Fuji Electric

MANUAL MOTOR STARTERS
MAGNETIC CONTACTORS

DUO SERIES

USEH530b

Advanced Motor Protection and Control – Fuji DUO series

Fuji's new motor control system for the international market.

The DUO series adds a new family of compact, high-performance combination starters to manual motor starters BM3 series, magnetic contactors SC-M and SC-E series and thermal overload relays TK-E series to form a complete line-up of motor control products.

Responding to today's market needs, Fuji DUO series was designed to provide various distinctive features.

ULTIMATE COST SAVING SOLUTION

- The number of components like Circuit Breakers can be reduced. (See page 4 to 7 for detail.)
- Combination starters combined with manual motor starters and contactors, provides 52% reduction for monting space and 90% reduction for wiring work to make a control panel.

RESPONSE TO THE INTERNATIONAL MARKET

- Short-circuit protective coordination between protective devices and the equipment to be protected.
- Conformance to UL including Type E, Type F, CSA, IEC and other international standards.

SAFETY AND ECOLOGICAL CONSIDERATION

- Application of international standards in safety features such as terminals with finger protection.
- Use of recycled materials to help conserve the environment and save resources.

FUJI meets emerging needs with a new form of motor protection.

DUO SERIES

Manual motor starters (MMS)

BM3 series

Manual Motor Starters that provide optimal protection by integrating the functions of a molded case circuit breaker and thermal overload relay into a highly compact unit.

Rated current: 0.16 to 32A, 10 to 63A
Short circuit current rating : 22, 50kA 480VAC
Width: 45mm, 55mm

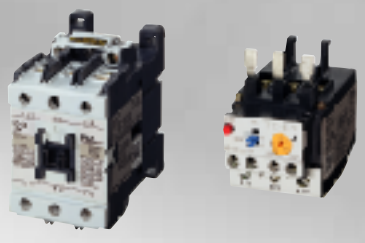
Contactors and thermal overload relays

SC-M series

Compact magnetic contactors and small capacity motor control for 3 to 5HP, 480VAC.

Rated capacity: AC-3 3 to 5HP, 480VAC
Width: 45mm

SC-E series **TK-E series**



Magnetic contactors and thermal overload relays featuring terminals with finger protection for 5 to 100HP.

Rated capacity: AC-3 5 to 100HP
Width: 43,54,67mm (5 to 50HP)
88,100,115mm (60 to 100HP)

Combination starters

Provide the ability to configure combination starters for compact, reliable motor protection by combining a manual motor starter and a magnetic contactor.

Manual motor starters BM3 series

Conforming to international standards and combining compactness with high breaking performance, this versatile series features leading-edge motor protection.

Molded case circuit breaker and thermal overload relay functions integrated into a highly compact unit.

Circuit breaker functions

- Short-circuit protection
- Overcurrent protection
- Line protection

+

Thermal overload relay functions

- Overload protection
- Phase-loss protection
- Rated current adjustment
- Ambient temperature compensation

Manual motor starter advantages

Compactness	Mounting space: MCCB + Thermal overload relay: 100% MMS: **43%** (**57%** reduction)
Reduction in wiring work	MCCB + Contactor + Thermal overload relay: 100% MMS + Contactor: **50%** (**50%** reduction)
Standards	• IEC 60947-1, 60947-2, 60947-4-1, UL 508, CSA C22.2 No.14
Approved	• cUL (File No. E163944, E211710), TÜV (R205062B)
Ecological design	• Recyclable thermoplastic resin used in plastic parts • Indication of materials used • Cadmium-free contacts

Magnetic contactors SC-M and SC-E series

A full line-up consisting of the mini-contactor SC-M series for 3 to 5HP, 480VAC use and the SC-E series for 5 to 100HP 480VAC use.

- Finger protection standard
- Lug terminal

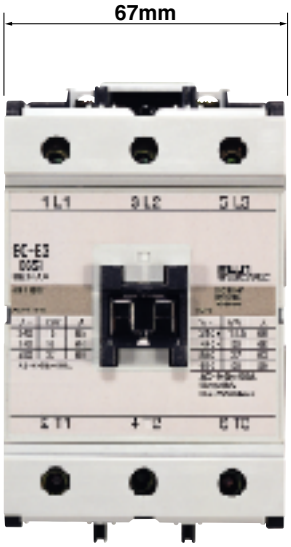
SC-M series

SC-M01, M02

SC-E series

SC-E02 to E05

SC-E1 to E2S

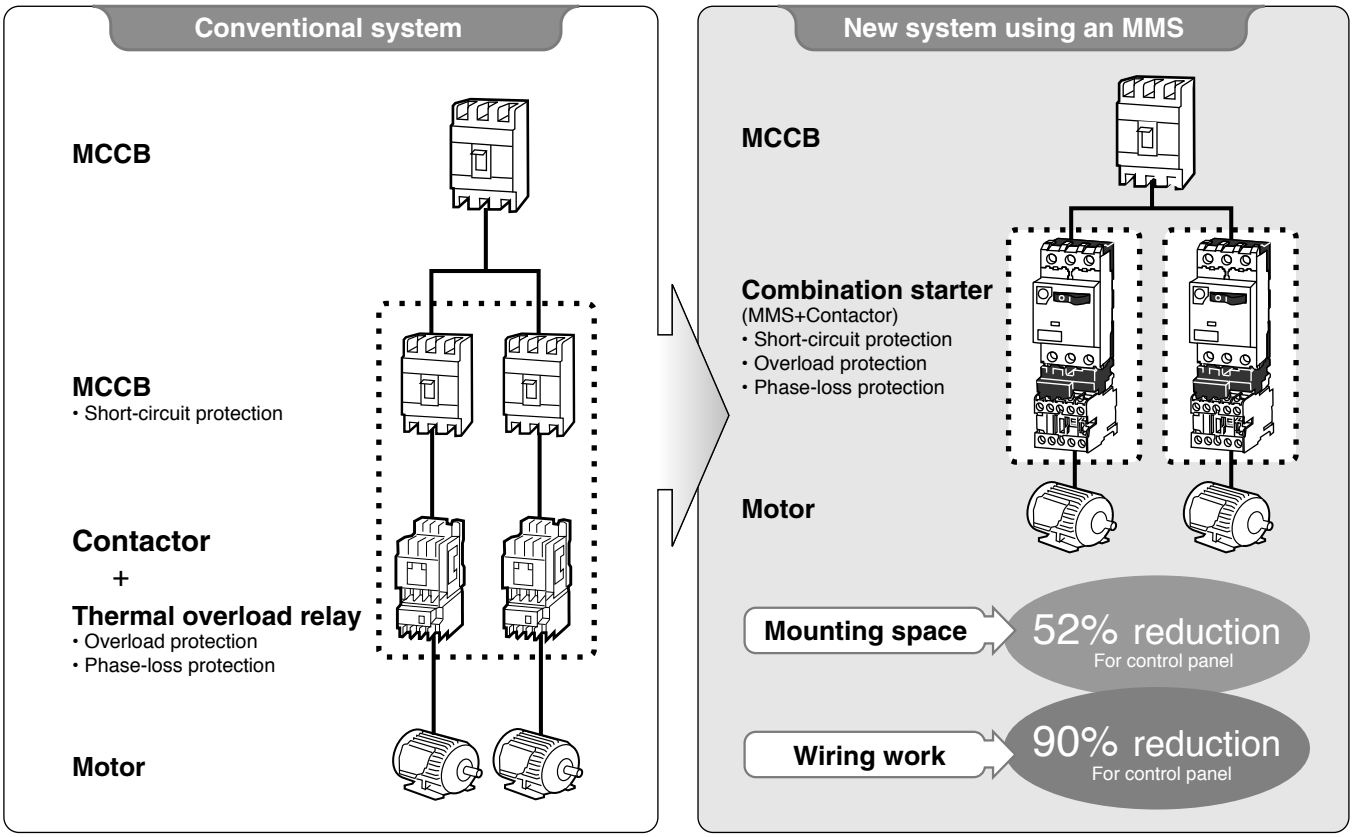


SC-E3, E4

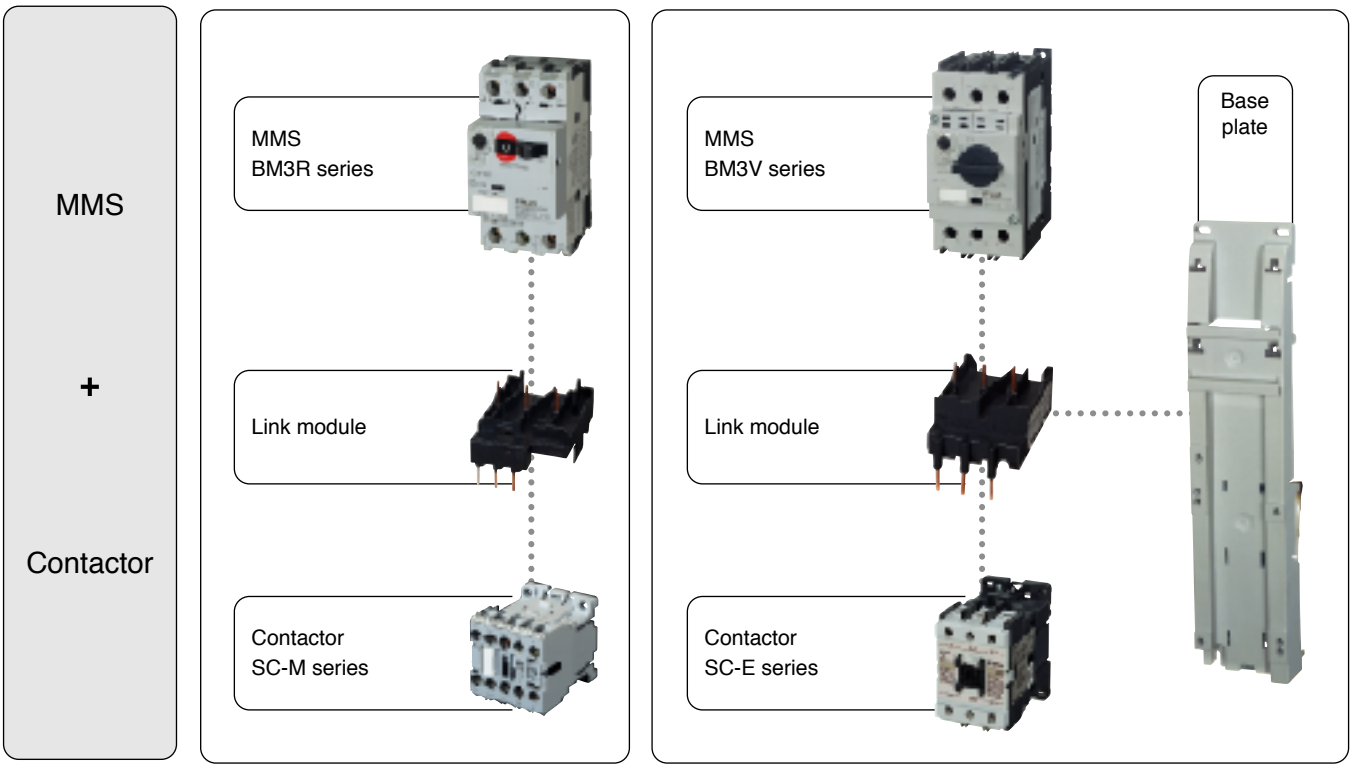
Combination of manual motor starters and magnetic contactors

A line-up that aims to set a new world standard for compactness, high performance, and utility in combination starters.

Space-saving, reliable motor protection achieved by combining a manual motor starter and magnetic contactor.



Combination starters can be easily configured with a manual motor starter, magnetic contactor and other parts.



Fuji proposes ultimate cost saving solution with DUO series

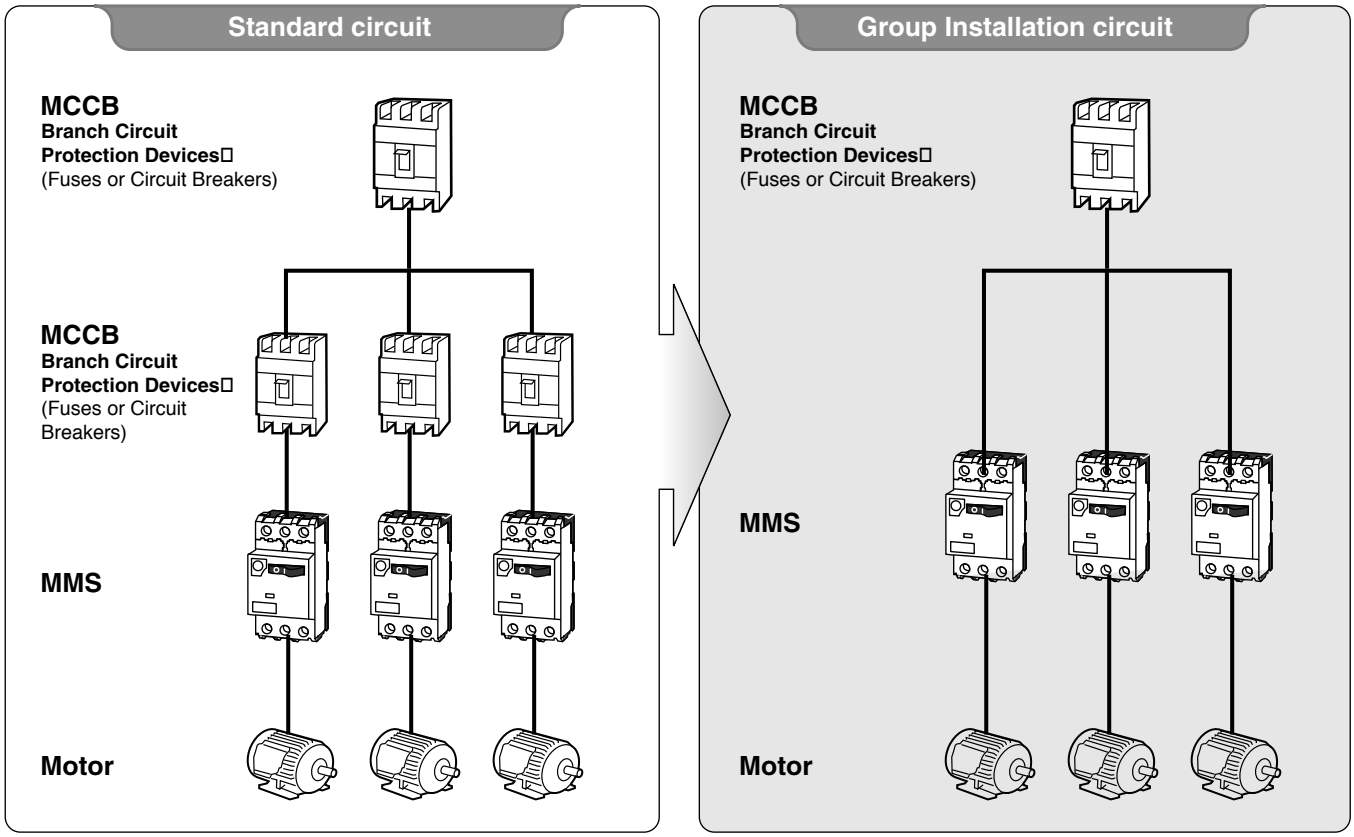
Fuji Manual Motor Starter (MMS) intends to apply for manual motor starting application.
As UL listed manual motor controller per UL508, they provide overload protection but are required to be installed with short circuit protection devices (Fuses or Circuit Breakers) on the upstream.
However, according to National Electrical Code (NEC), you can save the cost of short circuit protection devices and can make a smaller panel using DUO series.
The following are case studies for the cost saving use of Fuji DUO series.

Case study 1 : Group Motor Installation

Per NEC430-52 and -53, the combination with a specific rated Fuse or Circuit Breaker allows several motors in a circuit composition.
Fuji MMS are cUL listed per group installation regulations of NEC.
Two or more motors can be connected to one branch circuit when the MMS is used with a specific current rated branch circuit protection device (see remarks below).

The advantages of Group Installation are as follows.

- ***The number of components like Circuit Breakers can be reduced***
- ***The wire size can be reduced by 1/3 - 1/10 under certain conditions***
- ***The area inside the control panel can be minimized***



Remarks :
Per NEC regulations, to connect several motors on one branch circuit protection device, note the following conditions (A) or (B) or (C) and condition (D) listed NEC article 430.53 must be complied.
(A) : Not over 1 horsepower
(B) : If smallest rated motor protected
(C) : Other group installation
(D) : Single motor taps.
For complete details, please refer to NEC book.

Case study 2 : Self-Protected Combination Motor Controller / TYPE E and TYPE F

Fuji MMS are cUL listed as a Self-Protected Combination Controller such as Type E and Type F.
To apply MMS as Self-Protected Combination Controller, MMS must be attached to short circuit alarm contact block (**BZ0TKUAB**).
32A frame type, BM3R series must also be attached to the line side terminal cover (**BZ0TCRE**) because the Self-Protected Combination Controller has the clearance and creepage distance requirements as UL489 regulation.
(63A frame type, BM3V series complies with their regulation without terminal cover.)

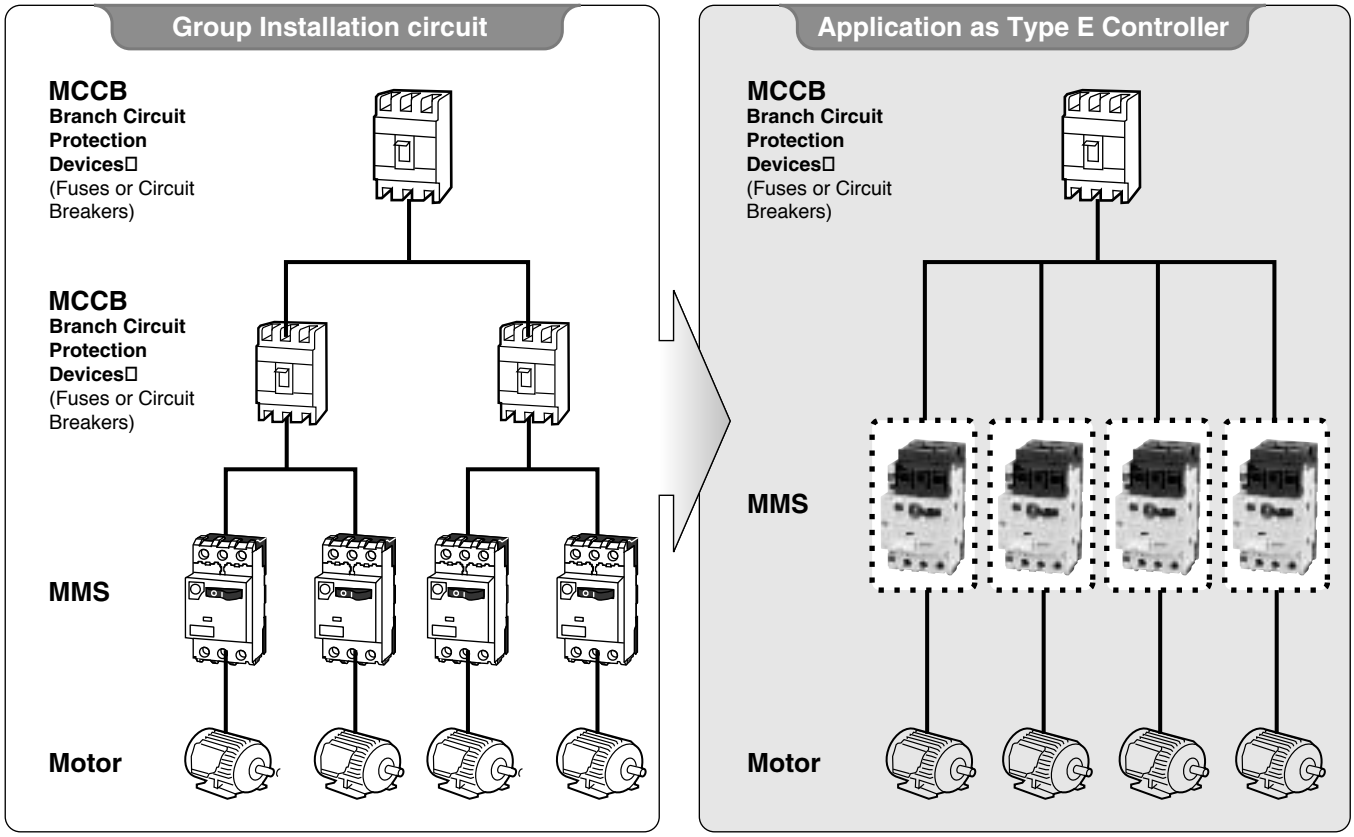
(1) Combination motor controller, **Type E**, when only MMS is used.
(Manual Self-Protected Combination Motor Controller according to UL508)

(2) Combination motor controller, **Type F**, when MMS is used with Fuji SC-E, SC-M contactor.
(Manual Self-Protected Combination Motor Controller + Magnetic contactor according to UL508)

The advantage of a Self-Protected Combination Motor Controller is that it can replace a **UL489 Circuit Breaker**.
This means that in a motor branch circuit, the UL489 Circuit Breaker upstream can be eliminated.
MMS has a trip function like a Circuit Breaker for the purpose of protection against short-circuit.
Therefore, the number of components can be reduced and will result in saving more space than the ordinary Group Installation.

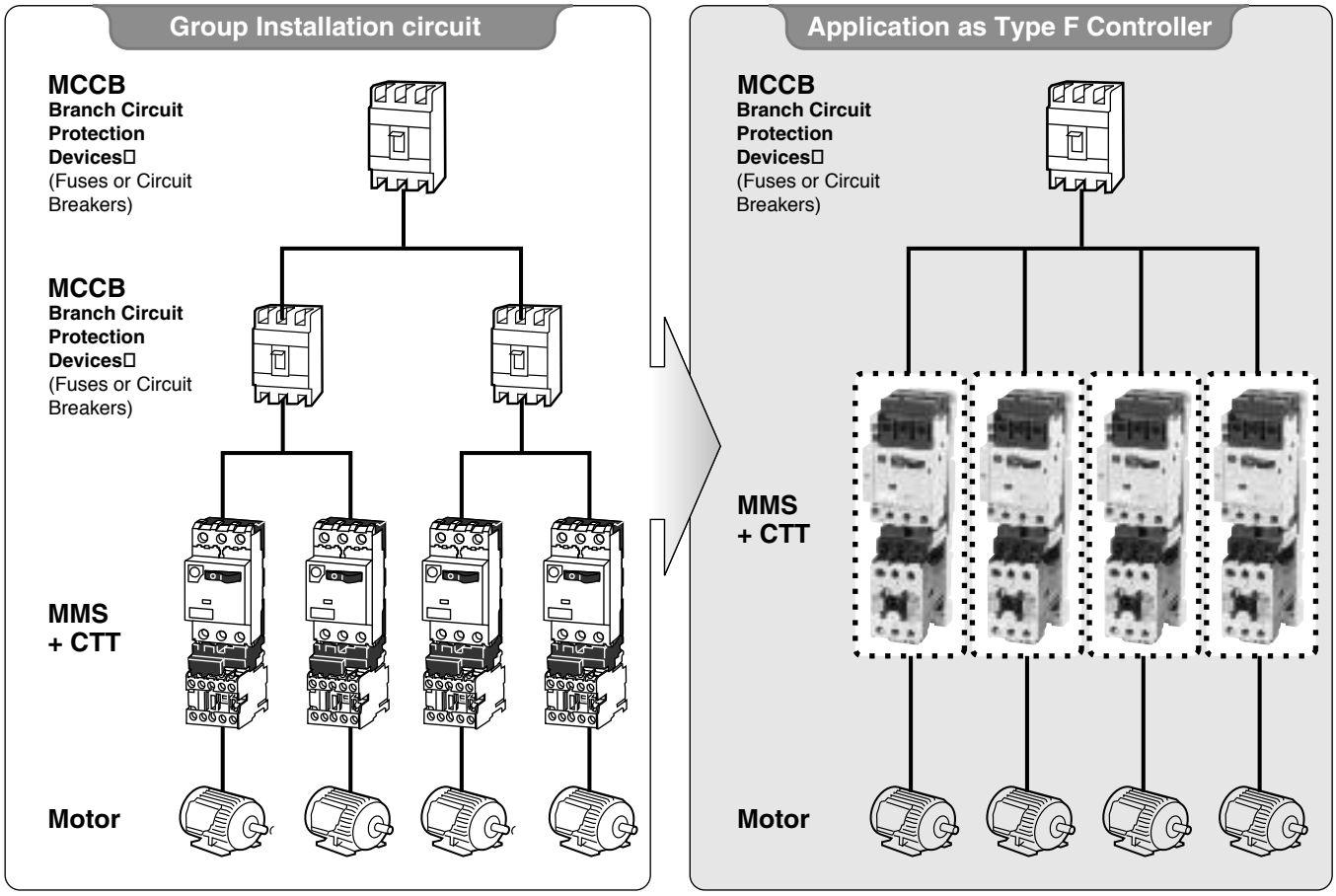
* The self-protected combination motor controller can be used as branch circuit protection in *Motor Circuit only*.
They cannot be applied to any other loads such as resistance load.

Example of Type E application



Requirements for Type E construction
- Terminal cover (BZ0TCRE) except for BM3V series.
- Short-circuit alarm contact block (BZ0TKUAB) for all MMS.

Example of Type F application



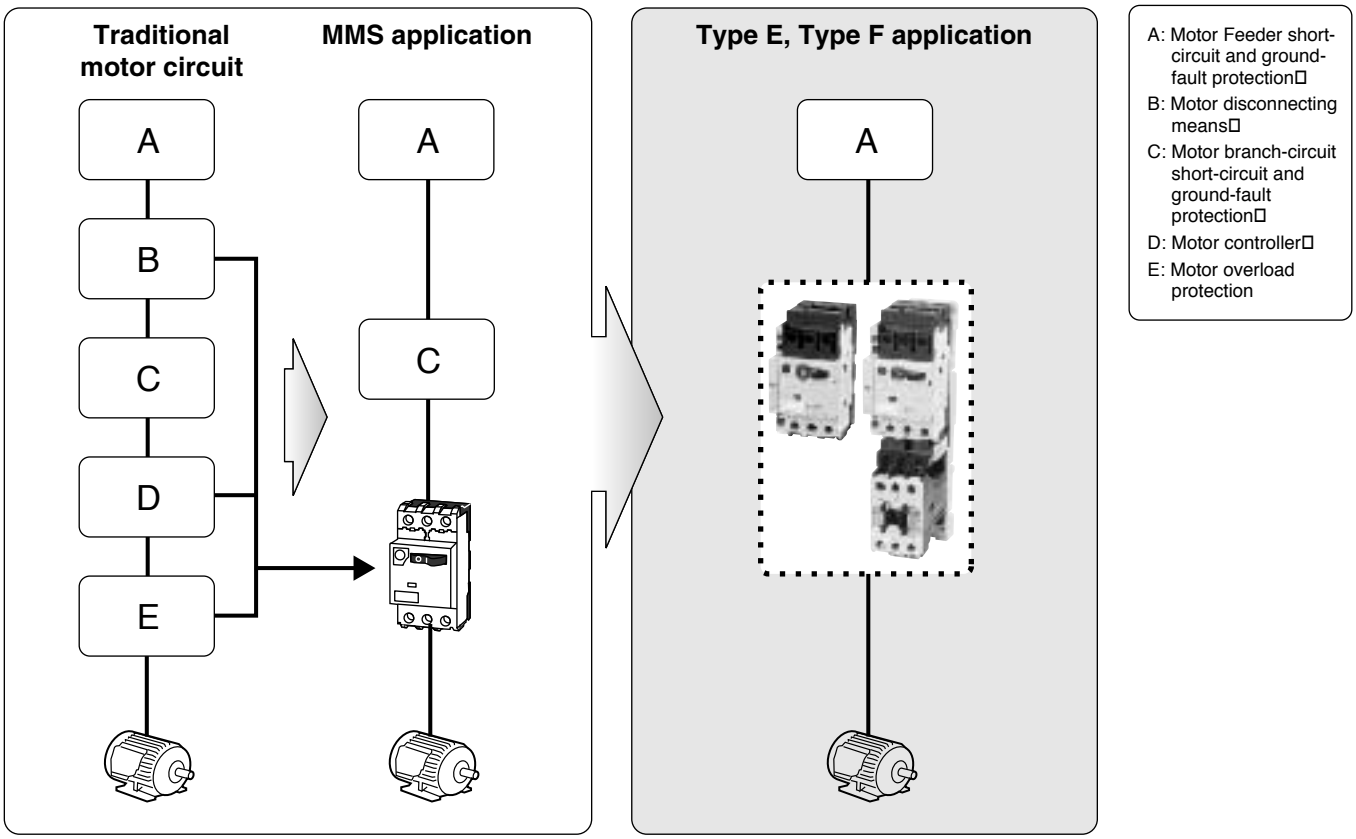
Requirements for Type F construction
- Must be used with contactor for motor control fuction.
- Terminal cover (BZ0TCRE) except for BM3V series.
- Short-circuit alarm contact block (BZ0TKUAB) for all MMS.

Case study 3 : Motor Disconnecting Means

Per NEC 430.102, a disconnecting means must be applied to each controller.
Fuji MMS are also cUL listed as **"Suitable as Motor disconnect"** and can be applied as a Motor disconnect.

The advantage of using MMS for disconnect means :

- An extra component will not be needed because the MMS has a dual function, which will lead to smaller space requirement and less components.



DUO SERIES

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Manual Motor Starters
Quick reference guide

32A Frame types and ratings

Adjustable thermal-magnetic trip type		**Standard breaking capacity** **BM3RSB-□**  KK01-317
Number of poles		3
Handle type		Rocker
Rated current Ie	(A)	0.16 to 32
Rated operational voltage Ue	(V)	200 to 690
Rated frequency	(Hz)	50/60
Rated insulation voltage Ui	(V)	690
Rated impulse withstand voltage Uimp	(kV)	6
Utilization category	IEC 60947-2 Circuit breaker	Cat. A
	IEC 60947-4-1 Motor starter	AC-3
Trip class IEC 60947-4-1		10
Instantaneous trip characteristic		13 × Ie max.
Power loss (total of 3-pole)		7W: In=0.16 to 25A 8.5W: In=32A
Mechanical durability (operations)		100,000: In=0.16 to 25A 70,000: In=32A
Electrical durability (operations)		100,000: In=0.16 to 25A 70,000: In=32A
Max. operations per hour (motor start-up)		25
Phase-loss protection		Provided
Trip indicator		Provided
Test trip function		Provided

Adjustable current range		UL/CSA 3phase HP rating (HP) *2				Instantaneous trip current (A)	UL/CSA Short circuit current rating (kA) *3			Maximum listed branch circuit protection *3
Code *1	Ie: Min.–Max. (A)	200-208VAC	220-240VAC	440-480VAC	550-600VAC		240VAC	480VAC	600VAC	Fuse or MCCB (A)
P16	0.1–0.16	In accordance with Motor full load current				2.1	100	50	10	500
P25	0.16–0.25					3.3	100	50	10	500
P40	0.25–0.4					5.2	100	50	10	500
P63	0.4–0.63					8.2	100	50	10	500
001	0.63–1				1/2	13	100	50	10	500
1P6	1–1.6			3/4	3/4	20.8	100	50	10	500
2P5	1.6–2.5	1/2	1/2	1	1-1/2	32.5	100	50	10	500
004	2.5–4	3/4	3/4	2	3	52	100	50	10	500
6P3	4–6.3	1	1-1/2	3	5	81.9	100	50	10	500
010	6.3–10	2	3	5	7-1/2	130	100	22	10	500
013	9–13	3	3	7-1/2	10	169	100	22	10	500
016	11–16	3	5	10	10	208	100	22	10	500
020	14–20	5	5	10	15	260	50	22	10	500
025	19–25	7-1/2	7-1/2	15	20	325	50	22	10	500
032	24–32	10	10	20	30	416	50	22	10	500

Dimensions (mm) W X H X D	45 X 90 X 66
Mass (g)	350

Optional accessory		
	Auxiliary contact block	◯
	Alarm contact block	◯
	Auxiliary and alarm contact block	◯
	Short-circuit alarm contact block	◯
	Shunt trip device	◯
	Undervoltage trip device	◯
	External operating handle	–
Standard		IEC 60947-1, 60947-2, 60947-4-1, UL 508, CSA C22.2 No.14

Notes: *1 Replace the □ mark in the part number by current range codes. ◯ Available – Not available
*2 The BM3RSB is cUL listed as HP rated motor controllers.
*3 The BM3RSB is cUL listed for group Installation as per NEC430-53(C).

■ 32A Frame types and ratings

Adjustable thermal-magnetic trip type			**High breaking capacity** **BM3RHB-□**  AF01-42							
Number of poles			3							
Handle type			Rotary							
Rated current Ie		(A)	0.16 to 32							
Rated operational voltage Ue		(V)	200 to 690							
Rated frequency		(Hz)	50/60							
Rated insulation voltage Ui		(V)	690							
Rated impulse withstand voltage Uimp		(kV)	6							
Utilization category	IEC 60947-2 Circuit breaker		Cat. A							
	IEC 60947-4-1 Motor starter		AC-3							
Trip class IEC 60947-4-1			10							
Instantaneous trip characteristic			13 × Ie max.							
Power loss (total of 3-pole)			7W: In=0.16 to 25A 8.5W: In=32A							
Mechanical durability (operations)			100,000: In=0.16 to 25A 70,000: In=32A							
Electrical durability (operations)			100,000: In=0.16 to 25A 70,000: In=32A							
Max. operations per hour (motor start-up)			25							
Phase-loss protection			Provided							
Trip indicator			Provided							
Test trip function			Provided							
Adjustable current range			UL/CSA 3phase HP rating (HP) *2				Instantaneous trip current (A)	UL/CSA Short circuit current rating (kA) *3			Maximum listed branch circuit protection *3
Code *1		Ie: Min.–Max. (A)	200-208VAC	220-240VAC	440-480VAC	550-600VAC		240VAC	480VAC	600VAC	Fuse or MCCB (A)
P16		0.1–0.16	In accordance with Motor full load current				2.1	100	50	10	500
P25		0.16–0.25					3.3	100	50	10	500
P40		0.25–0.4					5.2	100	50	10	500
P63		0.4–0.63					8.2	100	50	10	500
001		0.63–1				1/2	13	100	50	10	500
1P6		1–1.6			3/4	3/4	20.8	100	50	10	500
2P5		1.6–2.5	1/2	1/2	1	1-1/2	32.5	100	50	10	500
004		2.5–4	3/4	3/4	2	3	52	100	50	10	500
6P3		4–6.3	1	1-1/2	3	5	81.9	100	50	10	500
010		6.3–10	2	3	5	7-1/2	130	100	50	10	500
013		9–13	3	3	7-1/2	10	169	100	50	10	500
016		11–16	3	5	10	10	208	100	50	10	500
020		14–20	5	5	10	15	260	100	50	10	500
025		19–25	7-1/2	7-1/2	15	20	325	100	50	10	500
032		24–32	10	10	20	30	416	100	50	10	500
Dimensions (mm)	W X H X D		45 X 90 X 79								
Mass (g)			370								
Optional accessory	Auxiliary contact block		◯								
	Alarm contact block		◯								
	Auxiliary and alarm contact block		◯								
	Short-circuit alarm contact block		◯								
	Shunt trip device		◯								
	Undervoltage trip device		◯								
	External operating handle		◯								
Standard			IEC 60947-1, 60947-2, 60947-4-1, UL 508, CSA C22.2 No.14								

Notes: *1 Replace the □ mark in the part number by current range codes. ◯ Available – Not available
*2 The BM3RHB is cUL listed as HP rated motor controllers.
*3 The BM3RHB is cUL listed for group Installation as per NEC430-53(C).

Manual Motor Starters
Quick reference guide

63A Frame types and ratings

Adjustable thermal-magnetic trip type		**Standard breaking capacity** **BM3VSB-□**  AF01-47								
Number of poles		3								
Handle type		Rotary								
Rated current Ie	(A)	10 to 63								
Rated operational voltage Ue	(V)	200 to 690								
Rated frequency	(Hz)	50/60								
Rated insulation voltage Ui	(V)	1000								
Rated impulse withstand voltage Uimp	(kV)	8								
Utilization category	IEC 60947-2 Circuit breaker	Cat. A								
	IEC 60947-4-1 Motor starter	AC-3								
Trip class IEC 60947-4-1		10								
Instantaneous trip characteristic		13 x Ie max.								
Power loss (total of 3-pole)		11W: In=10 to 32A 15W: In=40 to 50A 17W: In=63A								
Mechanical durability (operations)		50,000								
Electrical durability (operations)		25,000								
Max. operations per hour (motor start-up)		25								
Phase-loss protection		Provided								
Trip indicator		Provided								
Test trip function		Provided								
Adjustable current range		UL/CSA 3phase HP rating (HP) *2				Instantaneous trip current (A)	UL/CSA Short circuit current rating (kA) *3			Maximum listed branch circuit protection *3
Code *1	Ie: Min.–Max. (A)	200-208VAC	220-240VAC	440-480VAC	550-600VAC		240VAC	480VAC	600VAC	Fuse or MCCB (A)
010	6.3–10	2	3	5	7-1/2	130	100	22	10	600
013	9–13	3	3	7-1/2	10	169	100	22	10	600
016	11–16	3	5	10	10	208	100	22	10	600
020	14–20	5	5	10	15	260	100	22	10	600
025	19-25	7-1/2	7-1/2	15	20	325	100	22	10	600
032	24-32	10	10	20	30	416	100	22	10	600
040	28-40	10	10	30	30	520	100	22	10	600
050	35-50	15	15	30	40	650	100	22	10	600
063	45-63	20	20	40	60	819	100	22	10	600
Dimensions (mm) W X H X D		55 X 110 X 96								
Mass (g)		780								
Optional accessory	Auxiliary contact block	○								
	Alarm contact block	○								
	Auxiliary and alarm contact block	○								
	Short-circuit alarm contact block	○								
	Shunt trip device	○								
	Undervoltage trip device	○								
	External operating handle	○								
Standard		IEC 60947-1, 60947-2, 60947-4-1, UL 508, CSA C22.2 No.14								

Notes: *1 Replace the □ mark in the part number by current range codes.
*2 The BM3VSB is cUL listed as HP rated motor controllers.
*3 The BM3VSB is cUL listed for group Installation as per NEC430-53(C).

