

Molded Case Circuit Breakers

**3VA molded case circuit breakers**

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3VL molded case circuit breakers up to 1600 A, according to UL 489

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Siemens Industry Online Support:
www.siemens.com/lowvoltage/product-support

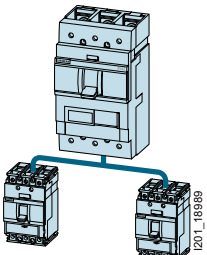
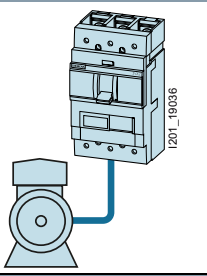
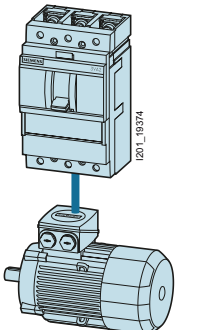

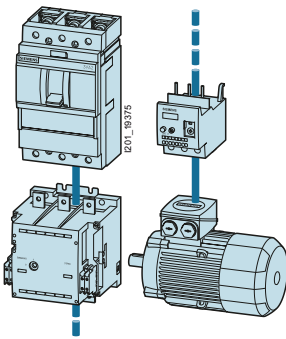

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Molded Case Circuit Breakers

3VA Molded Case Circuit Breakers

General data

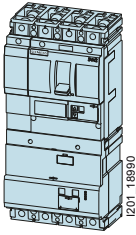
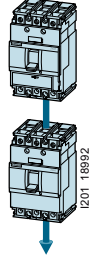
Overview

Application	Page	3VA1	3VA2	Description	Standards
Line protection					
	2/20 ... 2/41 2/46 ... 2/75	✓	✓	<p>The trip units for line protection are designed to provide overload and short-circuit protection for:</p> <ul style="list-style-type: none"> • Cables • Leads • Non-motor loads 	IEC / EN 60947-1, IEC / EN 60947-2
Generator protection					
	2/52 ... 2/59 2/68 ... 2/75	--	✓	<p>The setting values of the trip units are matched to protecting generators.</p>	IEC / EN 60947-1, IEC / EN 60947-2
Motor protection					
	2/78 ... 2/79	--	✓	<p>The overload and short-circuit releases are designed for optimized protection and direct-on-line starting of induction squirrel-cage motors. The molded case circuit breakers for motor protection have phase-failure sensitivity and a thermal image that protects the motor against overheating. The adjustable time lag class enables users to adjust the overload release to the startup conditions of the motor to be protected.</p> <div> <p>Are you IE3/IE4 ready?</p>  </div>	IEC / EN 60947-1, IEC / EN 60947-2, IEC / EN 60947-4-1 IE3 ready
Protection for starter combinations (starter protection)					
	2/42 ... 2/43 2/78 ... 2/79	✓	✓	<p>Starter combinations consist of: Molded case circuit breaker + contactor + overload relay.</p> <p>The molded case circuit breaker handles short-circuit protection and the isolating function. The task of the contactor is the operational switching of the feeder. The overload relay handles overload protection that can be specially matched to the motor. The molded case circuit breaker for the starter combination is therefore equipped with an adjustable and instantaneous short-circuit release.</p> <div> <p>Are you IE3/IE4 ready?</p>  </div>	IEC / EN 60947-1, IEC / EN 60947-2, IEC / EN 60947-4-1 IE3 ready

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General data

Application	Page	3VA1	3VA2	Description	Standards
Residual current protection					
	2/120 ... 2/122	✓	✓	Residual current protective devices afford fault protection (formerly referred to as: Protection in case of indirect contact) and supplementary protection (formerly referred to as: Protection in case of direct contact) in low-voltage systems in the event of the basic insulation failing or live parts being touched. Their task is to prevent or reduce injury to personnel or livestock, or damage to property.	IEC / EN 60947-2 (Annexes B, M)
Switch disconnectors					
	2/44	✓	--	Switch disconnectors are deployed: <ul style="list-style-type: none"> • As main disconnecting means • For on/off switching • For disconnection of loads • As switch disconnectors without overload and short-circuit protection The switch disconnectors comply with IEC / EN 60947-3.	IEC / EN 60947-1, IEC / EN 60947-3

Molded Case Circuit Breakers

3VA Molded Case Circuit Breakers

General data

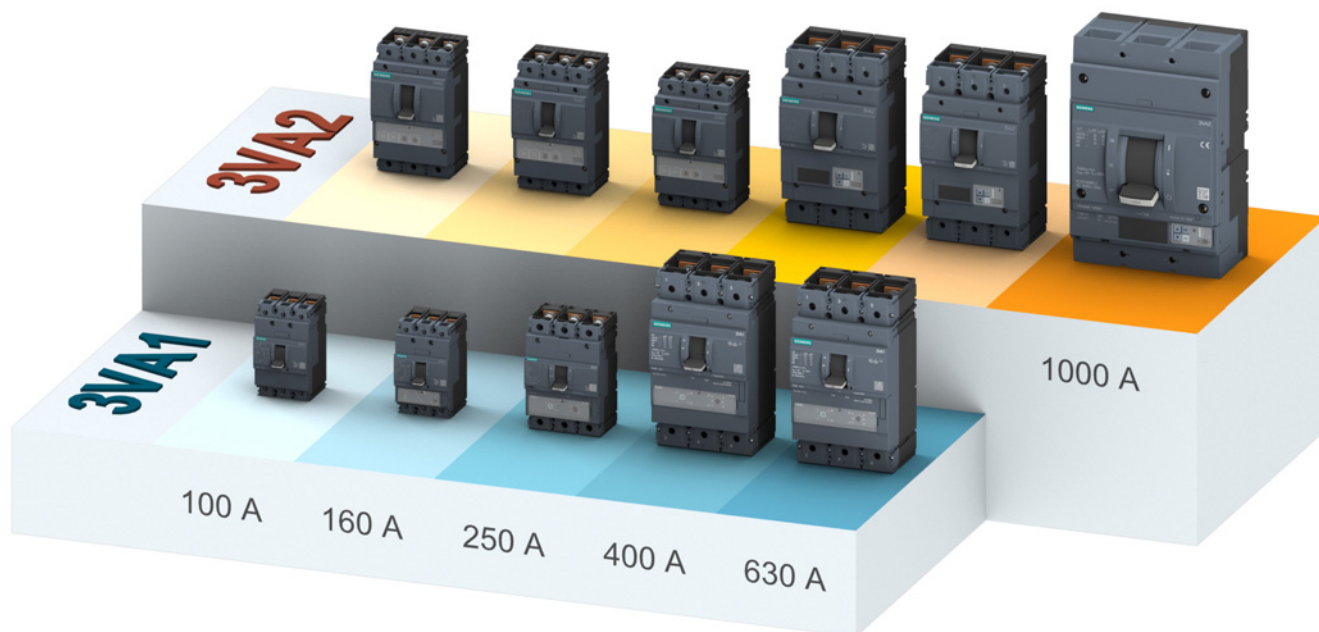
Sizes

The integrated 3VA portfolio consists of two different ranges of molded case circuit breakers in eleven frame sizes. The 1000 A frame size of the 3VA2 molded case circuit breaker and the 400 A and 630 A of the 3VA1 molded case circuit breaker are new.

