000         Maximum operating frequency       Ops/h       120	500 V DC	<i>I</i> <sub>cu</sub>	kA	30
sequence O-t-CO-t-CO       Ics       kA       85         400/415 V 50/60 Hz       Ics       kA       50         415 V AC       Ics       kA       50         up to 440 V 50/60 Hz       Ics       kA       35         525 V 50/60 Hz       Ics       kA       25         up to 690 V 50/60 Hz       Ics       kA       5         690 V AC       Ics       kA       10         Maximum low-voltage h.b.c. fuse       AgG/gL       355         Technical data, divergent from the products for the IEC         marketSwitching capacity NA switches (UL489, CSA 22.2 No. 5.1)       kA       85         480V 60 Hz       kA       35         600 V 60 Hz       kA       25         Utilization category to IEC/EN 60947-2       A         Rated short-time withstand current       t = 0.3 s       Icw       kA       1,9         t = 1 s       Icw       kA       1,9         Lifespan, mechanical       Operations       20000         Maximum operating frequency       Ops/h       120	750 V DC	<i>I</i> <sub>cu</sub>	kA	30
400/415 V 50/60 Hz       Ics       kA       50         415 V AC       Ics       kA       50         up to 440 V 50/60 Hz       Ics       kA       35         525 V 50/60 Hz       Ics       kA       5         690 V AC       Ics       kA       10         Maximum low-voltage h.b.c. fuse       AgG/gL       355         Technical data, divergent from the products for the IEC marketSwitching capacity NA switches (UL489, CSA 22.2 No. 5.1)         240 V 60 Hz       kA       85         480V 60Hz       kA       35         600 V 60 Hz       kA       25         Utilization category to IEC/EN 60947-2       A         Rated short-time withstand current       t = 0.3 s       Icw       kA       1,9         t = 1 s       Icw       kA       1,9         Lifespan, mechanical       Operations       20000         Maximum operating frequency       Ops/h       120	•			
415 V AC       I <sub>cs</sub> kA       50         up to 440 V 50/60 Hz       I <sub>cs</sub> kA       35         525 V 50/60 Hz       I <sub>cs</sub> kA       25         up to 690 V 50/60 Hz       I <sub>cs</sub> kA       5         690 V AC       I <sub>cs</sub> kA       10         Maximum low-voltage h.b.c. fuse       AgG/gL       355         Technical data, divergent from the products for the IEC marketSwitching capacity NA switches (UL489, CSA 22.2 No. 5.1)         240 V 60 Hz       kA       85         480V 60Hz       kA       35         600 V 60 Hz       kA       25         Utilization category to IEC/EN 60947-2       A         Rated short-time withstand current       t = 0.3 s       I <sub>cw</sub> kA       1,9         t = 1 s       I <sub>cw</sub> kA       1,9         Lifespan, mechanical       Operations       20000         Maximum operating frequency       Ops/h       120	240 V 50/60 Hz	I <sub>cs</sub>	kA	85
up to 440 V 50/60 Hz  525 V 50/60 Hz  1cs 1cs 1cs 1cs 1ds 525 V 50/60 Hz  1cs 1ds 1ds 1ds 1ds 1ds 1ds 1ds 1ds 1ds 1d	400/415 V 50/60 Hz	I <sub>cs</sub>	kA	50
Second   S	415 V AC	I <sub>cs</sub>	kA	50
up to 690 V 50/60 Hz  690 V AC    I <sub>cs</sub>   kA   10    Maximum low-voltage h.b.c. fuse   A   GG/gL     Technical data, divergent from the products for the IEC   marketSwitching capacity NA   switches (UL489, CSA 22.2 No. 5.1)    240 V 60 Hz   kA   85     480V 60Hz   kA   35     600 V 60 Hz   kA   25     Utilization category to IEC/EN   60947-2     Rated short-time withstand current   t = 0.3 s   I <sub>cw</sub>   kA   1,9     t = 1 s   I <sub>cw</sub>   kA   1,9     Lifespan, mechanical   Operations   20000     Maximum operating frequency   Ops/h   120	up to 440 V 50/60 Hz	I <sub>cs</sub>	kA	35
Maximum low-voltage h.b.c. fuse    Color	525 V 50/60 Hz	I <sub>cs</sub>	kA	25
Maximum low-voltage h.b.c. fuse  Technical data, divergent from the products for the IEC marketSwitching capacity NA switches (UL489, CSA 22.2 No. 5.1)  240 V 60 Hz  480V 60Hz  600 V 60 Hz  Utilization category to IEC/EN 60947-2  Rated short-time withstand current  t = 0.3 s t = 1 s  Low kA 1,9  Lifespan, mechanical  Maximum operating frequency  Max. operating frequency  A  355  A  85  A  85  A  48  48  5  A  48  48  48  5  48  48  48  48  48  48	up to 690 V 50/60 Hz	I <sub>cs</sub>	kA	5
Technical data, divergent from the products for the IEC marketSwitching capacity NA switches (UL489, CSA 22.2 No. 5.1)  240 V 60 Hz	690 V AC	I <sub>cs</sub>	kA	10
products for the IEC marketSwitching capacity NA switches (UL489, CSA 22.2 No. 5.1)  240 V 60 Hz  480V 60Hz  600 V 60 Hz  Utilization category to IEC/EN 60947-2  Rated short-time withstand current  t = 0.3 s  t = 1 s  Lifespan, mechanical  Maximum operating frequency  Max. operating frequency  Max. operating frequency  Max operating frequency	Maximum low-voltage h.b.c. fuse			355
480V 60Hz  600 V 60 Hz  KA 25  Utilization category to IEC/EN 60947–2  Rated short–time withstand current  t = 0.3 s  t = 1 s  Lifespan, mechanical  Maximum operating frequency  Max. operating frequency  KA 25  A  A  A  Description  A  A  Description  A  Description  Description  Description  A  Description  Descrip	products for the IEC marketSwitching capacity NA			
Willization category to IEC/EN 60947–2  Rated short–time withstand current t = 0.3 s  t = 1 s  Lifespan, mechanical  Maximum operating frequency  Max. operating frequency  Max. operating frequency  KA  25  A  A  1,9  KA  1,9  Cw  KA  1,9  Cow  Com  Com  Com  Com  Com  Com  Com	240 V 60 Hz		kA	85
Utilization category to IEC/EN 60947–2  Rated short–time withstand current t = 0.3 s	480V 60Hz		kA	35
Rated short–time withstand current  t = 0.3 s  t = 1 s  Lifespan, mechanical  Maximum operating frequency  Max. operating frequency  A  A  A  A  A  A  A  A  A  A  A  Description  A  Light A  L	600 V 60 Hz		kA	25
$t = 0.3 \text{ s}$ $I_{cw}$ kA1,9 $t = 1 \text{ s}$ $I_{cw}$ kA1,9Lifespan, mechanicalOperations20000Maximum operating frequencyOps/h120	• •			Α
t = 1 s	Rated short-time withstand current			
Lifespan, mechanical Operations 20000  Maximum operating frequency  Max. operating frequency Ops/h 120	t = 0.3 s	<i>I</i> <sub>cw</sub>	kA	1,9
Maximum operating frequency  Max. operating frequency  Ops/h  120	t = 1 s	I <sub>CW</sub>	kA	1,9
Max. operating frequency Ops/h 120	Lifespan, mechanical	Operations		20000
	Maximum operating frequency			
Lifespan, electrical	Max. operating frequency		Ops/h	120
	Lifespan, electrical			