○ Available – Not available

63A Frame types and ratings

Adjustable thermal-magnetic trip type	**High breaking capacity** **BM3VHB-□**  AF01-43

Number of poles		3
Handle type		Rotary
Rated current Ie	(A)	10 to 63
Rated operational voltage Ue	(V)	200 to 690
Rated frequency	(Hz)	50/60
Rated insulation voltage Ui	(V)	1000
Rated impulse withstand voltage Uimp	(kV)	8
Utilization category	IEC 60947-2 Circuit breaker	Cat. A
	IEC 60947-4-1 Motor starter	AC-3
Trip class IEC 60947-4-1		10
Instantaneous trip characteristic		13 x Ie max.
Power loss (total of 3-pole)		11W: In=10 to 32A 15W: In=40 to 50A 17W: In=63A
Mechanical durability (operations)		50,000
Electrical durability (operations)		25,000
Max. operations per hour (motor start-up)		25
Phase-loss protection		Provided
Trip indicator		Provided
Test trip function		Provided

Adjustable current range		UL/CSA 3phase HP rating (HP) *2				Instantaneous trip current (A)	UL/CSA Short circuit current rating (kA) *3			Maximum listed branch circuit protection *3
Code *1	Ie: Min.–Max. (A)	200-208VAC	220-240VAC	440-480VAC	550-600VAC		240VAC	480VAC	600VAC	Fuse or MCCB (A)
010	6.3–10	2	3	5	7-1/2	130	100	50	10	600
013	9–13	3	3	7-1/2	10	169	100	50	10	600
016	11–16	3	5	10	10	208	100	50	10	600
020	14–20	5	5	10	15	260	100	50	10	600
025	19-25	7-1/2	7-1/2	15	20	325	100	50	10	600
032	24-32	10	10	20	30	416	100	50	10	600
040	28-40	10	10	30	30	520	100	50	10	600
050	35-50	15	15	30	40	650	100	50	10	600
063	45-63	20	20	40	60	819	100	50	10	600

Dimensions (mm)	W X H X D	55 X 110 X 96
Mass (g)		780
Optional accessory	Auxiliary contact block	○
	Alarm contact block	○
	Auxiliary and alarm contact block	○
	Short-circuit alarm contact block	○
	Shunt trip device	○
	Undervoltage trip device	○
	External operating handle	○
Standard		IEC 60947-1, 60947-2, 60947-4-1, UL 508, CSA C22.2 No.14

Notes: *1 Replace the □ mark in the part number by current range codes. ○ Available – Not available
*2 The BM3VHB is cUL listed as HP rated motor controllers.
*3 The BM3VHB is cUL listed for group Installation as per NEC430-53(C).

Manual Motor Starters
Type E ratings

• BM3RSB (Type E ratings)

Manual motor starters		3 phase motor		Short circuit rating(kA)	
Code	Ie; Min-Max.□ (A)	Rated capacity (HP) 220-240V AC	Rated capacity (HP) 440-480V AC	up to 240V AC	up to 480/277V AC
P16	0.1-0.16	In accordance with Motor full load current		100	50
P25	0.16-0.25			100	50
P40	0.25-0.4			100	50
P63	0.4-0.63			100	50
001	0.63-1.0			100	50
1P6	1-1.6		3/4	100	50
2P5	1.6-2.5	1/2	1	100	50
004	2.5-4	3/4	2	100	50
6P3	4-6.3	1-1/2	3	100	50
010	6.3-10	3	5	100	22
013	9-13	3	7-1/2	100	22
016	11-16	5	10	100	22
020	14-20	5	10	100	22
025	19-25	7-1/2	15	50	22
032	24-32a	10	20	50	22

To make an application for use with Type E controller, you need to prepare BZ0TCRE and BZ0TKUAB accessories for BM3RSB separately.

• BM3RHB (Type E ratings)

Manual motor starters		3 phase motor		Short circuit rating(kA)	
Code	Ie; Min-Max.□ (A)	Rated capacity (HP) 220-240V AC	Rated capacity (HP) 440-480V AC	up to 240V AC	up to 480/277V AC
P16	0.1-0.16	In accordance with Motor full load current		100	50
P25	0.16-0.25			100	50
P40	0.25-0.4			100	50
P63	0.4-0.63			100	50
001	0.63-1.0			100	50
1P6	1-1.6		3/4	100	50
2P5	1.6-2.5	1/2	1	100	50
004	2.5-4	3/4	2	100	50
6P3	4-6.3	1-1/2	3	100	50
010	6.3-10	3	5	100	50
013	9-13	3	7-1/2	100	50
016	11-16	5	10	100	50
020	14-20	5	10	100	50
025	19-25	7-1/2	15	100	50
032	24-32	10	20	100	50

To make an application for use with Type E controller, you need to prepare BZ0TCRE and BZ0TKUAB accessories for BM3RHB separately.

• BM3VSB (Type E ratings)

Manual motor starters		3 phase motor		Short circuit rating(kA)	
Code	Ie; Min-Max.□ (A)	Rated capacity (HP) 220-240V AC	Rated capacity (HP) 440-480V AC	up to 240V AC	up to 480/277V AC
010	6.3-10	3	5	100	22
013	9-13	3	7-1/2	100	22
016	11-16	5	10	100	22
020	14-20	5	10	100	22
025	19-25	7-1/2	15	100	22
032	24-32	10	20	100	22
040	28-40	10	30	100	22
050	35-50	15	30	100	22
063	45-63	20	40	100	22

To make an application for use with Type E controller, you need to prepare BZ0TKUAB accessories for BM3VSB separately.

• BM3VHB (Type E ratings)

Manual motor starters		3 phase motor		Short circuit rating(kA)	
Code	Ie; Min-Max.□ (A)	Rated capacity (HP) 220-240V AC	Rated capacity (HP) 440-480V AC	up to 240V AC	up to 480/277V AC
010	6.3-10	3	5	100	50
013	9-13	3	7-1/2	100	50
016	11-16	5	10	100	50
020	14-20	5	10	100	50
025	19-25	7-1/2	15	100	50
032	24-32	10	20	100	50
040	28-40	10	30	100	50
050	35-50	15	30	100	50
063	45-63	20	40	100	50

To make an application for use with Type E controller, you need to prepare BZ0TKUAB accessories for BM3VHB separately.

Ordering information

Specify the following:
1. Part number
2. Accessories if required

BM3 V H B - 063

Product category

Frame size
R: 32A Frame 45mm wide
V: 63A Frame 55mm wide

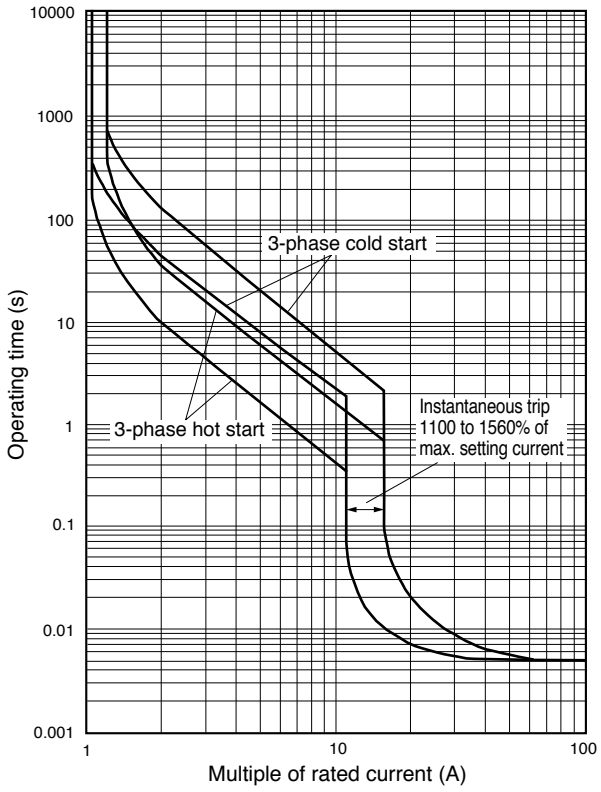
Rated current code (see page 9 to 12)

Operating characteristic
B: Adjustable thermal-magnetic trip

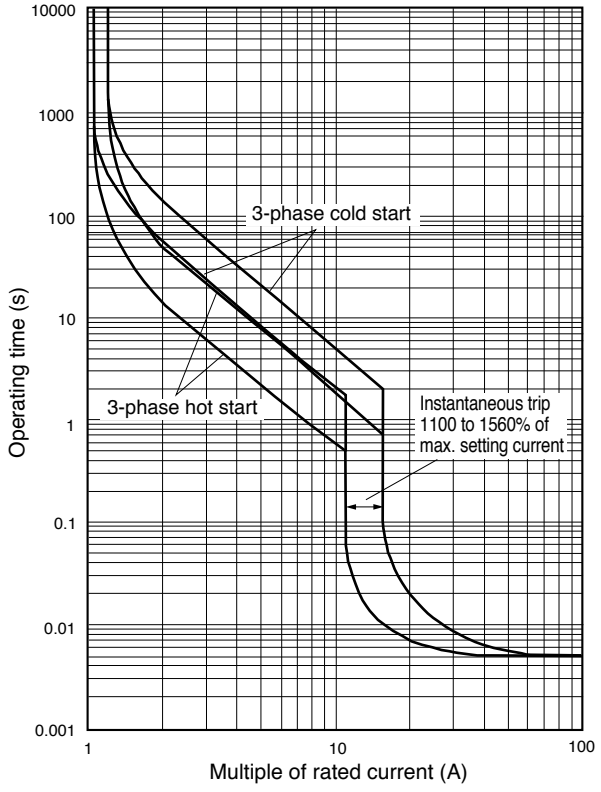
Breaking capacity
S: Standard breaking capacity
H: High breaking capacity

Characteristic curves

• BM3RSB, RHB



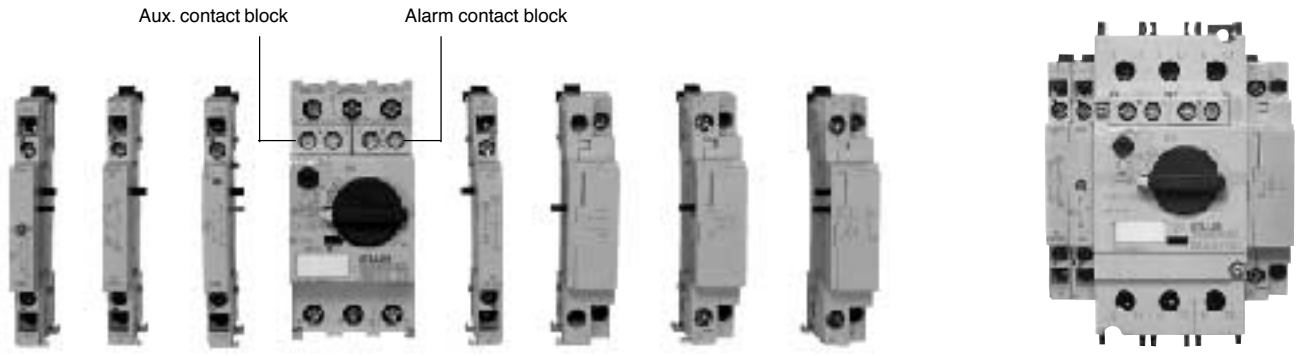
• BM3VSB, VHB



Manual Motor Starters
Optional accessories

Features

- All accessories can be used with BM3R (45mm wide) and BM3V (55mm wide) frames.
- Accessories are easily mounted.
- Internal auxiliary contact blocks and alarm contact blocks can be mounted on front side.
- External auxiliary contact blocks can be mounted on either the right or left side.
- Shunt trip and undervoltage trip devices are available in a wide range of operating voltages.
- Standard and emergency external handles are available.
- IP20 terminal cover prevents accidental contact to electrically charged parts.



Aux. contact blocks
Aux. and alarm contact block
Short-circuit alarm contact block

Aux. contact blocks
Shunt-trip device
Undervoltage trip device

AF01-76

Part number and ratings

• Auxiliary contact blocks (W)

Description		Starter type	Mounting	Contact arrangement	Part number	Mass (g)
 AF01-60L	These blocks are linked to the ON/OFF operation of the MMS. Up to two contact blocks can be mounted to the right/left front, and up to two contact blocks can be mounted to the right/left sides.	BM3R BM3V	Front	1NO 1NC	**BZ0WIA** **BZ0WIB**	9
 AF01-59, 01-58			Left side	2NO 1NO+1NC 2NC	**BZ0WUAAL** **BZ0WUABL** **BZ0WUBBL**	45
			Right side	2NO 1NO+1NC 2NC	**BZ0WUAAR** **BZ0WUABR** **BZ0WUBBR**	45

• Alarm contact blocks (K)

Description		Starter type	Mounting	Contact arrangement	Part number	Mass (g)
 AF01-60R	This block operates when the MMS trips due to overload, phase-loss, or short-circuit. It is not linked to the ON/OFF operation of the MMS. Note: Operation can be checked with the test trip function.	BM3R BM3V	Front (Right side only)	1NO 1NC	**BZ0KIA** **BZ0KIB**	9

• Auxiliary and alarm contact blocks (WK)

Description	Starter type	Mounting	Contact arrangement	Part number	Mass (g)
 AF01-57 • This contact block combines auxiliary contact and alarm contact that operate in the event of an overload, phase loss, or short-circuit. Alarm contact is not linked to the ON/OFF operation of the MMS. • An alarm is displayed in the contact block's indicator when the alarm contact operates. Note: Operation can be checked with the test trip function.	BM3R BM3V	Left	1NO (Aux.)+ 1NO (Alarm) 1NC (Aux.)+ 1NO (Alarm) 1NO (Aux.)+ 1NC (Alarm) 1NC (Aux.)+ 1NC (Alarm)	**BZ0WKUAA** **BZ0WKUBA** **BZ0WKUAB** **BZ0WKUBB**	45

• Short-circuit alarm contact block (KI)

Description	Starter type	Mounting	Contact arrangement	Part number	Mass (g)
 AF01-56 • The contacts operate only when the MMS has tripped due to a short-circuit. • When these contacts operate, the blue reset button extends out, and a trip indication is displayed. • The power to the MMS can be turned ON after pressing the reset button. Note: Operation can not be checked with the test trip function. Be sure to press the reset button before mounting to the MMS.	BM3R BM3V	Left	1NO+1NC	**BZ0TKUAB**	45

• Shunt trip devices (F)

Description	Starter type	Mounting	Coil voltage	Part number	Mass (g)
This device is used to remotely trip the MMS.  AF01-55 Notes: • This device cannot be used together with an undervoltage trip device. • When the MMS has been tripped with the shunt trip device, press the reset button before turning ON the power.	BM3R BM3V	Right	24VAC 50/60Hz 48VAC 60Hz 48VAC 50Hz/60VAC 60Hz 100VAC 50Hz/100–110VAC 60Hz 110–127VAC 50Hz/120VAC 60Hz 200VAC 50Hz/200–220VAC 60Hz 220–230VAC 50Hz/240–260VAC 60Hz 240VAC 50Hz/277VAC 60Hz 380–400VAC 50Hz/400–440VAC 60Hz 415–440VAC 50Hz/460–480VAC 60Hz 500VAC 50Hz/600VAC 60Hz 24–60V DC * 110-240V DC *	**BZ0FAZU** **BZ0FBZU** **BZ0FCZU** **BZ0F1ZU** **BZ0FDZU** **BZ0FEZU** **BZ0FFZU** **BZ0FGZU** **BZ0FHZU** **BZ0F4ZU** **BZ0FJZU** **BZ0FKZUD** **BZ0FLZUD**	115

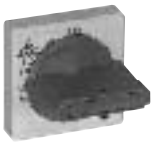
Note: * The time rating of coil is 5s.

• Undervoltage trip devices (R)

Description	Starter type	Mounting	Coil voltage	Part number	Mass (g)
R types This device automatically trips the MMS when the control circuit voltage drops below the specified value.  AF01-54 Notes: • This device cannot be used together with a shunt trip device. • When the MMS has been tripped with the undervoltage trip device, press the reset button before turning ON the power.	BM3R BM3V	Right	24VAC 50Hz 24VAC 60Hz 48VAC 50Hz 48VAC 60Hz 100VAC 50Hz/100–110VAC 60Hz 110–127VAC 50Hz/120VAC 60Hz 200VAC 50Hz/200–220VAC 60Hz 220–230VAC 50Hz/240–260VAC 60Hz 240VAC 50Hz/277VAC 60Hz 380–400VAC 50Hz/400–440VAC 60Hz 415–440VAC 50Hz/460–480VAC 60Hz 500VAC 50Hz/600VAC 60Hz	**BZ0RAZ1U** **BZ0RAZ2U** **BZ0RBZ1U** **BZ0RBZU** **BZ0R1ZU** **BZ0RDZU** **BZ0REZU** **BZ0RFZU** **BZ0RGZU** **BZ0RHZU** **BZ0R4ZU** **BZ0RJZU**	115

Manual Motor Starters
Optional accessories

• External operating handles

Description	Starter type	Handle type	Part number	Mass (g)
 KK02-305 • Used to operate an MMS installed inside a panel, from the outside of the panel. • Equipped with an interlock mechanism that prevents someone from mistakenly opening the panel door when the MMS is in the ON state. • The shaft can be cut to match the distance between the MMS and the panel door.	BM3RH	Standard (black) Emergency (red/yellow)	**BZ0VBBL** **BZ0VYRL**	160 160
 KK02-306 • Door interlock function • OFF lock function • Can be locked OFF with up to three padlocks. Note: Padlocks not included. • Release screw allows the door to be opened with the handle in the ON position. • IP54 enclosure	BM3V	Standard (black) Emergency (red/yellow)	**BZ0VBBM** **BZ0VYRM**	160 160

• Line side terminal cover

Description	Starter type	Part number	Mass (g)
 Used for making Type E or Type F condition	BM3R	**BZ0TCRE**	30

• Others

Description		Starter type	Part number	Mass (g)
Push-in lug 	Used for screw mounting. 10 pcs/pack	BM3R	**BZ0SET**	2.0
Terminal cover for IP20 	Prevents accidental contact to charged parts. 6 pcs/pack	BM3V	**BZ0TCV**	0.6
Dummy cover  KK02-39	• Used to cover the open space if an internally mounted accessory should become unnecessary. • Mounts to either the left-front or right-front position. • 10 pcs/pack	BM3R BM3V	**BZ0CFG**	1.4

Ratings of accessories

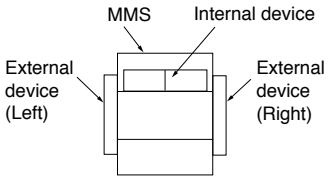
Accessory type		Auxiliary contact block/front	Auxiliary contact block/side	Alarm contact block	Aux. and alarm contact block	Short-circuit alarm contact block
Part number		**BZ0WI**	**BZ0WU**	**BZ0KI**	**BZ0WKU**	**BZ0TKUAB**
Standard		IEC 60947-5-1, UL 508				
Rated operational current (A)	48V AC AC-15	5	6	5	6	6
	125V AC	3	4	3	4	4
	230V AC	1.5	4	1.5	4	4
	400V AC	–	2.2	–	2.2	2.2
	500V AC	–	1.5	–	1.5	1.5
	690V AC	–	0.6	–	0.6	0.6
	48V DC DC-13	1.38	5	1.38	5	5
	110V DC	0.55	1.3	0.55	1.3	1.3
	220V DC	0.27	0.5	0.27	0.5	0.5
Contact rating code UL 508		B300	A600	B300	A600	A600
		Q300	P300	Q300	P300	P300
Min. voltage and current		17V 5mA				

Accessory type		Shunt trip device	Undervoltage device
Part number		**BZ0F**	**BZ0R**
Standard		IEC 60947-1, UL 508	
Rated insulation voltage (V AC)	IEC 60947	690	
	UL 508	600	
No. of ON-OFF operations		5000	
Operating time (ms)		20	
Power consumption	Inrush (VA/W)	21/12	
	Sealed (VA/W)	8/1.2	
Voltage range	Tripping voltage (V)	0.7 to 1.1Ue	0.35 to 0.7Ue
	Closing voltage (V)	–	0.85 to 1.1Ue
Time rating of coil (s)		AC: Continuous	AC: Continuous
		DC: 5	

Note: Ue: Rated Voltage

Manual Motor Starters
Optional accessories

Available accessory configuration



Internal devices

Auxiliary contact block (W) Alarm contact block (K)

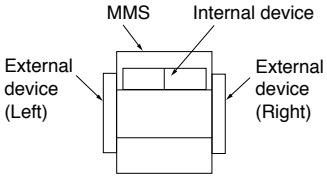
External devices

Auxiliary contact (W2) Auxiliary and alarm contact block (WK) Short-circuit alarm contact block (KI)

Shunt trip device (F) Undervoltage trip device (R)

Adj. thermal-magnetic trip type MMS		BM3RSB, BM3RHB						BM3VSB, BM3VHB					
Internal accessory			W	W	K	W+W	W+K		W	W	K	W+W	W+K
External accessory	W2 (Left)	W2	W2W	W2W	W2K	W2WW	W2WK	W2	W2W	W2W	W2K	W2WW	W2WK
	W2 (Right)	W2	W2W	W2W	W2K	W2WW	W2WK	W2	W2W	W2W	W2K	W2WW	W2WK
	WK (Left)	WK	WKW	WKW	WKK	WKWW	WKWK	WK	WKW	WKW	WKK	WKWW	WKWK
	KI (Left)	KI	KIW	KIW	KIK	KIWW	KIWK	KI	KIW	KIW	KIK	KIWW	KIWK
	F (Right)	F	WF	WF	KF	WWF	WKF	F	WF	WF	KF	WWF	WKF
	R (Right)	R	WR	WR	KR	WWR	WKR	R	WR	WR	KR	WWR	WKR
	W2 (Left)+F	W2F	W2WF	W2WF	W2KF	W2WWF	W2WKF	W2F	W2WF	W2WF	W2KF	W2WWF	W2WKF
	W2 (Left)+R	W2R	W2WR	W2WR	W2KR	W2WWR	W2WKR	W2R	W2WR	W2WR	W2KR	W2WWR	W2WKR
	WK+F	WKF	WKWF	WKWF	WKKF	WKWWF	WKWKF	WKF	WKWF	WKWF	WKKF	WKWWF	WKWKF
	WK+R	WKR	WKWR	WKWR	WKKR	WKWWR	WKWKR	WKR	WKWR	WKWR	WKKR	WKWWR	WKWKR
	KI+F	KIF	KIWF	KIWF	KIKF	KIWWF	KIWKF	KIF	KIWF	KIWF	KIKF	KIWWF	KIWKF
	KI+R	KIR	KIWR	KIWR	KIKR	KIWWR	KIWKR	KIR	KIWR	KIWR	KIKR	KIWWR	KIWKR
	W2 (Left)+ W2 (Left)	W2W2	W2W2W	W2W2W	W2W2K	W2W2WW	W2W2WK	W2W2	W2W2W	W2W2W	W2W2K	W2W2WW	W2W2WK
	W2 (Left)+ W2 (Right)	W2W2	W2W2W	W2W2W	W2W2K	W2W2WW	W2W2WK	W2W2	W2W2W	W2W2W	W2W2K	W2W2WW	W2W2WK

■ **Available accessory configuration** (continued)



Internal devices

Auxiliary contact block (W) Alarm contact block (K)

External devices

Auxiliary contact (W2) Auxiliary and alarm contact block (WK) Short-circuit alarm contact block (KI)

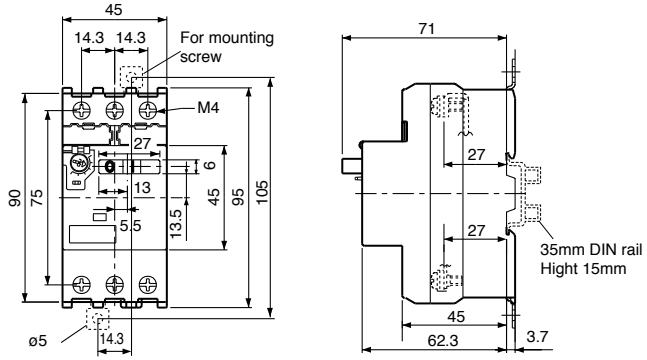
Shunt trip device (F) Undervoltage trip device (R)

Adj. thermal-magnetic trip type MMS		**BM3RSB, BM3RHB**						**BM3VSB, BM3VHB**					
Internal accessory			W	W	K	W+W	W+K		W	W	K	W+W	W+K
External accessory	W2 (Right)+ W2 (Right)	W2W2	W2W2W	W2W2W	W2W2K	W2W2WW	W2W2WK	W2W2	W2W2W	W2W2W	W2W2K	W2W2WW	W2W2WK
	W2 (Left)+ WK	W2WK	W2WKW	W2WKW	W2WKK	W2WKWW	W2WKWK	W2WK	W2WKW	W2WKW	W2WKK	W2WKWW	W2WKWK
	W2 (Right)+ WK	W2WK	W2WKW	W2WKW	W2WKK	W2WKWW	W2WKWK	W2WK	W2WKW	W2WKW	W2WKK	W2WKWW	W2WKWK
	W2 (Left)+ KI	W2KI	W2KIW	W2KIW	W2KIK	W2KIWW	W2KIWK	W2KI	W2KIW	W2KIW	W2KIK	W2KIWW	W2KIWK
	W2 (Right)+ KI	W2KI	W2KIW	W2KIW	W2KIK	W2KIWW	W2KIWK	W2KI	W2KIW	W2KIW	W2KIK	W2KIWW	W2KIWK
	KI+WK	KIWK	KIWKW	KIWKW	KIWKK	KIWKWW	KIWKWK	KIWK	KIWKW	KIWKW	KIWKK	KIWKWW	KIWKWK
	W2 (Left)+ W2 (Left)+F	W2W2F	W2W2WF	W2W2WF	W2W2KF	W2W2WWF	W2W2WKF	W2W2F	W2W2WF	W2W2WF	W2W2KF	W2W2WWF	W2W2WKF
	W2 (Left)+ W2 (Left)+R	W2W2R	W2W2WR	W2W2WR	W2W2KR	W2W2WWR	W2W2WKR	W2W2R	W2W2WR	W2W2WR	W2W2KR	W2W2WWR	W2W2WKR
	W2 (Left)+ WK+F	W2WKF	W2WKWF	W2WKWF	W2WKKF	W2WKWWF	W2WKWKF	W2WKF	W2WKWF	W2WKWF	W2WKKF	W2WKWWF	W2WKWKF
	W2 (Left)+ WK+R	W2WKR	W2WKWR	W2WKWR	W2WKKR	W2WKWWR	W2WKWKR	W2WKR	W2WKWR	W2WKWR	W2WKKR	W2WKWWR	W2WKWKR
	W2 (Left)+ KI+F	W2KIF	W2KIWF	W2KIWF	W2KIKF	W2KIWWF	W2KIWKF	W2KIF	W2KIWF	W2KIWF	W2KIKF	W2KIWWF	W2KIWKF
	W2 (Left)+ KI+R	W2KIR	W2KIWR	W2KIWR	W2KIKR	W2KIWWR	W2KIWKR	W2KIR	W2KIWR	W2KIWR	W2KIKR	W2KIWWR	W2KIWKR
	KI+WK+F	KIWKF	KIWKWF	KIWKWF	KIWKKF	KIWKWWF	KIWKWKF	KIWKF	KIWKWF	KIWKWF	KIWKKF	KIWKWWF	KIWKWKF
	KI+WK+R	KIWKR	KIWKWR	KIWKWR	KIWKKR	KIWKWWR	KIWKWKR	KIWKR	KIWKWR	KIWKWR	KIWKKR	KIWKWWR	KIWKWKR

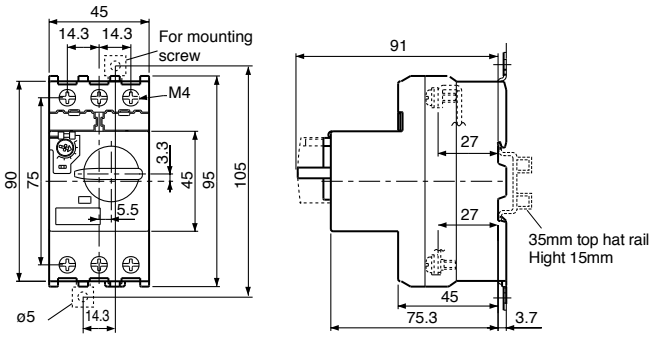
Manual Motor Starters
Dimensions

■ Dimensions, mm

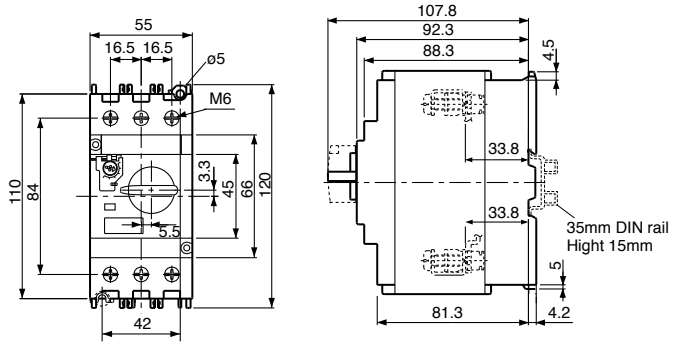
• Rocker handle types BM3RSB



• Rotary handle types BM3RHB

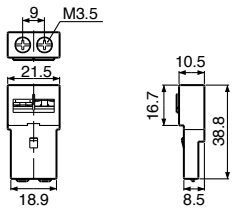


• Rotary handle types BM3VSB, BM3VHB

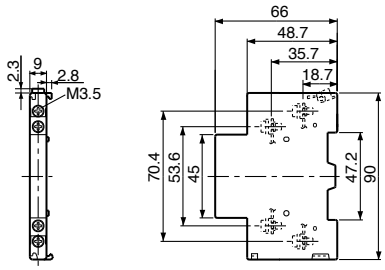


Accessories

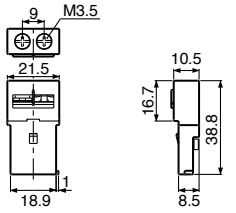
• Auxiliary contact blocks, front mounting BZ0WI



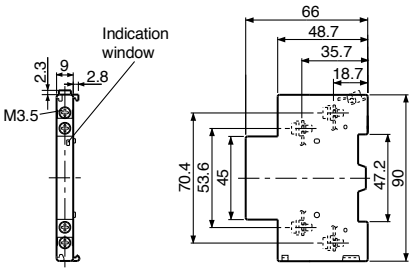
• Auxiliary contact blocks, side mounting BZ0WU



• Alarm contact blocks, front mounting BZ0KI



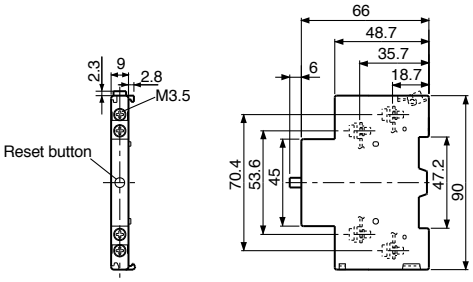
• Auxiliary and alarm contact blocks BZ0WKU



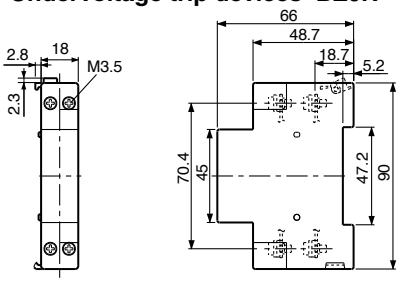
Dimensions, mm

Accessories

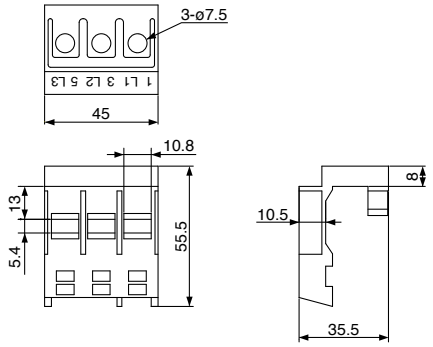
• Short-circuit alarm contact block BZ0TKUAB



• Shunt trip devices BZ0F
Undervoltage trip devices BZ0R

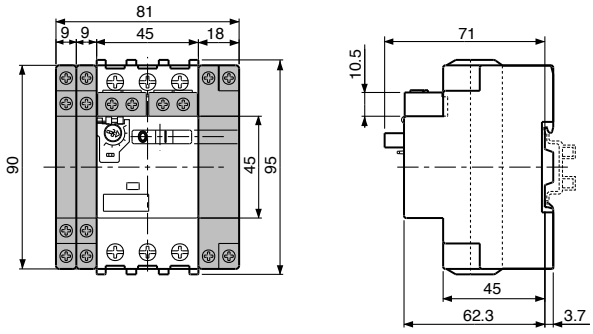


• BZ0TCRE

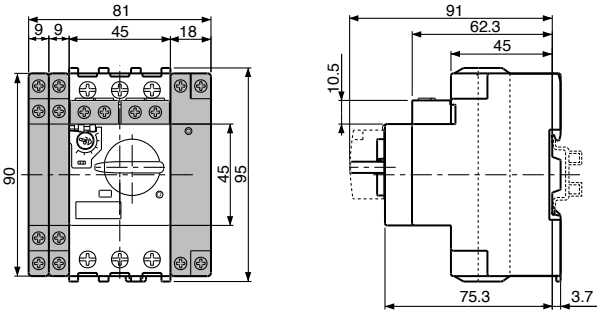


MMS with accessories

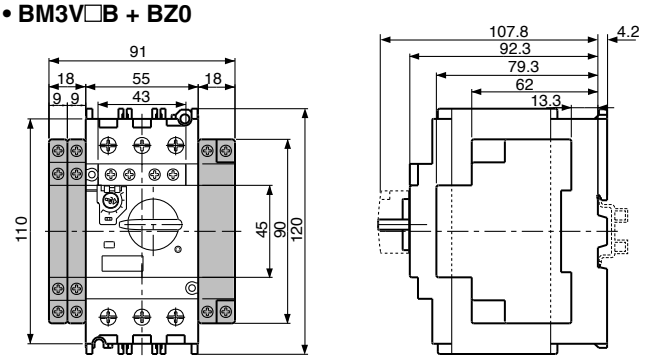
• BM3RSB + BZ0



• BM3RHB + BZ0

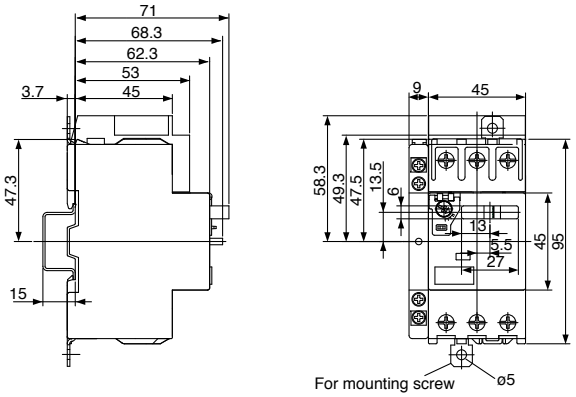


• BM3V□B + BZ0



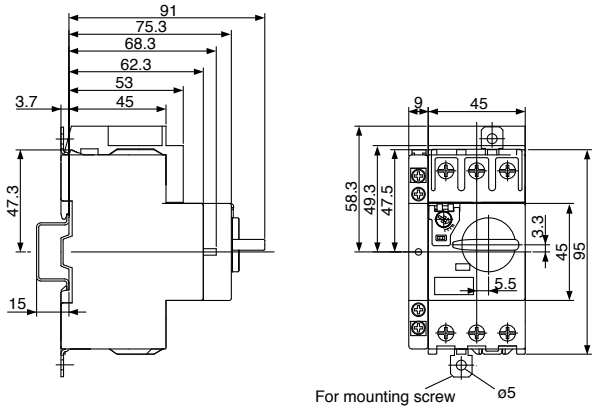
Type E construction

• BM3RSB



MMS	Line side terminal cover	Short-circuit alarm contact block	Mass (g)
BM3RSB	BZ0TCRE	BZ0TKUAB	425

• BM3RHB

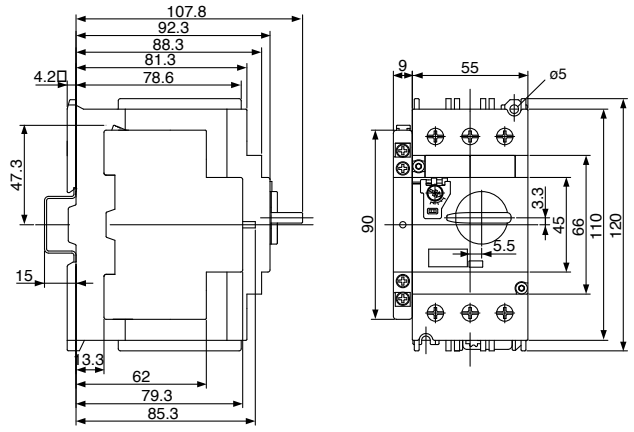


MMS	Line side terminal cover	Short-circuit alarm contact block	Mass (g)
BM3RHB	BZ0TCRE	BZ0TKUAB	445

Dimensions, mm

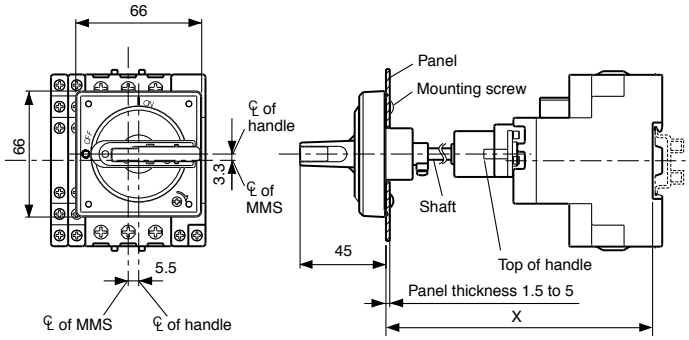
Type E construction

• BM3VSB, BM3VHB



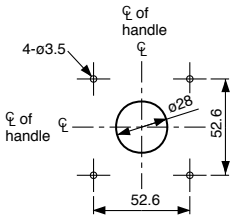
MMS	Line side terminal cover	Short-circuit alarm contact block	Mass (g)
BM3VSB,VHB	-	BZ0TKUAB	825

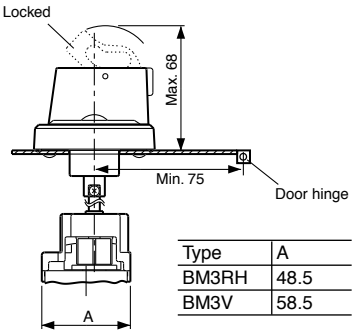
External operation handle BZ0V



Type	X min.	X max.
BZ0VBBL, BZ0VYRL	139 ±2	289 ±2
BZ0VBBM, BZ0VYRM	156 ±2	306 ±2

Panel drilling

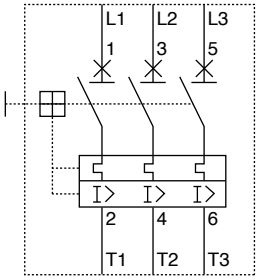




Type	A
BM3RH	48.5
BM3V	58.5

Wiring diagrams

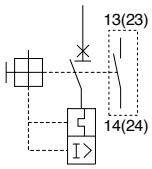
• MMS



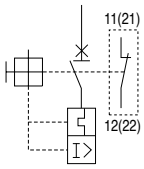
• Auxiliary contact blocks

Front mounting

BZ0WIA

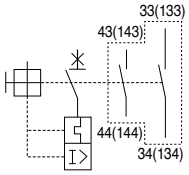


BZ0WIB

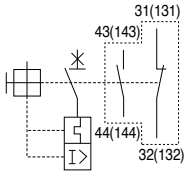


Side mounting

BZ0WUAAL



BZ0WUABL



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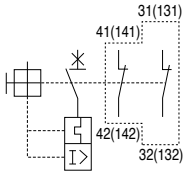

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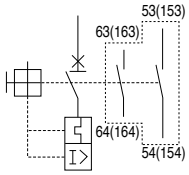
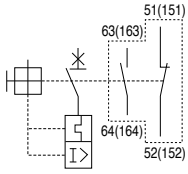


BZ0WUABR



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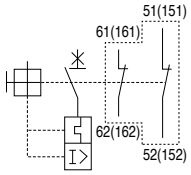
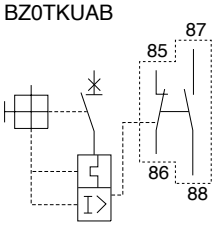


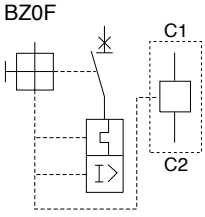
• Short-circuit alarm contact blocks

BZ0TKUAB



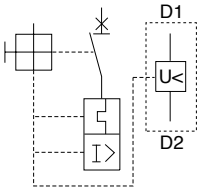
• Shunt trip devices

BZ0F



• Undervoltage trip devices

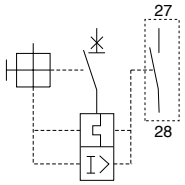
BZ0R



• Alarm contact blocks

Front mounting

BZ0KIA



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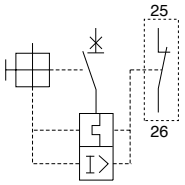
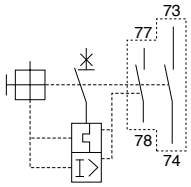


• Auxiliary and alarm contact blocks

BZ0WKUAA



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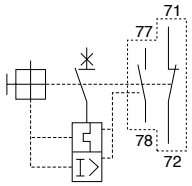

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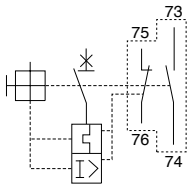

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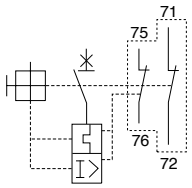


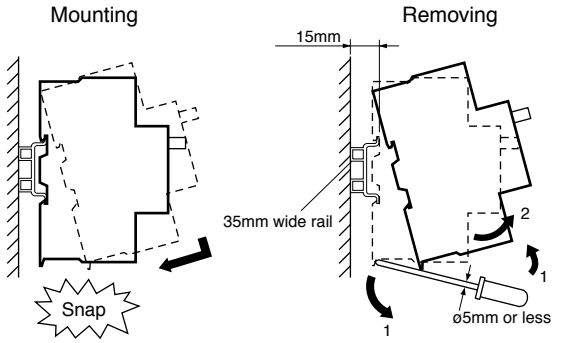
■ Standard operating conditions

Ambient temperature	Operating: –5 to +55°C Storage: –40 to +65°C	No sudden temperature changes resulting in condensation or icing.
Humidity	45 to 85%RH	
Altitude	2000m or lower	
Atmosphere	No excessive dust, smoke, corrosive gases, flammable gases, steam or salt.	
Vibration	10 to 55Hz 15m/s^2	No abnormal shock or vibration
Shock	50m/s^2	

■ Mountings

• Rail mounting

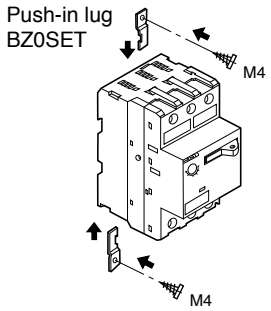
The MMS can be mounted to a 35mm DIN rail. Secure the rail with screws at mounting pitch of less than 400mm for the BM3R type and less than 300mm for the BM3V type.
Applicable rail:
Use a 15mm-high TH35-15 (FUJI model TH35-15AL) rail conforming to EN-50022 and IEC715.
The standard rail mounting direction is horizontal. When using the MMS on a vertically mounted rail, use FUJI end clamp kits.