The 3VA molded case circuit breakers set new standards in flexibility and the variety of modular accessories available. Standardized accessories suitable for use with several sizes of circuit breaker from all the 3VA ranges help to cut costs and save time.

The 3VA1 molded case circuit breakers are available in 1 to 4-pole versions (3VA1 160 A) or in 3 and 4-pole versions (3VA1 100 A to 630 A). The 3VA2 molded case circuit breakers are available in 3 and 4-pole versions.

The circuit breakers are available with rated operational currents ranging from 16 A to 1000 A and rated voltages up to 690 V AC, depending on the range and frame size.



Integrated system

When it comes to operation, functionality and installation, the 3VA range of molded case circuit breakers is a fully integrated system. This principle is embodied in the basic units and in all internal and external accessories.

The benefits offered by the internal and external accessories available for the 3VA molded case circuit breakers are:

- Standardized methods of operation
- Standardized scope of functions
- Standardized installation procedures
- Uniform accessories from 100 A ... 1000 A (e.g. auxiliary switches, auxiliary releases, etc.)

3VA1 molded case circuit breakers

The 3VA1 molded case circuit breakers reliably perform all the tasks required for line protection.

Features

The key features of the 3VA1 range are:

- Compact design
- Depending on size: 1-pole to 4-pole versions
- Depending on size: Breaking capacity of 16 kA ... 70 kA at 415 V, 3 or 4-pole breakers and 36 kA at 240 V, 1-pole breakers

- Fixed-mounted, plug-in version (depending on size)
- Thermal-magnetic trip units
- AC/DC applications
- No derating up to +50 °C
- Modular and easy-to-fit internal accessories with diverse functions
- Uniform accessories platform across all 3VA molded case circuit breakers

Compact dimensions

Thanks to a mounting depth of 70 mm and a cover size of 45 mm, the 3VA1 molded case circuit breakers of sizes 100 A, 160 A and 250 A are predestined for protecting cables and lines in the plant area, especially for the electrical installation area. For these applications, there is also a wide range of accessories available such as adapters for installation on DIN rails, as well as residual current devices (RCD310 (up to 160 A) and RCD510) that can be side-mounted.

Thermal-magnetic trip unit

A thermal-magnetic principle trip unit is the basic trip unit for providing overload and short-circuit protection. This has been developed for implementing economical, cost-efficient installations up to 630 A. It is suitable for use in three-phase networks, AC networks, 400 Hz applications, and with DC currents.

3VA2 molded case circuit breakers

The 3VA2 molded case circuit breakers reliably perform all the tasks required for line protection, generator protection, motor protection and protection of starter combinations.

This range is designed for applications with increased requirements:

- Increased breaking capacity
- Very good selective protection response
- Integrated metering function
- Connection to a communication system

Features

The most important features of the 3VA2 series are:

- Compact dimensions
- 3 and 4-pole versions
- 6 sizes (1000 A **NEW**)
- Four breaking capacity classes from 55 kA ... 150 kA (depending on size)
- Fixed-mounting, plug-in technology, draw-out technology
- Depending on size: Selective protection response in rated operational current interval 1 : 2.5
- Electronic Trip Units
- Retrofittable communication for ETU 5-series and 8-series
- Depending on the ETU: integrated metering function for ETUs of the 8-series
- AC applications
- Modular and easy-to-fit internal accessories with diverse functions
- Uniform accessories platform across all 3VA molded case circuit breakers

Compact dimensions with function expansions

In addition to its expanded functionality, the 3VA2 molded case circuit breaker also comes with compact dimensions for fixed mounting, as a plug-in version (up to 630 A) and a draw-out version (up to 630 A).

A cover size of 70 mm (up to 630 A) for the door cut-out and a complete selection of breaking capacity classes from 55 kA to 150 kA (depending on size) at 415 V AC provide the necessary flexibility for planning.

Despite its compact size, the circuit breaker offers the following benefits:

- Extremely high breaking capacity
- Extremely good selectivity
- Electronic Trip Units, versions with and without integrated metering function and optional communication interface

Selective contact system (up to 630 A)

With its contact system, the 3VA2 molded case circuit breaker is designed for fast selectivity tripping. The selective contact system ensures the following:

- Dynamic instantaneous short-circuit range
- High breaking capacity
- Selective protection response of the molded case circuit breakers in relation to each other
- Selective protection response of the molded case circuit breakers in relation to other protection devices such as downstream low-voltage fuses, etc.

Electronic Trip Units (ETUs)

The current sensor of the 3VA2 comprises an iron-cored transformer for the internal power supply and a Rogowski coil for precise current measurement. Each transformer can be optimized accordingly for its specific task. Thanks to the high accuracy of current measurement, the 3VA2 molded case circuit breaker is suitable for power/energy measurement. In addition, finer adjustment of ground fault current monitoring is possible.