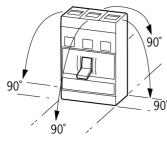
400/415 V 50/60 Hz       Operations       10000         415 V       Operations       10000         690 V 50/60 Hz       Operations       7500         AC3       Operations       6500         415 V       Operations       6500         690 V 50/60 Hz       Operations       5000         DC1       Operations       7500         750 V DC       Operations       7500         DC - 3       Operations       3000	C-1			
690 V 50/60 Hz  AC3  400/415 V 50/60 Hz  Operations 6500  415 V  Operations 6500  690 V 50/60 Hz  Operations 5000  DC1  500 V DC  Operations 7500  Operations 7500  Operations 7500  Operations 7500  Operations 7500  Operations	00/415 V 50/60 Hz	Opera	tions	10000
AC3 400/415 V 50/60 Hz	5 V	Opera	tions	10000
400/415 V 50/60 Hz       Operations       6500         415 V       Operations       6500         690 V 50/60 Hz       Operations       5000         DC1       Operations       7500         750 V DC       Operations       7500         DC - 3       Operations       7500	90 V 50/60 Hz	Opera	tions	7500
415 V Operations 6500 690 V 50/60 Hz Operations 5000  DC1 500 V DC Operations 7500 750 V DC Operations 7500  DC - 3	C3			
690 V 50/60 Hz Operations 5000  DC1  500 V DC Operations 7500  750 V DC Operations 7500  DC - 3	00/415 V 50/60 Hz	Opera	tions	6500
DC1 500 V DC Operations 7500 750 V DC Operations 7500 DC - 3	5 V	Opera	tions	6500
500 V DC       Operations       7500         750 V DC       Operations       7500         DC – 3       7500	90 V 50/60 Hz	Opera	tions	5000
750 V DC Operations 7500 DC – 3	C <b>−</b> −1			
DC – 3	00 V DC	Opera	tions	7500
	50 V DC	Opera	tions	7500
500 V DC Operations 3000	C – 3			
	00 V DC	Opera	tions	3000
750 V DC Operations > 3000	50 V DC	Opera	tions	> 3000
Current heat loss per pole at I <sub>u</sub> W 19	urrent heat loss per pole	at I <sub>u</sub>	W	19
Current heat loss (3-pole) at I <sub>u</sub> W 19	urrent heat loss (3-pole)	at Iu	W	19
Overload releases	verload releases			
to IEC/EN 60947, VDE 0660	IEC/EN 60947, VDE 066	0		
Temperature compensation to IEC/EN 60947 Residual error in the range –25 °C/+70 °C (reference temperature 30 °C) %/K 0	C/EN 60947 Residual er nge –25 °C/+70 °C (refe	or in the	%/K	0
Temperature compensation 0	emperature compensatio	1		0
Total opening delay at short–circuit ms < 10	otal opening delay at sho	t-circuit	ms	< 10
Terminal capacities	erminal capacities			
Standard equipment Screw terminal	andard equipment			Screw terminal
Accessories  Box terminal Tunnel terminal Connection on rear	ccessories			Tunnel terminal
Rated power of coil	ated power of coil			
Box terminal	ox terminal			
Solid $mm^2 \begin{cases} 1 \times (4-16) \\ 2 \times (4-16) \end{cases}$	olid			
Stranded $mm^2$ $1 \times (25 - 185)$ $2 \times (25 - 70)$	randed		mm <sup>2</sup>	1 × (25 – 185) 2 × (25 – 70)
Tunnel terminal	unnel terminal			
Solid mm <sup>2</sup> 1 × 16	olid		mm <sup>2</sup>	1 × 16
Stranded	randed			
Single hole $\text{mm}^2$ 1 × (25 – 185)	ngle hole		mm <sup>2</sup>	1 × (25 – 185)
Bolt terminal and rear-side	olt terminal and rear–side			