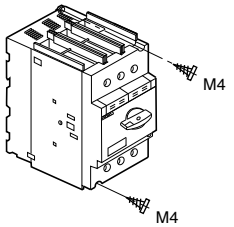
• Screw mounting

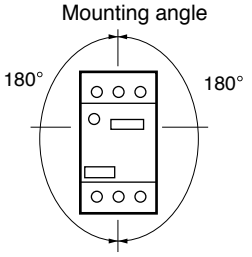
The separately sold push-in lug (BZ0SET) is required for screw mounting the BM3R frame. The BM3V frame can be screw mounted directly to the panel.

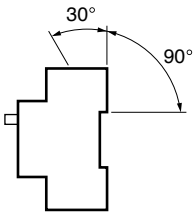
BM3RSB
BM3RHB



BM3VSB
BM3VHB



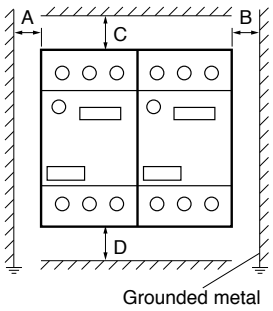




■ Arc space

The arc space required when mounting is shown in the table below.

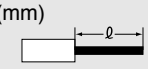
Type	Rated operational voltage Ue (V)	Min. distance to grounded metal (mm) A, B	C, D
BM3RS	Up to 460	15	20
	500	15	30
	Up to 690	40	40
BM3RH	Up to 500	15	30
	Up to 690	40	50
BM3V	Up to 500	15	40
	Up to 690	40	50



When frames are mounted side-by-side, operating conditions such as a high ambient temperature or using the maximum setting for continuous current may cause slight changes in operating characteristics due to temperature rises.
Under such conditions, it is recommended that the frames be separated by at least 5mm.

■ Wirings

While pressing the wire with a screwdriver, tighten the screw to the specified tightening torque.

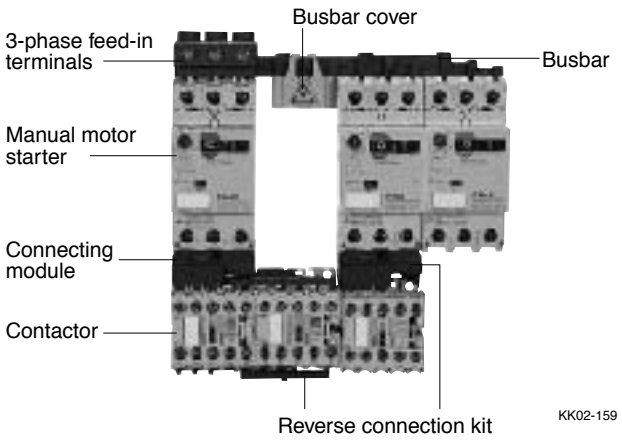
Type		BM3R	BM3V	BZ0 Accessories
Solid wire (mm)		ø1.6 to 2.6	ø1.6 to 2.6	ø1 to 1.6
Stranded wire (mm^2)	Single-wire	1 to 10	1 to 25	0.5 to 2.5
	2-wire	1 to 6	1 to 16	0.5 to 2.5
AWG	Single-wire	18 to 8	18 to 4	18 to 14
	2-wire	18 to 10	18 to 4	18 to 14
Sheath stripping length (mm) 		Approx.10	Approx.13	Approx.10
Terminal screw		Pan head screw (PZ2) M4	Pan head screw (PZ2) M6	Pan head screw (PZ2) M3.5
Tightening torque (N·m)		2	4	0.8

Note: There is no need for a crimp terminal or any other terminal on the end of the connection wire.

Features

- The busbar system reduces wiring time and saves floorspace.
- The busbar makes it easy to power from 2 to 5 manual motor starters – with no wiring needed.
- The 3-phase feed-in terminals are used to connect the wire for the power supply circuit.
- The busbar cover guards against accidental contact with non-connected busbar terminals (charged parts).

<Note>
If using BZ0TCRE terminal cover with BM3R series MMS, the busbar system can not be used.



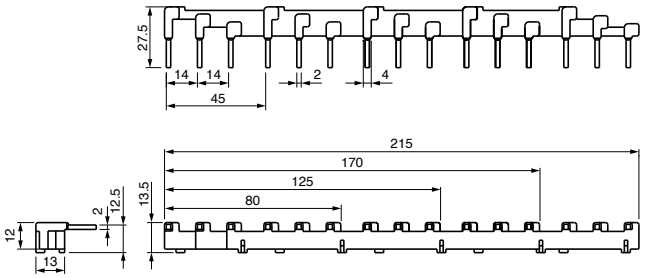
Part number and ratings

Description	Used with	Specification		Part number	Mass (g)
Busbar	BM3R	Continuous current: 64A max. Pin connection	2-BM3R, modular space: 45mm	**BZ0BR02A**	30
			3-BM3R, modular space: 45mm	**BZ0BR03A**	50
			4-BM3R, modular space: 45mm	**BZ0BR04A**	70
			5-BM3R, modular space: 45mm	**BZ0BR05A**	90
	BM3R+1-external accessory, 9mm wide		2-BM3R, modular space: 54mm	**BZ0BR12A**	30
			3-BM3R, modular space: 54mm	**BZ0BR13A**	55
			4-BM3R, modular space: 54mm	**BZ0BR14A**	80
			5-BM3R, modular space: 54mm	**BZ0BR15A**	105
	BM3R+2-external accessory, 9mm wide or BM3R+1-external accessory, 18mm wide	Continuous current: 64A max. Fork connection	2-BM3R, modular space: 63mm	**BZ0BR22A**	45
			4-BM3R, modular space: 63mm	**BZ0BR24A**	100
	BM3V	Continuous current: 126A max. Pin connection	2-BM3V, modular space: 55mm	**BZ0BV02A**	140
			3-BM3V, modular space: 55mm	**BZ0BV03A**	240
			4-BM3V, modular space: 55mm	**BZ0BV04A**	340
	BM3V+1-external accessory, 9mm wide		2-BM3V, modular space: 64mm	**BZ0BV12A**	150
			3-BM3V, modular space: 64mm	**BZ0BV13A**	270
			4-BM3V, modular space: 64mm	**BZ0BV14A**	380
	BM3V+2-external accessory, 9mm wide or BM3V+1-external accessory, 18mm wide		2-BM3V, modular space: 73mm	**BZ0BV22A**	165
			4-BM3V, modular space: 73mm	**BZ0BV24A**	425
3-phase feed-in terminal	BM3R	Continuous current: 64A max. Applicable cable size: 25mm^2 max.		**BZ0BFRA**	40
	BM3V	Continuous current: 126A max. Applicable cable size: 50mm^2 max.		**BZ0BFVA**	170
Busbar cover	BZ0BR	For pin connection		**BZ0BCRA**	10
		For fork connection		**BZ0BCRB**	5
	BZ0BV	For pin connection		**BZ0BCVA**	5

■ Dimensions, mm

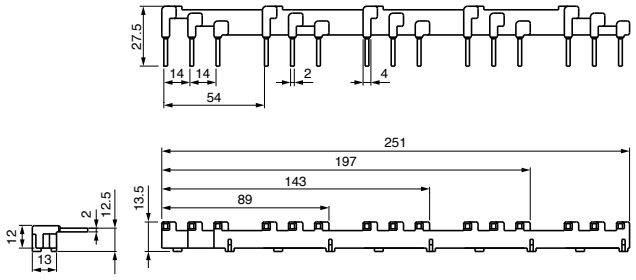
• For BM3R

BZ0BR0 Without external accessory



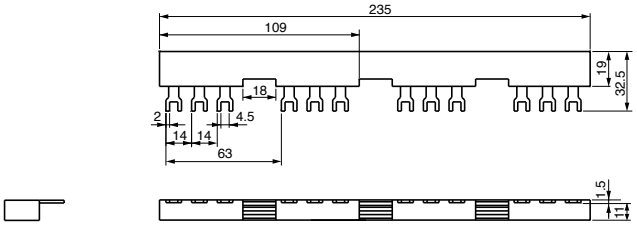
BZ0BR02A: 80mm
BZ0BR03A: 125mm
BZ0BR04A: 170mm
BZ0BR05A: 215mm

BZ0BR1 With 1-external accessory



BZ0BR12A: 89mm
BZ0BR13A: 143mm
BZ0BR14A: 197mm
BZ0BR15A: 251mm

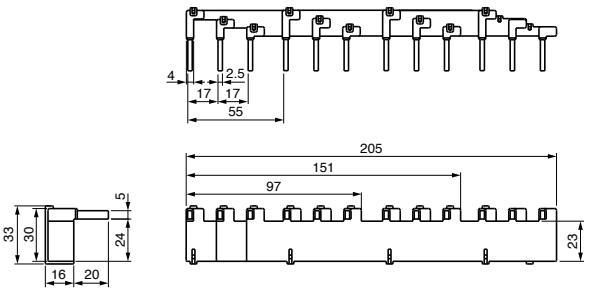
BZ0BR2 With 2-external accessory, 9mm wide
With 1-external accessory, 18mm wide



BZ0BR22A: 109mm
BZ0BR24A: 235mm

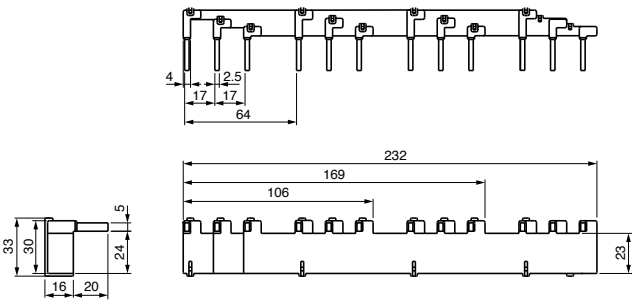
• For BM3V

BZ0BV0 Without external accessory



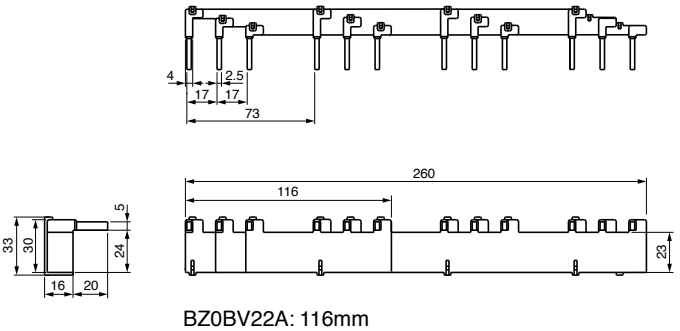
BZ0BV02A: 97mm
BZ0BV03A: 151mm
BZ0BV04A: 205mm

BZ0BV1 With 1-external accessory, 9mm wide



BZ0BV12A: 106mm
BZ0BV13A: 169mm
BZ0BV14A: 232mm

BZ0BV2 With 2-external accessory, 9mm wide
With 1-external accessory, 18mm wide

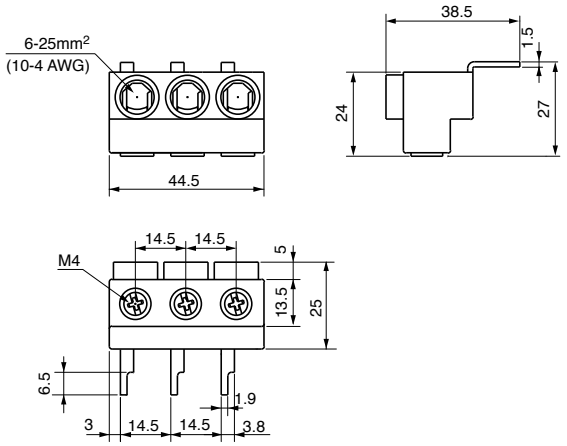


BZ0BV22A: 116mm
BZ0BV24A: 260mm

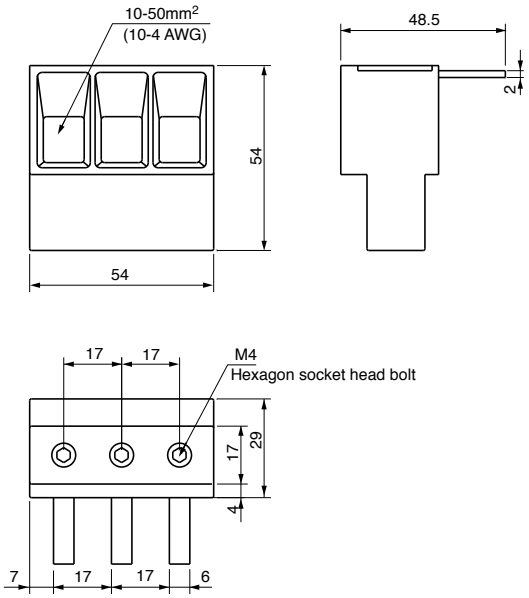
■ Dimensions, mm

• 3-phase feed-in terminals

BZ0BFRA



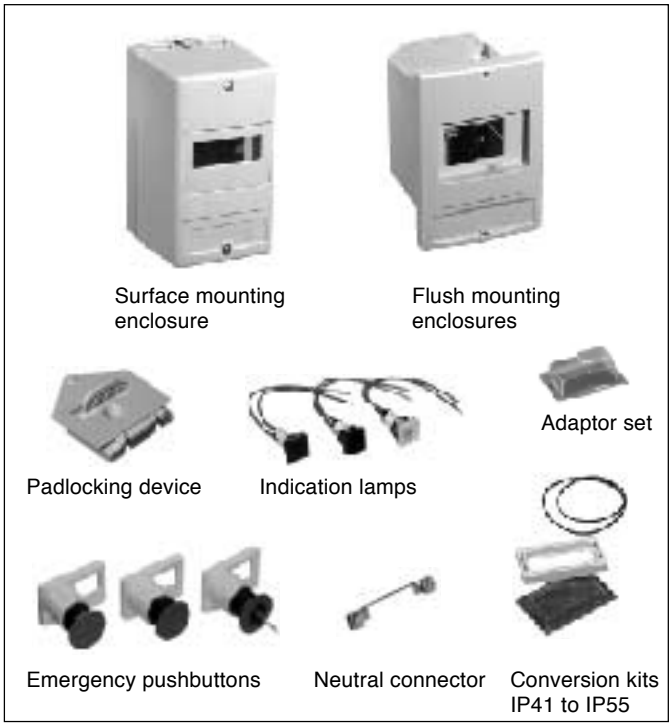
BZ0BFVA



Manual Motor Starters
Enclosures

Features

- Accommodates a variety of manual motor starters (BM3RSB-P16 to 025). Put the manual motor starter inside an enclosure for use in harsh environments. Surface mounting and flush mounting types available.
- IP41 and IP55 enclosure protection degree available.
- Manual motor starters (BM3RSB-P16 to 025) equipped with internal accessories and the following external accessories can be used inside an enclosure.
  Left side: One auxiliary contact block (W) or one auxiliary and alarm contact block (WK)
  Right side: One shunt trip device (F) or one undervoltage trip device (R)
- A wide variety of enclosure accessories are available. Padlocking device, emergency mushroom head pushbutton, conversion kit, and indicator lamps.



Part number and ratings

Enclosures for BM3RSB-P16 to 025

Mounting	Specification	Part number	Mass (g)
Surface	IP41	**BZ0CSLA**	320
	IP55 (with conversion kit)	**BZ0CSLB**	340
Flush	IP41	**BZ0CFLA**	240
	IP55 (with conversion kit)	**BZ0CFLB**	260

Accessories for enclosures

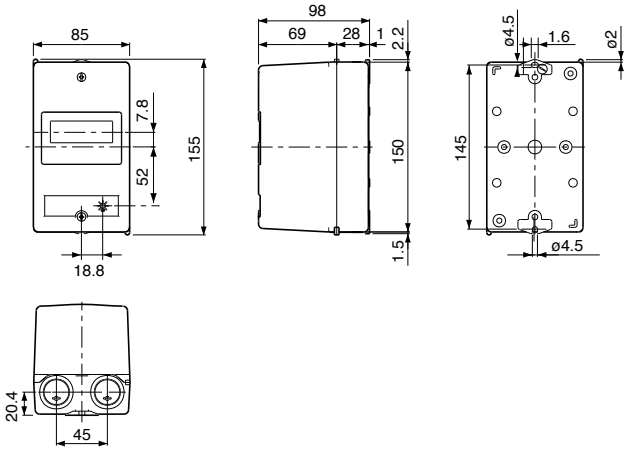
Description	Specification	Part number	Mass (g)
Padlocking device	OFF locking possible using up to three padlocks with a 5 to 8mm shackle diameter.	**BZ0CKA**	90
Emergency pushbutton	Momentary	**BZ0CPM**	55
	Push-lock turn reset	**BZ0CPL**	55
	Key operated	**BZ0CPK**	90
Conversion kit	Converts IP41 to IP55	**BZ0CCA**	25
Adaptor set	For BM3RS + undervoltage trip device with auxiliary contact.	**BZ0CUA**	20
Neutral connector	Used inside the enclosure for neutral and ground connection.	**BZ0CNA**	10
Indication lamp	Green, 100–120V AC	**BZ0CLGA**	15
	Green, 200–240V AC	**BZ0CLGB**	15
	Green, 380–440V AC	**BZ0CLGC**	15
	Green, 480–500V AC	**BZ0CLGD**	15
	Green, 500–600V AC	**BZ0CLGE**	15
	Red, 100–120V AC	**BZ0CLRA**	15
	Red, 200–240V AC	**BZ0CLRB**	15
	Red, 380–440V AC	**BZ0CLRC**	15
	Red, 480–500V AC	**BZ0CLRD**	15
	Red, 500–600V AC	**BZ0CLRE**	15
	White, 100–120V AC	**BZ0CLCA**	15
	White, 200–240V AC	**BZ0CLCB**	15
	White, 380–440V AC	**BZ0CLCC**	15
	White, 480–500V AC	**BZ0CLCD**	15
	White, 500–600V AC	**BZ0CLCE**	15

Notes: • The padlocking device cannot be used together with the emergency pushbutton or undervoltage trip device with auxiliary contact.
• The emergency pushbutton cannot be used together with the undervoltage trip device with auxiliary contact.

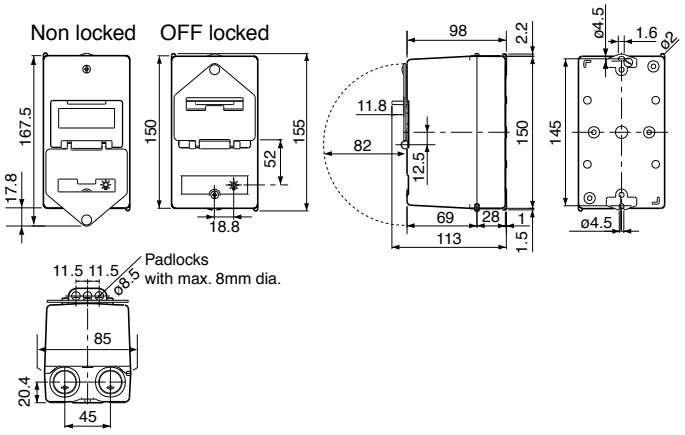
■ Dimensions, mm

• Surface mounting

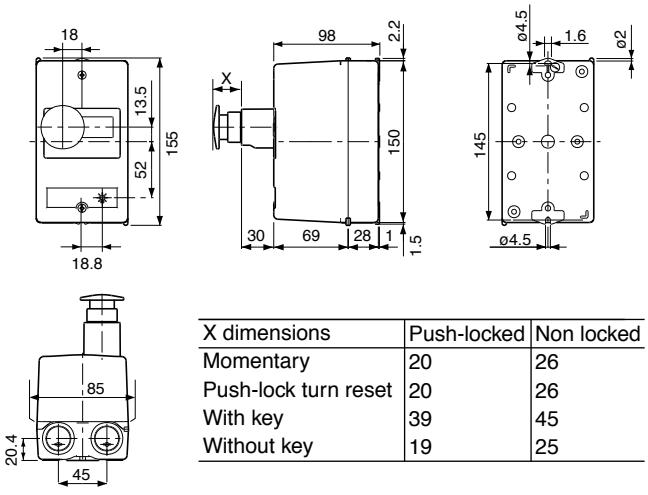
For without accessory



For with padlocking device



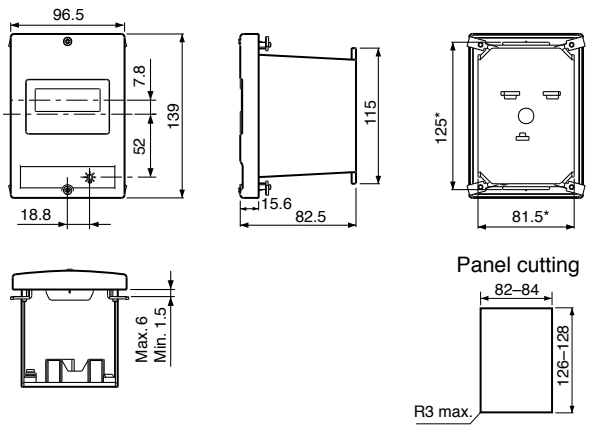
For with emergency pushbutton



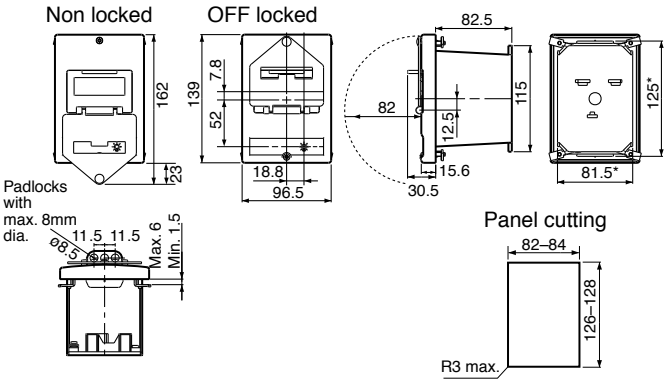
X dimensions	Push-locked	Non locked
Momentary	20	26
Push-lock turn reset	20	26
With key	39	45
Without key	19	25

• Flush mounting

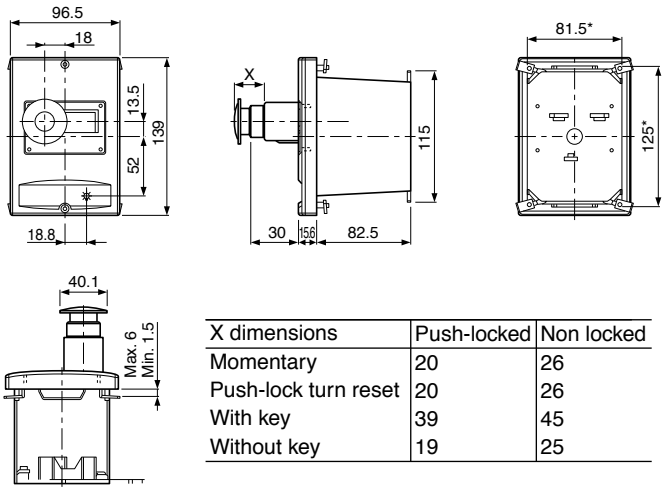
For without accessory



For with padlocking device

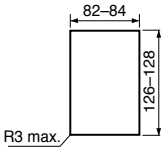


For with emergency pushbutton



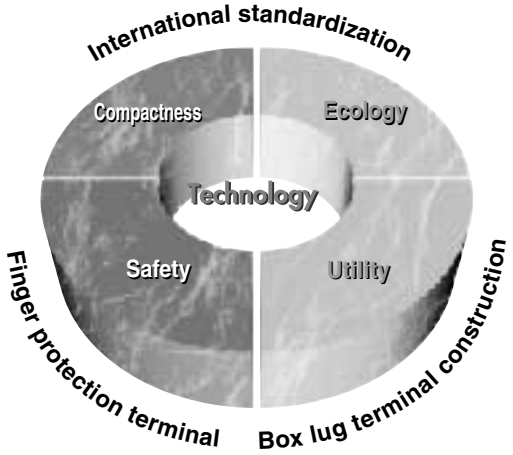
X dimensions	Push-locked	Non locked
Momentary	20	26
Push-lock turn reset	20	26
With key	39	45
Without key	19	25

Panel cutting



3 to 100HP at 480V AC
The SC-M and SC-E series further enhance the high reliability of the SC series with full conformance to International standards.

In addition to the five basic concepts of the existing SC series magnetic contactors and motor starters — international standardization, compactness, safety, utility, and ecology — the SC-M and SC-E series take the line-up to the next step in utility with a new finger protection terminal and box lug terminal construction.



International standardization
IEC 60947-4-1, EN 60947-4-1, VDE 0660
UL 508, CSA C 22.2, JIS C 8201-4-1
[Approved cUL (File No. E42419, E44592),
TÜV (R2018010, R2150072, R50013402)]

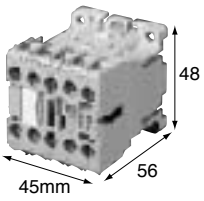
Compactness
- SC-M01, M02: 45mm wide
  SC-E02 to E05: 43mm wide, SC-E1 to E2S: 54mm wide
  SC-E3, E4: 67mm wide, SC-E5: 88mm wide
  SC-E6: 100mm wide, SC-E7: 115mm wide
- Reducing mounting area

Safety
- Terminals with finger-touch protection (DIN 57106/ VDE 0106 Teil100)

Utility
- Box lug terminal construction
- Long electrical life
- Reduction of wiring work

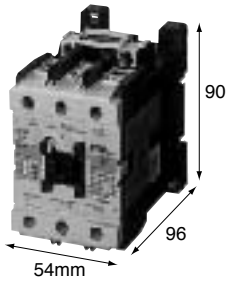
Ecology
- Reducing power consumption
- Recycled thermoplastic resin used for plastic parts.
- The names of materials are indicated on all major parts to facilitate their recycling.

SC-M series

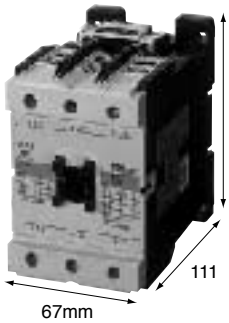


SC-M01, M02

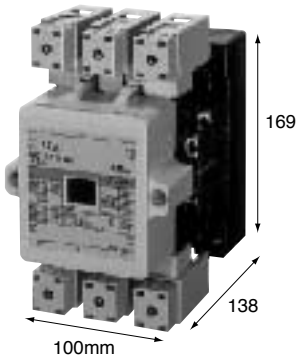
SC-E series



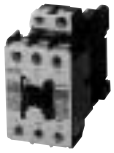
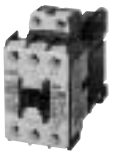
SC-E1 to E2S



SC-E3, E4



SC-E6 with SUPER magnet

Contactor	AC operating	**SC-M01**	**SC-M02**	**SC-E02**	**SC-E03**	**SC-E04**	**SC-E05**	**SC-E1**
	DC operating	**SC-M01/G**	**SC-M02/G**	**SC-E02/G**	**SC-E03/G**	**SC-E04/G**	**SC-E05/G**	**SC-E1/G**
		 KK02-292	 KK02-292	 AF01-12	 AF01-11	 AF01-10	 KK01-105	 AF01-8
Rating of 3-phase motor	(HP)							
200V		1-1/2	3	2	3	5	5	7 1/2
220-240V		1-1/2	3	2	3	5	7 1/2	10
400-480V		3	5	5	7 1/2	10	15	25
550-600V		3	5	5	7 1/2	10	15	25
Rated operational current	(A)							
200V		6.9	11	7.8	11	17.5	17.5	25.3
220-240V		6	9.6	6.8	9.6	15.2	22	28
400-480V		4.8	7.6	7.6	11	14	21	34
550-600V		3.9	6.1	6.1	9	11	17	27
Rated thermal current AC-1	(A)	20	20	20	20	25	32	50
Auxiliary contact		1NO, 1NC	1NO, 1NC	–	–	–	–	–
Dimensions	AC operated	45×48×56		43×80×81				54×90×96
W×H×D (mm)	DC operated	45×48×68		43×80×108				54×90×121.5
Standard		IEC 60947-1, EN 60947-4-1, VDE 0660, UL 508, CSA C22.2						
Thermal overload relay				**TK-E02**	**TK-E02**	**TK-E02**	**TK-E02**	**TK-E2**
				 KK01-86	 KK01-86	 KK01-86	 KK01-86	 KK01-88
Ampere setting range	(A)			0.1–0.15 0.13–0.2 0.15–0.24 0.2–0.3 0.24–0.36 0.3–0.45 0.36–0.54 0.48–0.72 0.64–0.96 0.8–1.2 0.95–1.45 1.4–2.2 1.7–2.6 2.2–3.4 2.8–4.2 4–6 5–8 6–9 7–11	0.1–0.15 0.13–0.2 0.15–0.24 0.2–0.3 0.24–0.36 0.3–0.45 0.36–0.54 0.48–0.72 0.64–0.96 0.8–1.2 0.95–1.45 1.4–2.2 1.7–2.6 2.2–3.4 2.8–4.2 4–6 5–8 6–9 7–11 9–13	0.1–0.15 0.13–0.2 0.15–0.24 0.2–0.3 0.24–0.36 0.3–0.45 0.36–0.54 0.48–0.72 0.64–0.96 0.8–1.2 0.95–1.45 1.4–2.2 1.7–2.6 2.2–3.4 2.8–4.2 4–6 5–8 6–9 7–11 9–13 12–18	0.1–0.15 0.13–0.2 0.15–0.24 0.2–0.3 0.24–0.36 0.3–0.45 0.36–0.54 0.48–0.72 0.64–0.96 0.8–1.2 0.95–1.45 1.4–2.2 1.7–2.6 2.2–3.4 2.8–4.2 4–6 5–8 6–9 7–11 9–13 12–18 16–22 20–25	4–6 5–8 6–9 7–11 9–13 12–18 18–26 24–36
Dimensions W×H×D (mm)				53×60.5×80.5				54×78.5×97
Standard				IEC 60947-1, EN 60947-4-1, VDE 0660, UL 508, CSA C22.2				

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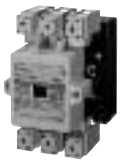
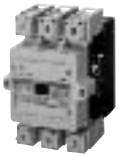
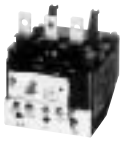
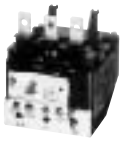
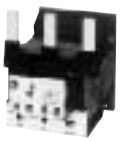
Contactors SC-M and SC-E series
Quick reference guide

Contactors	AC operating	**SC-E2**	**SC-E2S**	**SC-E3**	**SC-E4**	**SC-E5**	**SC-E6**	**SC-E7**
	DC operating	**SC-E2/G**	**SC-E2S/G**	**SC-E3/G**	**SC-E4/G**			
		 AF01-7	 AF01-6	 AF01-5	 AF01-4	 AF01-3	 AF01-2	 AF01-1
Rating of 3-phase motor (HP)								
200V		10	15	20	25	30	40	50
220-240V		15	20	25	30	30	40	50
400-480V		30	30	50	50	60	75	100
550-600V		30	30	50	50	75	100	125
Rated operational current (A)								
200V		32.2	48.3	63.1	78.2	92	119.6	149.5
220-240V		42	54	68	80	80	104	130
400-480V		40	40	65	65	77	96	124
550-600V		32	32	52	52	77	99	125
Rated thermal current AC-1 (A)		60	65	100	105	150	150	200
Auxiliary contact		–	–	–	–	2NO+2NC	2NO+2NC	2NO+2NC
Dimensions	AC operated	54×90×96		67×112×111		88×155×132	100×169×138	115×175×140
W×H×D (mm)	DC operated	54×90×121.5		67×112×130				
Standard		IEC 60947-1, EN 60947-4-1, VDE 0660, UL 508, CSA C22.2						

Thermal overload relay	**TK-E2**	**TK-E2**	**TK-E3**	**TK-E3**	**TK-E5**	**TK-E6**	**TK-E6**
	 KK01-88	 KK01-88	 KK01-87	 KK01-87	 KK01-85	 KK01-84	 KK01-84
Ampere setting range (A)	4–6	4–6	7–11	7–11	18–26	45–65	45–65
	5–8	5–8	9–13	9–13	24–36	53–80	53–80
	6–9	6–9	12–18	12–18	28–40	65–95	65–95
	7–11	7–11	18–26	18–26	34–50	85–125	85–125
	9–13	9–13	24–36	24–36	45–65		110–160
	12–18	12–18	28–40	28–40	65–95		
	18–26	18–26	34–50	34–50	85–105		
	24–36	24–36	45–65	45–65			
	32–42	32–42	48–68	48–68			
		40–50		64–80			
		44–54					
Dimensions W×H×D (mm)	54×78.5×97		68×89.5×107.5		76.5×105×106	100×122×123	
Standard	IEC 60947-1, EN 60947-4-1, VDE 0660, UL 508, CSA C22.2						

■ Available coil

• AC coil, SC-M01 to SC-M02 and SC-E02 to SC-E4

Code	Coil operating voltage and frequency
24VAC	24V AC 50Hz / 24–26V AC 60Hz
48VAC	48V AC 50Hz / 48–52V AC 60Hz
100VAC	100V AC 50Hz / 100–110V AC 60Hz
110VAC	100–110V AC 50Hz / 110–120V AC 60Hz
120VAC	110–120V AC 50Hz / 120–130V AC 60Hz
200VAC	200V AC 50Hz / 200–220V AC 60Hz
220VAC	200–220V AC 50Hz / 220–240V AC 60Hz
400VAC	380–400V AC 50Hz / 400–440V AC 60Hz
440VAC	415–440V AC 50Hz / 440–480V AC 60Hz
500VAC	480–500V AC 50Hz / 500–550V AC 60Hz

• Super Magnet Coil, SC-E5 to SC-E7

Code	Coil operating voltage and frequency
24V	24–25V AC 50/60Hz, 24V DC
48V	48–50V AC 50/60Hz, 48V DC
100V	100–127V AC 50/60Hz, 100–120V DC
200V	200–250V AC 50/60Hz, 200–240V DC
400V	380–450V AC 50/60Hz
500V	460–575V AC 50/60Hz

• DC coil, SC-M01/G to SC-M02/G and SC-E02/G to SC-E4/G

Code	Coil operating voltage
12VDC	12V DC
24VDC	24V DC
48VDC	48V DC
100VDC	100V DC
110VDC	110V DC
200VDC	200V DC

■ Coil characteristics

• AC operation

Frame size	Power consumption (VA)		Power loss (W)		Pick-up voltage (V) *1	Drop-out voltage (V) *1	Operating time (ms)	
	Inrush 50/60 Hz	Sealed 50/60 Hz	50Hz	60Hz			Coil ON → Contact ON	Coil OFF → Contact OFF
M01, M02	32/36	6/6	1.5	1.6	0.8–1.1 X US	0.35–0.55 X US	7–12	6–13
E02 to E05	90/95	9/9	2.7	2.8	0.85–1.1 X US	0.2–0.75 X US	9–20	5–16
E1 to E2S	120/135	12.7/12.4	3.6	3.8	0.85–1.1 X US	0.2–0.75 X US	10–17	6–13
E3, E4	180/190	13.3/13.4	4.5	5	0.85–1.1 X US	0.2–0.75 X US	10–18	8–18
E5	80/95	4/4.6	3.2	3.6	0.85–1.1 X US	0.2–0.75 X US	39–45	27–33
E6, E7	190/230	4.9/5.8	3.4	3.7	0.8–1.1 X US	0.1–0.65 X US	31–37	30–36