The Electronic Trip Units (ETUs) provide the following protection functions:

- Overload protection L ("L" = Long-time delay)
- Short-time delayed short-circuit protection S ("S" = Short-time delay) for time-selective response in case of a short circuit
- Instantaneous short-circuit protection I ("I" = Instantaneous)
- Protection of the neutral conductor N against overload and short circuit ("N" = Neutral)
- Protection against residual currents to ground G ("G" = Ground fault)
- ELISA:
Improved selective grading of downstream LV HRC fuses and upstream molded case circuit breakers by means of a special form of current-time characteristic

Energy management and communication

The Electronic Trip Units (ETUs) provide the following energy management and communication functions:

- Metering functions
- Communication
- Flexible, local, digital inputs and outputs via the EFB300 external function box
- Software commissioning and service support with powerconfig
- Testing and archiving with the TD300 and TD500 test devices (with powerconfig)

Molded Case Circuit Breakers

3VA Molded Case Circuit Breakers

General data

3VA1 up to 630 A

2



Type	3VA10	3VA11		
Number of poles	3, 4	1	2	3, 4
3VA1 molded case circuit breakers for line protection, standard applications				
Electrical characteristics according to IEC 60947-2				
Size	100 A	160 A	160 A	160 A
Rated operational current I_n at 50 °C ambient temperature	A 16 ... 100	16 ... 160	16 ... 160	16 ... 160
Rated operational voltage U_e 50/60 Hz AC	V 690	415	415	690
Rated insulation voltage U_i	V 800	500	500	800
Rated impulse withstand voltage U_{imp}	kV 8	8	8	8
Use in IT networks	✓	✓	✓	✓
Frequency	Hz 0 ... 400	0 ... 400	0 ... 400	0 ... 400

Breaking capacity		B	N	S	N	S	M	N	S	M	N	S	M	H
Rated ultimate short-circuit breaking capacity I_{cu} RMS value, according to IEC 60947-2														
220 - 240 V AC / 50/60 Hz	kA	25	36	55	25	36	55	36	55	85	36	55	85	100
380 - 415 V AC / 50/60 Hz	kA	16	25	36	5	6	6	25	36	55	25	36	55	70
440 V AC / 50/60 Hz	kA	8	16	25	--	--	--	--	--	--	16	25	36	55 ¹⁾
500 V AC / 50/60 Hz	kA	5	5	7	--	--	--	--	--	--	7	7	10	10
690 V AC / 50/60 Hz	kA	5	5	7	--	--	--	--	--	--	7	7	10	10
125 V DC (1 switching pole)	kA	--	--	--	16	25	30	16	25	30	--	--	--	--
250 V DC (2 switching poles)	kA	25	36	55	--	--	--	36	55	85	36	55	85	100
500 V DC (3 switching poles)	kA	25	36	55	--	--	--	--	--	--	36	55	85	100
600 V DC (4 switching poles)	kA	8	16	25	--	--	--	--	--	--	16	25	36	55
Rated service short-circuit breaking capacity I_{cs} RMS value, according to IEC 60947-2														
220 - 240 V AC / 50/60 Hz	kA	25	36	55	25	36	55	36	55	85	36	55	85	100
380 - 415 V AC / 50/60 Hz	kA	16	25	36	5	6	6	25	36	55	25	36	55	70
440 V AC / 50/60 Hz	kA	8	16	25	--	--	--	--	--	--	16	25	36	40 ¹⁾
500 V AC / 50/60 Hz	kA	5	5	5	--	--	--	--	--	--	5	5	5	5
690 V AC / 50/60 Hz	kA	5	5	5	--	--	--	--	--	--	5	5	5	5
125 V DC (1 switching pole)	kA	--	--	--	16	25	30	16	25	30	--	--	--	--
250 V DC (2 switching poles)	kA	25	36	55	--	--	--	36	55	85	36	55	85	100
500 V DC (3 switching poles)	kA	25	36	55	--	--	--	--	--	--	36	55	85	100
600 V DC (4 switching poles)	kA	8	16	25	--	--	--	--	--	--	16	25	36	55

✓ Available -- Not available

* On request

1) I_n 125 A, 160 A: $I_{cu} / I_{cs} = 36 \text{ kA} / 36 \text{ kA}$

Molded Case Circuit Breakers

3VA Molded Case Circuit Breakers

General data

3VA1 up to 630 A

2



3VA12

3VA13 **NEW**3VA14 **NEW**

3, 4

3, 4

3, 4

3VA1 molded case circuit breakers for line protection, standard applications

250 A

400 A

630 A

160 ... 250

320 ... 400

500 ... 630

690

690

690

800

800

800

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✓

✓

0 ... 400

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Molded Case Circuit Breakers

3VA Molded Case Circuit Breakers

General data

3VA2 up to 630 A

2



Type	3VA20	3VA21	3VA22
Number of poles	3, 4	3, 4	3, 4

3VA2 for line protection, selectivity applications

Electrical characteristics according to IEC 60947-2

Size		100 A	160 A	250 A
Rated operational current I_n at 50 °C ambient temperature	A	25 ... 100	25 ... 160	160 ... 250
Rated operational voltage U_e 50/60 Hz AC	V	690	690	690
Rated insulation voltage U_i	V	800	800	800
Rated impulse withstand voltage U_{imp}	kV	8	8	8
Use in IT networks		✓	✓	✓
Frequency	Hz	50 ... 60	50 ... 60	50 ... 60

Breaking capacity		M	H	C	L	M	H	C	L	M	H	C	L
Rated ultimate short-circuit breaking capacity I_{cu} RMS value, according to IEC 60947-2													
220 - 240 V AC / 50/60 Hz	kA	85	110	150	200	85	110	150	200	85	110	150	200
380 - 415 V AC / 50/60 Hz	kA	55	85	110	150	55	85	110	150	55	85	110	150
440 V AC / 50/60 Hz	kA	55	85	110	150	55	85	110	150	55	85	110	150
500 V AC / 50/60 Hz	kA	36	55	85	100	36	55	85	100	36	55	85	100
690 V AC / 50/60 Hz	kA	2	2	2	25	2.5	2.5	2.5	25	3	3	3	25
125 V DC (1 switching pole)	kA	--	--	--	--	--	--	--	--	--	--	--	--
250 V DC (2 switching poles)	kA	--	--	--	--	--	--	--	--	--	--	--	--
500 V DC (3 switching poles)	kA	--	--	--	--	--	--	--	--	--	--	--	--
600 V DC (4 switching poles)	kA	--	--	--	--	--	--	--	--	--	--	--	--
Rated service short-circuit breaking capacity I_{cs} RMS value, according to IEC 60947-2													
220 - 240 V AC / 50/60 Hz	kA	85	110	150	200	85	110	150	200	85	110	150	200
380 - 415 V AC / 50/60 Hz	kA	55	85	110	150	55	85	110	150	55	85	110	150
440 V AC / 50/60 Hz	kA	55	85	110	150	55	85	110	150	55	85	110	150
500 V AC / 50/60 Hz	kA	36	55	85	100	36	55	85	100	36	55	85	100
690 V AC / 50/60 Hz	kA	2	2	2	18	2.5	2.5	2.5	18	3	3	3	18
125 V DC (1 switching pole)	kA	--	--	--	--	--	--	--	--	--	--	--	--
250 V DC (2 switching poles)	kA	--	--	--	--	--	--	--	--	--	--	--	--
500 V DC (3 switching poles)	kA	--	--	--	--	--	--	--	--	--	--	--	--
600 V DC (4 switching poles)	kA	--	--	--	--	--	--	--	--	--	--	--	--