connection			
Direct on the switch			
Solid		mm <sup>2</sup>	1 × (4 – 16) 2 × (4 – 16)
Stranded		mm <sup>2</sup>	1 × (25 – 185) 2 × (25 – 70)
Al conductors, Cu cable			
Tunnel terminal			
Solid		$mm^2$	1 × 16
Stranded			
Single hole		mm <sup>2</sup>	1 × (25 – 185) je nach Kabelhersteller bis zu 240 mm² anschließbar
Bolt terminal and rear-side connection			
Direct on the switch			
Solid		mm <sup>2</sup>	1 × (10 – 16) 2 × (10 – 16)
Stranded		mm <sup>2</sup>	1 × (25 – 50) 2 × (25 – 50)
Cu strip (number of segments x width x segment thickness)			
Box terminal			
	min.	mm <sup>2</sup>	2 × 9 × 0.8
	max.	mm <sup>2</sup>	10 × 16 × 0.8
Bolt terminal and rear-side connection			
Flat copper strip, with holes	min.	mm	2 × 16 × 0.8
Flat copper strip, with holes	max.	mm	10 × 16 × 0.8
Copper busbar (width × thickness)			
Bolt terminal and rear-side connection			
Screw connection			M8
Direct on the switch			
	min.	mm <sup>2</sup>	16 × 5
	max.	mm <sup>2</sup>	20 × 5
Notes			
Notes			For rated operational voltage the following applies: DC voltage values on request For switching capacity of NA switches with NZM1NA