Note: *1 US: Rated coil voltage

• DC operation

Frame size	Power consumption (VA)		Time constant (ms)	Pick-up voltage (V) *1	Drop-out voltage (V) *1	Operating time (ms)	
	Inrush	Sealed				Coil ON → Contact ON	Coil OFF → Contact OFF
M01/G, M02/G	3	3	35	0.8–1.1 X US	0.2–0.4 X US	24–27	5–8
E02/G to E05/G	7	7	50	0.85–1.1 X US	0.1–0.75 X US	45–49	10–26
E1/G to E2S/G	9	9	60	0.85–1.1 X US	0.1–0.75 X US	40–50	8–17
E3/G, E4/G	12	12	70	0.85–1.1 X US	0.1–0.75 X US	60–70	14–21
E5	90	2.8	1	0.85–1.1 X US	0.1–0.75 X US	35–41	26–32
E6, E7	225	3.2	1	0.8–1.1 X US	0.1–0.65 X US	28–34	27–33

Note: *1 US: Rated coil voltage

■ Auxiliary contact ratings for UL and CSA

Frame size	Rated insulation voltage (V)	Rated thermal current (A)	Making and breaking current (A)					
			AC (rating code A600)			DC (rating code Q300)		
			Voltage	Making	Breaking	Voltage	Making	Breaking
M01, M02 M01/G, M02/G	600	16	120V 240V 480V 600V	60 30 15 12	6 3 1.5 1.2	125V 250V 301-600V	0.55 0.27 0.1	0.55 0.27 0.1
E02 to E4, E02/G to E4/G	–	–	–	–	–	–	–	–
E5 to E7	600	10	120V 240V 480V 600V	60 30 15 12	6 3 1.5 1.2	125 250V	0.55 0.27	0.55 0.27

Contactors SC-M and SC-E series
Ordering information and Characteristics

■ Ordering information

Specify the following :
1. Part number
2. Operating coil voltage code
3. Auxiliary contact arrangement (SC-M series only)

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SC-M 01 /G - 24VAC - 1NO

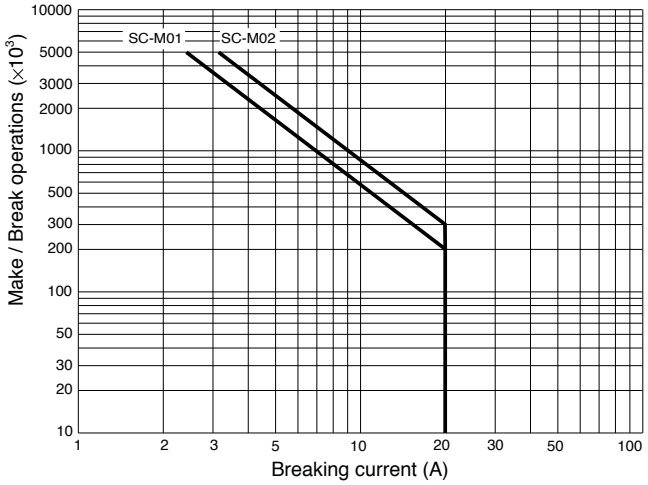
- **Product category**
- **Frame size**
- **AC coil operating: None**
  DC coil operating: /G
- **Operating coil voltage code** (see page 34)
- **Aux. contact arrangement** 1NO or 1NC required

SC-E 02 /G - 24VAC

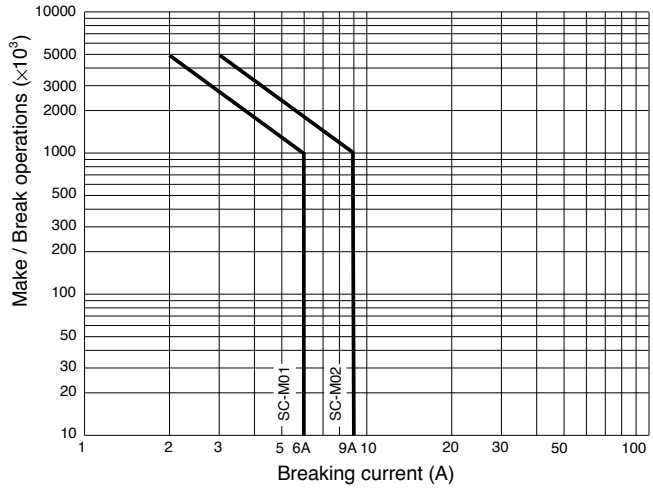
- **Product category**
- **Frame size**
- **AC coil operating: None**
  DC coil operating: /G
- **Operating coil voltage code** (see page 34)

■ Electrical durability

• AC-1 duty / 380 to 440 V AC / SC-M

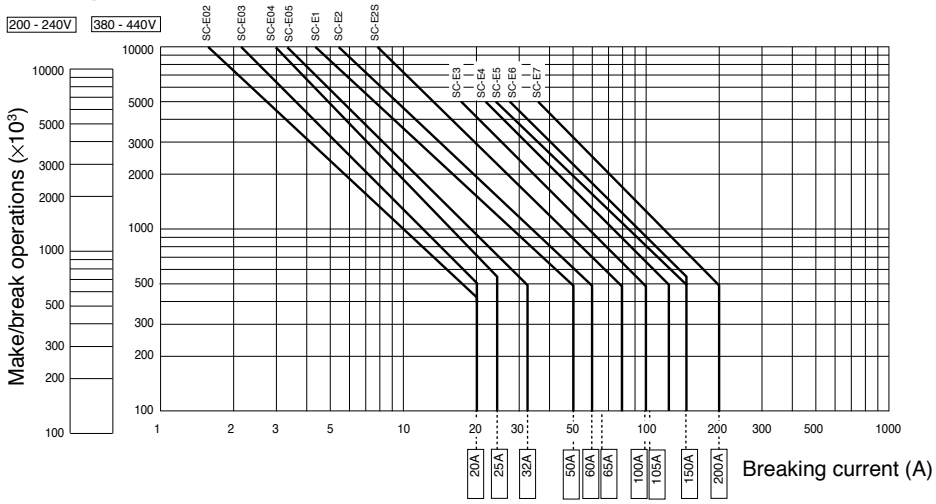


• AC-3 duty / 380 to 440 V AC / SC-M

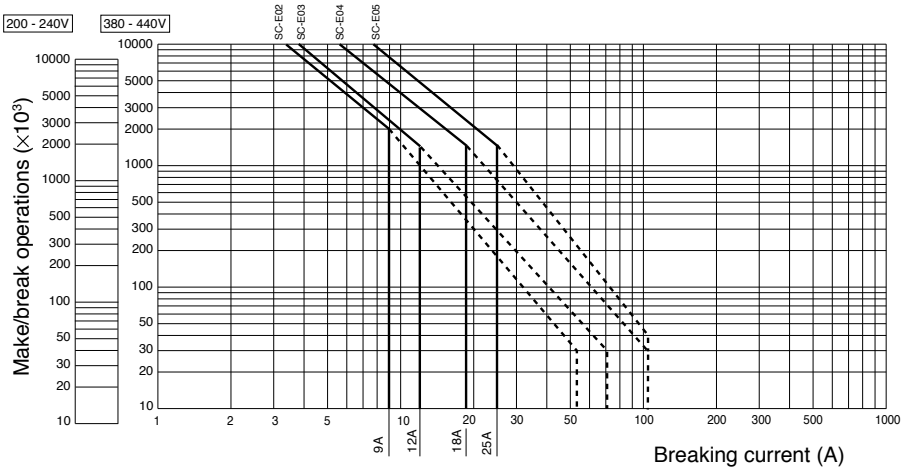


■ Electrical durability

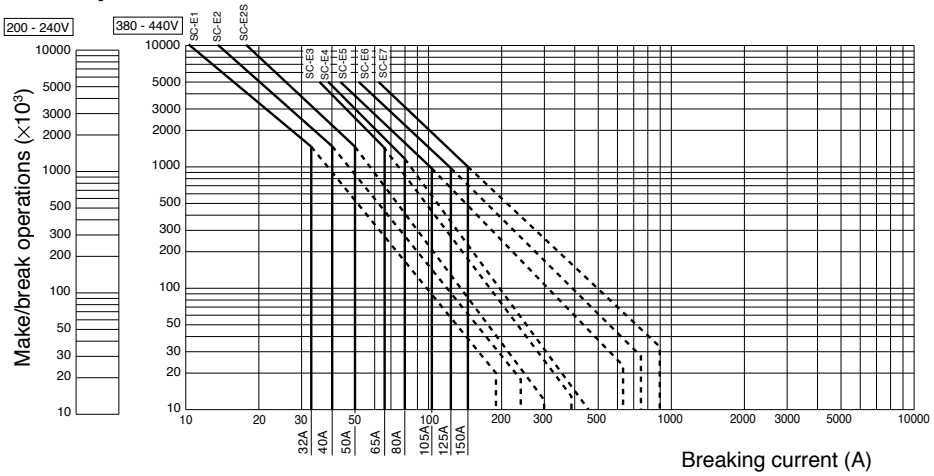
• AC-1 duty / SC-E02 to SC-E7



• AC-3 duty / SC-E02 to SC-E05



• AC-3 duty / SC-E1 to SC-E7

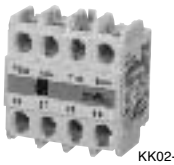


Contactors SC-M and SC-E series
Optional accessories

• Auxliary contact blocks with terminal covers

Applicable contactor	Mounting	No. of contacts	Contact arrangement	Part number
SC-M01, M02 SC-M01/G, M02/G	Front mounting	4	4NO	**SZ-MA40**
			3NO+1NC	**SZ-MA31**
			2NO+2NC	**SZ-MA22**
			1NO+3NC	**SZ-MA13**
			4NC	**SZ-MA04**
		2	2NO	**SZ-MA20**
			1NO+1NC	**SZ-MA11**
			2NC	**SZ-MA02**
	Side mounting	1	1NO	**SZ-MAS10**
			1NC	**SZ-MAS01**
SC-E02 to E4 SC-E02/G to E4/G	Front mounting	4	4NO	**SZ-A40/T**
			3NO+1NC	**SZ-A31/T**
			2NO+2NC	**SZ-A22/T**
		2	2NO	**SZ-A20/T**
			1NO+1NC	**SZ-A11/T**
			2NC	**SZ-A02/T**
	Side mounting	2	1NO+1NC	**SZ-AS1/T**
SC-E5, E6, E7	Side mounting	2	1NO+1NC	**SZ-AS2/T**

Front mounting



KK02-081

AF88-080

SZ-A22/T **SZ-A11/T**

Side mounting

SZ-AS1/T
SZ-AS2/T

KK01-090

Contact ratings

• Based on UL and CSA

Rated thermal current (A)	Making and breaking current (A) AC (rating code A600)			DC (rating code Q300)		
	Volts	Making	Breaking	Volts	Making	Breaking
10	120V	60	6	125V	0.55	0.55
	240V	30	3	250V	0.27	0.27
	480V	15	1.5			
	600V	12	1.2			

• Main circuit surge suppression units

Applicable contactor	Mounting	Rated voltage and frequency	CR constant	Applicable 3-phase motor	Part number
SC-M01, M02, M01/G, M02/G	–	–	–	–	–
SC-E02 to E05	Front mounting	250V AC	C=0.22 μF	200–240V AC	**SZ-ZM1E**
SC-E02/G to E05/G	Side mounting	50/60Hz	R=100 Ω	1-1/2–5HP	**SZ-ZM2E**
SC-E1 to E4	Front mounting	250V AC	C=0.33 μF	200–240V AC	**SZ-ZM3E**
SC-E1/G to E4/G	Side mounting	50/60Hz	R=47Ω	1-1/2–30HP	**SZ-ZM4E**

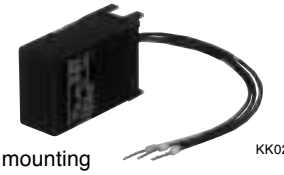
• Coil surge suppression units

Applicable contactor		Operating coil voltage	Device	Operation indicator	Part number
SC-M01, M02	–	12–60VAC	CR	–	**SZ-MZ1**
		72–250VAC		–	**SZ-MZ2**
–	SC-M01/G,M02/G	6–250V DC	Diode	–	**SZ-MZ3**
SC-E02 to E05	SC-E02/G to E05/G	24–48V AC/DC	Varistor	–	**SZ-Z1**
		100–250V AC/DC		–	**SZ-Z2**
	–	380–440V AC/DC		–	**SZ-Z3**
SC-E02 to E05	SC-E02/G to E05/G	24–48V AC/DC		Red LED	**SZ-Z6**
		100–250V AC/DC		Red LED	**SZ-Z7**
SC-E1 to E4	SC-E1/G to E4/G	24–48V AC/DC		–	**SZ-Z31**
		100–250V AC/DC		–	**SZ-Z32**
	–	380–440V AC/DC		–	**SZ-Z33**
SC-E02 to E05	SC-E02/G to E05/G	24–48V AC/DC	CR	–	**SZ-Z4**
		100–250V AC/DC		–	**SZ-Z5**
SC-E02 to E05	SC-E02/G to E05/G	24–48V AC/DC		Red LED	**SZ-Z8**
		100–250V AC/DC		Red LED	**SZ-Z9**
SC-E1 to E4	–	24–48V AC/DC		–	**SZ-Z34**
		100–250V AC/DC		–	**SZ-Z35**
–	SC-E1/G to E4/G	24–48V AC/DC		–	**SZ-Z36**
		100–250V AC/DC		–	**SZ-Z37**

Main circuit surge suppression units

KK02-077

Front mounting
SZ-ZM1E



KK02-079

Side mounting
SZ-ZM4E

Coil surge suppression unit

CR
SZ-Z4

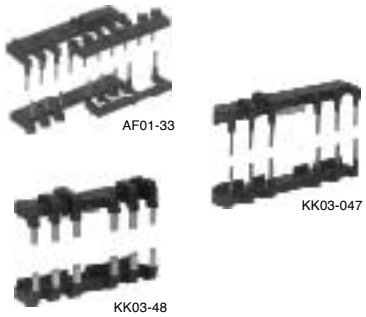
AF88-766

Contactors SC-M and SC-E series
Optional accessories

• Power Connection kit for reversing for SC-M and SC-E contactor

Description	Applicable contactor	Part number	Mass (g)
Line side and load side wire kits	SC-M01, M02, M01/G, M02/G	**SZ-MRWC**	4.2
Line side wire kit	SC-E02 to E05	**SZ-ERW1/A**	19
Load side wire kit	SC-E02/G to E05/G	**SZ-ERW1/B**	17
Load side wire kit for the contactor to be connected with overload relay.		**SZ-ERW1/D**	13
Line side wire kit	SC-E1 to E2S,	**SZ-ERW2/A**	48
Load side wire kit	SC-E1/G to E2S/G,	**SZ-ERW2/B**	42
Load side wire kit for the contactor to be connected with overload relay.		**SZ-ERW2/D**	31
Line side wire kit	SC-E3,E4	**SZ-ERW3/A**	162
Load side wire kit	SC-E3/G,E4/G	**SZ-ERW3/B**	138
Load side wire kit for the contactor to be connected with overload relay.		**SZ-ERW3/D**	110

Power Connection kit for reversing for SC-M and SC-E contactor



• Mechanical interlock unit

Description	Applicable contactor	Part number	Mass (g)
	~~SC-M01, M02, M01/G, M02/G~~	~~**SZ-MRM**~~	~~3~~
	SC-E02 to E4 SC-E02/G to E4/G	**SZ-RM**	27

Mechanical interlock unit

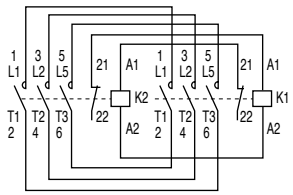
• Preparing to make a reversing contactors and motor starters.

<For SC-M contactor>
1. SC-M_ x 2
2. SZ-MRWC x 1
3. SZ-MRM x 1

<For SC-E contactor>
1. SC-E_ x 2
2. SZ-ERW_/A x 1
3. SZ-ERW_/B x 1
4. SZ-RM x 1
5. SZ-_A/T x 2

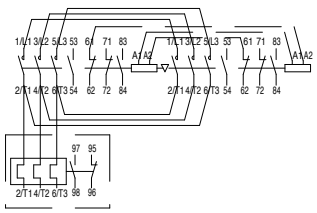
<For SC-E motor starters>
1. SC-E_ x 2
2. TK-E_ X1
3. SZ-ERW_/A x 1
4. SZ-ERW_/D x 1
5. SZ-RM x 1
6. SZ-_A/T x 2

Example of connecting, SC-M reversing contactor

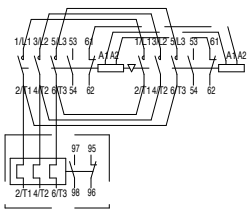


Example of connecting, SC-E reversing motor starter

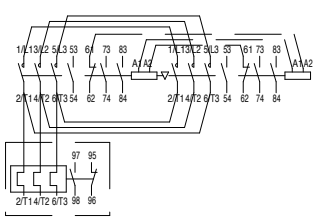
AUX.4P (2NO+1NC) x~2



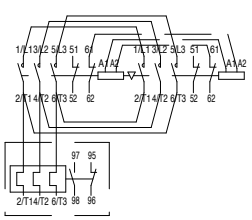
AUX.2P (1NO) x~2



AUX.4P (3NO) x~2



AUX.2P (1NC) x~2



Replacement coils

Replacement coil for SC-M series is not available
Replacement coil for SC-E series, AC coil is available, DC coil is not available

Contactor part number	AC coil part number	Super magnet coil part number
SC-E02 to E05	**4NC0H-#MC**	**N/A**

Replace the # symbol with the desired code, shown in the chart below.

Code letter #	AC coil 60Hz	AC coil 50Hz
E	24-26V	24V
F	48-52V	48V
A	100-110V	100V
1	110-120V	100-110V
G	120-130V	110-120V
B	200-220V	200V
2	220-240V	200-220V
C	400-440V	380-400V
4	440-480V	415-440V
5	550-600	500-550V

Contactor part number	AC coil part number (Chart 1)	Super magnet coil part number (Chart 2)
SC-E1, E2 and E2S	**SZ-GM/N1-#**	**N/A**
SC-E3 and E4	**SZ-GM/N2S-#**	**N/A**
SC-E5	**N/A**	**SZ-GS/N5-#**
SC-E6 and E7	**N/A**	**SZ-GS/N6-#**

Replace the # symbol with the desired code, shown in the charts below.

Chart 1 : AC coil

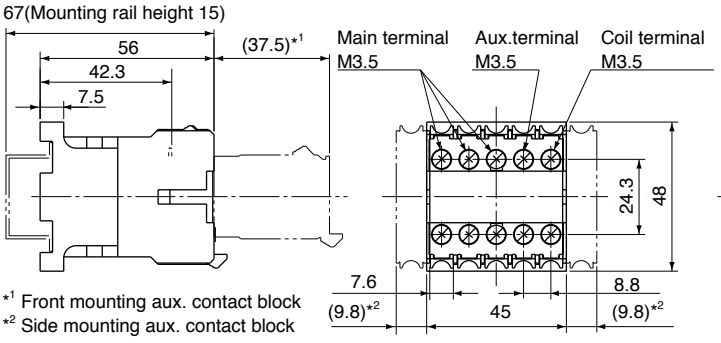
Code letter #	AC coil 60Hz	AC coil 50Hz
24	24-26V	24V
48	48-52V	48V
100	100-110V	100V
110	110-120V	100-110V
120	120-130V	110-120V
200	200-220V	200V
220	220-240V	200-220V
400	400-440V	380-400V
440	440-480V	415-440V
500	550-600	500-550V

Chart 2 : Super magnet coil

Code letter #	AC coil 50/60Hz	DC
24	24-25V	24V
48	48-50V	48V
100	100-127V	100-120V
200	200-250V	200-240V
400	380-450V	N/A
500	460-575V	N/A

■ Dimensions, mm

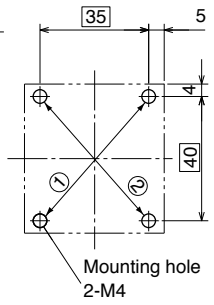
• Non-reversing AC operated
SC-M01, SC-M02



*1 Front mounting aux. contact block
*2 Side mounting aux. contact block

Mass: 0.17kg

Panel drilling

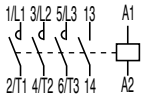


Use the two mounting holes on a diagonal line ① or ② to mount a contactor.

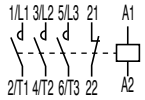
■ Wiring diagrams

Aux. contact

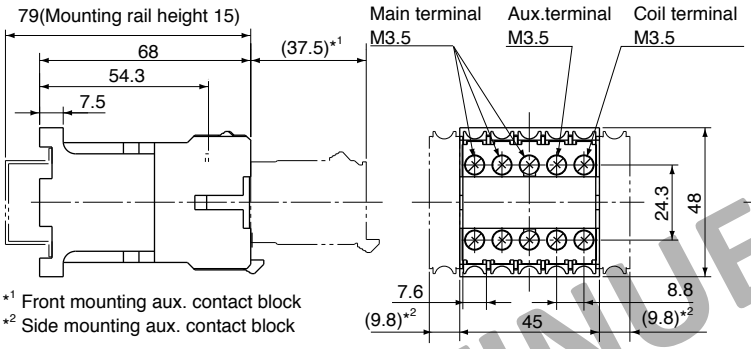
1NO



1NC



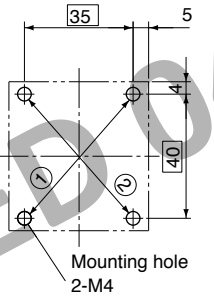
• Non-reversing DC operated
SC-M01/G, SC-M02/G



*1 Front mounting aux. contact block
*2 Side mounting aux. contact block

Mass: 0.23kg

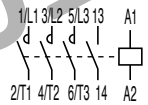
Panel drilling



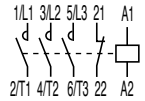
Use the two mounting holes on a diagonal line ① or ② to mount a contactor.

Aux. contact

1NO

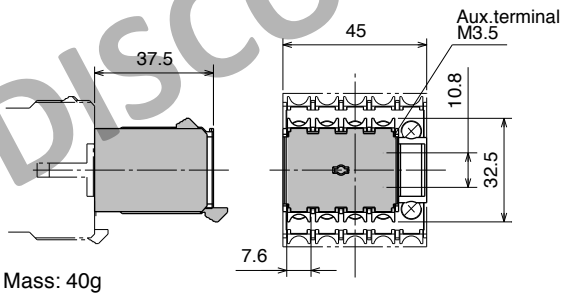


1NC



DISCONTINUED 04-2013

• Auxiliary contact blocks Front mounting
SZ-MA40, MA31, MA22, MA13, MA04



Mass: 40g

4NO

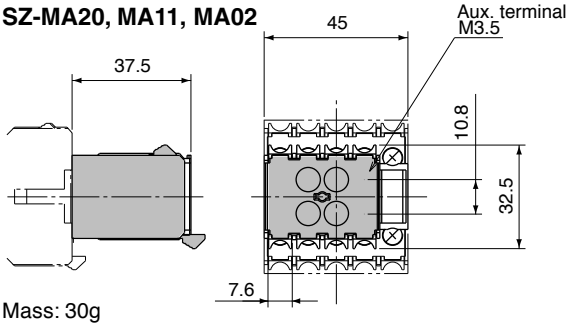
3NO+1NC

2NO+2NC

4NC

1NO+3NC

SZ-MA20, MA11, MA02



Mass: 30g

2NO

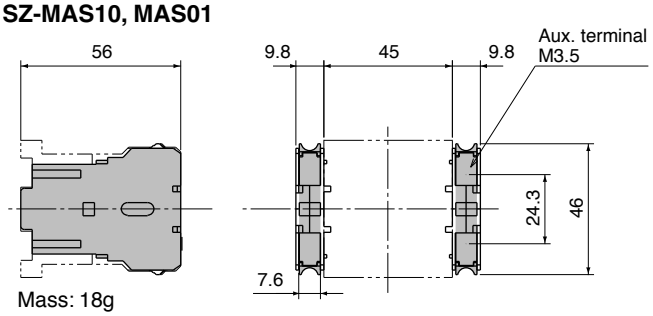
1NO+1NC

2NC

Contactors SC-M and SC-E series
Dimensions

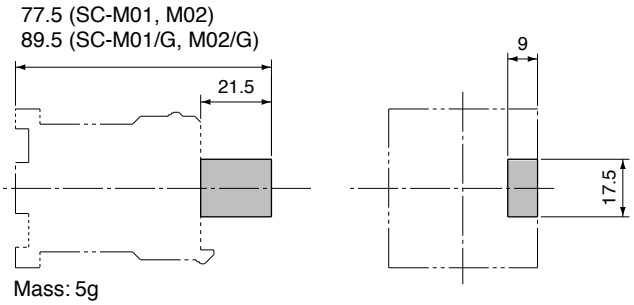
Dimensions, mm

• Aux. contact blocks (Side mounting)
SZ-MAS10, MAS01



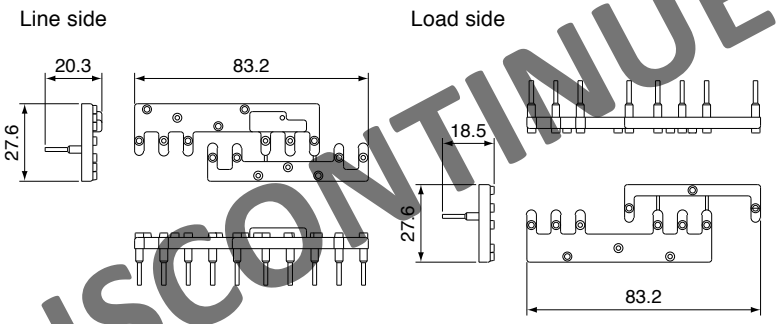
Mass: 18g

• Coil surge suppression unit
SZ-MZ1, MZ2, MZ3



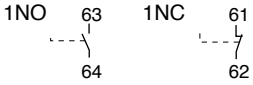
Mass: 5g

• Power Connection kit for reversing for SC-M

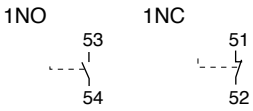


Wiring diagrams

Aux. contact
• Mounted on the right side

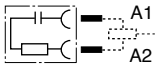


• Mounted on the left side

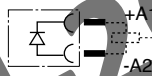


Internal circuit

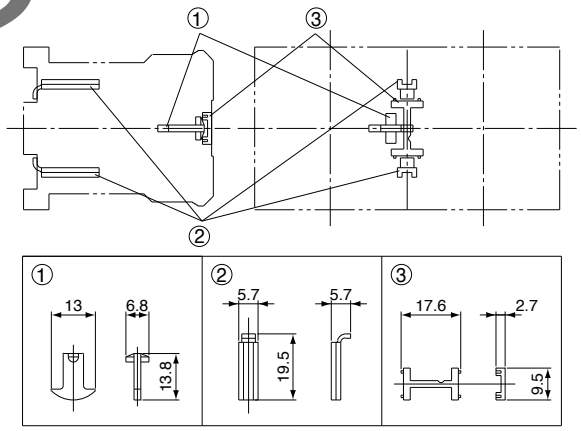
• Built-in CR



• Built-in diode



• Mechanical interlock unit



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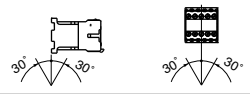
Standard operating conditions

Ambient temperature	Operating: –5 to 55˚C No sudden temperature changes resulting in condensation or icing (The average temperature over a 24-hour period must not exceed 35˚C) Storage: –40 to 65˚C
Humidity	45 to 85%RH
Altitude	2000m or lower
Atmosphere	No excessive dust, smoke, corrosive gases, flammable gases, steam, or salt.
Vibration	10 to 55Hz 15m/s^2
Shock	50m/s^2
Mounting	Screw mounting, 35mm-wide top hat rail (DIN)
Mounting angle	
Standard	IEC 60947-4-1, EN 60947-4-1, VDE 0660 JIS C 8201-4-1, JEM 1038 UL 508, CSA C22.2

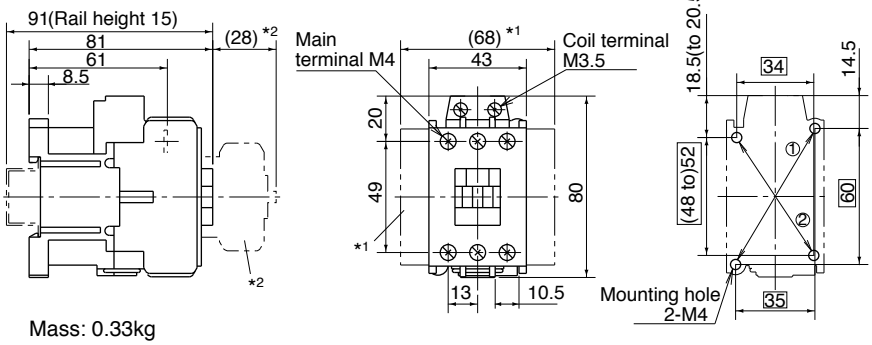
Wiring

Terminal screw	M3.5
Connectable wire size	1.25 to 2mm^2(ø1.2 to 2mm)
Applicable round crimp terminal	7.5mm (R2-3.5)
Tightening torque	0.8 to 1.0N·m

■ Dimensions, mm

• Non-reversing AC operated

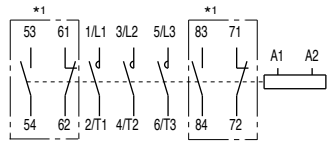
SC-E02, E03, E04, E05



Mass: 0.33kg

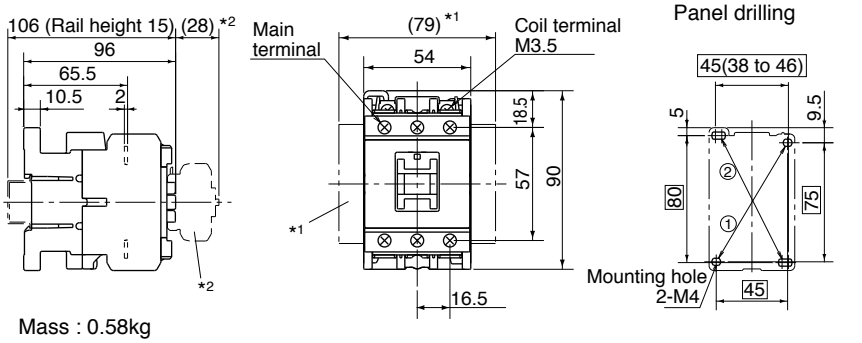
Use the two mounting holes on a diagonal line
① or ② to mount contactor
①: 35 × 60 ②: 35 × (48 to) 52

■ Wiring diagrams

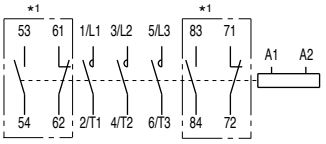


*1 In case of aux. contact 2NO+2NC

SC-E1, E2, E2S



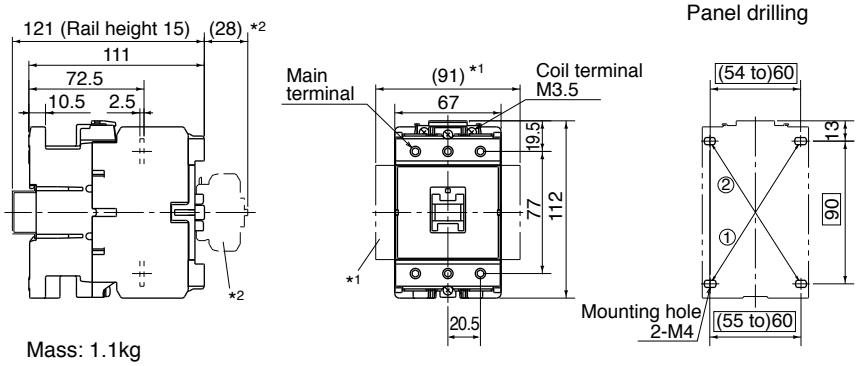
Mass : 0.58kg



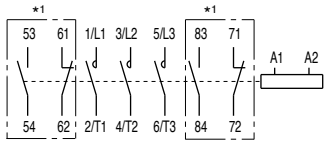
*1 In case of aux. contact 2NO+2NC

Use the two mounting holes on a diagonal line
① or ② to mount contactor
①: 45×75 ②: 45 (38 to 46)×80

SC-E3, E4



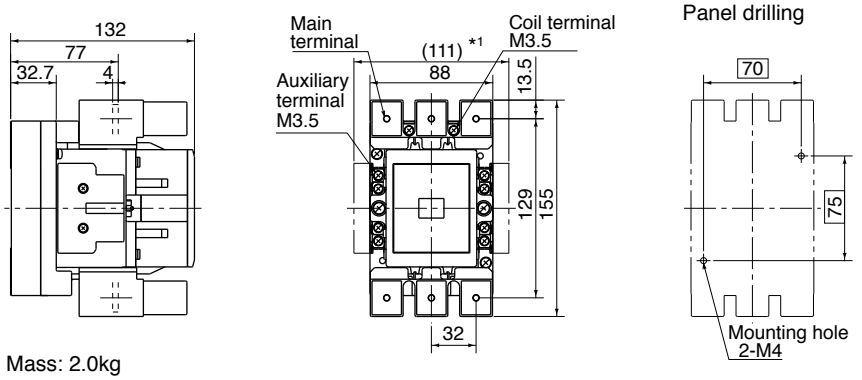
Mass: 1.1kg



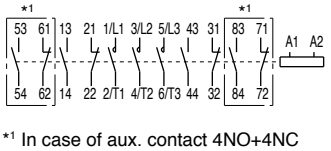
*1 In case of aux. contact 2NO+2NC

Use the two mounting holes on a diagonal line
① or ② to mount contactor
①: (55 to) 60 × 90 ②: (54 to) 60 × 90

SC-E5



Mass: 2.0kg



*1 In case of aux. contact 4NO+4NC

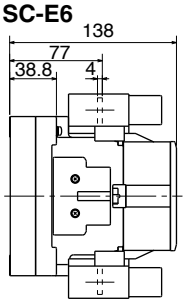
*1 Side mounting aux. contact block
*2 Front mounting aux. contact block

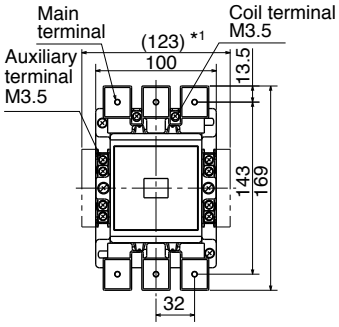
Contactors SC-M and SC-E series
Dimensions

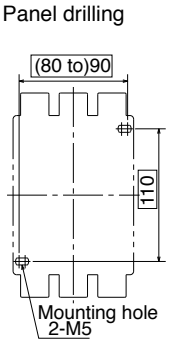
■ Dimensions, mm

• Non-reversing AC operated

SC-E6

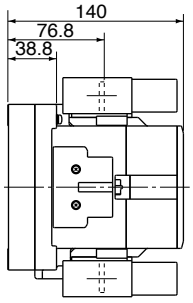


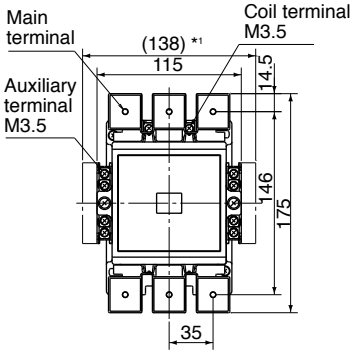


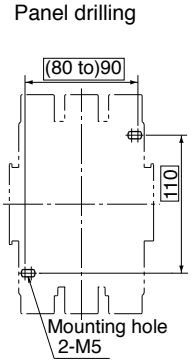


Mass: 2.6kg

SC-E7



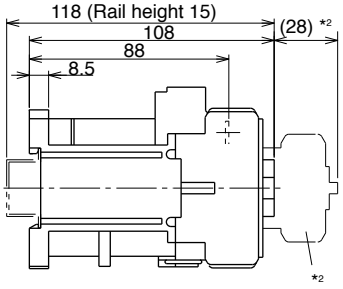


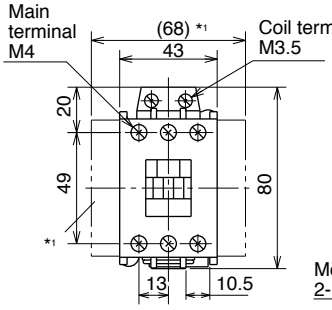


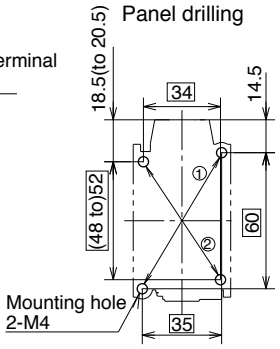
Mass: 2.9kg

• Non-reversing DC operated

SC-E02/G, E03/G, E04/G, E05/G



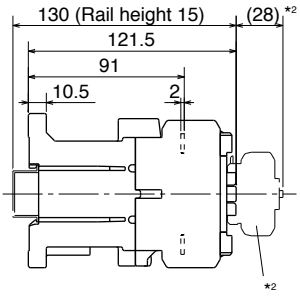


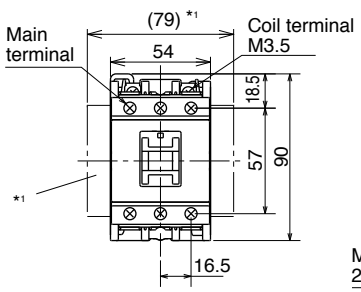


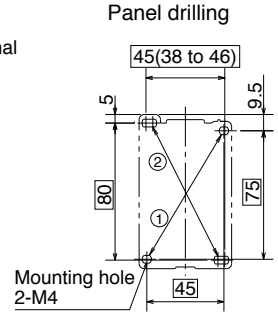
Use the two mounting holes on a diagonal line
① or ② to mount contactor
①: 35 × 60 ②: 35 × (48 to) 52

Mass: 0.59kg

SC-E1/G, E2/G, E2S/G





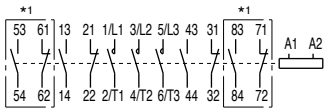


Use the two mounting holes on a diagonal line
① or ② to mount contactor
①: 45×75 ②: 45 (38 to 46)×80

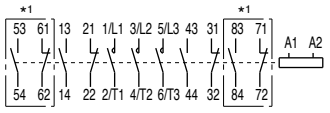
Mass: 0.79kg

*1 Side mounting aux. contact block
*2 Front mounting aux. contact block

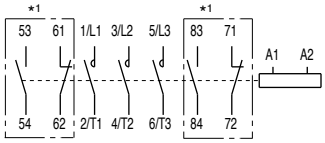
■ Wiring diagrams



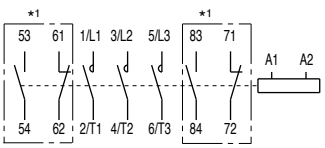
*1 In case of aux. contact 4NO+4NC



*1 In case of aux. contact 4NO+4NC



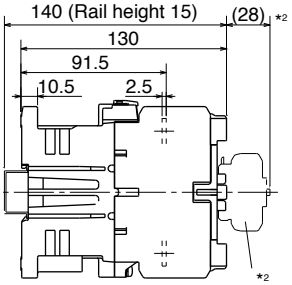
*1 In case of aux. contact 2NO+2NC

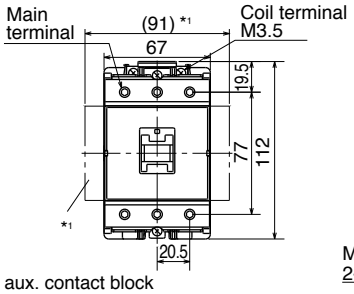


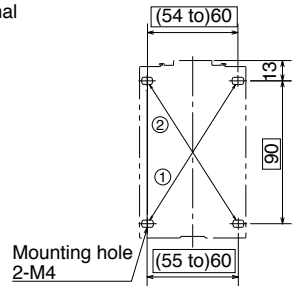
*1 In case of aux. contact 2NO+2NC

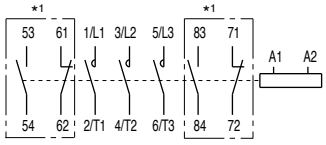
■ Dimensions, mm

• Non-reversing DC operated
SC-E3/G, E4/G









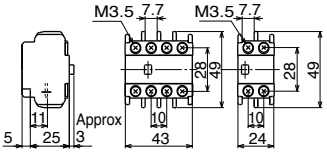
*1 In case of aux. contact 2NO+2NC

Use the two mounting holes on a diagonal line
① or ② to mount contactor
①: (55 to) 60 × 90 ②: (54 to) 60 × 90