✓ Available -- Not available

* On request

¹⁾ Valid for I_n 400, 500 A;
however for I_n 630 A: $I_{cs} = 65$ kA

Molded Case Circuit Breakers

3VA Molded Case Circuit Breakers

General data

3VA2 up to 630 A

3VA2 over 630 A **NEW**

2



3VA23

3VA24

3VA25

3, 4

3, 4

3, 4

3VA2 for line protection, selectivity applications

400 A

630 A

1000 A

250 ... 400

400 ... 630

630 ... 1000

690

690

690

800

800

800

8

8

8

✓

✓

✓

50 ... 60

50 ... 60

50 ... 60

M

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Molded Case Circuit Breakers

3VA Molded Case Circuit Breakers

General data

3VA1 up to 630 A

2



Type

3VA10

3VA11

3VA11

3VA11

3VA1 molded case circuit breakers for line protection, standard applications

Service life (make-break operations)

Mechanical			20000 ¹⁾	20000 ¹⁾	20000 ¹⁾	20000 ¹⁾
Electrical		380 ... 415 V	8000	8000	8000	8000
Trip units	FTFM	TM210	✓	✓	✓	✓
	ATFM	TM220	--	--	--	✓
	ATAM	TM240	--	--	--	✓
	LI	ETU320	--	--	--	--
	LIG	ETU330	--	--	--	--
	ELISA LI	ETU340	--	--	--	--
	LSI	ETU350	--	--	--	--
	LSI	ETU550/ETU850	--	--	--	--
	LSIG	ETU560/ETU860	--	--	--	--

3VA1 molded case circuit breakers for starter protection (IEC 60947-4-1 standards and specifications acc. to AC-1)

Rated operational current I_n at 50 °C ambient temperature	A	--	--	--	32 ... 125
Mechanical		20000 ¹⁾	20000 ¹⁾	20000 ¹⁾	20000 ¹⁾
Electrical	380 ... 415 V	8000	8000	8000	8000
Trip units	AM	TM120M	--	--	✓
	I	ETU310M	--	--	--
	LSI	ETU350M	--	--	--
	LSIG	ETU860M	--	--	--

Switch disconnectors

Electrical characteristics according to IEC 60947-3

Number of poles		--	--	--	3, 4
Rated uninterrupted current I_U at 50 °C ambient temperature	A	--	--	--	63 ... 160
Rated operational voltage U_e 50/60 Hz AC	V	--	--	--	690
Rated operational voltage U_e DC	V	--	--	--	500 (3p)/ 600 (4p)
Rated short-circuit making capacity I_{cn} with upstream circuit breaker	kA	--	--	--	70 kA at 415 V
Permissible rated short-time withstand current I_{cw} 1 s	kA	--	--	--	2

Dimensions

	A	mm	76.2 (3p)/ 101.6 (4p)	25.4	50.8	76.2 (3p)/ 101.6 (4p)
	B	mm	130	130	130	130
	C	mm	70	70	70	70
	D	mm	88	88	88	88
Weight	1-pole nut keeper kit	kg	--	0.35	--	--
	2-pole nut keeper kit	kg	--	--	0.60	--
	3-pole nut keeper kit	kg	0.90	--	--	0.90
	4-pole nut keeper kit	kg	1.15	--	--	1.15

General information

Standards and specifications	IEC 60947-2, -3, -4	IEC 60947-2, -3, -4	IEC 60947-2, -3, -4	IEC 60947-2, -3, -4
Utilization category according to IEC 60947-2	A	A	A	A
Power and infeed direction	Top and bottom			
Isolating features according to IEC 60947	✓	✓	✓	✓

✓ Available

-- Not available

¹⁾ Operating cycles NO-NC

Molded Case Circuit Breakers

3VA Molded Case Circuit Breakers

General data

3VA1 up to 630 A

2



3VA12



3VA13 **NEW**



3VA14 **NEW**

3VA1 molded case circuit breakers for line protection, standard applications

20000 ¹⁾	15000	15000
8000	6000	4000
--	--	--
--	--	--
✓	✓	✓
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--

3VA1 molded case circuit breakers for starter protection (IEC 60947-4-1 standards and specifications acc. to AC-1)

160, 200	250	400 ... 500
20000 ¹⁾	15000	15000
8000	6000	4000
✓	✓	✓
--	--	--
--	--	--
--	--	--

Switch disconnectors

3, 4	3, 4	--
250	400	--
690	690	--
500 (3p)/ 600 (4p)	500 (3p)/ 600 (4p)	--
70 kA at 415 V	On req.	--
3	6	--

Dimensions

105 (3p)/ 140 (4p)	138 (3p)/184 (4p)	138 (3p)/184 (4p)
158	248	248
70	110	110
88	137	137
--	--	--
--	--	--
1.8	4.3	4.3
2.3	4.8	4.8

General information

IEC 60947-2, -3, -4	IEC 60947-2, -3, -4	IEC 60947-2, -3, -4
A	A	A/B ¹⁾
✓	Top and bottom	Top and bottom
✓	✓	✓

¹⁾ Utilization category B only for 400 A and 500 A and the trip units of the ETU5 and ETU8 series

Molded Case Circuit Breakers

3VA Molded Case Circuit Breakers

General data

3VA2 up to 630 A

2



Type

3VA20

3VA21

3VA22

3VA2 molded case circuit breakers for line protection, standard applications

Service life (make-break operations)

Mechanical			20000	20000	20000
Electrical		380 ... 415 V	12000	12000	10000
Trip units	FTFM	TM210	--	--	--
	ATFM	TM220	--	--	--
	ATAM	TM240	--	--	--
	LI	ETU320	✓	✓	✓
	LIG	ETU330	✓	✓	✓
	ELISA LI	ETU340	✓	✓	✓
	LSI	ETU350	✓	✓	✓
	LSI	ETU550/ETU850	✓	✓	✓
	LSIG	ETU560/ETU860	✓	✓	✓

3VA2 molded case circuit breakers for motor/starter protection (IEC 60947-4-1 standards and specifications acc. to AC-1)