the following applies: 480Y/277 V from 60 A For rated operational current AC-3 at NZMB2, NZMN2, NZMH2, NZM4 the following applies: 400 V: max. 650 kW; 600 V: max. 600 kW For switching capacity of NA switches with NZML2 and NZML3 the following applies: current limiting switch to **UL489** For overload release temperature compensation NZM2 thermomagnetic the following applies: with NZM1...1-...160: 0.4 For switching capacity of NA switches with NZML4 at 240 V 60 Hz the following applies: please enquire The current heat loss per pole ratings refer to the maximum current rating of the frame size.

### **Mounting position**

Vertical and 90° in all directions



With plug-in adapter NZM2, N(S)2: vertical, 90° right/left

With withdrawable unit NZM3, N(S)3: vertical, 90° left NZM4, N(S)4: vertical with remote operator: NZM2, N(S)2, NZM3, N(S)3, NZM4, N(S)4: vertical and 90° to all directions

with residual current release NZM2: vertical and 90° to all directions

### Overview

Basic equipment

Box terminal ● - - -

Screw connection − • • •

Accessories

Box terminal – ● • -

Screw connection • - -

Tunnel terminal • • • •

Connection on rear • • • •

#### **Notes**

For rated operational voltage switching on 3 contacts the following applies: DC correction factor for instantaneous release response value NZM1: 1.25, NZM2: 1.35

Setting for  $I_i$  at DC = setting  $I_i$  AC/DC correction factor

Details apply for 3–pole system protection circuit–breaker with thermomagnetic release NZM(H)1(2)–A...

### Switching of one pole via two series contacts

Switching of one pole via three series contacts





For NA switch switching capacity with NZM...1-...(C)NA the following applies: 480 Y/277 V from 60  $^{\Delta}$ 

For AC-3 rated operational current with NZM4 the following applies: 400 V: max. 650 kW; 690 V: max. 600 kW

For NA switch switching capacity with NZML2 and NZML3 the following applies: Current Limiting switch to UL489

For 3-pole system protection circuit-breaker the AC-3 specification is not applicable

For NA switch switching capacity with NZML4 at 240 V 60 Hz the following applies: on request

For current heat loss per pole the specification refers to the maximum nominal current of the frame size.

For 3-pole system protection circuit-breaker the following applies: 690 V

For 3-pole system protection circuit-breaker the following applies: 400/415 V 7500 switching operations

Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit-breaker.