Mass: 1.4kg

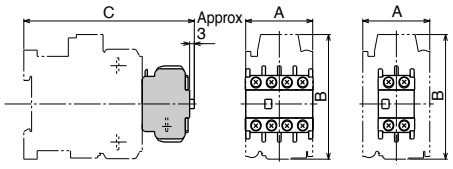
*1 Side mounting aux. contact block
*2 Front mounting aux. contact block

• Auxiliary contact blocks Front mounting
SZ-A40/T, A31/T, A22/T, A20/T, A11/T, A02/T for SC-E02 to E4



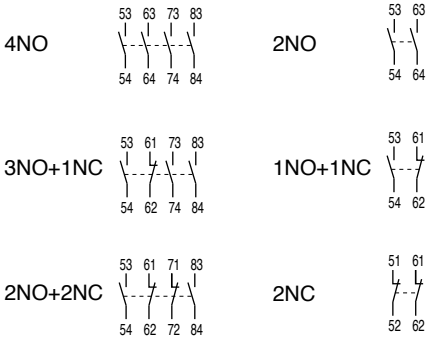
SZ-A40/T, A31/T, A22/T Mass: 36g
SZ-A20/T, A11/T, A02/T Mass: 20g

Contactor with aux. contact block

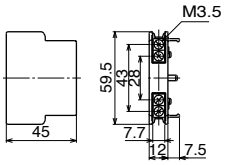


Type□	A□	B□	C□
SC-E02, E03, E04, E05□	43□	80□	109□
SC-E1, E2, E2S	54□	90□	124□
SC-E3, E4	67	112	139

■ Wiring diagrams

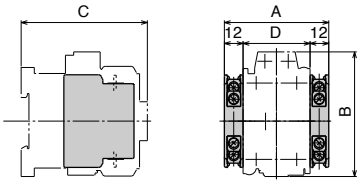


• Auxiliary contact blocks Side mounting
SZ-AS1/T, for SC-E02 to E4



Mass: 28g

Contactor with aux. contact block

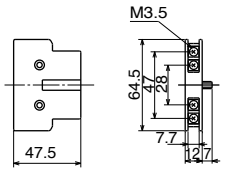


Type□	A□	B□	C□	D
SC-E02, E03, E04, E05□	67	80□	81□	43
SC-E1, E2, E2S□	78□	90	96□	54
SC-E3, E4	91	112	111	67

1NO+1NC Mounted on right side

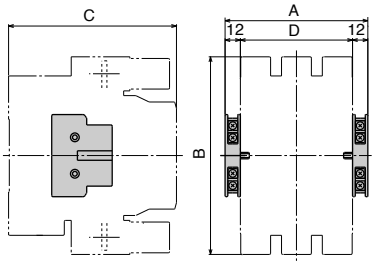
Mounted on left side

SZ-AS2/T, for SC-E5 to E7



Mass: 40g

Contactor with aux. contact block



Type□	A□	B□	C□	D□
SC-E5□	112□	155□	132□	88□
SC-E6□	124□	169□	138□	100□
SC-E7	139	175	140	115

1NO+1NC Mounted on right side

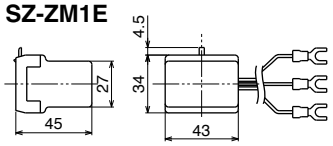
Mounted on left side

Contactors SC-M and SC-E series
Dimensions

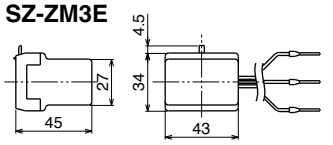
■ Dimensions, mm

• Main circuit surge suppression units

SZ-ZM1E

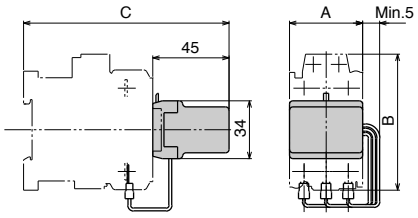


SZ-ZM3E



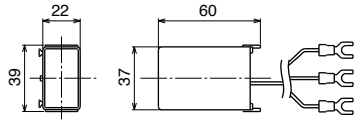
Mass: 60g

Contactor with surge suppression unit

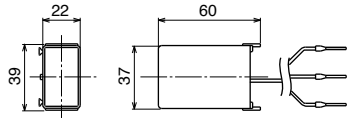


Type□	A□	B□	C□
SC-E02+SZ-ZM1E□	43□	80□	121□
SC-E03□	□	□	□
SC-E04□	□	□	□
SC-E05□	□	□	□
SC-E1+SZ-ZM3E□	54□	90□	136□
SC-E2□	□	□	□
SC-E2S□	□	□	□
SC-E3+SZ-ZM3E□ SC-E4	67	112	151

SZ-ZM2E

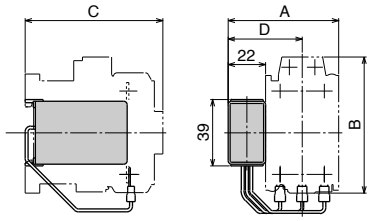


SZ-ZM4E



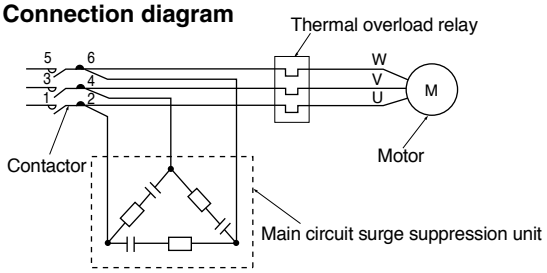
Mass: 60g

Contactor with surge suppression unit



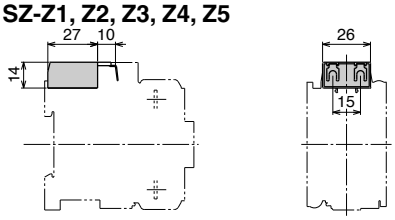
Type□	A□	B□	C□	D□
SC-E02+SZ-ZM2E□	65□	80□	81□	43.5□
SC-E03□	□			
SC-E04□	□			
SC-E05□	□			
SC-E1□				
SC-E2+SZ-ZM2E□ SC-E2S□	76□	90□	96□	49□
SC-E3+SZ-ZM2E□ SC-E4	89	112	111	55.5

Connection diagram



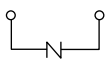
• Coil surge suppression units

SZ-Z1, Z2, Z3, Z4, Z5

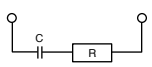


Mass: 14g

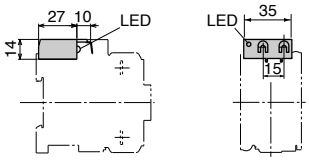
SC-E02 to E05 + SZ-Z1 to Z3
(Built-in varistor)



SC-E02 to E05 + SZ-Z4, Z5
(Built-in CR)

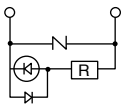


SZ-Z6, Z7, Z8, Z9

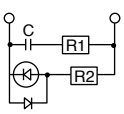


Mass: 16g

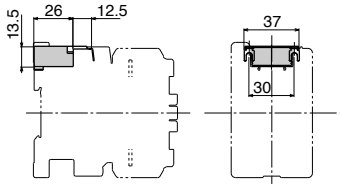
SC-E02 to E05 + SZ-Z6, Z7
(Built-in varistor with operating indicator)



SC-E02 to E05 + SZ-Z8, Z9
(Built-in CR with operating indicator)

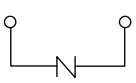


SZ-Z31, Z32, Z33, Z34, Z35, Z36, Z37

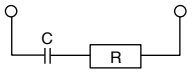


Mass: 15g

SC-E1 to E4 + SZ-Z31 to Z33
(Built-in varistor)



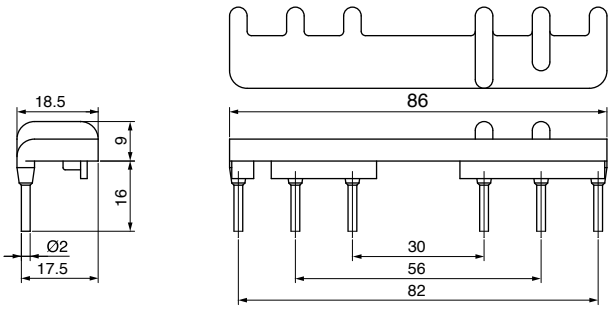
SC-E1 to E4 + SZ-Z34, Z35
(Built-in CR)
SC-E1/G to E4/G + SZ-Z36, Z37
(Built-in CR)



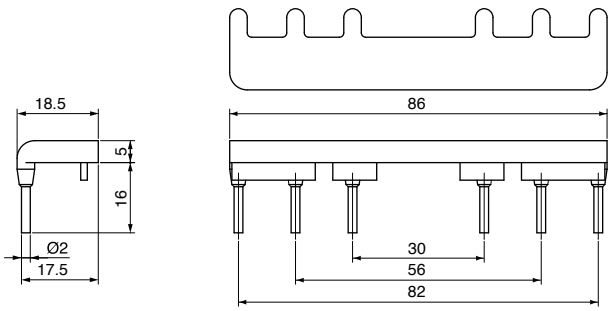
Dimensions, mm

• Power connection kit for reversing for SC-E

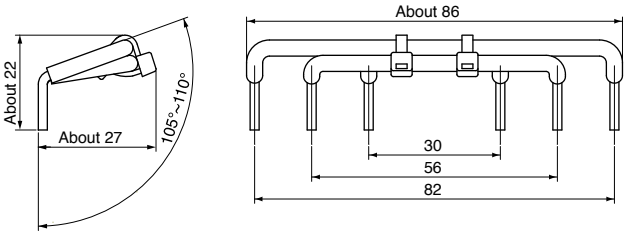
SZ-ERW1/A



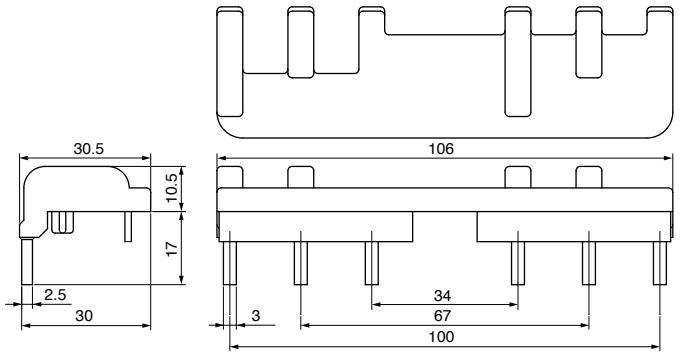
SZ-ERW1/B



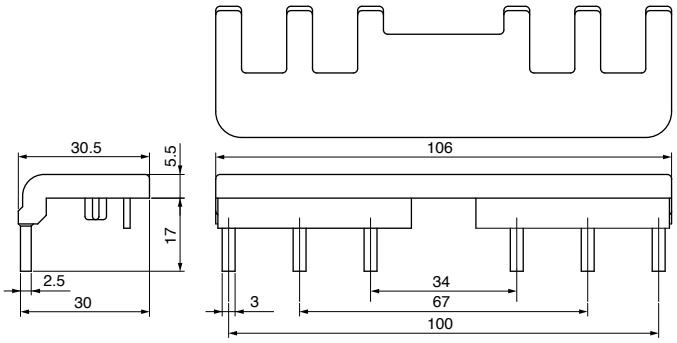
SZ-ERW1/D



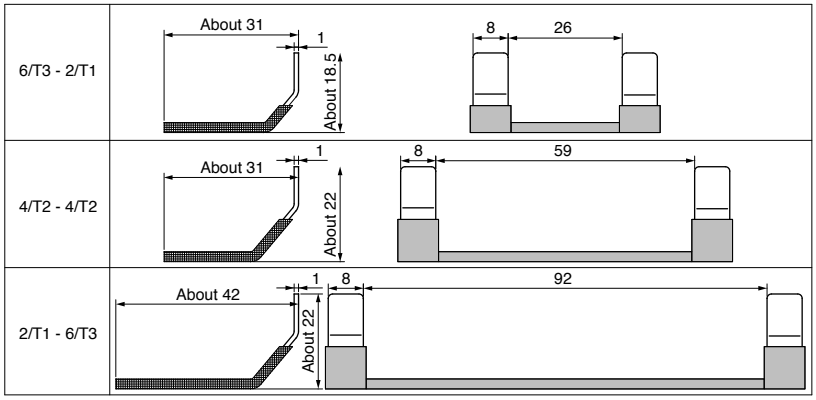
SZ-ERW2/A



SZ-ERW2/B



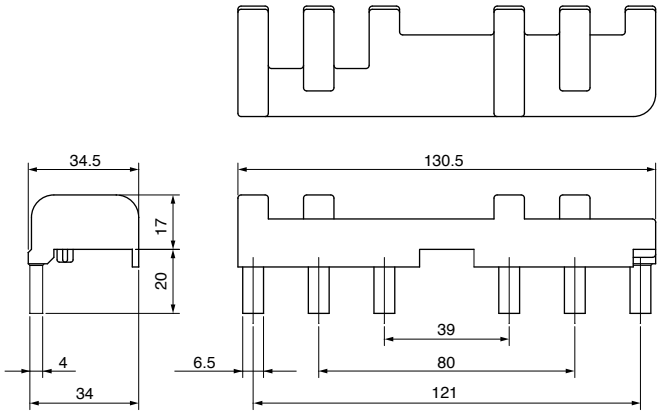
SZ-ERW2/D



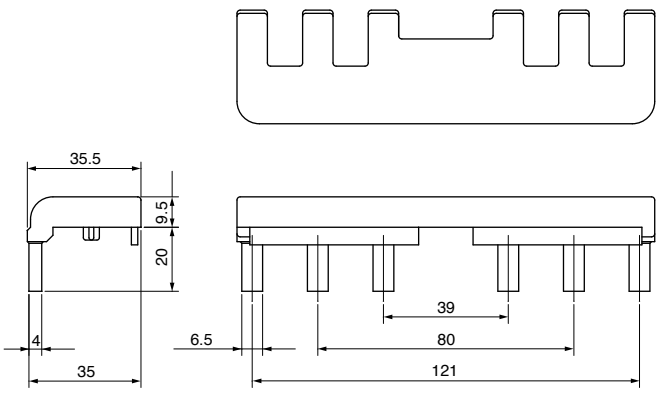
Dimensions, mm

Power connection kit for reversing for SC-E

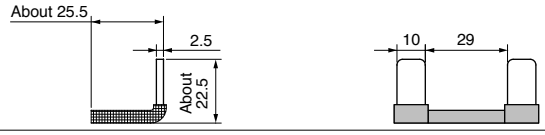
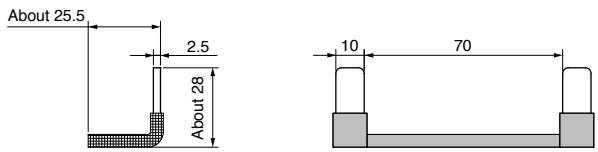
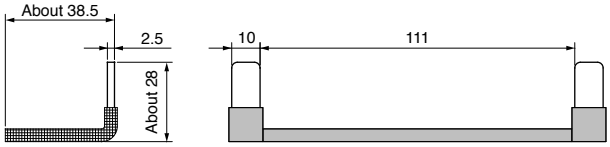
SZ-ERW3/A



SZ-ERW3/B



SZ-ERW3/D

6/T3 - 2/T1	
4/T2 - 4/T2	
2/T1 - 6/T3	

■ Standard operating conditions

The magnetic contactors are manufactured for use in the standard operating conditions given in the table at the right. Consult FUJI before using the magnetic contactors in different conditions.

Ambient temperature	Operating: –5 to 55˚C No sudden temperature changes resulting in condensation or icing (The average temperature over a 24-hour period must not exceed 35˚C) Storage: –40 to 65˚C
Humidity	45 to 85%RH
Altitude	2000m or lower
Atmosphere	No excessive dust, smoke, corrosive gases, flammable gases, steam, or salt
Vibration	10 to 55Hz 15m/s^2
Shock	50m/s^2
Mounting	Screw mounting, 35mm DIN rail mounting (SC-E02 to SC-E4)
Mounting angle	
Standard	IEC 60947-4-1, EN 60947-4-1, VDE 0660 JIS C 8201-4-1, JEM 1038 UL 508, CSA C22.2

■ Wirings

• Connection wires and terminal processing

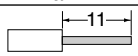
Be sure to perform wiring correctly with reference to the connections diagram. Main terminals for models SC-E02 to SC-E7 are wired using solid wires or stranded wires. Stranded wires or flexible stranded wires can be connected by twisting them together, crimping a sleeve (ferrule) onto them before connecting.

• Tightening torque

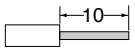
If wires are not tightened sufficiently, they may become hot or come loose and result in a fire, short-circuit, electric shock, or some other potentially dangerous situation. Be sure to tighten the wires to the torques specified in the tables below.

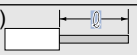
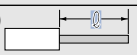
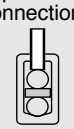
• Connectable wire sizes, tightening tools, tightening torques

Main circuit

Contactor type		SC-E02 SC-E02/G	SC-E03 SC-E03/G	SC-E04 SC-E04/G	SC-E05 SC-E05/G
Solid wire□ (mm^2)	One	0.75 to 4		0.75 to 6	
	Two	1 to 4		1.5 to 6	
Stranded wire (mm^2)	One	0.75 to 4		0.75 to 6	
	Two	1 to 4		1.5 to 6	
AWG	One	12 max.		10 max.	
	Two	12 max.		10 max.	
Sheath stripping length (mm)					
Terminal screw size		M4			
Tool		⊕Phillips screwdriver, H-type, No. 2 (ISO 8764) ⊖Flat-blade screwdriver, 1×5.5×L-type, B (ISO 2830)			
Tightening torque (N·m)		1.2 to 1.5			

Control circuit

Solid or stranded wire (mm^2)	One	0.75 to 2.5 (ø1 to 1.6)
	Two	0.75 to 2.5
AWG	One	18 to 14
	Two	18 to 14
Sheath stripping length (mm)		
Fork terminal		Max. 7.7mm wide
Terminal screw size		M3.5
Tool		⊕Phillips screwdriver, H-type, No. 2 (ISO 8764) ⊖Flat-blade screwdriver, 1×5.5×L-type, B (ISO 2830)
Tightening torque (N·m)		0.8 to 1

Contactor type			SC-E1, E2, E2S SC-E1/G, E2/G, E2S/G	SC-E3, E4 SC-E3/G, E4/G	SC-E5, E6	SC-E7
Top-only connection 	Solid or stranded wire (mm^2) *1		0.75 to 35	1.5 to 70	4 to 70	4 to 120
	Flexible stranded wire with sleeve (mm^2) *1		0.75 to 25	1.5 to 50	2.5 to 50	2.5 to 95
	Flexible stranded wire without sleeve (mm^2) *1		0.75 to 25	1.5 to 50	4 to 50	4 to 95
	AWG		18 to 2	16 to 2/0	12 to 2/0	12 to 250MCM
	Solid or stripping length (mm) 		15	19.5	26.5	28.5
Bottom-only connection 	Single stranded wire (mm^2) *1		0.75 to 25	1.5 to 50	4 to 70	4 to 120
	Flexible stranded wire with sleeve (mm^2) *1		0.75 to 16	1.5 to 35	2.5 to 50	2.5 to 95
	Flexible stranded wire without sleeve (mm^2) *1		0.75 to 16	1.5 to 35	4 to 50	4 to 95
	AWG		18 to 3	16 to 1/0	12 to 2/0	12 to 250MCM
	Sheath stripping length (mm) 		12.5	16	26.5	28.5
Top/bottom connection 	Solid or stranded wire (mm^2) *1	Top/bottom□	0.75 to 25	1.5 to 50	4 to 70	4 to 120
	Flexible stranded wire with sleeve (mm^2) *1	Top/bottom□	0.75 to 16	1.5 to 35	2.5 to 50	2.5 to 95
	Flexible stranded wire without sleeve (mm^2) *1	Top/bottom	0.75 to 16	1.5 to 35	4 to 50	4 to 95
	AWG	Top/bottom	18 to 3	16 to 1/0	12 to 2/0	12 to 250MCM
Tool			⊕Phillips screwdriver, H-type, No. 2 (ISO 8764) ⊖Flat-blade screwdriver, 1×5.5×L-type, B (ISO 2830)	◎Hex. wrench 4 (ISO 2936)		
Tightening torque (N·m)			2.5	8		10
Self-locking torque (N·m) *2			1	2		

Notes: *1 Stranded wire (0 to 25mm^2) consists of 7 wires or less.
Stranded wire (35 to 120mm^2) consists of 19 wires or less.
Flexible stranded wire consists of more number wires than the above.

*2 The tightening bolt must be loosened in order to insert the wire. However, stop loosening the bolt when the anti-drop attachment on the bottom of the bolt reaches the top edge of the terminal. If a torque exceeding that given in the table is applied in this state, the retaining bracket may come loose.

Thermal overload relays TK-E series
Quick reference guide and Ordering information

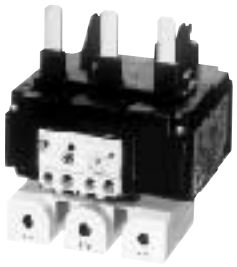
TK-E series with open-phase protection device

Features

- This relay protects motor windings from burning due to overloads, locked rotor current, or open-phases.
- Maintenance and inspection safety has been improved by employing a finger protection mechanism to cover exposed terminals (conforms to DIN 57106, VDE 0106 Teil 100).
- A high-precision scale for the current adjustment dial enables easy and exact current setting.
- The operating status can be visually checked with ease.
- The relays can be manually tripped. A trip-free mechanism is also provided.
- Base unit can be added to enable separate-mounting types of the TK-E02, E2, and E3 models.

TK-E02

AF01-86



TK-E6

AF01-84

Part number and specification

Applicable contactor	Part number	Aux. contact	Trip category (JIS)	No. of heater elements	Power consumption per pole	Provided functions
SC-E02 to E05, E02/G to E05/G	**TK-E02**	1NO+1NC	10A	3	2.2VA	Overload, phase-loss protection□ Ambient temperature compensation□ Manual or auto reset selectable□ Manual trip mechanism□ Trip indicator
SC-E1 to E2S, E1/G to E2S/G	**TK-E2**				3.8VA	
SC-E3, E4, E3/G, E4/G	**TK-E3**				6.6VA	
SC-E5	**TK-E5**				6.6VA	
SC-E6, E7	**TK-E6**				8.0VA	

Note: Separerate mounting type is available for TK-E6. The part number is TK-E6H.

Ampere ranges

Thermal overload relay type				
TK-E02	**TK-E2**	**TK-E3**	**TK-E5**	**TK-E6, E6H ***
0.1–0.15				
0.13–0.2				
0.15–0.24				
0.2–0.3				
0.24–0.36				
0.36–0.54				
0.48–0.72				
0.64–0.96				
0.8–1.2				
0.95–1.45				
1.4–2.2				
1.7–2.6				
2.2–3.4				
2.8–4.2				
4–6	4–6			
5–8	5–8			
6–9	6–9			
7–11	7–11	7–11		
9–13	9–13	9–13		
12–18	12–18	12–18		
16–22				
	18–26	18–26	18–26	
20–25				
	24–36	24–36	24–36	
		28–40	28–40	
	32–42			
		34–50	34–50	
	40–50			
	44–54			
		45–65	45–65	45–65
		48–68		
				53–80
		64–80		
			65–95	65–95
			85–105	
				85–125
				110–160

Note: * Applicable only for separate-mounting type. Not applicable for use in combination with a magnetic contactor

Standards

IEC 60947-4-1, EN60947-4-1
VDE 0660, JIS C 8201-4-1
UL 508, CSA C22.2

Ordering information

Specify the following:
1. Part number
2. Ampere range

TK-E 02 - 0.1–0.15

Product category

Frame size

Ampere range

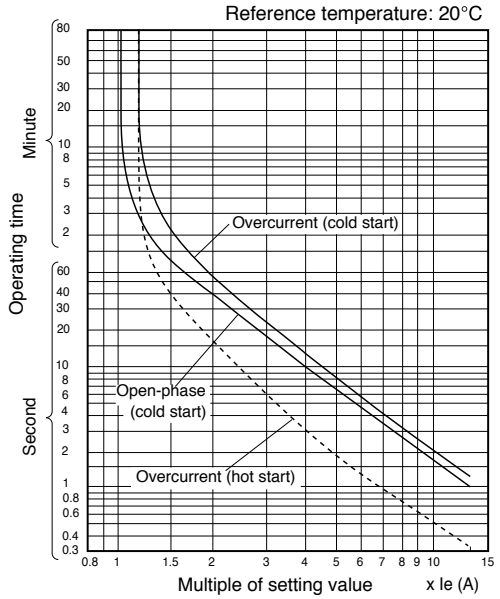
■ Auxiliary contact ratings

• Based on UL and CSA

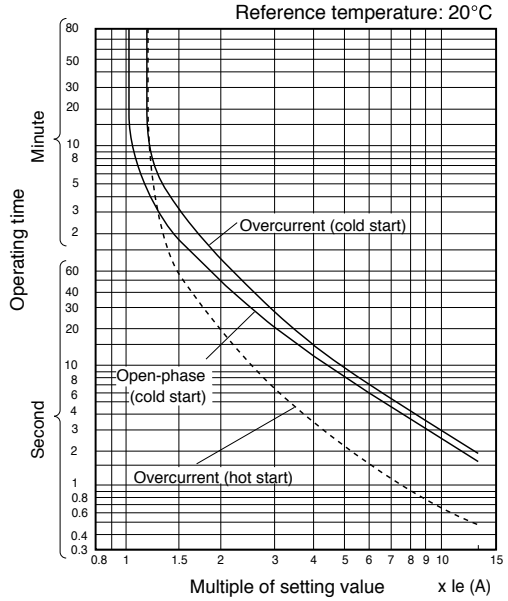
Part number	Rated insulation voltage (V)	Rated thermal current (A)	Making and breaking current (A)					
			AC (rating code B600)			DC (rating code R300)		
			Voltage (V)	Making (A)	Breaking (A)	Voltage (V)	Making (A)	Breaking (A)
TK-E02	600	5	120	30	3	120	0.22	0.22
TK-E2, E3			240	15	1.5	250	0.11	0.11
TK-E5			480	7.5	0.75			
TK-E6			600	6	0.6			

■ Operating characteristics (mean value)

• TK-E02



• TK-E2 to E6, E6H



Thermal overload relays TK-E series
Optional accessories

■ Optional accessories for TK-E series

• Base units for separate mounting

The base unit modifies thermal overload relays to separate mounting that can be mounted to 35mm-wide IEC top hat rail or secured with screws.

Applicable thermal overload relay	Type
TK-E02	**SZ-HCE**
TK-E2	**SZ-HDE**
TK-E3	**SZ-HEE**

• Trip indicator

Reports any tripping action at a thermal overload relay through its LED display.

Applicable thermal overload relay	Rated voltage	Type
TK-E02	100–110V AC, 50/60Hz	**SZ-L100**
	200–220V AC, 50/60Hz	**SZ-L200**
TK-E2 to TK-E6	100–110V AC, 50/60Hz	**SZ-L100N2**
	200–220V AC, 50/60Hz	**SZ-L200N2**

• Reset release button

Reset a thermal overload relay from the rear side of the board or a distant location.

Applicable thermal overload relay	Load length (mm)	Type
TK-E02	300	**SZ-R1**
	500	**SZ-R2**
	700	**SZ-R3**
TK-E2 to TK-E6	300	**SZ-R4**
	500	**SZ-R5**
	700	**SZ-R6**

• Dial cover

Protects the setting current value of a thermal overload relay from being changed unintentionally.

Applicable thermal overload relay	Type
TK-E02 to TK-E6	**SZ-DA**

KK01-108

Base unit
SZ-HDE

AF00-291

Trip indicator
SZ-L200N2

AF88-585

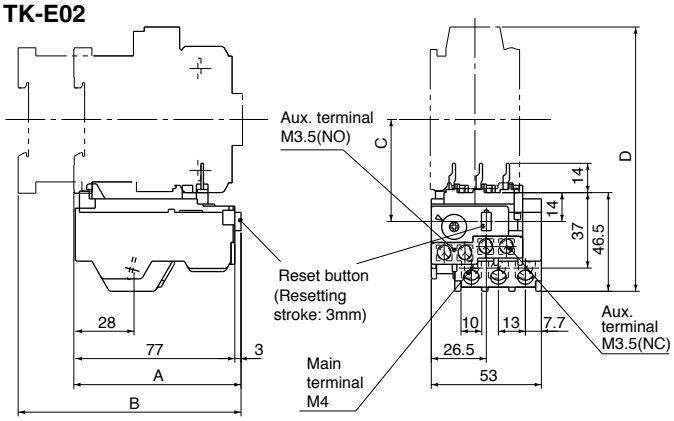
Reset release button
SZ-R1

AF88-1056

Dial cover
SZ-DA

Dimensions, mm

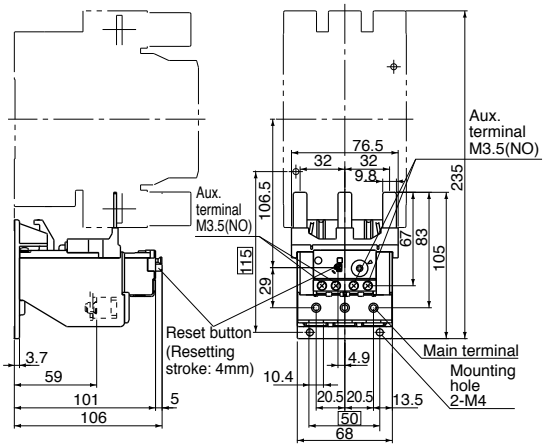
TK-E02



Contactor	A	B	C	D
SC-E02 to 05	80.5	–	49	127.5
SC-E02/G to 05/G	–	107.5	49	127.5

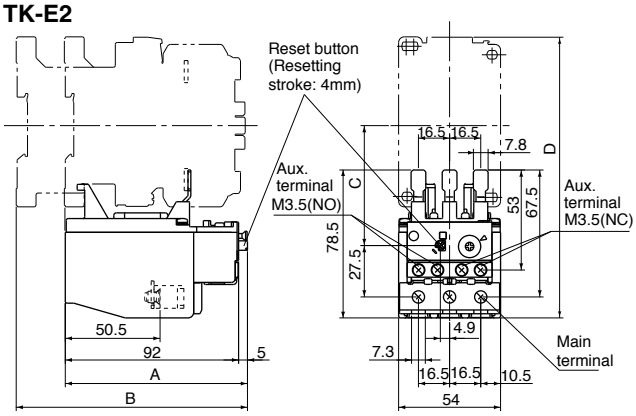
Mass: 0.13kg

TK-E5 On-contactor mounting only



Mass: 0.37kg

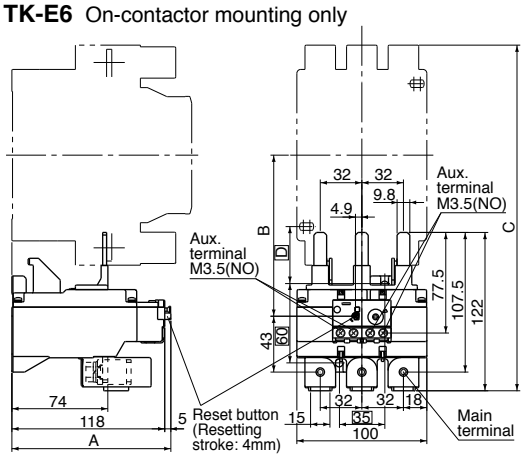
TK-E2



Contactor	A	B	C	D
SC-E1 to E2S	97	–	63.5	149
SC-E1/G to E2S/G	–	123	63.5	149

Mass: 0.25kg

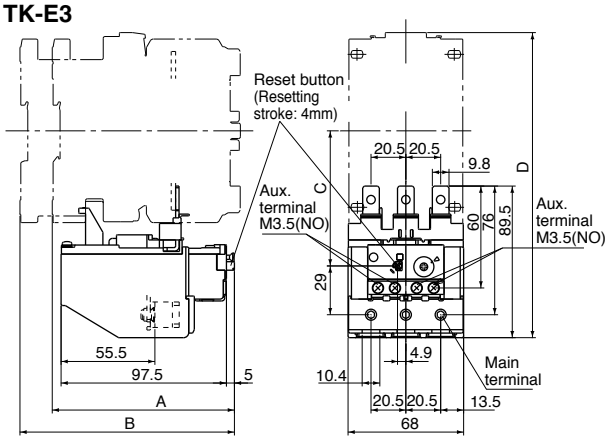
TK-E6 On-contactor mounting only



Contactor	A	B	C	D
SC-E6	123	124	266.5	45
SC-E7	123	129	274	50

Mass: 0.71kg

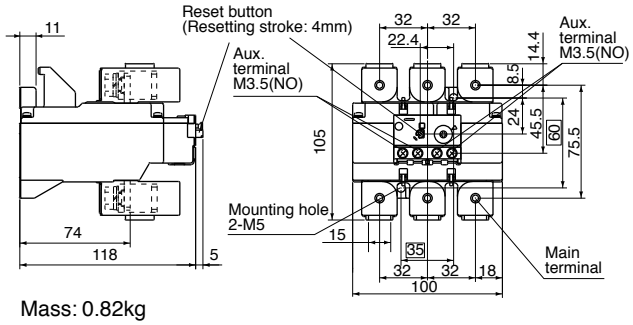
TK-E3



Contactor	A	B	C	D
SC-E3, E4	107.5	–	79.5	180
SC-E3/, E4/G	–	126.5	79.5	180

Mass: 0.34kg

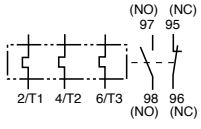
TK-E6H For separate mounting only



Mass: 0.82kg

Wiring diagrams

3-heater element

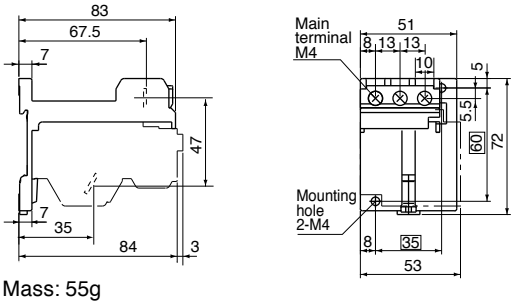


Thermal overload relays TK-E series
Dimensions

■ Dimensions, mm

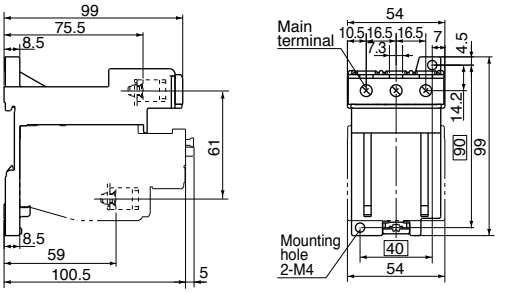
• Base units for separate mounting

SZ-HCE



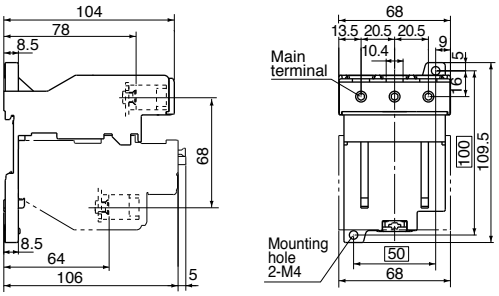
Mass: 55g

SZ-HDE



Mass: 0.1kg

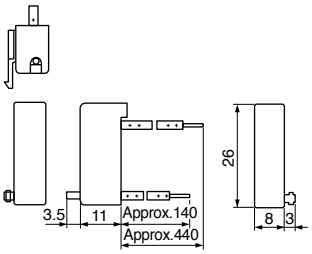
SZ-HEE



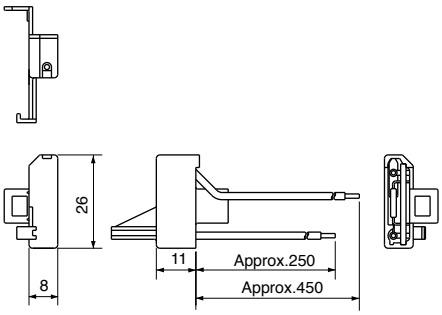
Mass: 0.15kg

• Trip indicators

SZ-L100, L200

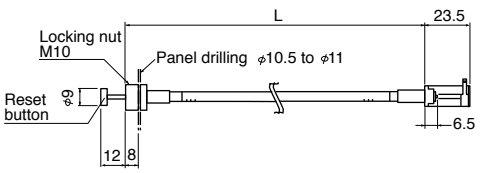


SZ-L100N2, L200N2



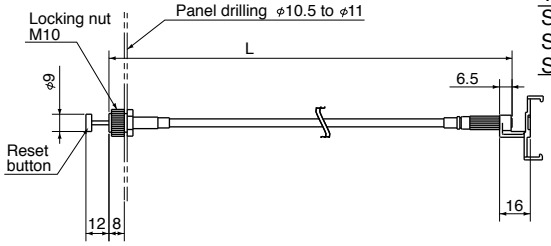
• Reset release button

SZ-R1, R2, R3



Type	L
SZ-R1	300
SZ-R2	500
SZ-R3	700

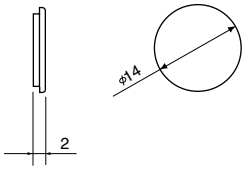
SZ-R4, R5, R6



Type	L
SZ-R4	300
SZ-R5	500
SZ-R6	700

• Dial cover

SZ-DA



■ Standard operating conditions

The thermal overload relays are manufactured for use in the standard operating conditions given in the table at the right. Consult FUJI before using the thermal overload in different conditions.

Ambient temperature	Operating: –5 to 55˚C No sudden temperature changes resulting in condensation or icing (The average temperature over a 24-hour period must not exceed 35˚C) Storage: –40 to 65˚C
Humidity	45 to 85%RH
Atmosphere	No excessive dust, smoke, corrosive gases, flammable gases, steam, or salt
Vibration	10 to 55Hz 15m/s^2
Shock	50m/s^2

■ Wiring

• Connection wires and terminal processing

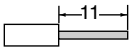
Be sure to perform wiring correctly referring to the connection diagram. Main terminals for models TK-E02 to TK-E6 are wired using solid wires or stranded wires. Stranded wires or flexible stranded wires can be connected by twisting them together crimping a sleeve (ferrule) onto them before connecting.