Rated operational current I_n at 50 °C ambient temperature	A	--	25 ... 100	160 ... 200
---	---	----	------------	-------------

Service life (make-break operations)

Mechanical			--	20000	20000
Electrical		380 ... 415 V	--	12000	10000
Trip units	AM	TM120M	--	--	--
	I	ETU310M	--	✓	✓
	LSI	ETU350M	--	✓	✓
	LSIG	ETU860M	--	✓	✓

Dimensions

	A	mm	105 (3p)/ 140 (4p)	105 (3p)/140 (4p)	105 (3p)/140 (4p)
	B	mm	181	181	181
	C	mm	86	86	86
	D	mm	107	107	107

Weight	1-pole nut keeper kit	kg	--	--	--
	2-pole nut keeper kit	kg	--	--	--
	3-pole nut keeper kit	kg	2.29	2.29	2.41
	4-pole nut keeper kit	kg	2.94	2.94	3.09

General information

Standards and specifications	IEC 60947-2, -3, -4	IEC 60947-2, -3, -4	IEC 60947-2, -3, -4
Utilization category according to IEC 60947-2	A	A	A
Power and infeed direction	Top and bottom	Top and bottom	Top and bottom
Isolating features according to IEC 60947	✓	✓	✓

✓ Available -- Not available

¹⁾ Operating cycles NO-NC

Molded Case Circuit Breakers

3VA Molded Case Circuit Breakers

General data

2

3VA2 up to 630 A

3VA2 over 630 A **NEW**

3VA23

3VA24

3VA25

3VA2 molded case circuit breakers for line protection, standard applications

15000

15000

10000

6000

4000

5000

--

--

--

--

--

--

--

--

--

✓

✓

✓

✓

✓

✓

✓

✓

✓

✓

✓

✓

✓

✓

✓

✓

✓

✓

3VA2 molded case circuit breakers for motor/starter protection
(IEC 60947-4-1 standards and specifications acc. to AC-1)

250

400 ... 500

630 ... 800

15000

15000

10000

6000

4000

4000

--

--

--

✓

✓

--

✓

✓

✓

✓

✓

✓

Dimensions

138 (3p)/184 (4p)

138 (3p)/184 (4p)

210 (3p)/280 (4p)

248

248

320

110

110

120

137

137

253

--

--

--

--

--

--

4.3

4.3

11.35

4.8

4.8

15.42

General information

IEC 60947-2, -3, -4

IEC 60947-2, -3, -4

IEC 60947-2

A

A/B¹⁾

A

Top and bottom

Top and bottom

Top and bottom

✓

✓

✓

¹⁾ Utilization category B only for 400 A and 500 A and the trip units of the ETU5 and ETU8 series

Molded Case Circuit Breakers

3VA Molded Case Circuit Breakers

General data

Molded case circuit breakers and accessories in the system

The 3VA molded case circuit breakers come with a large portfolio of internal and external accessories that can be installed flexibly in any size of circuit breaker (depending on the type of accessory).

The table below shows the molded case circuit breakers in or on which the accessories can be installed, and the sizes covered by the same accessory component:

Accessories	3VA molded case circuit breakers up to 630 A										3VA above 630 A	
	3VA1					3VA2					3VA2	
	100	160	250	400	630	100	160	250	400	630	1000	
Auxiliary switches and alarm switches												
Auxiliary releases												
Connection technology												
Plug-in technology												
Draw-out technology												
Front mounted rotary operator												
Door mounted rotary operator												
Side wall mounted rotary operator												
Motor operator MO310 (mounted on the side)												
Motor operator MO320 (mounted on the front)												
Locking, blocking and interlocking												
Residual current device (mounted on the side)												
Residual current device (mounted underneath)												
Communications interface												
EFB300												
TD300 and TD500												
Cover frame												
DIN rail adapter												

Front terminals



The portfolio of connection components for the molded case circuit breakers includes a large selection of front cable and busbar terminals.

Connection technology available from/installed at the factory

All 3VA molded case circuit breakers are available as standard with a nut keeper kit (clip-in nut and clamping screw) at the infeed and load ends.

For units up to size 160 A, a box terminal for direct cable connection can be optionally selected instead of the nut keeper kit. The box terminal is preassembled and installed at the factory.

The connection technology available from/installed at the factory can be selected in the 12th position of the article number of the molded case circuit breaker.

Connection technology	Illustration	3VA1					3VA2					
		100	160	250	400	630	100	160	250	400	630	1000
Nut keeper kit		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Box terminal		✓	✓	--	--	--	✓	✓	--	--	--	--

✓ Available

Insulated busbars and cables with cable lugs can be connected directly to the nut keeper kit. Furthermore, all connection bar extensions are attached to the molded case circuit breaker using the nut keeper kit:

- Front bus connectors extended (phase barriers included in scope of supply)
- Front bus connectors offset (phase barriers included in scope of supply)
- Bus connectors edgewise (phase barriers included in scope of supply)
- Nut keeper kit, right-angled (phase barriers included in scope of supply)