<sup>≦</sup> 1600 A

Higher switching capacity on request

#### **Notes**

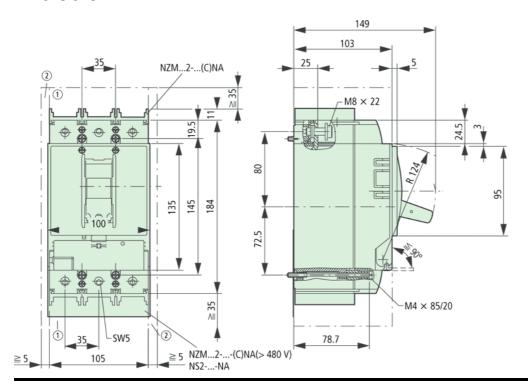
XSV = plug-in unit

XAV = withdrawable unit

TM = thermomagnetic

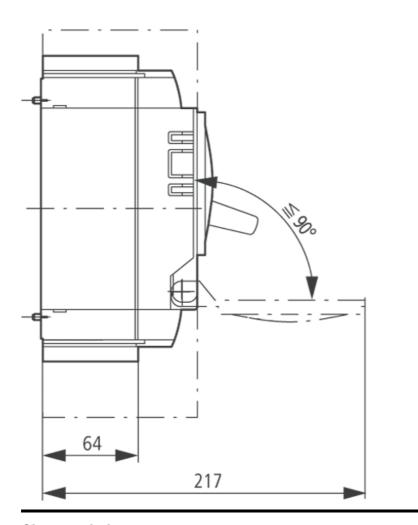
E = electronic

# **Dimensions**

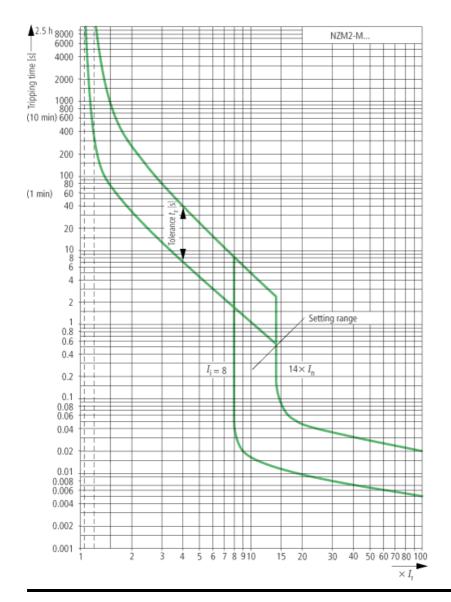


Blow out area, minimum distance to other parts 35 mm Minimum distance to adjacent parts 5 mm

## **Dimensions**

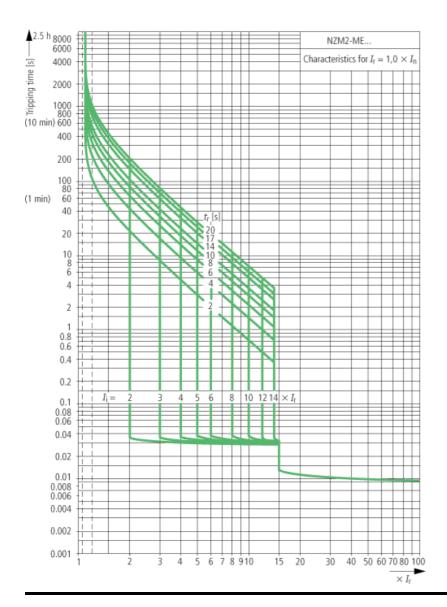


Characteristic curve

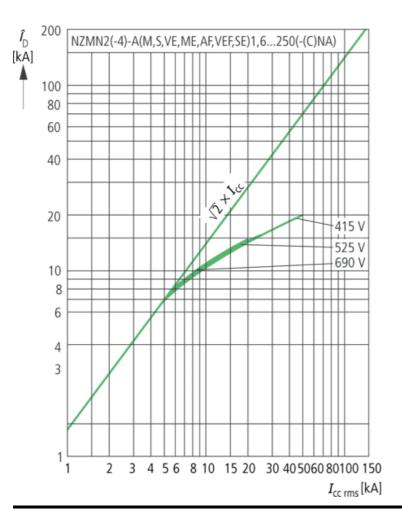


Motor protection with NZM2

# **Characteristic curve**

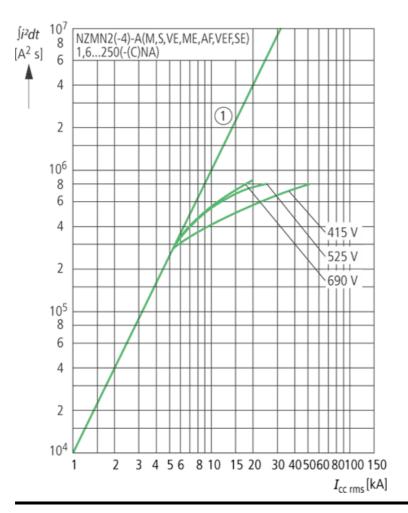


# Characteristic curve



Let–through current  $\hat{i}_D$ Let–through energy  $\hat{f}^2t$ 

# **Characteristic curve**



## 1 half-shaft

Moeller GmbH, Hein-Moeller-Str. 7-11, D-53115 Bonn E-Mail: catalog@moeller.net, Internet: www.moeller.net, http://catalog.moeller.net Copyright 2006 by Moeller GmbH. HPL-C2007G V2.1