• Tightening torque

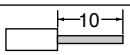
If wires are not tightened sufficiently, they may become hot or come loose and result in a fire, short-circuit, electric shock, or some other potentially dangerous situation. Be sure to tighten the wires to the torques specified in the tables below.

• Wire sizes, tightening tools, tightening torques

Main circuit

Thermal overload relay type		**TK-E02**
Base unit type		SZ-HCE
Solid wire (mm^2)	One	0.75 to 4
	Two	1 to 4
Stranded wire (mm^2)	One	0.75 to 4
	Two	1 to 4
AWG	One	12 max.
	Two	12 max.
Sheath stripping length (mm)		
Terminal screw size		M4
Tool		⊕Phillips screwdriver, H-type, No. 2 (ISO 8764) ⊖Flat-blade screwdriver, 1×5.5×L-type, B (ISO 2830)
Tightening torque [N·m(lb·in)]		1.2 to 1.5 (11 to 13)

Control circuit

Single stranded □ wire (mm^2)□	One	0.75 to 2.5 (ø1 to ø1.6)
	Two	0.75 to 2.5
AWG	One	18 to 14
	Two	18 to 14
Sheath stripping length (mm)		
Fork terminal		Max. 7.7mm wide (R2-3.5)
Terminal screw size		M3.5
Tool		⊕Phillips screwdriver, H-type, No. 2 (ISO 8764)
□		⊖Flat-blade screwdriver, 1×5.5×L-type, B (ISO 2830)
Tightening torque [N·m(lb·in)]		0.8 to 1 (7 to 9)

Thermal overload relay type		**TK-E2**	**TK-E3**	**TK-E5**	**TK-E6, E6H**
Base unit type		SZ-HDE	SZ-HEE	–	–
	Single stranded wire (mm^2) *1	0.75 to 16	1.5 to 35		16 to 70
	Flexible stranded wire with sleeve (mm^2) *1	0.75 to 16	1.5 to 35		16 to 70
	Flexible stranded wire without sleeve (mm^2)	0.75 to 16	1.5 to 35		16 to 70
	AWG	6 max.	2 max.		00 max.
	Sheath stripping length (mm) 	18	21		23
	Tool	⊕Phillips screwdriver, H-type, No. 2 (ISO 8764) ⊖Flat-blade screwdriver, 1×5.5×L-type, B (ISO 2830)	◎Hex. wrench 4 (ISO 2936)		
	Tightening torque (N·m)	2.5	6		10

Notes: *1 Stranded wire (0 to 25mm^2) consists of 7 wires or less.
Stranded wire (35 to 120mm^2) consists of 19 wires or less.
Flexible stranded wire consists of more number wires than the above.

Combination Starters
Quick reference guide

Features
- The user can assemble a combination starter by combining a BM3 series manual motor starter and an SC series magnetic contactor according to the load motor capacity.
- The manual motor starter provides overload, phase-loss, and short-circuit protections for the motor circuit, and incorporates a dial for flexible adjustment to match the total load current of the motor.
- The magnetic contactor allows remote ON/OFF operation of the motor circuit with high frequency, and features a electrical durability of one million operations.
- The manual motor starter and magnetic contactor are connected via link module and mounted to a base plate.


KK02-162

BM3RSB-010 + SC-M02


KK02-152

BM3VHB-050 + SC-E2S

Combinations meeting for North American market

• BM3RSB, BM3RHB (General)

220-240V AC		440-480V AC		MMS part number			Contactor □ part number	Link module	Base plate
HP rating (HP)	Rated current (A)	HP rating (HP)	Rated current (A)	Part number		Current range (A)			
-	-	-	-	**BM3RSB-P16**	**BM3RHB-P16**	0.1-0.16	**SC-M01, M01/G**	BZ0LRC09AA	-
							SC-E02	BZ0LRE22AA	BZ0BPRE22A
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A
-	-	-	-	**BM3RSB-P25**	**BM3RHB-P25**	0.16-0.25	**SC-M01, M01/G**	BZ0LRC09AA	-
							SC-E02	BZ0LRE22AA	BZ0BPRE22A
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A
-	-	-	-	**BM3RSB-P40**	**BM3RHB-P40**	0.25-0.4	**SC-M01, M01/G**	BZ0LRC09AA	-
							SC-E02	BZ0LRE22AA	BZ0BPRE22A
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A
-	-	-	-	**BM3RSB-P63**	**BM3RHB-P63**	0.4-0.63	**SC-M01, M01/G**	BZ0LRC09AA	-
							SC-E02	BZ0LRE22AA	BZ0BPRE22A
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A
-	-	-	-	**BM3RSB-001**	**BM3RHB-001**	0.63-1	**SC-M01, M01/G**	BZ0LRC09AA	-
							SC-E02	BZ0LRE22AA	BZ0BPRE22A
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A
-	-	3/4	1.6	**BM3RSB-1P6**	**BM3RHB-1P6**	1-1.6	**SC-M01, M01/G**	BZ0LRC09AA	-
							SC-E02	BZ0LRE22AA	BZ0BPRE22A
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A
1/2	2.2	1	2.1	**BM3RSB-2P5**	**BM3RHB-2P5**	1.6-2.5	**SC-M01, M01/G**	BZ0LRC09AA	-
							SC-E02	BZ0LRE22AA	BZ0BPRE22A
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A
3/4	3.2	2	3.4	**BM3RSB-004**	**BM3RHB-004**	2.5-4	**SC-M01, M01/G**	BZ0LRC09AA	-
							SC-E02	BZ0LRE22AA	BZ0BPRE22A
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A
1-1/2	6	3	4.8	**BM3RSB-6P3**	**BM3RHB-6P3**	4-6.3	**SC-M01, M01/G**	BZ0LRC09AA	-
							SC-E02	BZ0LRE22AA	BZ0BPRE22A
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A
-	-	5	7.6	**BM3RSB-010**	**BM3RHB-010**	6.3-10	**SC-M02, M02/G**	BZ0LRC09AA	-
							SC-E02	BZ0LRE22AA	BZ0BPRE22A
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A
3	9.6	7-1/2	11	**BM3RSB-013**	**BM3RHB-013**	10-13	**SC-E03**	BZ0LRE22AA	BZ0BPRE22A
							SC-E03/G	BZ0LRE22GA	BZ0BPRE22A
5	15.2	10	14	**BM3RSB-016**	**BM3RHB-016**	11-16	**SC-E04**	BZ0LRE22AA	BZ0BPRE22A
							SC-E04/G	BZ0LRE22GA	BZ0BPRE22A
5	15.2	10	14	**BM3RSB-020**	**BM3RHB-020**	14-20	**SC-E04**	BZ0LRE22AA	BZ0BPRE22A
							SC-E04/G	BZ0LRE22GA	BZ0BPRE22A
7-1/2	22	15	21	**BM3RSB-025**	**BM3RHB-025**	18-25	**SC-E05**	BZ0LRE22AA	BZ0BPRE22A
							SC-E05/G	BZ0LRE22GA	BZ0BPRE22A
10	28	20	27	**BM3RSB-032**	**BM3RHB-032**	24-32	**SC-E1**	BZ0LRE32AA	BZ0BPRE32A
							SC-E1/G	BZ0LRE32GA	BZ0BPRE32A

• BM3RSB, BM3RHB (Type F coordination)

220-240V AC		440-480V AC		MMS part number			Contactor □ part number	Link module	Base plate	Short-circuit ratings at 480Y/277 AC (kA)	
HP rating (HP)	Rated current (A)	HP rating (HP)	Rated current (A)	Part number		Current range (A)				for BM3RSB	for BM3RHB
-	-	-	-	**BM3RSB-P16**	**BM3RHB-P16**	0.1-0.16	**SC-M01, M01/G**	BZ0LRC09AA	-	65	65
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
-	-	-	-	**BM3RSB-P25**	**BM3RHB-P25**	0.16-0.25	**SC-M01, M01/G**	BZ0LRC09AA	-	65	65
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
-	-	-	-	**BM3RSB-P40**	**BM3RHB-P40**	0.25-0.4	**SC-M01, M01/G**	BZ0LRC09AA	-	65	65
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
-	-	-	-	**BM3RSB-P63**	**BM3RHB-P63**	0.4-0.63	**SC-M01, M01/G**	BZ0LRC09AA	-	65	65
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
-	-	-	-	**BM3RSB-001**	**BM3RHB-001**	0.63-1	**SC-M01, M01/G**	BZ0LRC09AA	-	65	65
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
-	-	3/4	1.6	**BM3RSB-1P6**	**BM3RHB-1P6**	1-1.6	**SC-M01, M01/G**	BZ0LRC09AA	-	65	65
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
1/2	2.2	1	2.1	**BM3RSB-2P5**	**BM3RHB-2P5**	1.6-2.5	**SC-M01, M01/G**	BZ0LRC09AA	-	50	65
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
3/4	3.2	2	3.4	**BM3RSB-004**	**BM3RHB-004**	2.5-4	**SC-M01, M01/G**	BZ0LRC09AA	-	50	65
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
1-1/2	6	3	4.8	**BM3RSB-6P3**	**BM3RHB-6P3**	4-6.3	**SC-M01, M01/G**	BZ0LRC09AA	-	50	65
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
-	-	5	7.6	**BM3RSB-010**	**BM3RHB-010**	6.3-10	**SC-M02, M02/G**	BZ0LRC09AA	-	25	65
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
3	9.6	-	-	**BM3RSB-010**	**BM3RHB-010**	6.3-10	**SC-M02, M02/G**	BZ0LRC09AA	-	25	65
							SC-E03	BZ0LRE22AA	BZ0BPRE22A		
							SC-E03/G	BZ0LRE22GA	BZ0BPRE22A		
-	-	7-1/2	11	**BM3RSB-013**	**BM3RHB-013**	10-13	**SC-E03**	BZ0LRE22AA	BZ0BPRE22A	25	65
							SC-E03/G	BZ0LRE22GA	BZ0BPRE22A		
5	15.2	10	14	**BM3RSB-016**	**BM3RHB-016**	11-16	**SC-E04**	BZ0LRE22AA	BZ0BPRE22A	25	65
							SC-E04/G	BZ0LRE22GA	BZ0BPRE22A		
5	15.2	10	14	**BM3RSB-020**	**BM3RHB-020**	14-20	**SC-E04**	BZ0LRE22AA	BZ0BPRE22A	25	65
							SC-E04/G	BZ0LRE22GA	BZ0BPRE22A		
7-1/2	22	15	21	**BM3RSB-025**	**BM3RHB-025**	18-25	**SC-E05**	BZ0LRE22AA	BZ0BPRE22A	25	50
							SC-E05/G	BZ0LRE22GA	BZ0BPRE22A		
10	28	20	27	**BM3RSB-032**	**BM3RHB-032**	24-32	**SC-E1**	BZ0LRE32AA	BZ0BPRE32A	25	50
							SC-E1/G	BZ0LRE32GA	BZ0BPRE32A		

To make an application for Type F condition, You need to prepare BZ0TCRE and BZ0TKUAB accessories separately.

Combination Starter
Quick reference guide

• BM3VSB, BM3VHB (General)

220-240V AC		440-480V AC		MMS part number			Contactor □ part number	Link module	Base plate
HP rating (HP)	Rated current (A)	HP rating (HP)	Rated current (A)	Part number		Current range (A)			
3	9.6	5	7.6	**BM3VSB-010**	**BM3VHB-010**	6.3-10	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A
3	9.6	7-1/2	11	**BM3VSB-013**	**BM3VHB-013**	10-13	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A
5	15.2	10	14	**BM3VSB-016**	**BM3VHB-016**	11-16	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A
5	15.2	10	14	**BM3VSB-020**	**BM3VHB-020**	14-20	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A
7-1/2	22	15	21	**BM3VSB-025**	**BM3VHB-025**	18-25	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A
10	28	20	27	**BM3VSB-032**	**BM3VHB-032**	24-32	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A
10	28	30	40	**BM3VSB-040**	**BM3VHB-040**	28-40	**SC-E2** **SC-E2/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A
15	42	30	40	**BM3VSB-050**	**BM3VHB-050**	35-50	**SC-E2S** **SC-E2S/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A
20	54	40	52	**BM3VSB-063**	**BM3VHB-063**	45-63	**SC-E3** **SC-E3/G**	BZ0LVE65AA BZ0LVE65GA	BZ0BPVE65A BZ0BPVE65A

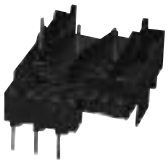
• BM3VSB, BM3VHB (Type F coordination)

220-240V AC		440-480V AC		MMS part number			Contactor □ part number	Link module	Base plate	Short-circuit ratings at 480Y/277 AC (kA)	
HP rating (HP)	Rated current (A)	HP rating (HP)	Rated current (A)	Part number		Current range (A)				for BM3VSB	for BM3VHB
3	9.6	5	7.6	**BM3VSB-010**	**BM3VHB-010**	6.3-10	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A	25	65
3	9.6	7-1/2	11	**BM3VSB-013**	**BM3VHB-013**	10-13	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A	25	65
5	15.2	10	14	**BM3VSB-016**	**BM3VHB-016**	11-16	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A	25	65
5	15.2	10	14	**BM3VSB-020**	**BM3VHB-020**	14-20	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A	25	65
7-1/2	22	15	21	**BM3VSB-025**	**BM3VHB-025**	18-25	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A	25	65
10	28	20	27	**BM3VSB-032**	**BM3VHB-032**	24-32	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A	25	65
10	28	30	40	**BM3VSB-040**	**BM3VHB-040**	28-40	**SC-E2** **SC-E2/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A	25	65
15	42	30	40	**BM3VSB-050**	**BM3VHB-050**	35-50	**SC-E2S** **SC-E2S/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A	25	65
20	54	40	52	**BM3VSB-063**	**BM3VHB-063**	45-63	**SC-E3** **SC-E3/G**	BZ0LVE65AA BZ0LVE65GA	BZ0BPVE65A BZ0BPVE65A	25	65

To make an application for Type F condition, You need to prepare BZ0TKUAB accessories separately.

■ Optional accessories

• Link modules

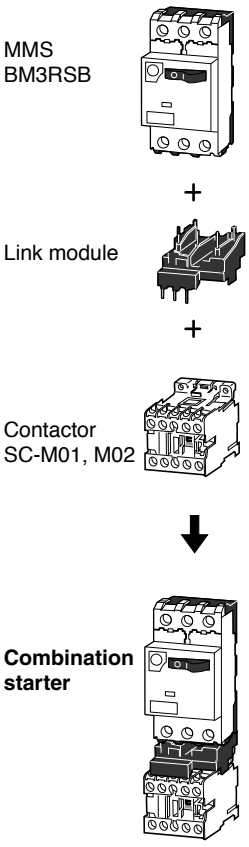
Description	Applicable MMS	Applicable magnetic contactor	Operating coil	Type	Mass (g)
 (No.KK01-153) The link module connects the manual motor starter and magnetic contactor electrically and mechanically.	BM3R	SC-M01, M02	AC	**BZ0LRC09AA**	25
		SC-M01/G, M02/G	DC	**BZ0LRC09AA**	25
		SC-E02, E03, E04, E05	AC	**BZ0LRE22AA**	25
		SC-E02/G, E03/G, E04/G, E05/G	DC	**BZ0LRE22GA**	35
		SC-E1	AC	**BZ0LRE32AA**	45
		SC-E1/G	DC	**BZ0LRE32GA**	60
	BM3V	SC-E1, E2, E2S	AC	**BZ0LVE51AA**	45
		SC-E1/G, E2/G, E2S/G	DC	**BZ0LVE51GA**	60
		SC-E3	AC	**BZ0LVE65AA**	65
		SC-E3/G	DC	**BZ0LVE65GA**	80

• Base plates

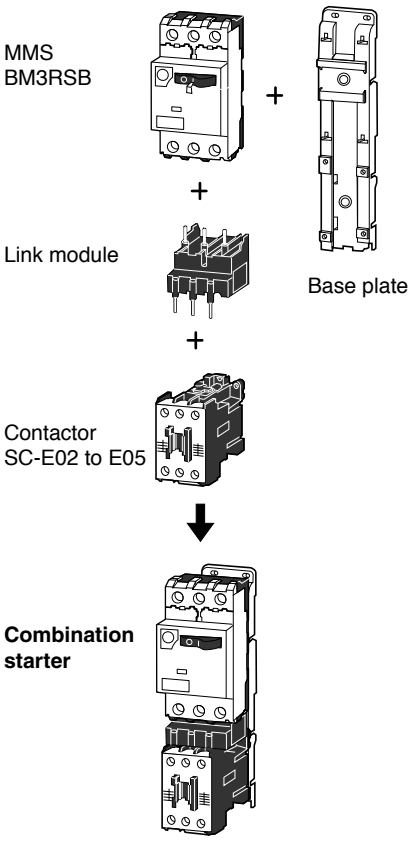
Description	Applicable MMS	Applicable magnetic contactor	Operating coil	Type	Mass (g)
 (No.KK01-155) The base plate is a plastic plate to which the combination starter is mounted. The base plate can then be mounted to a panel with screws or to a DIN rail.	BM3R	SC-E02, E03, E04, E05	AC	**BZ0BPRE22A**	100
		SC-E02/G, E03/G, E04/G, E05/G	DC	**BZ0BPRE22A**	100
		SC-E1	AC	**BZ0BPRE32A**	160
		SC-E1/G	DC	**BZ0BPRE32A**	160
	BM3V	SC-E1, E2, E2S	AC	**BZ0BPVE51A**	160
		SC-E1/G, E2/G, E2S/G	DC	**BZ0BPVE51A**	160
		SC-E3	AC	**BZ0BPVE65A**	195
		SC-E3/G	DC	**BZ0BPVE65A**	195

■ Combination starter configurations

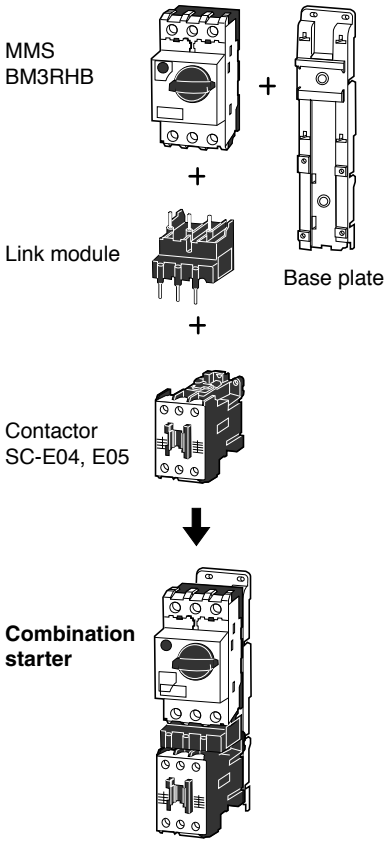
• BM3RSB+SC-M01, M02



• BM3RSB+SC-E02 to E05

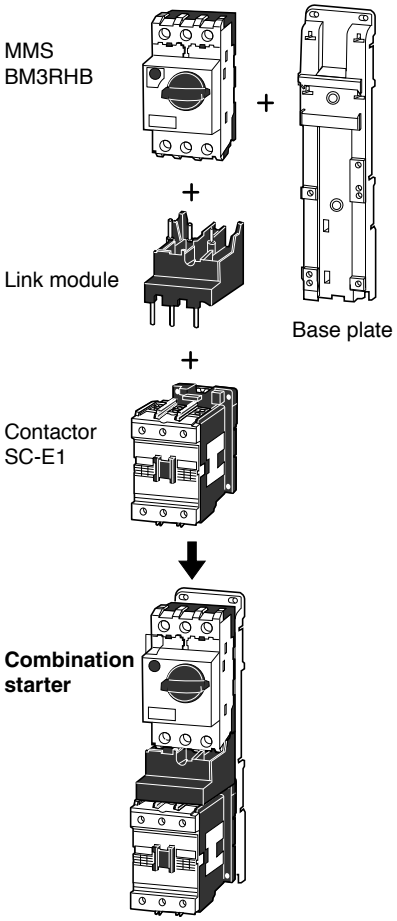


• BM3RHB+SC-E04, E05

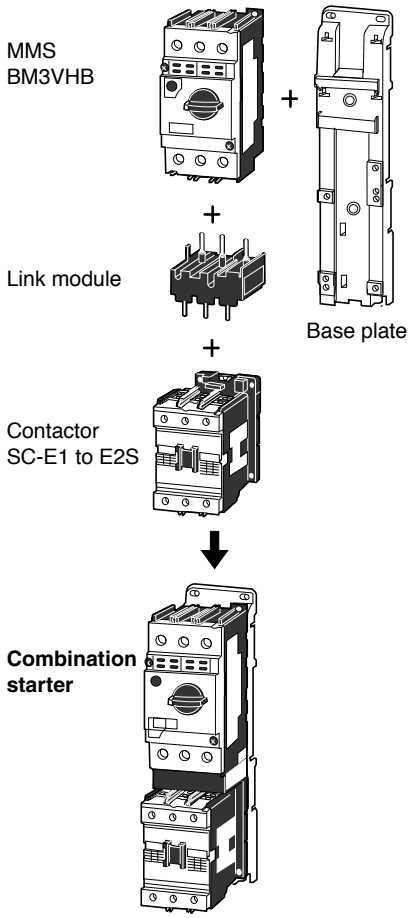


Combination Starters
Optional accessories

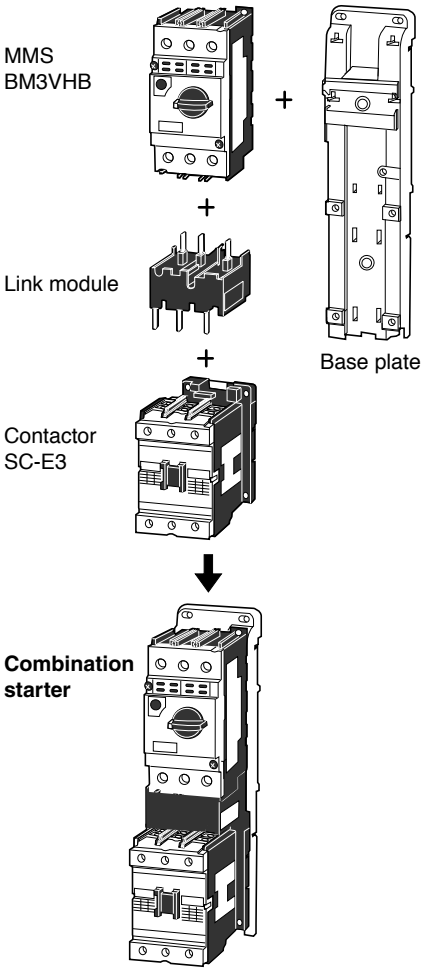
• BM3RHB+SC-E1



• BM3VHB+SC-E1 to E2S



• BM3VHB+SC-E3

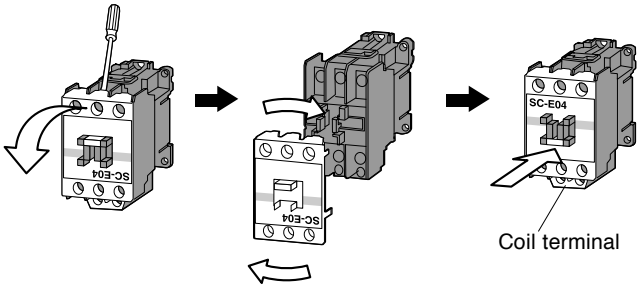


■ Notes for mounting an MMS and contactor

When the manual motor starter and magnetic contactor are configured as a combination starter, the nameplate ends up facing the wrong direction because the coil terminal of the magnetic contactor faces downward. Use the following procedure to turn the nameplate upside down.

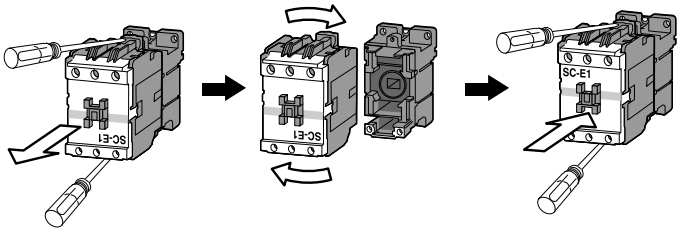
For SC-E02 to SC-E05 magnetic contactors

- Insert a flat-blade screwdriver between the arc-chamber of the S phase or V phase and the terminal screw, and lift the arc-chamber to remove it.
- After removing the cover, turn the cover 180 degrees (top to bottom), then re-mount it onto the magnetic contactor.
- Align the cover with the top and bottom terminals and press it on firmly by hand.



For SC-E1 to SC-E3 magnetic contactors

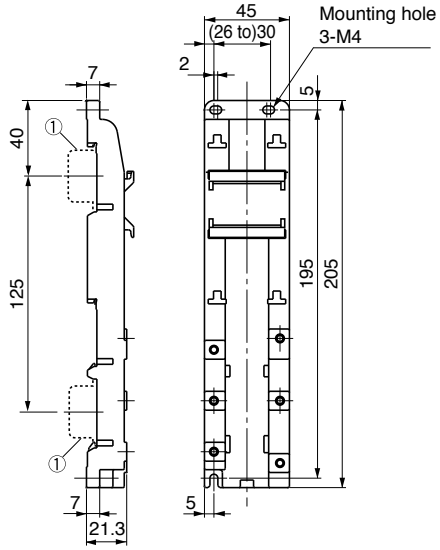
- Use a Phillips screwdriver to remove the two screws securing the front and back bodies.
- Remove the front body and turn it 180 degrees (top to bottom), then re-mount it with the screws.
- Make sure that no foreign matter enters the interior of the magnetic contactor during this removal and re-mounting procedure.



■ Dimensions, mm

• Base plates

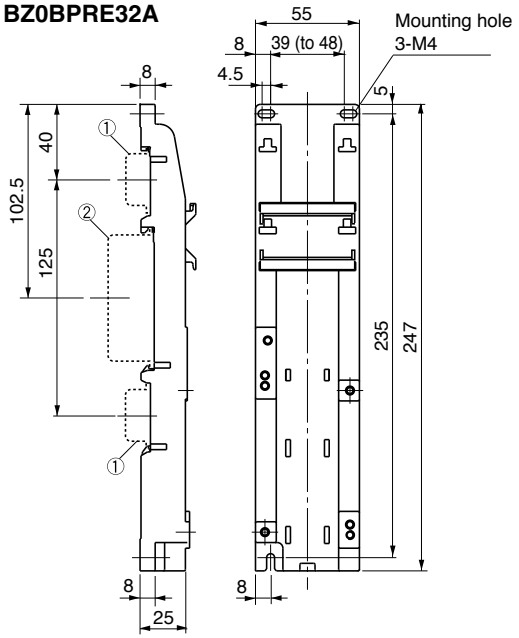
BZ0BPRE22A



①35mm wide rail (hight 15mm) x 2

Base plate type	Applicable type	
	MMS	Contactor
BZ0BPRE22A	BM3RSB	SC-E02, E03, E04, E05
	BM3RHB	E02/G, E03/G, E04/G, E05/G

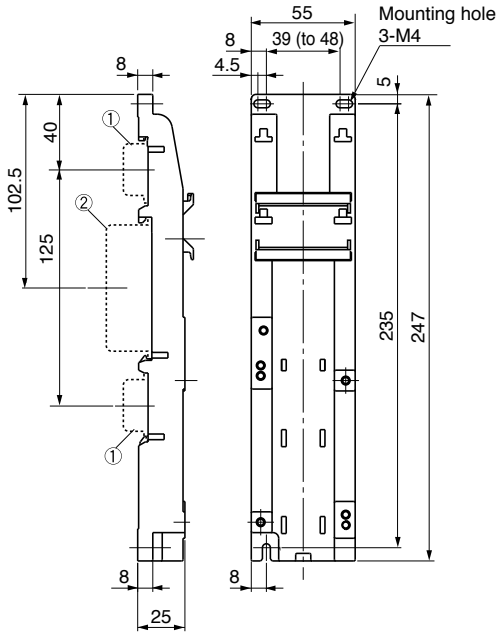
BZ0BPRE32A



①35mm wide rail (hight 15mm) x 2
②75mm wide rail (hight 25mm) x 1

Base plate type	Applicable type	
	MMS	Contactor
BZ0BPRE32A	BM3RSB	SC-E1, E1/G
	BM3RHB	

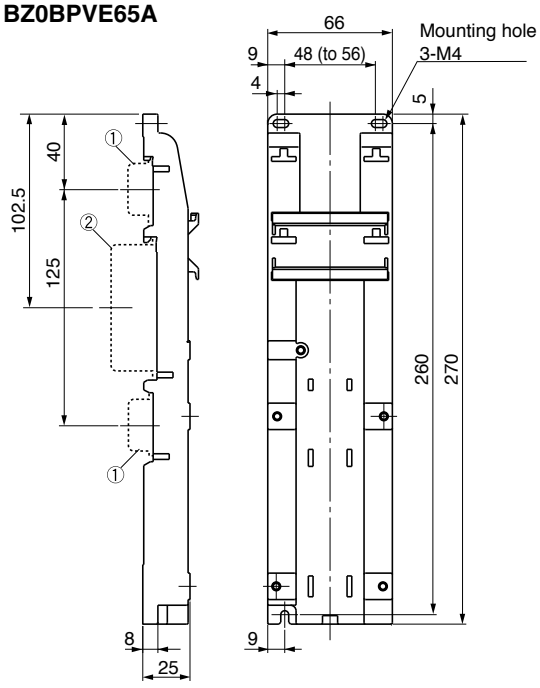
BZ0BPVE51A



①35mm wide rail (hight 15mm) x 2
②75mm wide rail (hight 25mm) x 1

Base plate type	Applicable type	
	MMS	Contactor
BZ0BPVE51A	BM3VSB	SC-E1, E2, E2S,
	BM3VHB	E1/G, E2/G, E2S/G

BZ0BPVE65A



①35mm wide rail (hight 15mm) x 2
②75mm wide rail (hight 25mm) x 1

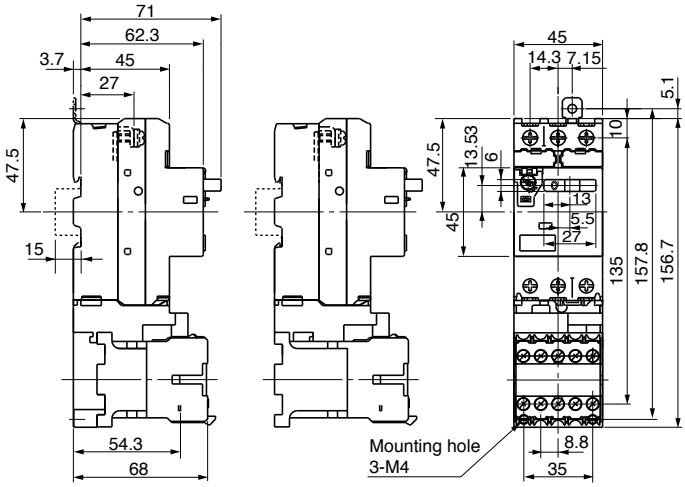
Base plate type	Applicable type	
	MMS	Contactor
BZ0BPVE65A	BM3VSB	SC-E3, E3/G
	BM3VHB	

Combination Starters
Dimensions

■ Dimensions, mm

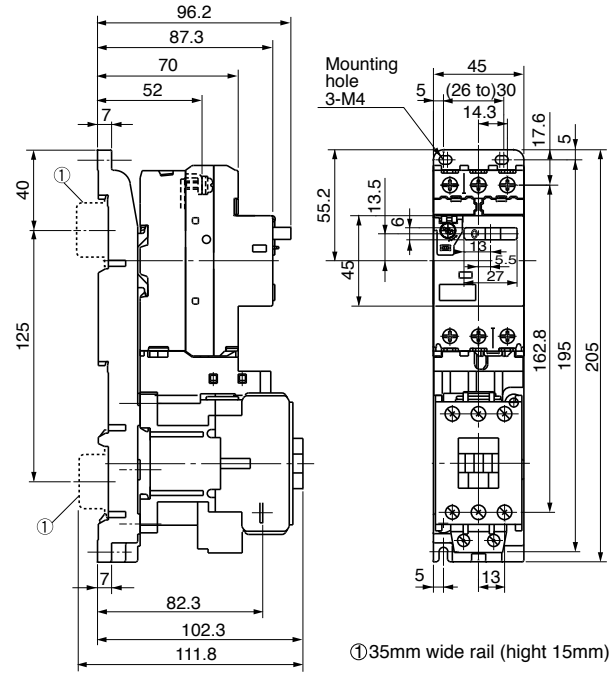
• Combination

BM3RSB + SC-M01, M02
+ SC-M01/G, SC-M02/G



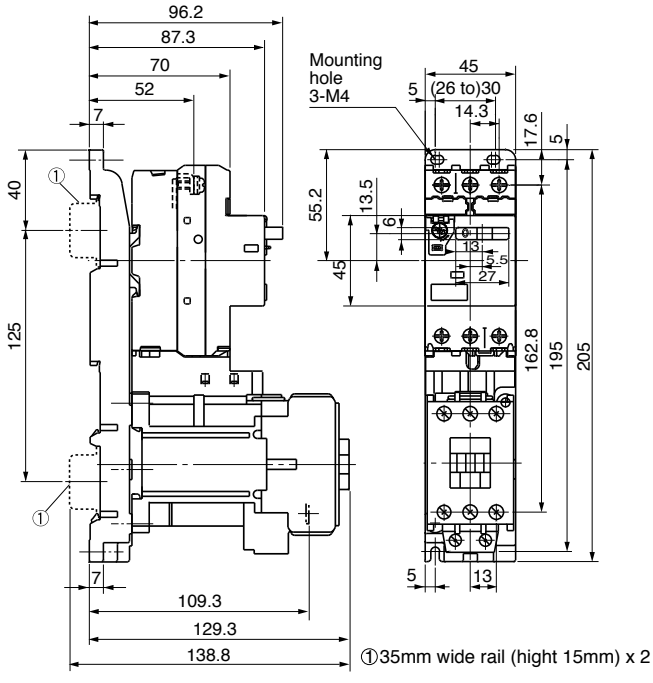
MMS	Contactors	Link module	Mass(g)
BM3RSB	SC-M01, M02	BZ0LRC09AA	540
	SC-M01/G, SC-M02/G	BZ0LRC09AA	600

BM3RSB + SC-E02 to E05



MMS	Contactors	Link module	Base plate	Mass (g)
BM3RSB	SC-E02, E03, E04, E05	BZ0LRE22AA	BZ0BPRE22A	820

BM3RSB + SC-E02/G to E05/G

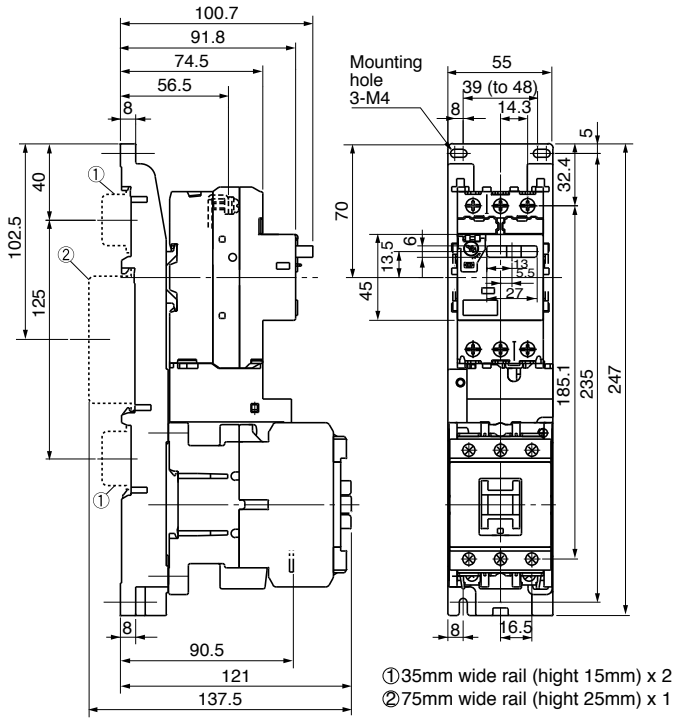


MMS	Contactors	Link module	Base plate	Mass (g)
BM3RSB	SC-E02/G, E03/G, E04/G, E05/G	BZ0LRE22GA	BZ0BPRE22A	1,065

■ Dimensions, mm

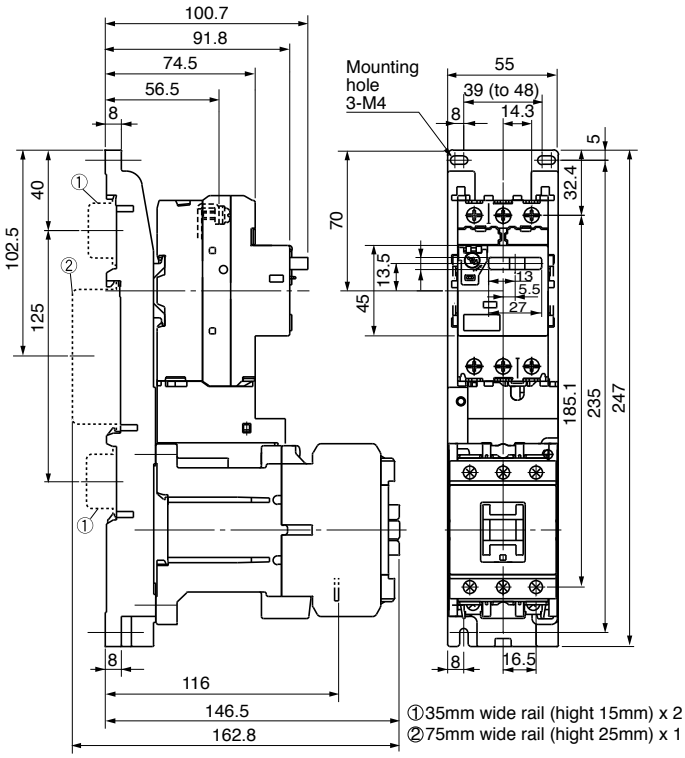
• Combination

BM3RSB + SC-E1



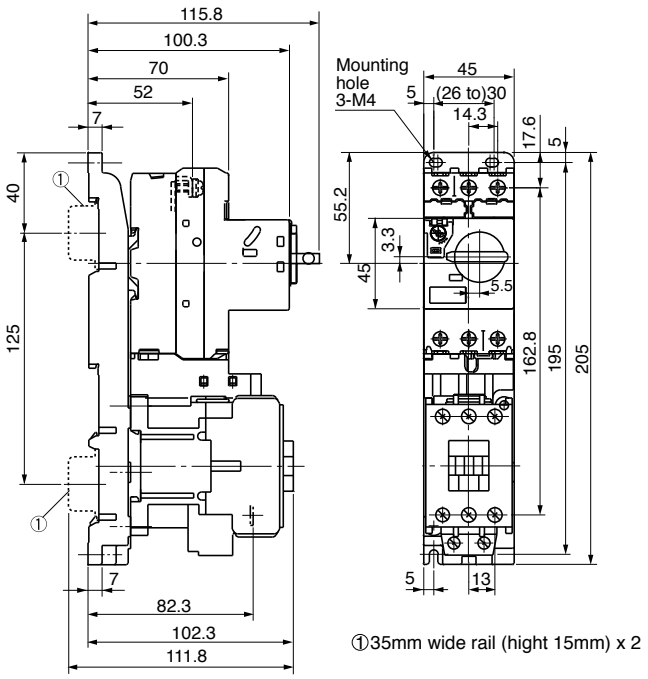
MMS	Contactors	Link module	Base plate	Mass (g)
BM3RSB	SC-E1	BZ0LRE32AA	BZ0BPRE32A	1,135