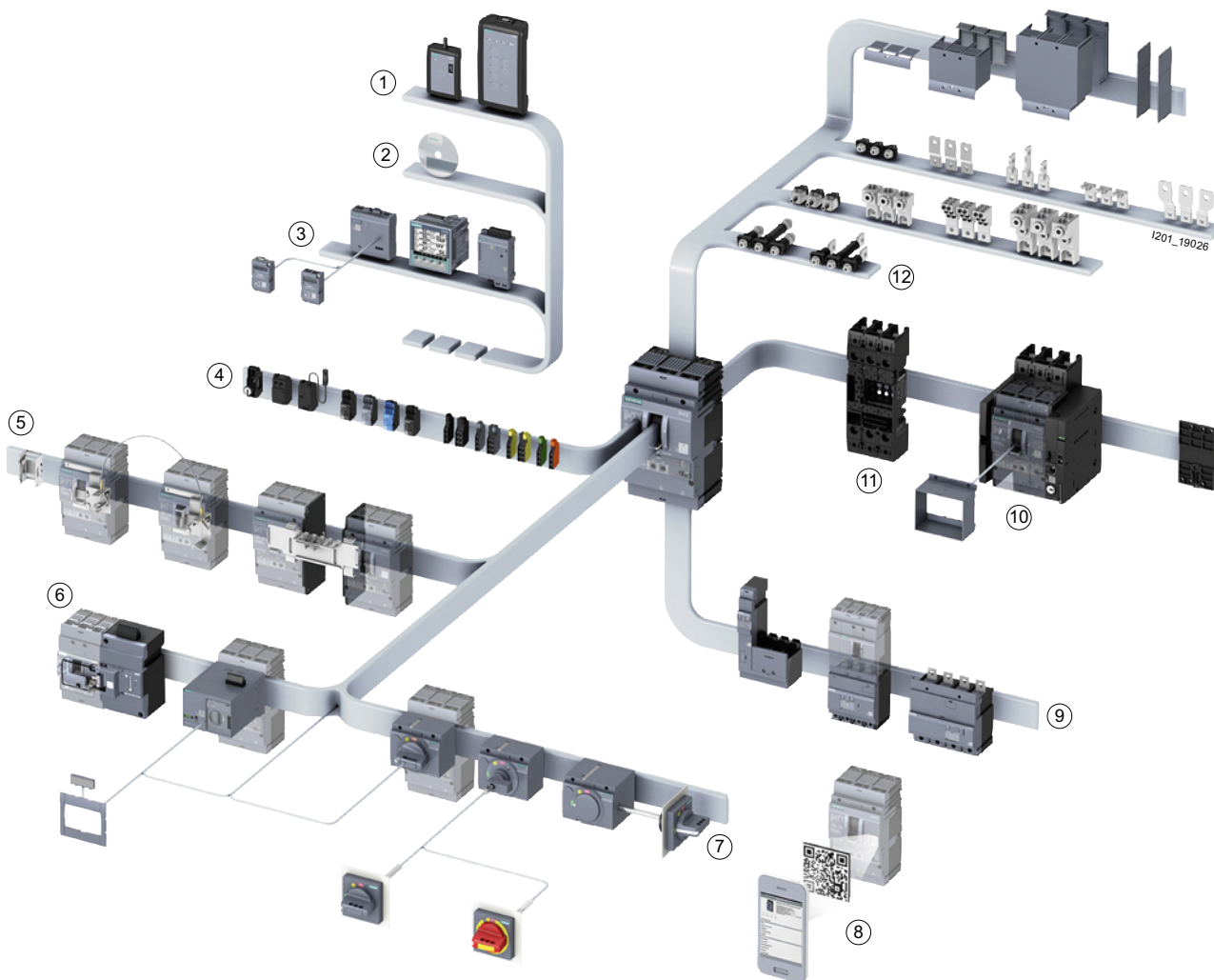
The implementation of insulation measures (phase barriers or terminal covers) is recommended. With some accessory components, insulation measures are essential (and these are included in the scope of supply of the relevant component).

Molded Case Circuit Breakers

3VA Molded Case Circuit Breakers

General data

2



- ① Test devices (page 2/129)
- ② powerconfig commissioning and service software (pages 2/126, chapter "Measuring Devices and Power Monitoring" and chapter "Software")
- ③ Communication (pages 2/124 to 2/129)
- ④ Internal accessories (pages 2/80 to 2/88)
- ⑤ Accessories for locking, blocking and interlocking (pages 2/130 to 2/133)
- ⑥ Motor operators (page 2/96)

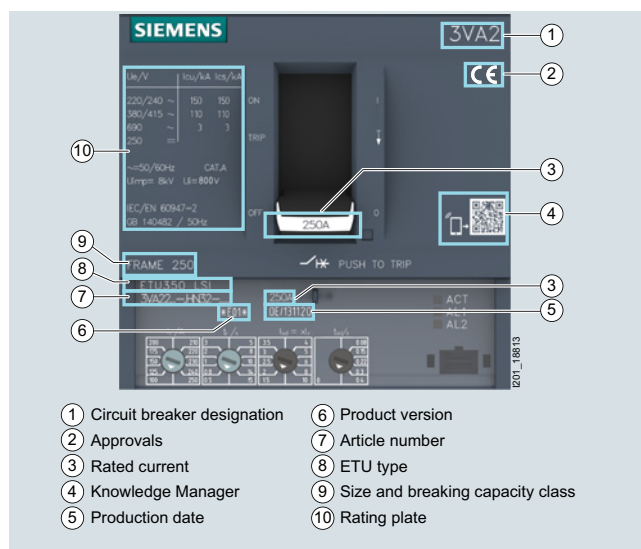
- ⑦ Manual operators (pages 2/89 to 2/95)
- ⑧ Knowledge Manager (page 2/15)
- ⑨ Residual current devices (pages 2/120 to 2/122)
- ⑩ Draw-out technology (pages 2/115 to 2/119)
- ⑪ Plug-in technology (pages 2/115 to 2/119)
- ⑫ Connection technology (pages 2/97 to 2/114)

Knowledge Manager

By reading out the QR code using a smartphone and the "Siemens Industry Online Support" app, it is possible to view key product information via the Internet at any time.

Siemens provides the app free of charge.

Technical information about installation, parameterization or maintenance can be called up directly from the system by QR code on a smartphone.



Front: Inscription

Molded Case Circuit Breakers

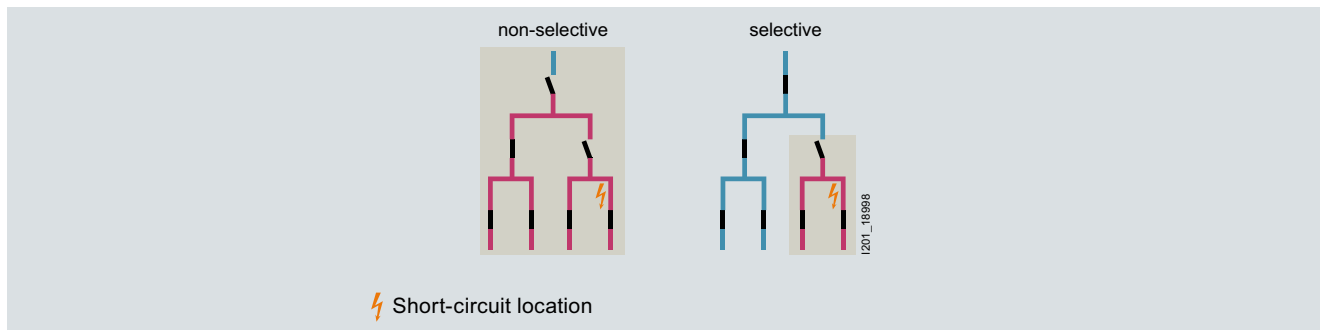
3VA Molded Case Circuit Breakers

General data

Selectivity

Switching devices connected in series, e.g. molded case circuit breakers and fuses, work in a coordinated manner to ensure that switching devices are tripped successively. The closest, upstream switching device before the location of the short-circuit must trip. The other switching devices on the same current run do not trip. The purpose of selectivity is to minimize the effects of a fault in terms of its duration and the area affected by the fault.

Selectivity is achieved when the circuit breakers are matched to each other by means of selection, configuring and trip settings in such a way that, in the event of a fault, only the breaker closest to the location of the fault trips.



Selectivity with 3VA2 molded case circuit breakers

The 3VA2 range is designed to deliver excellent selective tripping combined with optimum current limiting and outstanding breaking capacity.

3VA2 molded case circuit breakers have been specifically designed to meet the following requirements:

- System-wide, high selectivity with a rated operational current interval of 1 : 2.5 up to the miniature circuit breaker
- Selectivity in combination with high current limiting and high breaking capacity
- Cost-effective design / configuring of selective power distribution systems

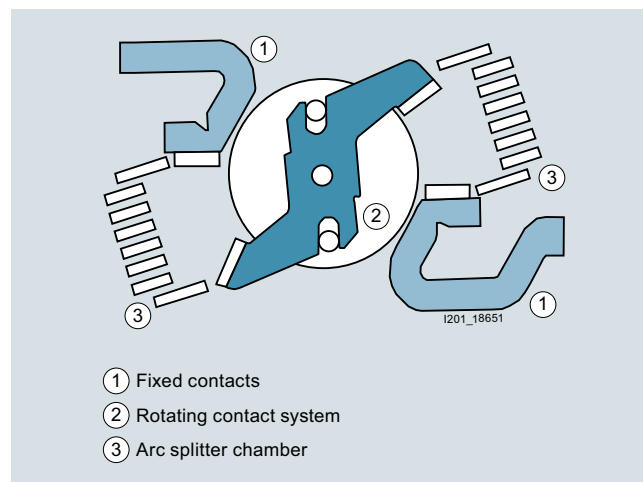
You can find information on selectivity values for the 3VA2 molded case circuit breakers on the Internet under the link for the 3VA documentation

(www.siemens.com/3VA-documentation).

Current limiting

To achieve excellent current limiting, the 3VA molded case circuit breakers up to size 630 A are equipped with a rotary double-contact system that opens dynamically on its own above the specified disengaging currents on the principle of magnetic repulsion before the expected peak value of the short-circuit current is reached. These limits have been coordinated and optimized to suit the overall device characteristics. This substantially reduces the thermal and mechanical loading on the molded case circuit breaker.

The switching pole cassettes of the 3VA molded case circuit breakers are optimized for high breaking capacity, and their rotary double-contact system design enables extremely good current limiting thanks to the very fast build-up of peak arc voltage generated at both contacts in the event of a short circuit. This results in significant limitation of the let-through energy i^2t and the expected let-through current I_{SC} .



- ① Fixed contacts
- ② Rotating contact system
- ③ Arc splitter chamber

Molded Case Circuit Breakers

3VA Molded Case Circuit Breakers

General data

Standards and guidelines

The standards fulfilled by the 3VA molded case circuit breakers include:

- IEC/EN 60947-1
- IEC/EN 60947-2
- IEC/EN 60947-2, Annexes B, M, H
- IEC/EN 60947-3
- IEC/EN 60947-4-1

Certificates

You can find information on the available certification (CE, CCC, EHC) on the Internet (www.siemens.com/lowvoltage/certificates).

In the Entry List you can use the certificate type (general product approval, explosion protection, test certificates, shipbuilding, etc.) as a filter criterion.

Operating conditions

- Pollution degree:
Operation of the 3VA1 and 3VA2 molded case circuit breakers is approved in accordance with IEC / EN 60947-1 and IEC / EN 60664-1 for pollution degree 3.
- Ambient temperature:
- 3VA molded case circuit breakers are used at ambient temperatures from -25 °C to +70 °C. At temperatures above +50 °C there are reductions in the rated operational current (derating).
- The permissible storage temperature in original Siemens packaging lies between -40 °C and +80 °C.

IE3 ready

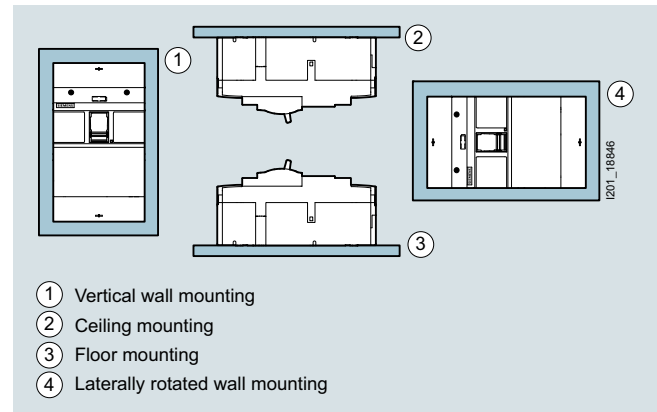
As from January 2015, the energy-efficiency class IE3 will be mandatory, with a few exceptions only, for three-phase asynchronous motors. This will have an effect on motors, low-voltage power distribution and electrical installation technology, as well as industrial controls.

For use of 3VA molded case circuit breakers in conjunction with highly energy-efficient IE3 motors, please observe the information on dimensioning and configuring, [see application manual for controls with IE3/IE4 motors](#), at <https://support.industry.siemens.com/cs/ww/en/view/94770820>.

Are you
IE3/IE4 ready?



Permissible mounting positions



Positions in which the 3VA molded case circuit breakers are allowed to be installed

Further technical specifications

- See manual in SIOS at <https://support.industry.siemens.com/cs/ww/en/view/90318775>

3VA
Equipment manual



- See communications manual in SIOS at <https://support.industry.siemens.com/cs/ww/en/view/98746267>