BM3RSB + SC-E1/G



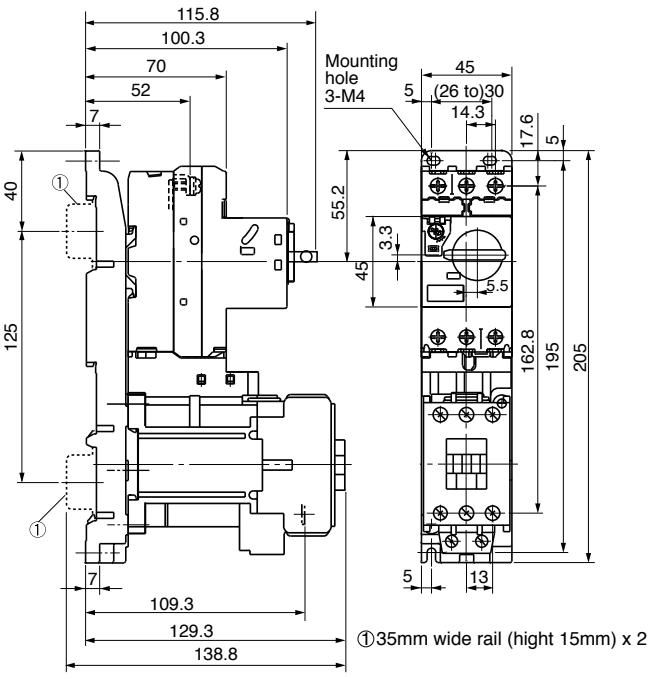
MMS	Contactors	Link module	Base plate	Mass (g)
BM3RSB	SC-E1/G	BZ0LRE32GA	BZ0BPRE32A	1,360

BM3RHB + SC-E02 to E05



MMS	Contactors	Link module	Base plate	Mass (g)
BM3RHB	SC-E02, E03, E04, E05	BZ0LRE22AA	BZ0BPRE22A	840

BM3RHB + SC-E02/G to E05/G



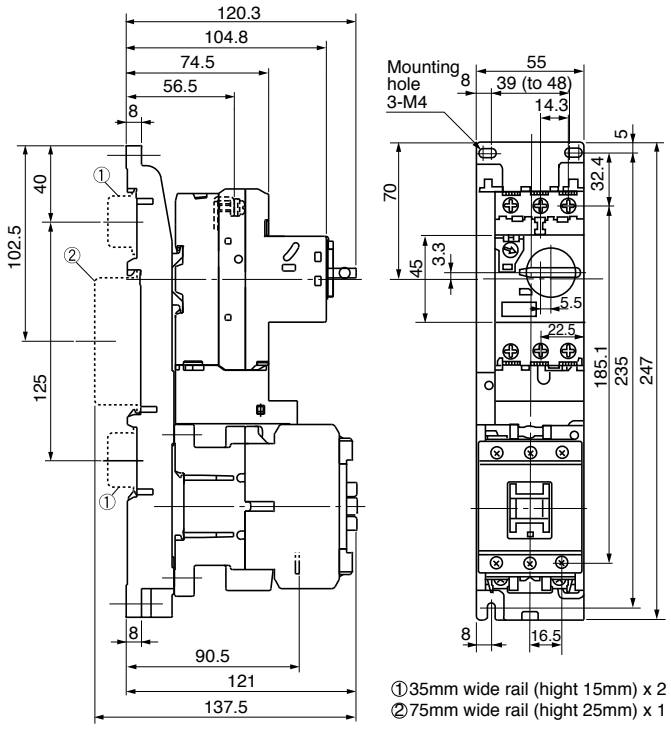
MMS	Contactors	Link module	Base plate	Mass (g)
BM3RHB	SC-E02/G, E03/G, E04/G, E05/G	BZ0LRE22GA	BZ0BPRE22A	1,085

Combination Starters
Dimensions

■ Dimensions, mm

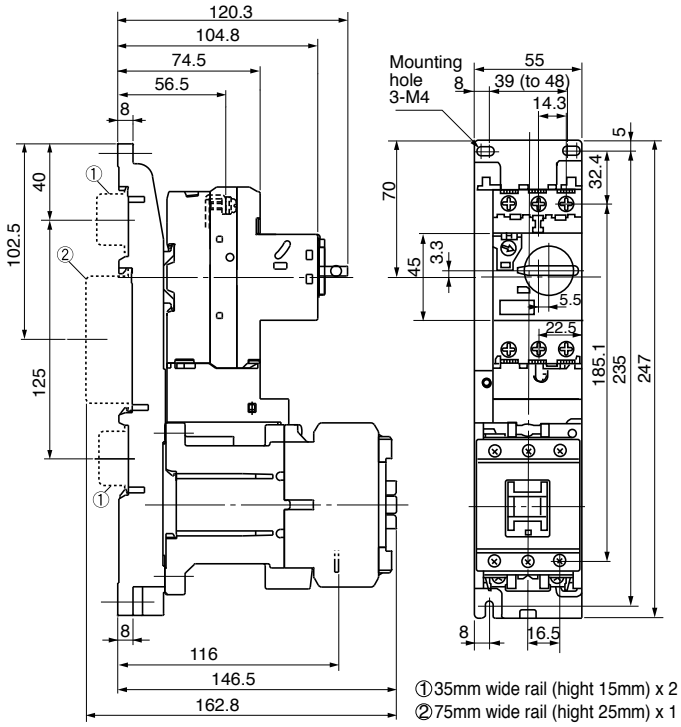
• Combination

BM3RHB + SC-E1



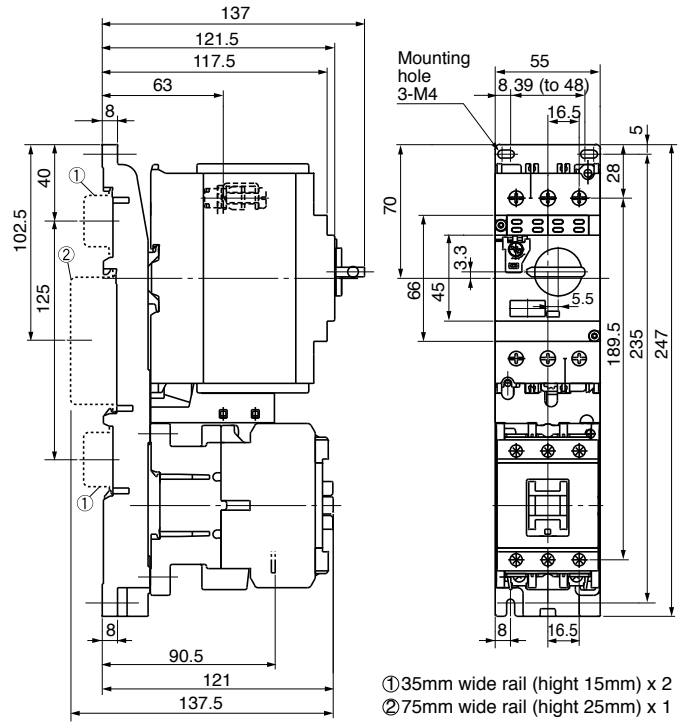
MMS	Contactors	Link module	Base plate	Mass (g)
BM3RHB	SC-E1	BZ0LRE32AA	BZ0BPRE32A	1,155

BM3RHB + SC-E1/G



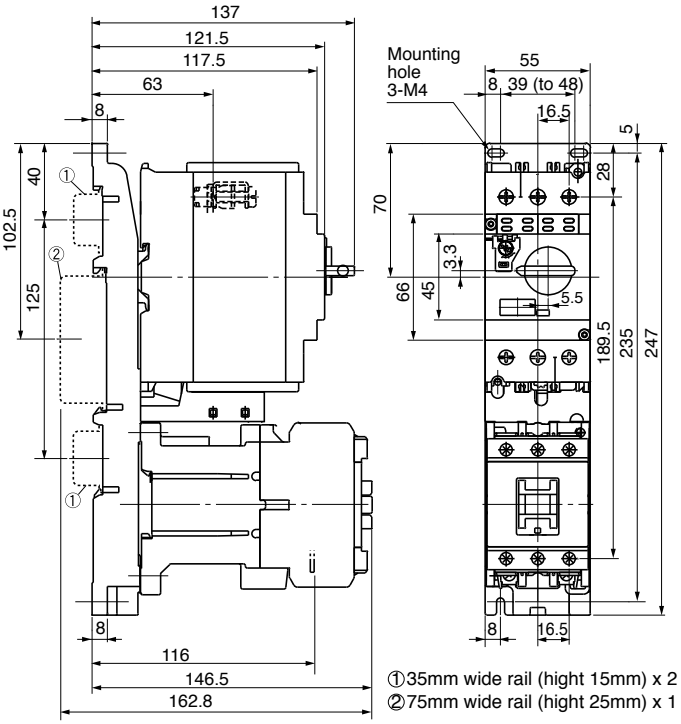
MMS	Contactors	Link module	Base plate	Mass (g)
BM3RHB	SC-E1/G	BZ0LRE32GA	BZ0BPRE32A	1,380

BM3V□B + SC-E1, E2, E2S



MMS	Contactors	Link module	Base plate	Mass (g)
BM3VSB BM3VHB	SC-E1, E2, E2S	BZ0LVE51AA	BZ0BPVE51A	1,580

BM3V□B + SC-E1/G, E2/G, E2S/G

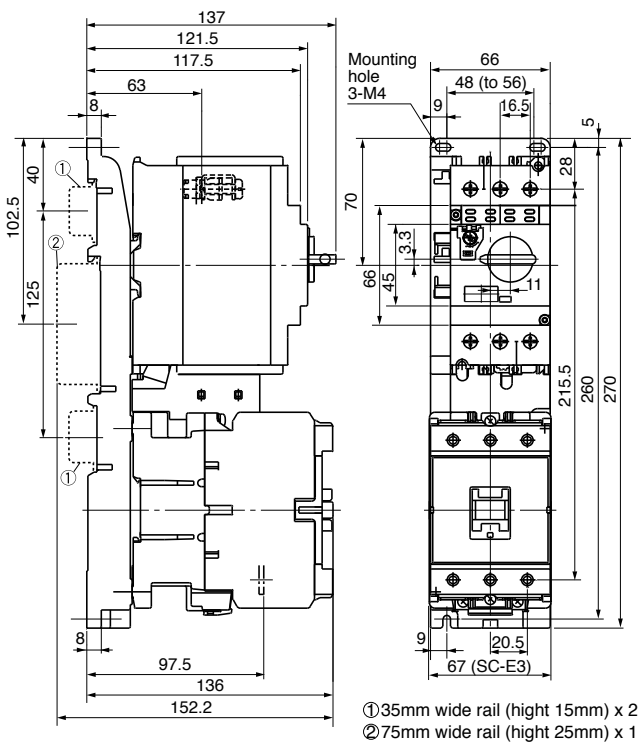


MMS	Contactors	Link module	Base plate	Mass (g)
BM3VSB BM3VHB	SC-E1/G, E2/G, E2S/G	BZ0LVE51GA	BZ0BPVE51A	1,810

■ Dimensions, mm

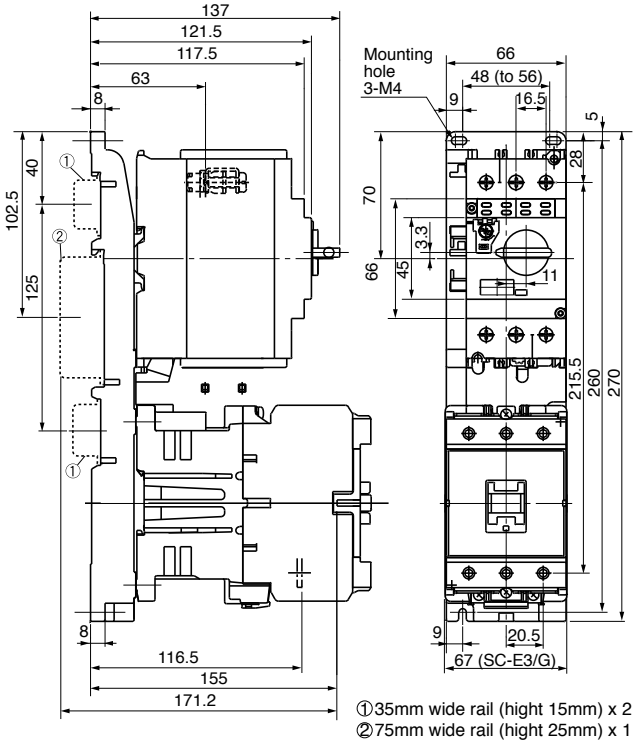
• Combination

BM3V□B + SC-E3



MMS	Contactors	Link module	Base plate	Mass (g)
BM3VSB BM3VHB	SC-E3	BZ0LVE65AA	BZ0BPVE65A	2,080

BM3V□B + SC-E3/G



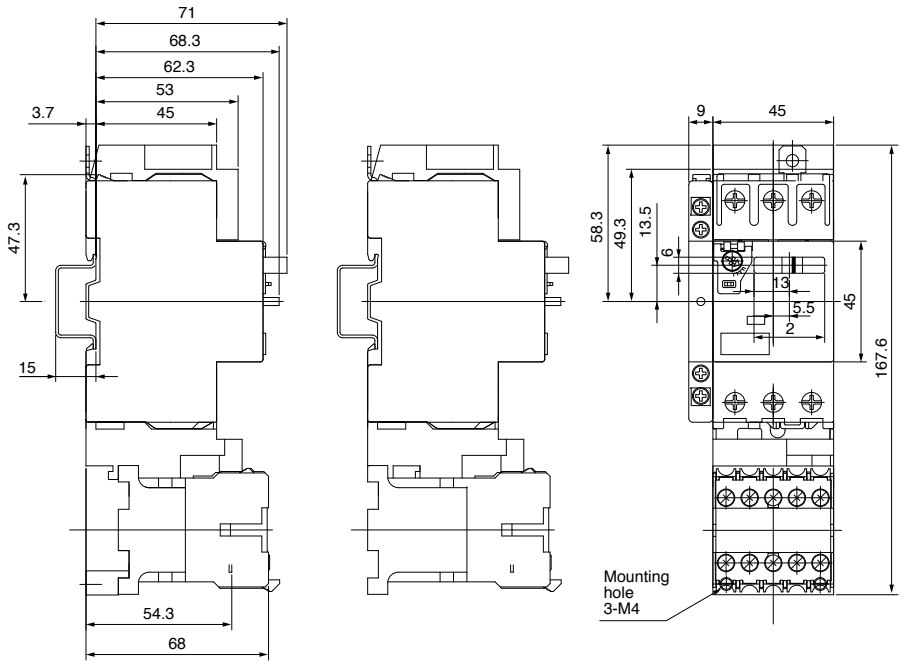
MMS	Contactors	Link module	Base plate	Mass (g)
BM3VSB BM3VHB	SC-E3/G	BZ0LVE65GA	BZ0BPVE65A	2,400

Combination Starters
Dimensions

■ Dimensions, mm

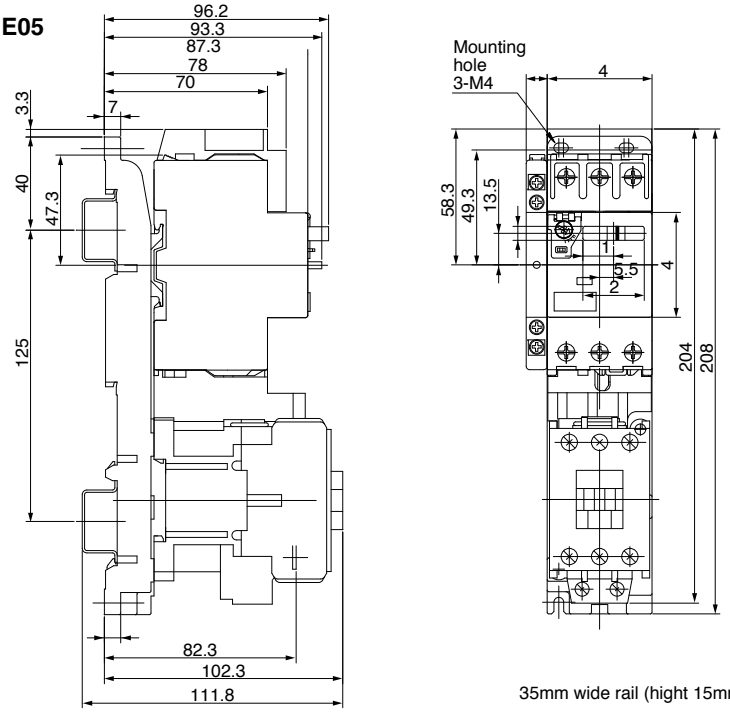
• Type F combination

BM3RSB + SC-M01, M02, M01/G, M02/G



MMS	Contactors	Line side terminal cover	Short-circuit alarm contact block	Link module	Base plate	Mass (g)
BM3RSB	SC-M01, M02	BZ0TCRE	BZ0TKUAB	BZ0LRC09AA	-	615
BM3RSB	SC-M01/G, M02/G	BZ0TCRE	BZ0TKUAB	BZ0LRC09AA	-	675

BM3RSB + SC-E02 to E05



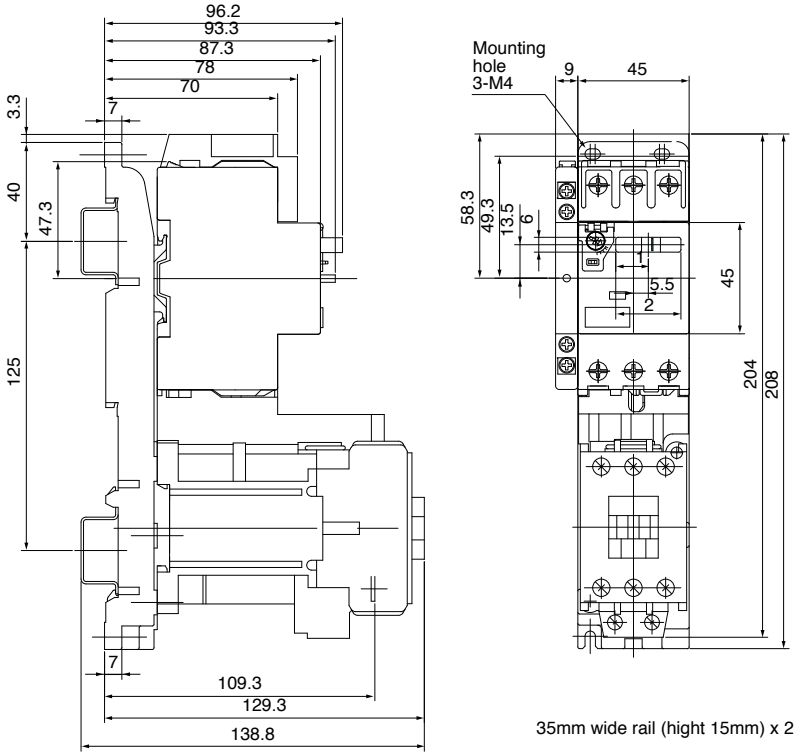
35mm wide rail (hight 15mm) x 2

MMS	Contactors	Line side terminal cover	Short-circuit alarm contact block	Link module	Base plate	Mass (g)
BM3RSB	SC-E02, E03, E04, E05	BZ0TCRE	BZ0TKUAB	BZ0LRE22AA	BZ0BPRE22A	895

Dimensions, mm

• Type F combination

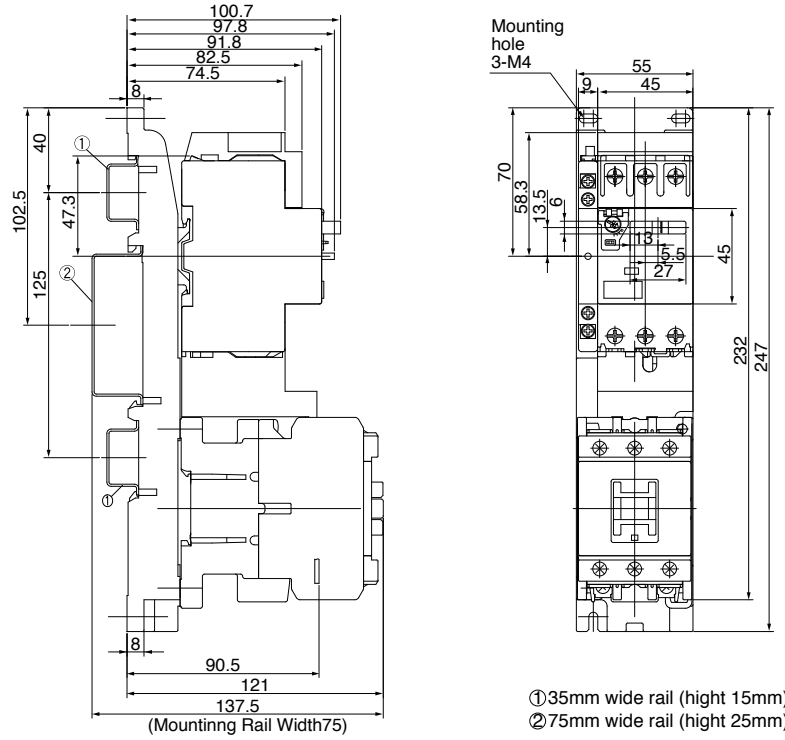
BM3RSB + SC-E02/G to E05/G



35mm wide rail (hight 15mm) x 2

MMS	Contactors	Line side terminal cover	Short-circuit alarm contact block	Link module	Base plate	Mass (g)
BM3RSB	SC-E02/G, E03/G, E04/G, E05/G	BZ0TCRE	BZ0TKUAB	BZ0LRE22GA	BZ0BPRE22A	1,160

BM3RSB + SC-E1



①35mm wide rail (hight 15mm) x 2
②75mm wide rail (hight 25mm) x 1

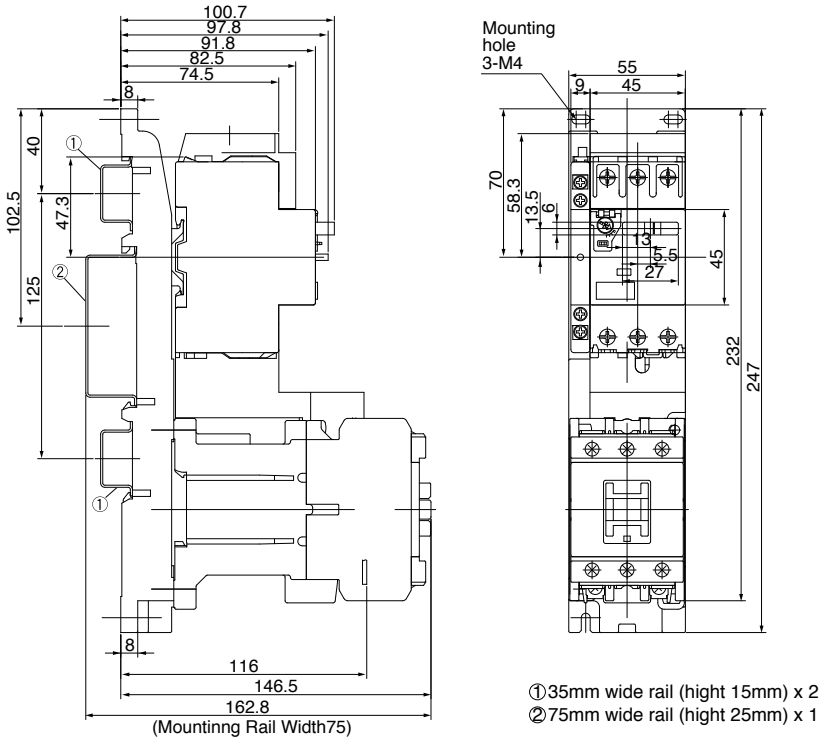
MMS	Contactors	Line side terminal cover	Short-circuit alarm contact block	Link module	Base plate	Mass (g)
BM3RSB	SC-E1	BZ0TCRE	BZ0TKUAB	BZ0LRE32AA	BZ0BPRE32A	1,230

Combination Starters
Dimensions

■ Dimensions, mm

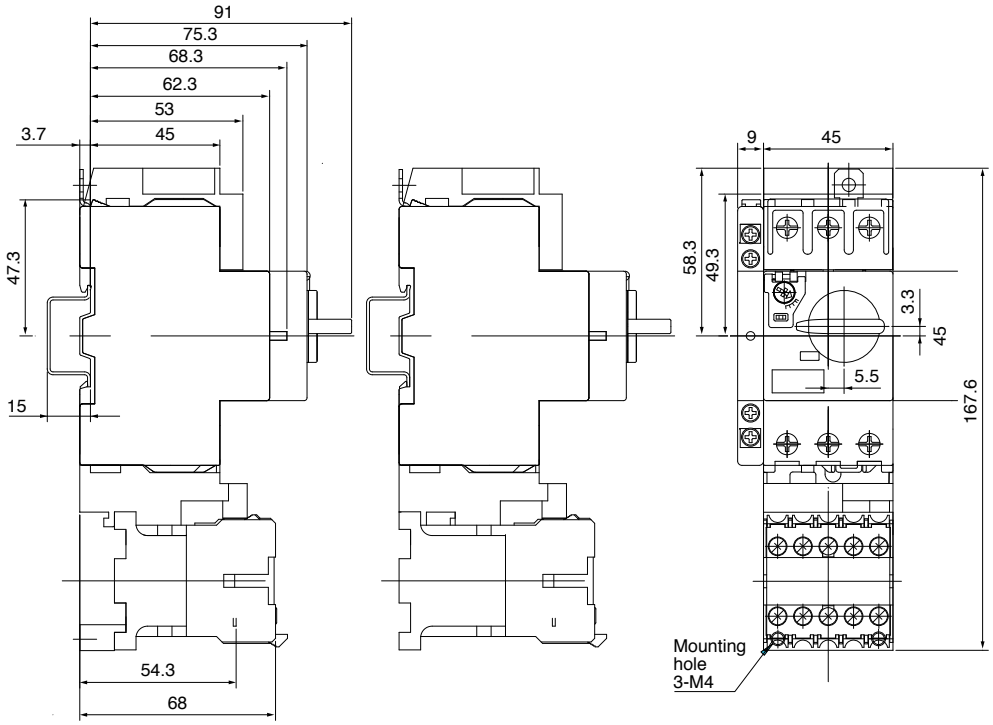
• Type F combination

BM3RSB + SC-E1/G



MMS	Contactors	Line side terminal cover	Short-circuit alarm contact block	Link module	Base plate	Mass (g)
BM3RSB	SC-E1/G	BZ0TCRE	BZ0TKUAB	BZ0LRE32GA	BZ0BPRE32A	1,455

BM3RHB + SC-M01, M02, M01/G, M02/G

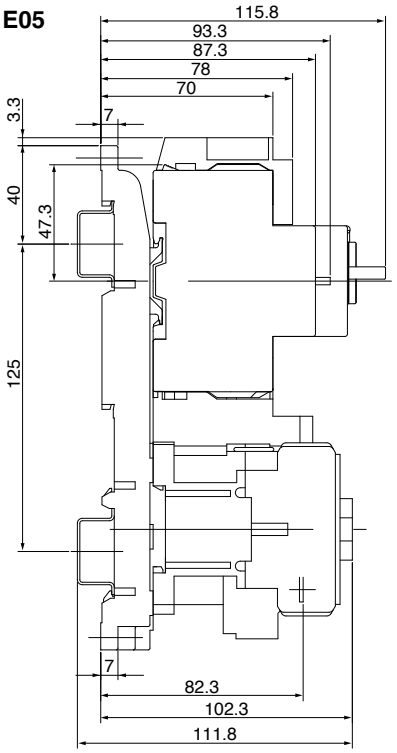


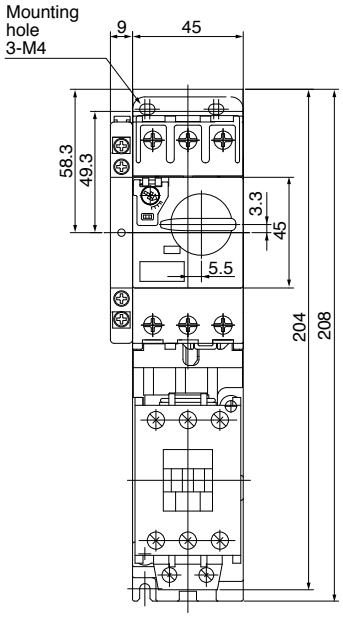
MMS	Contactors	Line side terminal cover	Short-circuit alarm contact block	Link module	Base plate	Mass (g)
BM3RHB	SC-M01, M02	BZ0TCRE	BZ0TKUAB	BZ0LRC09AA	-	635
BM3RHB	SC-M01/G, M02/G	BZ0TCRE	BZ0TKUAB	BZ0LRC09AA	-	695

Dimensions, mm

• Type F combination

BM3RHB + SC-E02 to E05

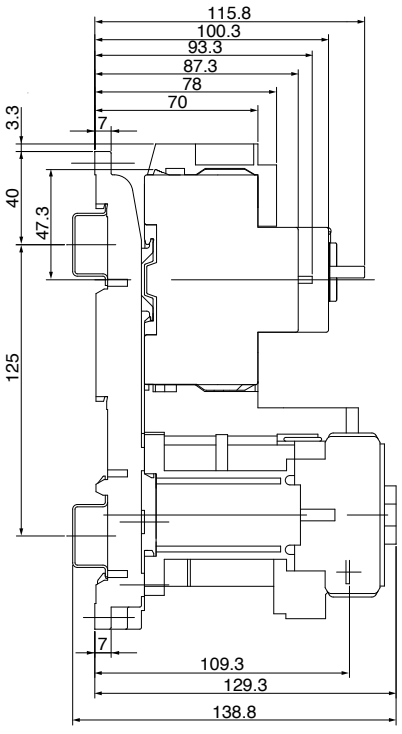


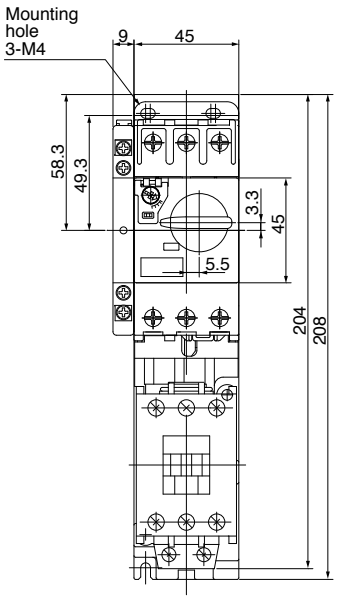


35mm wide rail (hight 15mm) x 2

MMS	Contactors	Line side terminal cover	Short-circuit alarm contact block	Link module	Base plate	Mass (g)
BM3RHB	SC-E02, E03, E04, E05	BZ0TCRE	BZ0TKUAB	BZ0LRE22AA	BZ0BPRE22A	915

BM3RHB + SC-E02/G to E05/G





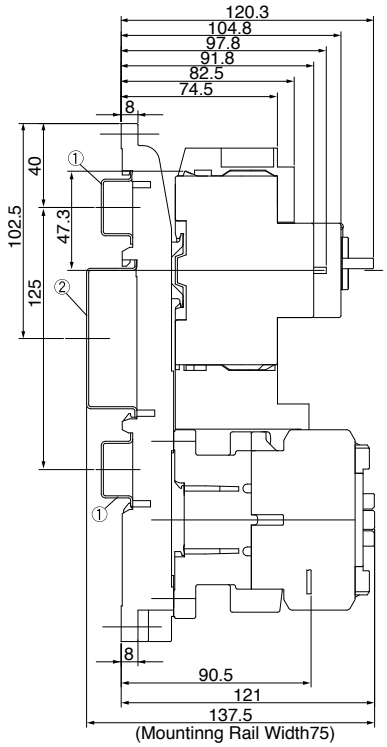
35mm wide rail (hight 15mm) x 2

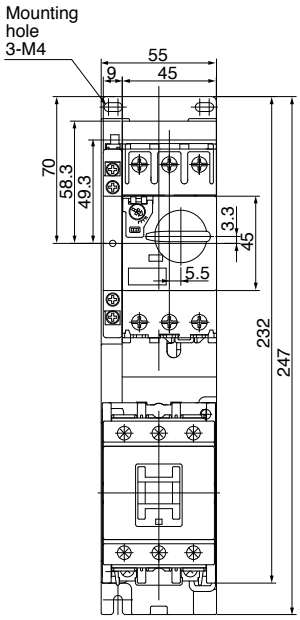
MMS	Contactors	Line side terminal cover	Short-circuit alarm contact block	Link module	Base plate	Mass (g)
BM3RHB	SC-E02/G, E03/G, E04/G, E05/G	BZ0TCRE	BZ0TKUAB	BZ0LRE22GA	BZ0BPRE22A	1,160

Combination Starters
Dimensions

■ Dimensions, mm
• Type F combination

BM3RHB + SC-E1

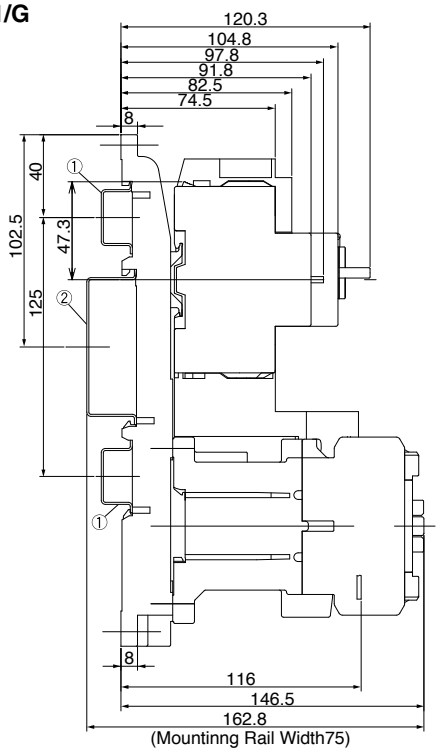


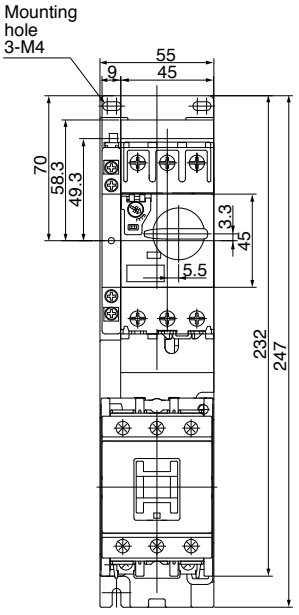


①35mm wide rail (hight 15mm) x 2
②75mm wide rail (hight 25mm) x 1

MMS	Contactors	Line side terminal cover	Short-circuit alarm contact block	Link module	Base plate	Mass (g)
BM3RHB	SC-E1	BZ0TCRE	BZ0TKUAB	BZ0LRE32AA	BZ0BPRE32A	1,230

BM3RHB + SC-E1/G





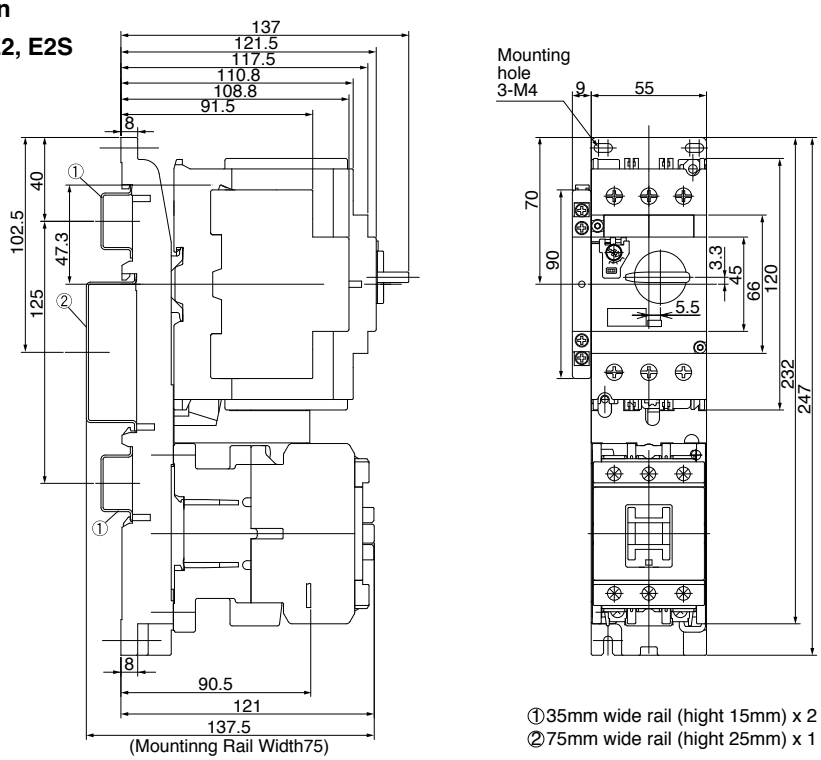
①35mm wide rail (hight 15mm) x 2
②75mm wide rail (hight 25mm) x 1

MMS	Contactors	Line side terminal cover	Short-circuit alarm contact block	Link module	Base plate	Mass (g)
BM3RHB	SC-E1/G	BZ0TCRE	BZ0TKUAB	BZ0LRE32GA	BZ0BPRE32A	1,455

■ Dimensions, mm

• Type F combination

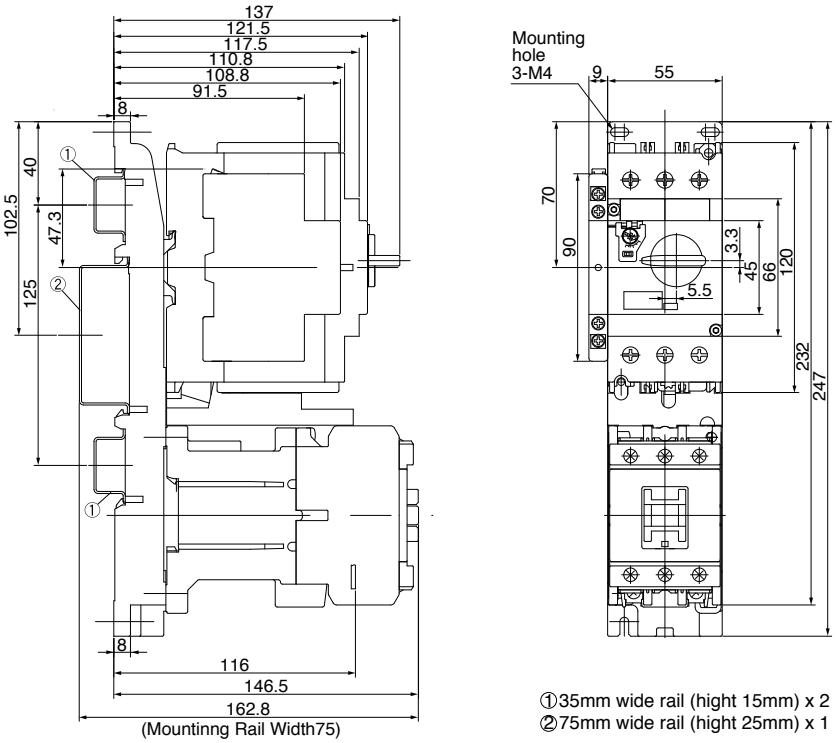
BM3V□B + SC-E1, E2, E2S



①35mm wide rail (hight 15mm) x 2
②75mm wide rail (hight 25mm) x 1

MMS	Contactors	Line side terminal cover	Short-circuit alarm contact block	Link module	Base plate	Mass (g)
BM3VSB,VHB	SC-E1,E2,E2S	-	BZ0TKUAB	BZ0LVE51AA	BZ0BPVE51A	1,625