3VA Communication
manual



Molded Case Circuit Breakers


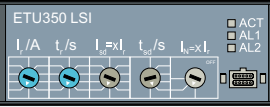

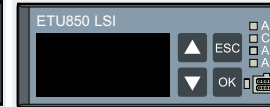



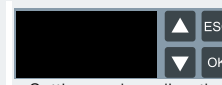




















3VA Molded Case Circuit Breakers

General data

Protection system

Description of functions

2

	Thermal-magnetic TM 2-series	Electronic ETU 3-series	Electronic with display ETU 5-series	Electronic with display and metering function – ETU 8-series
Protection				
Trip units	 <p>Line protection: TM210, TM220, TM240 Starter protection: TM120M</p>	 <p>Line protection: ETU320, ETU330, ETU340, ETU350 Starter protection: ETU310M Motor protection: ETU350M</p>	 <p>Line protection: ETU550, ETU560</p>	 <p>Line protection: ETU850, ETU860 Motor protection: ETU860M</p>
Integrated functions				
Parameterizing	 <p>Setting and reading the parameters in A</p>	 <p>Setting and reading the parameters in A and s</p>	 <ul style="list-style-type: none"> Setting and reading the parameters via display and communication Fine setting of the parameters Reading the measured values 	 <ul style="list-style-type: none"> Setting and reading the parameters via display and communication Fine setting of the parameters Reading the measured values
Status display	--	 <p>Indicating the ETU status via LEDs</p>	 <p>Indicating the ETU status via LEDs</p>	 <p>Indicating the ETU status via LEDs</p>
Interface	--	 <p>Interface for test devices</p>	 <p>Interface for test devices</p>	 <p>Interface for test devices</p>
Metering function	--	--	--	Metering function integrated
Optional expansions				
--	--	--	 <p>24 V module for continuous power supply (also without primary current through the molded case circuit breaker)</p>	 <p>24 V module for continuous power supply (also without primary current through the molded case circuit breaker)</p>
--	 <p>EFB300 external function box for connecting to the ETU</p>	 <p>EFB300 external function box for connecting to the ETU</p>	 <p>EFB300 external function box for connecting to the ETU</p>	--
--	--	--	 <p>COM060 communication module</p>	 <p>COM060 communication module</p>
--	--	--	 <p>COM800/COM100 breaker data server Interface to</p> <ul style="list-style-type: none"> PROFIBUS PROFINET Modbus RTU Ethernet (Modbus TCP) 	 <p>COM800/COM100 breaker data server Interface to</p> <ul style="list-style-type: none"> PROFIBUS PROFINET Modbus RTU Ethernet (Modbus TCP)
--	--	--	 <p>DSP800 external display for installing in the cubicle door</p>	 <p>DSP800 external display for installing in the cubicle door</p>
--	 <p>TD300/TD500 test device</p>	 <p>TD300/TD500 test device</p>	 <p>TD300/TD500 test device</p>	--

Molded Case Circuit Breakers

3VA Molded Case Circuit Breakers

General data

Protection functions of the 3VA1 molded case circuit breakers with thermal-magnetic trip unit

	TM120M AM	TM210 FTFM	TM220 ATFM	TM240 ATAM
Protection				
Starter protection	✓	--	--	--
Line protection	--	✓	✓	✓
Version available with				
1-pole and 2-pole breakers	--	✓	--	--
3-pole breaker	✓	✓	✓	✓
4-pole breaker	--	✓	✓	✓
Available protection parameters				
I_r adjustable	--	--	✓	✓
I_i adjustable	✓	--	--	✓
I_r fixed	--	✓	--	--
I_i fixed	--	✓	✓	--
I_{N1}	--	✓	✓	✓

1) 3VA10 only without N protection
 3VA11 without, 50% or 100% N protection
 50% N protection from $I_n \geq 100$ A and only in size 160 A

Protection functions of the 3VA2 with Electronic Trip Unit

	ETU310M I	ETU320 LI	ETU330 LIG	ETU340 ELISA®	ETU350 LSI	ETU350M LSI	ETU550 LSI	ETU560 LSIG	ETU850 LSI	ETU860 LSIG	ETU860M LSIG
Protection											
Starter protection	✓	--	--	--	--	--	--	--	--	--	--
Motor protection	--	--	--	--	--	✓	--	--	--	--	✓
Line protection	--	✓	✓	✓	✓	--	✓	✓	✓	✓	--
Generator protection	--	✓	✓	--	✓	--	✓	✓	✓	✓	--
Version available with											
3-pole without external neutral conductor transformer	✓	✓	✓	✓	✓	✓	--	--	--	--	✓
3-pole with external neutral conductor transformer	--	--	--	--	--	--	✓	✓	✓	✓	--
4-pole with protected neutral conductor transformer	--	✓	✓	✓	✓	--	✓	✓	✓	✓	--
Available protection parameters											
Characteristic in L range	I^2t	I^2t	I^2t	I^4t	I^2t	I^2t	I^2t	I^2t	I^2t	I^2t	I^2t
I_r	--	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
t_r at $6 \times I_r$	--	✓	✓	--	✓	--	✓	✓	✓	✓	--
t_c	--	--	--	--	--	✓	--	--	--	--	✓
t_p	--	--	--	--	--	--	--	--	--	--	✓
Thermal image	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Thermal image can be switched on/off	--	--	--	--	--	--	✓	✓	✓	✓	--
I_{sd}	--	--	--	--	✓	✓	✓	✓	✓	✓	✓
t_{sd} at $8 \times I_r$	--	--	--	--	✓	✓	✓	✓	✓	✓	✓
Characteristic in S range: I^2t_{sd}	--	--	--	--	✓	--	✓	✓	✓	✓	--
Characteristic in S range: selectable I^2t_{sd} / t_{sd}	--	--	--	--	--	--	✓	✓	✓	✓	--
I_i	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
I_{N1}	--	✓	✓	✓	✓	--	✓	✓	✓	✓	--
I_g	--	✓	✓	--	--	--	--	✓	--	✓	✓
t_g at $2 \times I_g$	--	--	✓	--	--	--	--	✓	--	✓	✓
Characteristic in G range: I^2t_g	--	--	✓	--	--	--	--	✓	--	✓	✓
Characteristic in G range: selectable I^2t_g / t_g	--	--	✓	--	--	--	--	✓	--	✓	✓
Ground-fault alarm function	--	--	--	--	--	--	--	✓	--	✓	✓
Blocking protection	--	--	--	--	--	--	--	--	--	--	✓
ZSI in combination with an EFB external function box	--	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Features and options											
Setting by rotary switch	✓	✓	✓	✓	✓	✓	--	--	--	--	--
Setting by ETU display	--	--	--	--	--	--	✓	✓	✓	✓	✓
Data shown on ETU display	--	--	--	--	--	--	✓	✓	✓	✓	✓
Metering function	--	--	--	--	--	--	--	--	✓	✓	✓
Communication option	--	--	--	--	--	--	✓	✓	✓	✓	✓
Front interface	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

1) Available in a version with external current transformer for N conductor or 4-pole breaker

✓ Available

-- Not available