BM3V□B + SC-E1/G, E2/G, E2S/G



①35mm wide rail (hight 15mm) x 2
②75mm wide rail (hight 25mm) x 1

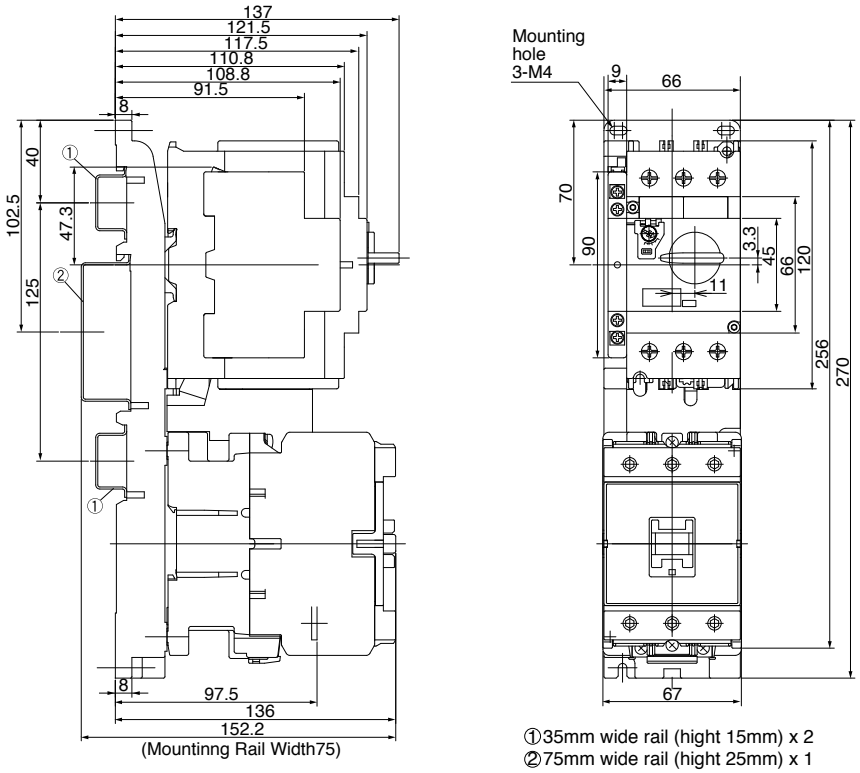
MMS	Contactors	Line side terminal cover	Short-circuit alarm contact block	Link module	Base plate	Mass (g)
BM3VSB,VHB	SC-E1/G,E2/G,E2S/G	-	BZ0TKUAB	BZ0LVE51GA	BZ0BPVE51A	1,855

Combination Starters
Dimensions

■ Dimensions, mm

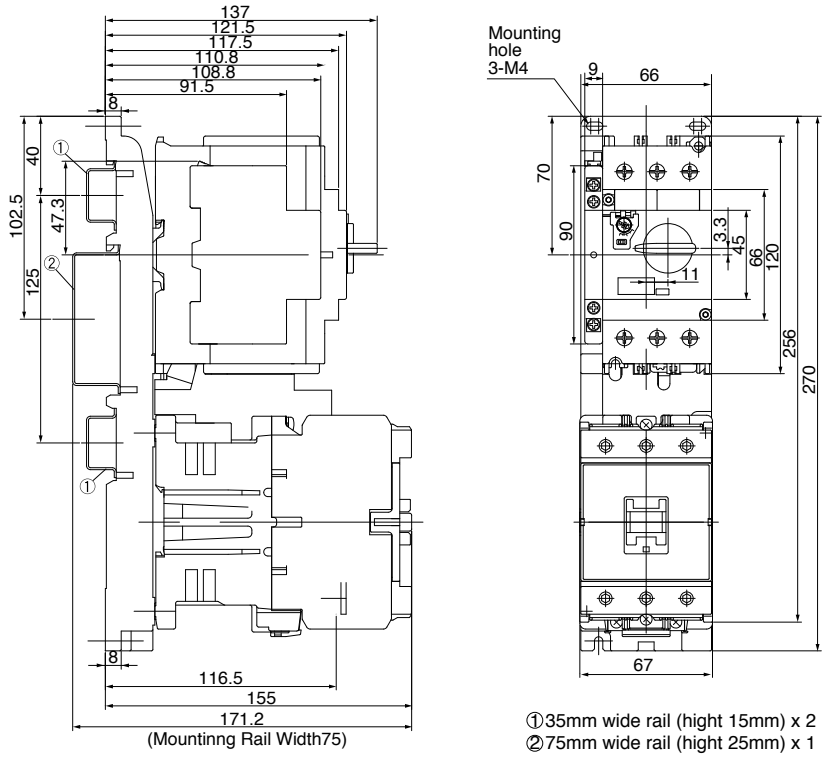
• Type F combination

BM3V□B + SC-E3



MMS	Contactors	Line side terminal cover	Short-circuit alarm contact block	Link module	Base plate	Mass (g)
BM3VSB,VHB	SC-E3	-	BZ0TKUAB	BZ0LVE65AA	BZ0BPVE65A	2,125

BM3V□B + SC-E3/G



MMS	Contactors	Line side terminal cover	Short-circuit alarm contact block	Link module	Base plate	Mass (g)
BM3VSB,VHB	SC-E3/G	-	BZ0TKUAB	BZ0LVE65GA	BZ0BPVE65A	2,445

32A Frame types

Standard breaking capacity			High breaking capacity		
Part number	Discount code	List Price	Part number	Discount code	List Price
BM3RSB-P16	D14	80.00	**BM3RHB-P16**	D14	100.00
BM3RSB-P25	D14	80.00	**BM3RHB-P25**	D14	100.00
BM3RSB-P40	D14	80.00	**BM3RHB-P40**	D14	100.00
BM3RSB-P63	D14	80.00	**BM3RHB-P63**	D14	100.00
BM3RSB-001	D14	80.00	**BM3RHB-001**	D14	100.00
BM3RSB-1P6	D14	80.00	**BM3RHB-1P6**	D14	100.00
BM3RSB-2P5	D14	80.00	**BM3RHB-2P5**	D14	100.00
BM3RSB-004	D14	80.00	**BM3RHB-004**	D14	100.00
BM3RSB-6P3	D14	80.00	**BM3RHB-6P3**	D14	100.00
BM3RSB-010	D14	90.00	**BM3RHB-010**	D14	110.00
BM3RSB-013	D14	90.00	**BM3RHB-013**	D14	110.00
BM3RSB-016	D14	90.00	**BM3RHB-016**	D14	110.00
BM3RSB-020	D14	90.00	**BM3RHB-020**	D14	110.00
BM3RSB-025	D14	100.00	**BM3RHB-025**	D14	120.00
BM3RSB-032	D14	150.00	**BM3RHB-032**	D14	170.00

63A Frame types

Standard breaking capacity			High breaking capacity		
Part number	Discount code	List Price	Part number	Discount code	List Price
BM3VSB-010	D14	170.00	**BM3VHB-010**	D14	260.00
BM3VSB-013	D14	170.00	**BM3VHB-013**	D14	260.00
BM3VSB-016	D14	170.00	**BM3VHB-016**	D14	260.00
BM3VSB-020	D14	170.00	**BM3VHB-020**	D14	260.00
BM3VSB-025	D14	190.00	**BM3VHB-025**	D14	290.00
BM3VSB-032	D14	210.00	**BM3VHB-032**	D14	310.00
BM3VSB-040	D14	210.00	**BM3VHB-040**	D14	310.00
BM3VSB-050	D14	230.00	**BM3VHB-050**	D14	330.00
BM3VSB-063	D14	230.00	**BM3VHB-063**	D14	330.00

List Price for BM3 Series Manual Motor Starters accessories

Part number	Description	Discount code	List Price
Auxliary contact block (W)			
BZ0WIA	Front mounting Auxiliary contact - Internal type 1NO	D14	8.50
BZ0WIB	Front mounting Auxiliary contact - Internal type 1NC	D14	8.50
BZ0WUAAL	Left side mounting Auxiliary contact - Lateral type 2NO	D14	12.00
BZ0WUABL	Left side mounting Auxiliary contact - Lateral type 1NO+1NC	D14	12.00
BZ0WUBBL	Left side mounting Auxiliary contact - Lateral type 2NC	D14	12.00
BZ0WUAAR	Right side mounting Auxiliary contact - Lateral type 2NO	D14	12.00
BZ0WUABR	Right side mounting Auxiliary contact - Lateral type 1NO+1NC	D14	12.00
BZ0WUBBR	Right side mounting Auxiliary contact - Lateral type 2NC	D14	12.00
Alarm contact block (K)			
BZ0KIA	Front (right side only) mounting Alarm contact - Internal type 1NO	D14	9.00
BZ0KIB	Front (right side only) mounting Alarm contact - Internal type 1NC	D14	9.00
Auxliary and alarm contact blocks (WK)			
BZ0WKUAA	Left side mounting Auxiliary and Alarm contact 1NO(Aux.)+1NO(Alarm)	D14	18.00
BZ0WKUBA	Left side mounting Auxiliary and Alarm contact 1NC(Aux.)+1NO(Alarm)	D14	18.00
BZ0WKUAB	Left side mounting Auxiliary and Alarm contact 1NO(Aux.)+1NC(Alarm)	D14	18.00
BZ0WKUBB	Left side mounting Auxiliary and Alarm contact 1NC(Aux.)+1NC(Alarm)	D14	18.00
Short-circuit alarm contact block (KI)			
BZ0TKUAB	Left side mounting Short Circuit Alarm contact 1NO+1NC	D14	20.00
Shunt trip devices (F)			
BZ0FAZU	Right side mounting Shunt trip / Coil voltage 24VAC 50/60Hz	D14	34.00
BZ0FBZU	Right side mounting Shunt trip / Coil voltage 48VAC 60Hz	D14	34.00
BZ0FCZU	Right side mounting Shunt trip / Coil voltage 48VAC 50Hz / 60VAC 60Hz	D14	34.00
BZ0F1ZU	Right side mounting Shunt trip / Coil voltage 100VAC 50Hz / 100-110VAC 60Hz	D14	34.00
BZ0FDZU	Right side mounting Shunt trip / Coil voltage 110-127VAC 50Hz / 120VAC 60Hz	D14	34.00
BZ0FEZU	Right side mounting Shunt trip / Coil voltage 200VAC 50Hz / 200-220VAC 60Hz	D14	34.00
BZ0FFZU	Right side mounting Shunt trip / Coil voltage 220-230VAC 50Hz / 240-260VAC 60Hz	D14	34.00
BZ0FGZU	Right side mounting Shunt trip / Coil voltage 240VAC 50Hz / 277VAC 60Hz	D14	34.00
BZ0FHZU	Right side mounting Shunt trip / Coil voltage 380-400VAC 50Hz / 400-440VAC 60Hz	D14	34.00
BZ0F4ZU	Right side mounting Shunt trip / Coil voltage 415-440VAC 50Hz / 460-480VAC 60Hz	D14	34.00
BZ0FJZU	Right side mounting Shunt trip / Coil voltage 500VAC 50Hz / 600VAC 60Hz	D14	34.00
BZ0FKZUD	Right side mounting Shunt trip / Coil voltage 24-60VDC	D14	34.00
BZ0FLZUD	Right side mounting Shunt trip / Coil voltage 110-240VDC	D14	34.00
Undervoltage trip devices (R)			
BZ0RAZ1U	Right side mounting Undervoltage trip / Coil voltage 24VAC 50Hz	D14	34.00
BZ0RAZ2U	Right side mounting Undervoltage trip / Coil voltage 24VAC 60Hz	D14	34.00
BZ0RBZ1U	Right side mounting Undervoltage trip / Coil voltage 48VAC 50Hz	D14	34.00
BZ0RBZU	Right side mounting Undervoltage trip / Coil voltage 48VAC 60Hz	D14	34.00
BZ0R1ZU	Right side mounting Undervoltage trip / Coil voltage 100VAC 50Hz / 100-110VAC 60Hz	D14	34.00
BZ0RDZU	Right side mounting Undervoltage trip / Coil voltage 110-127VAC 50Hz / 120VAC 60Hz	D14	34.00
BZ0REZU	Right side mounting Undervoltage trip / Coil voltage 200VAC 50Hz / 200-220VAC 60Hz	D14	34.00
BZ0RFZU	Right side mounting Undervoltage trip / Coil voltage 220-230VAC 50Hz / 240-260VAC 60Hz	D14	34.00
BZ0RGZU	Right side mounting Undervoltage trip / Coil voltage 240VAC 50Hz / 277VAC 60Hz	D14	34.00
BZ0RHZU	Right side mounting Undervoltage trip / Coil voltage 380-400VAC 50Hz / 400-440VAC 60Hz	D14	34.00
BZ0R4ZU	Right side mounting Undervoltage trip / Coil voltage 415-440VAC 50Hz / 460-480VAC 60Hz	D14	34.00
BZ0RJZU	Right side mounting Undervoltage trip / Coil voltage 500VAC 50Hz / 600VAC 60Hz	D14	34.00
External operating handles			
BZ0VBBL	External operating handle Standard type (Black) for BM3RH	D14	40.00
BZ0VYRL	External operating handle Emergency type (Red / Yellow) for BM3RH	D14	45.00
BZ0VBBM	External operating handle Standard type (Black) for BM3V	D14	40.00
BZ0VYRM	External operating handle Emergency type (Red / Yellow) for BM3V	D14	45.00
Line side terminal cover			
BZ0TCRE	Line side terminal cover for BM3R	D14	18.00
Others			
BZ0SET	Push-in lug for BM3R (10pcs/pack)	D14	8.00
BZ0TCV	IP 20 Terminal cover for BM3V (6pcs/pack)	D14	12.00
BZ0CFG	Dummy cover (10pcs/pack)	D14	40.00

List Price for BM3 Series Manual Motor Starters accessories

Part number	Description	Discount code	List Price
Busbar system			
BZ0BR02A	Busbar / 2-BM3R, modular space : 45mm	D14	19.00
BZ0BR03A	Busbar / 3-BM3R, modular space : 45mm	D14	23.00
BZ0BR04A	Busbar / 4-BM3R, modular space : 45mm	D14	27.00
BZ0BR05A	Busbar / 5-BM3R, modular space : 45mm	D14	28.00
BZ0BR12A	Busbar / 2-BM3R+1(9mm) external accessory, modular space : 54mm	D14	20.00
BZ0BR13A	Busbar / 3-BM3R+1(9mm) external accessory, modular space : 54mm	D14	24.00
BZ0BR14A	Busbar / 4-BM3R+1(9mm) external accessory, modular space : 54mm	D14	28.00
BZ0BR15A	Busbar / 5-BM3R+1(9mm) external accessory, modular space : 54mm	D14	30.00
BZ0BR22A	Busbar / 2-BM3R+1(18mm) or 2(9mm) external accessories, modular space : 63mm	D14	44.00
BZ0BR24A	Busbar / 4-BM3R+1(18mm) or 2(9mm) external accessories, modular space : 63mm	D14	54.00
BZ0BV02A	Busbar / 2-BM3V, modular space : 55mm	D14	42.00
BZ0BV03A	Busbar / 3-BM3V, modular space : 55mm	D14	53.00
BZ0BV04A	Busbar / 4-BM3V, modular space : 55mm	D14	65.00
BZ0BV12A	Busbar / 2-BM3V+1(9mm) external accessory, modular space : 64mm	D14	46.00
BZ0BV13A	Busbar / 3-BM3V+1(9mm) external accessory, modular space : 64mm	D14	59.00
BZ0BV14A	Busbar / 4-BM3V+1(9mm) external accessory, modular space : 64mm	D14	70.00
BZ0BV22A	Busbar / 2-BM3V+1(18mm) or 2(9mm) external accessories, modular space : 73mm	D14	50.00
BZ0BV24A	Busbar / 4-BM3V+1(18mm) or 2(9mm) external accessories, modular space : 73mm	D14	78.00
BZ0BFRA	3-phase feed-in terminal for BM3R	D14	23.00
BZ0BFVA	3-phase feed-in terminal for BM3V	D14	48.00
BZ0BCRA	Busbar cover for BZ0BR (pin connection)	D14	6.00
BZ0BCRB	Busbar cover for BZ0BR (fork connection)	D14	6.00
BZ0BCVA	Busbar cover for BZ0BV (pin connection)	D14	8.00
Enclosure			
BZ0CSLA	Enclosure Surface mounting type IP41	D14	40.00
BZ0CSLB	Enclosure Surface mounting type IP55 with conversion kits	D14	57.00
BZ0CFLA	Enclosure Flush mounting type IP41	D14	40.00
BZ0CFLB	Enclosure Flush mounting type IP55 with conversion kits	D14	51.00
BZ0CKA	Padlocking device	D14	30.00
BZ0CPM	Emergency pushbutton / Momentary	D14	39.00
BZ0CPL	Emergency pushbutton / Puch-lock turn reset	D14	40.00
BZ0CPK	Emergency pushbutton / Key operated	D14	82.00
BZ0CCA	Conversion kit from IP41 to IP55	D14	12.00
BZ0CUA	Adapter set	D14	11.00
BZ0CNA	Neutral connector	D14	4.00
BZ0CLGA	Indication Lamp / Green, 100-120VAC	D14	33.00
BZ0CLGB	Indication Lamp / Green, 200-240VAC	D14	33.00
BZ0CLGC	Indication Lamp / Green, 380-440VAC	D14	33.00
BZ0CLGD	Indication Lamp / Green, 480-500VAC	D14	33.00
BZ0CLGE	Indication Lamp / Green, 500-600VAC	D14	33.00
BZ0CLRA	Indication Lamp / Red, 100-120VAC	D14	33.00
BZ0CLRB	Indication Lamp / Red, 200-240VAC	D14	33.00
BZ0CLRC	Indication Lamp / Red, 380-440VAC	D14	33.00
BZ0CLRD	Indication Lamp / Red, 480-500VAC	D14	33.00
BZ0CLRE	Indication Lamp / Red, 500-600VAC	D14	33.00
BZ0CLCA	Indication Lamp / Transparent, 100-120VAC	D14	33.00
BZ0CLCB	Indication Lamp / Transparent, 200-240VAC	D14	33.00
BZ0CLCC	Indication Lamp / Transparent, 380-440VAC	D14	33.00
BZ0CLCD	Indication Lamp / Transparent, 480-500VAC	D14	33.00
BZ0CLCE	Indication Lamp / Transparent, 500-600VAC	D14	33.00

List Price for SC-E Series Contactors and TK-E Series Overload Relays and accessories

List Price for SC-E Series Contactors and TK-E Series Overload Relays

Contactors **Overload Relays**

AC operating coil			DC operating coil			Overload Relays		
Part number	Discount code	List Price	Part number	Discount code	List Price	Part number	Discount code	List Price
SC-M01	D14	40.00	**SC-M01/G**	D14	57.00	**-**	-	-
SC-M02	D14	40.00	**SC-M02/G**	D14	57.00	**-**	-	-
SC-E02	D14	33.00	**SC-E02/G**	D14	38.00	**TK-E02**	D14	42.00
SC-E03	D14	40.00	**SC-E03/G**	D14	60.00	**TK-E02**	D14	42.00
SC-E04	D14	54.00	**SC-E04/G**	D14	80.00	**TK-E02**	D14	42.00
SC-E05	D14	65.00	**SC-E05/G**	D14	94.00	**TK-E02**	D14	42.00
SC-E1	D14	78.00	**SC-E1/G**	D14	99.00	**TK-E2**	D14	80.00
SC-E2	D14	108.00	**SC-E2/G**	D14	130.00	**TK-E2**	D14	80.00
SC-E2S	D14	130.00	**SC-E2S/G**	D14	158.00	**TK-E2**	D14	80.00
SC-E3	D14	140.00	**SC-E3/G**	D14	175.00	**TK-E3**	D14	90.00
SC-E4	D14	160.00	**SC-E4/G**	D14	200.00	**TK-E3**	D14	90.00
Super magnet operating coil								
SC-E5	D14	360.00				**TK-E5**	D14	100.00
SC-E6	D14	460.00				**TK-E6**	D14	148.00
SC-E7	D14	535.00				**TK-E6**	D14	148.00
						TK-E6H	D14	148.00

List Price for SC-E Series Contactors and TK-E Series Overload Relays accessories

Part number	Description	Discount code	List Price
Auxliary contact block			
SZ-MA40	Front mounting Auxliary contact block (4NO) for SC-M01(/G), SC-M02(/G)	D14	30.00
SZ-MA31	Front mounting Auxliary contact block (3NO+1NC) for SC-M01(/G), SC-M02(/G)	D14	30.00
SZ-MA22	Front mounting Auxliary contact block (2NO+2NC) for SC-M01(/G), SC-M02(/G)	D14	30.00
SZ-MA13	Front mounting Auxliary contact block (1NO+3NC) for SC-M01(/G), SC-M02(/G)	D14	30.00
SZ-MA04	Front mounting Auxliary contact block (4NC) for SC-M01(/G), SC-M02(/G)	D14	30.00
SZ-MA20	Front mounting Auxliary contact block (2NO) for SC-M01(/G), SC-M02(/G)	D14	25.00
SZ-MA11	Front mounting Auxliary contact block (1NO+1NC) for SC-M01(/G), SC-M02(/G)	D14	25.00
SZ-MA02	Front mounting Auxliary contact block (2NC) for SC-M01(/G), SC-M02(/G)	D14	25.00
SZ-MAS10	Side mounting Auxliary contact block (1NO) for SC-M01(/G), SC-M02(/G)	D14	15.00
SZ-MAS01	Side mounting Auxliary contact block (1NC) for SC-M01(/G), SC-M02(/G)	D14	15.00
SZ-A40/T	Front mounting Auxliary contact block (4NO) for SC-E02(/G) to SC-E4(/G)	D14	20.00
SZ-A31/T	Front mounting Auxliary contact block (3NO+1NC) for SC-E02(/G) to SC-E4(/G)	D14	20.00
SZ-A22/T	Front mounting Auxliary contact block (2NO+2NC) for SC-E02(/G) to SC-E4(/G)	D14	20.00
SZ-A20/T	Front mounting Auxliary contact block (2NO) for SC-E02(/G) to SC-E4(/G)	D14	14.00
SZ-A11/T	Front mounting Auxliary contact block (1NO+1NC) for SC-E02(/G) to SC-E4(/G)	D14	14.00
SZ-A02/T	Front mounting Auxliary contact block (2NC) for SC-E02(/G) to SC-E4(/G)	D14	14.00
SZ-AS1/T	Side mounting Auxliary contact block (1NO+1NC) for SC-E02(/G) to SC-E4(/G)	D14	22.00
SZ-AS2/T	Side mounting Auxliary contact block (1NO+1NC) for SC-E5 to SC-E7	D14	22.00
Main circuit surge suppression unit			
SZ-ZM1E	Front mounting Main circuit surge suppression unit for SC-E02(/G) to SC-E05(/G)	D14	38.00
SZ-ZM2E	Side mounting Main circuit surge suppression unit for SC-E02(/G) to SC-E05(/G)	D14	38.00
SZ-ZM3E	Front mounting Main circuit surge suppression unit for SC-E1(/G) to SC-E4(/G)	D14	40.00
SZ-ZM4E	Side mounting Main circuit surge suppression unit for SC-E1(/G) to SC-E4(/G)	D14	40.00

List Price for SC-E Series Contactors and TK-E Series Overload Relays accessories

Part number	Description	Discount code	List Price
Coil surge suppression unit			
SZ-MZ1	Coil surge suppression unit CR type 12-60VAC for SC-M01, SC-M02	D14	5.00
SZ-MZ2	Coil surge suppression unit CR type 72-250VAC for SC-M01, SC-M02	D14	5.00
SZ-MZ3	Coil surge suppression unit Diode type 6-250VDC for SC-M01/G, SC-M02/G	D14	5.00
SZ-Z1	Coil surge suppression unit Varistor type 24-48VAC/DC for SC-E02(/G) to SC-E05(/G)	D1	13.00
SZ-Z2	Coil surge suppression unit Varistor type 100-250VAC/DC for SC-E02(/G) to SC-E05(/G)	D1	13.00
SZ-Z3	Coil surge suppression unit Varistor type 380-440VAC/DC for SC-E02 to SC-E05	D1	13.00
SZ-Z6	Coil surge suppression unit Varistor type 24-48VAC/DC with LED for SC-E02(/G) to SC-E05(/G)	D1	17.00
SZ-Z7	Coil surge suppression unit Varistor type 100-250VAC/DC with LED for SC-E02(/G) to SC-E05(/G)	D1	17.00
SZ-Z31	Coil surge suppression unit Varistor type 24-48VAC/DC for SC-E1(/G) to SC-E4(/G)	D1	22.00
SZ-Z32	Coil surge suppression unit Varistor type 100-250VAC/DC for SC-E1(/G) to SC-E4(/G)	D1	22.00
SZ-Z33	Coil surge suppression unit Varistor type 380-440VAC/DC for SC-E1 to SC-E4	D1	22.00
SZ-Z4	Coil surge suppression unit CR type 24-48VAC/DC for SC-E02(/G) to SC-E05(/G)	D1	13.00
SZ-Z5	Coil surge suppression unit CR type 100-250VAC/DC for SC-E02(/G) to SC-E05(/G)	D1	13.00
SZ-Z8	Coil surge suppression unit CR type 24-48VAC/DC with LED for SC-E02(/G) to SC-E05(/G)	D1	17.00
SZ-Z9	Coil surge suppression unit CR type 100-250VAC/DC with LED for SC-E02(/G) to SC-E05(/G)	D1	17.00
SZ-Z34	Coil surge suppression unit CR type 24-48VAC/DC for SC-E1 to SC-E4	D1	23.00
SZ-Z35	Coil surge suppression unit CR type 100-250VAC/DC for SC-E1 to SC-E4	D1	23.00
SZ-Z36	Coil surge suppression unit CR type 24-48VAC/DC for SC-E1/G to SC-E4/G	D1	23.00
SZ-Z37	Coil surge suppression unit CR type 100-250VAC/DC for SC-E1/G to SC-E4/G	D1	23.00
Power connection kit for reversing			
SZ-MRWC	Power connection kit for reversing line side and load side for SC-M01(/G), SC-M02(/G)	D14	18.00
SZ-ERW1/A	Power connection kit for reversing line side for SC-E02(/G) to SC-E05(/G)	D14	10.00
SZ-ERW1/B	Power connection kit for reversing load side for Reversing Contactor SC-E02(/G) to SC-E05(/G)	D14	10.00
SZ-ERW1/D	Power connection kit for reversing load side for Reversing Motor Starter SC-E02(/G) to SC-E05(/G)	D14	10.00
SZ-ERW2/A	Power connection kit for reversing line side for SC-E1(/G) to SC-E2S(/G)	D14	20.00
SZ-ERW2/B	Power connection kit for reversing load side for Reversing Contactor SC-E1(/G) to SC-E2S(/G)	D14	20.00
SZ-ERW2/D	Power connection kit for reversing load side for Reversing Motor Starter SC-E1(/G) to SC-E2S(/G)	D14	20.00
SZ-ERW3/A	Power connection kit for reversing line side for SC-E3(/G) to SC-E4(/G)	D14	40.00
SZ-ERW3/B	Power connection kit for reversing load side for Reversing Contactor SC-E3(/G) to SC-E4(/G)	D14	40.00
SZ-ERW3/D	Power connection kit for reversing load side for Reversing Motor Starter SC-E3(/G) to SC-E4(/G)	D14	40.00
Mechanical interlock unit			
SZ-MRM	Mechanical interlock unit for SC-M01(/G), SC-M02(/G)	D14	4.00
SZ-RM	Mechanical interlock unit for SC-E02(/G) to SC-E4(/G)	D1	20.00
Replacement coil			
4NC0H-#MC	Replacement coil for SC-E02 to SC-E05 (# : operating coil voltage code)	D1	30.00
SZ-GM/N1-#	Replacement coil for SC-E1 to SC-E2S (# : operating coil voltage code)	D1	30.00
SZ-GM/N2S-#	Replacement coil for SC-E3 to SC-E4 (# : operating coil voltage code)	D1	31.00
SZ-GS/N5-#	Replacement coil for SC-E5 (# : operating coil voltage code)	D1	250.00
SZ-GS/N6-#	Replacement coil for SC-E6 to SC-E7 (# : operating coil voltage code)	D1	276.00
Base unit for separate mounting			
SZ-HCE	Separate mounting base unit for TK-E02	D14	10.00
SZ-HDE	Separate mounting base unit for TK-E2	D14	20.00
SZ-HEE	Separate mounting base unit for TK-E3	D14	25.00
Trip indicator			
SZ-L100	Trip indicator 100-110VAC for TK-E02	D1	15.00
SZ-L200	Trip indicator 200-220VAC for TK-E02	D1	15.00
SZ-L100N2	Trip indicator 100-110VAC for TK-E2 to TK-E6	D1	15.00
SZ-L200N2	Trip indicator 100-110VAC for TK-E2 to TK-E6	D1	15.00
Reset release button			
SZ-R1	Reset release button 300mm for TK-E02	D1	96.00
SZ-R2	Reset release button 500mm for TK-E02	D1	112.00
SZ-R3	Reset release button 700mm for TK-E02	D1	127.00
SZ-R4	Reset release button 300mm for TK-E2 to TK-E6	D1	100.00
SZ-R5	Reset release button 500mm for TK-E2 to TK-E6	D1	120.00
SZ-R6	Reset release button 700mm for TK-E2 to TK-E6	D1	135.00
Dial cover			
SZ-DA	Dial cover for TK-E02 to TK-E6	D1	2.00

List Price for Combination Starters accessories

Part number	Description	Discount code	List Price
BZ0LRC09AA	Link module for BM3R and SC-M01(/G), SC-M02(/G)	D14	15.00
BZ0LRE22AA	Link module for BM3R and SC-E02 to SC-E05	D14	15.00
BZ0LRE22GA	Link module for BM3R and SC-E02/G to SC-E05/G	D14	20.00
BZ0LRE32AA	Link module for BM3R and SC-E1	D14	18.00
BZ0LRE32GA	Link module for BM3R and SC-E1/G	D14	20.00
BZ0LVE51AA	Link module for BM3V and SC-E1 to E2S	D14	18.00
BZ0LVE51GA	Link module for BM3V and SC-E1/G to E2S/G	D14	22.00
BZ0LVE65AA	Link module for BM3V and SC-E3	D14	24.00
BZ0LVE65GA	Link module for BM3V and SC-E3/G	D14	28.00
Base plates			
BZ0BPRE22A	Base plate for BM3R and SC-E02(/G) to SC-E05(/G)	D14	22.00
BZ0BPRE32A	Base plate for BM3R and SC-E1(/G)	D14	24.00
BZ0BPVE51A	Base plate for BM3V and SC-E1(/G) to SC-E2S(/G)	D14	26.00
BZ0BPVE65A	Base plate for BM3V and SC-E3(/G)	D14	30.00

Appendix 1 : Construction of combination motor controllers

The UL508 standard defines 6 categories depending on the construction type for the combination motor controllers. The type and component function is shown below.

Type	Component	Component standard	Component funciton per NEC			
			Disconnect	Branch circuit protection	Motor control	Motor overload
A	Manual disconnect	UL98,UL1087	X			
	Fuse	UL248		X		
	Magnetic	UL508			X	
	Overload relay	UL508				X
B	Manual disconnect	UL98,UL1087	X			
	Motor short-circuit Protector	UL508		X		
	Magnetic	UL508			X	
	Overload relay	UL508				X
C	Inverse time Circuit Breaker	UL489	X	X		
	Magnetic	UL508			X	
	Overload relay	UL508				X
D	Instantaneous Circuit Breaker	UL489	X	X		
	Magnetic	UL508			X	
	Overload relay	UL508				X
E	Self-Protected control device	UL508	X	X	X	X
F	Manual Self-protected combination motor controller	UL508	X	X		X
	Magnetic	UL508			X	

Fuji MMS is indicated on the label with "Manual Self-Protected Combination Motor Controller" (TYPE E) and "Combination Motor Controller" (TYPE F).

Appendix 2 : Short circuit coordination comparison

UL508 (Part IV, Combination Motor Controllers) and IEC60947-4-1 are the two major standards concerning the combination of the MMS and the Contactor. In IEC60947-4-1, it only regulates the short-circuit protective coordination between the Contactor and the Circuit Breaker. However, in UL508, it takes the combination of the MMS and Contactor as a united component and requires additional performances besides the short-circuit test.
UL standard is available for another standard related short circuit coordination, that is **UL subject 508E**.
(IEC type "2" Coordination Short Circuit Tests of Electromagnetic Motor Controllers in accordance with IEC Publication 947-4-1)
UL subject 508E is to certify that the coordination between the MMS and Contactor comply with IEC60947-4-1 type 2 requirements.
Fuji combination Starters are also cUL listed UL subject 508E, which means that it comforms to both UL and IEC regulation for short-circuit coordination.

Test	UL508 Type F	IEC60947-4-1		UL subject 508E
		Type 1	Type 2	
Short-Circuit □ Coordination	X - The contactor may be damaged□ - It may not be suitable for further service without repair or replacement.	X - The contactor may be damaged□ - It may not be suitable for further service without repair or replacement.	X - No damage except light welding of the contacts of the contactor.□ - It shall be suitable for further use.	X - No damage except light welding of the contacts of the contactor.□ - It shall be suitable for further use.
Current withstand	X	-	-	-
Dielectric voltage withstand	X	X	X	X
Calibration	X	-	X	X
Temperature	X	-	-	-
Effective region	North America	Europe	Europe	North America

Coordination details between MMS and Contactor as UL508 Type F, please see page 56, 57, as UL subject 508E, please see page 79, 80.

• BM3RSB, BM3RHB (UL subject E coordination)

220-240V AC		440-480V AC		MMS part number			Contactor □ part number	Link module	Base plate	Short-circuit ratings at 480V AC (kA)	
HP rating (HP)	Rated current (A)	HP rating (HP)	Rated current (A)	Part number		Current range (A)				for BM3RSB	for BM3RHB
-	-	-	-	**BM3RSB-P16**	**BM3RHB-P16**	0.1-0.16	**SC-M01, M01/G**	BZ0LRC09AA	-	50	50
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
-	-	-	-	**BM3RSB-P25**	**BM3RHB-P25**	0.16-0.25	**SC-M01, M01/G**	BZ0LRC09AA	-	50	50
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
-	-	-	-	**BM3RSB-P40**	**BM3RHB-P40**	0.25-0.4	**SC-M01, M01/G**	BZ0LRC09AA	-	50	50
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
-	-	-	-	**BM3RSB-P63**	**BM3RHB-P63**	0.4-0.63	**SC-M01, M01/G**	BZ0LRC09AA	-	50	50
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
-	-	-	-	**BM3RSB-001**	**BM3RHB-001**	0.63-1	**SC-M01, M01/G**	BZ0LRC09AA	-	50	50
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
-	-	3/4	1.6	**BM3RSB-1P6**	**BM3RHB-1P6**	1-1.6	**SC-M01, M01/G**	BZ0LRC09AA	-	50	50
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
1/2	2.2	1	2.1	**BM3RSB-2P5**	**BM3RHB-2P5**	1.6-2.5	**SC-M01, M01/G**	BZ0LRC09AA	-	50	50
							SC-E02	BZ0LRE22AA	BZ0BPRE22A		
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
3/4	3.2	2	3.4	**BM3RSB-004**	**BM3RHB-004**	2.5-4	**SC-E02**	BZ0LRE22AA	BZ0BPRE22A	50	50
							SC-E02/G	BZ0LRE22GA	BZ0BPRE22A		
1-1/2	6	3	4.8	**BM3RSB-6P3**	**BM3RHB-6P3**	4-6.3	**SC-E04**	BZ0LRE22AA	BZ0BPRE22A	50	50
							SC-E04/G	BZ0LRE22GA	BZ0BPRE22A		
3	9.6	5	7.6	**-**	**BM3RHB-010**	6.3-10	**SC-E04**	BZ0LRE22AA	BZ0BPRE22A	-	50
							SC-E04/G	BZ0LRE22GA	BZ0BPRE22A		
3	9.6	7-1/2	11	**-**	**BM3RHB-013**	10-13	**SC-E05**	BZ0LRE22AA	BZ0BPRE22A	-	50
							SC-E05/G	BZ0LRE22GA	BZ0BPRE22A		
5	15.2	10	14	**-**	**BM3RHB-016**	11-16	**SC-E05**	BZ0LRE22AA	BZ0BPRE22A	-	50
							SC-E05/G	BZ0LRE22GA	BZ0BPRE22A		
5	15.2	10	14	**-**	**BM3RHB-020**	14-20	**SC-E05**	BZ0LRE22AA	BZ0BPRE22A	-	50
							SC-E05/G	BZ0LRE22GA	BZ0BPRE22A		
7-1/2	22	15	21	**-**	**BM3RHB-025**	18-25	**SC-E1**	BZ0LRE32AA	BZ0BPRE32A	-	50
							SC-E1/G	BZ0LRE32GA	BZ0BPRE22A		
10	28	20	27	**-**	**BM3RHB-032**	24-32	**SC-E1**	BZ0LRE32AA	BZ0BPRE32A	-	50
							SC-E1/G	BZ0LRE32GA	BZ0BPRE22A		

• BM3VSB, BM3VHB (UL subject E coordination)

220-240V AC		440-480V AC		MMS part number			Contactor □ part number	Link module	Base plate	Short-circuit ratings at 480V AC (kA)	
HP rating (HP)	Rated current (A)	HP rating (HP)	Rated current (A)	Part number		Current range (A)				for BM3VSB	for BM3VHB
3	9.6	5	7.6	**BM3VSB-010**	**BM3VHB-010**	6.3-10	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A	25	50
3	9.6	7-1/2	11	**BM3VSB-013**	**BM3VHB-013**	10-13	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A	25	50
5	15.2	10	14	**BM3VSB-016**	**BM3VHB-016**	11-16	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A	25	50
5	15.2	10	14	**BM3VSB-020**	**BM3VHB-020**	14-20	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A	25	50
7-1/2	22	15	21	**BM3VSB-025**	**BM3VHB-025**	18-25	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A	25	50
10	28	20	27	**BM3VSB-032**	**BM3VHB-032**	24-32	**SC-E1** **SC-E1/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A	25	50
10	28	30	40	**BM3VSB-040**	**BM3VHB-040**	28-40	**SC-E2** **SC-E2/G**	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A BZ0BPVE51A	25	50

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