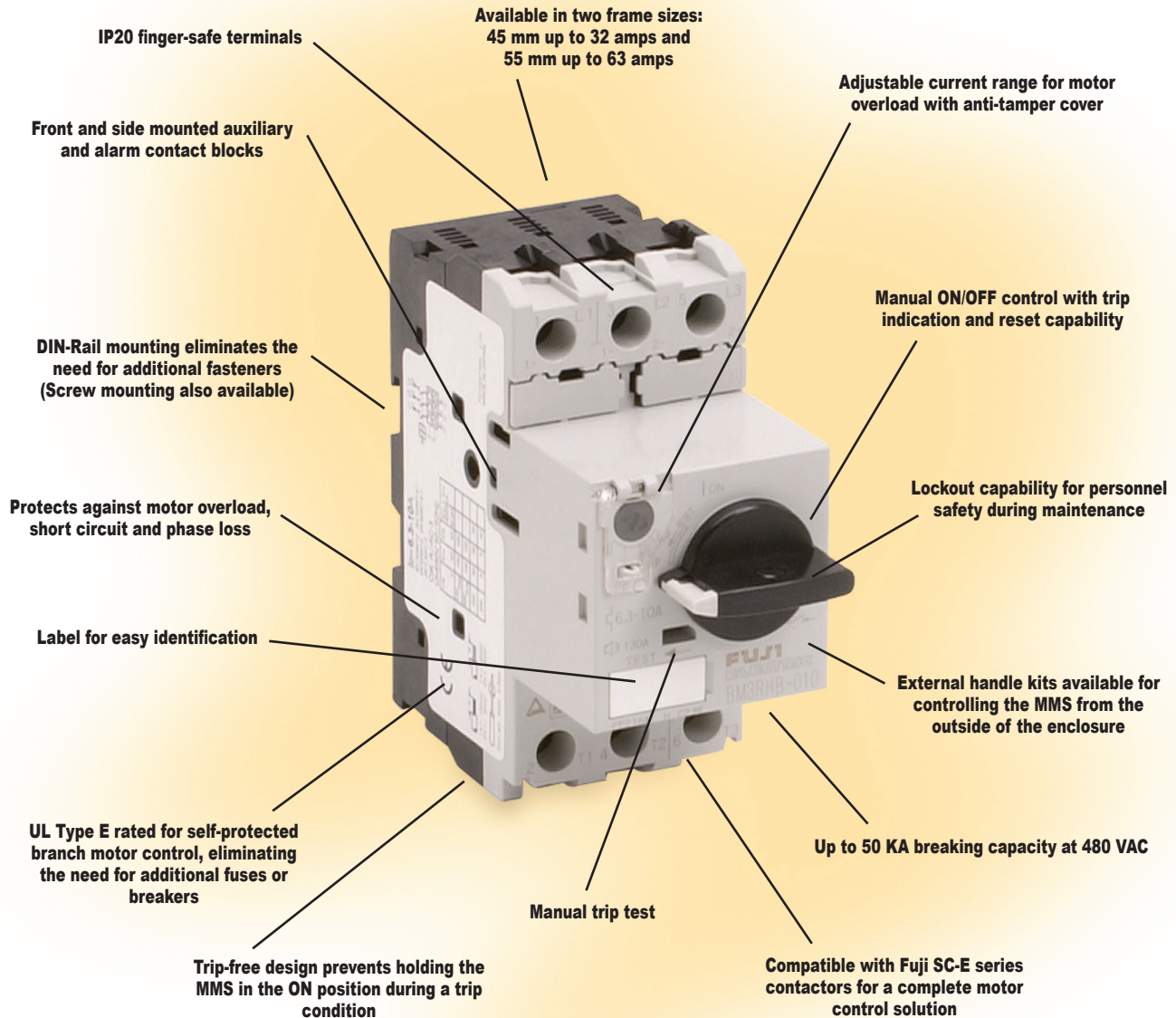


Fuji Duo Series Manual Motor Starters

The manual motor starter is a protective device for motor use that provides optimal protection by integrating the functions of a molded case circuit breaker and thermal overload relay into a compact unit. Since Fuji's MMS is UL listed for Category E self-protected motor control, it can be used for motor branch circuit protection without the need for additional protection such as

fuses or molded case circuit breakers. The MMS is available in a 32A version with a 45 mm frame width, and a 63A version with a 55 mm frame width. Both MMS versions have high breaking capacities, up to 100,000A in some ranges. A wide range of accessories is available, including shunt trips and undervoltage releases.



Auxiliary and alarm contact blocks



Shunt trips and undervoltage releases



MMS external handles



MMS Busbars

Accessories

Fuji Duo Series Manual Motor Starters

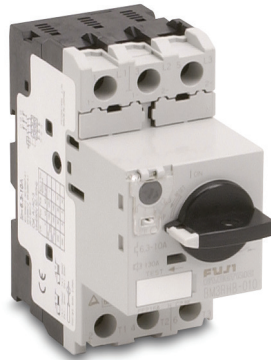
General Information

Features

- Adjustable thermal-magnetic trip
- Available in two frame sizes, 45 mm width and 55 mm width
- A wide motor capacity range up to 40 hp, 3-phase (440/480 VAC, 63A); 60 hp @ 600 V
- Rotary handle operators
- On/Off and trip state indicators for all frames
- Max. breaking capacity of 100 kA (240 VAC)
- Common accessories to reduce inventory
- A wide rated operational current range of up to 32A for the 45 mm wide and 63A for the 55 mm wide starters
- ON/OFF and trip indicators for instant status recognition
- Accessories such as auxiliary contact blocks, shunt trip devices, and undervoltage trip devices are compatible with the 45 mm and 55 mm wide frame sizes
- External operating handles are available as optional accessories
- Lockout/tagout feature

Standards

- UL listed, file E163944, Standard UL 508
- cUL listed, file E163944, CSA C22.2 No.14
- TÜV, CE
- cULus listed for group installation per NEC 430-53(c)



BM3RHB-xxx Models (45mm wide)

Rated current: 0.16 to 32A

Rated insulation voltage: 690V

Operation handle: Rotary

Short circuit current rating:

- 100 kA at 240 VAC
- 50 kA at 480 VAC

NOTE: When using BM3RHB-xxx MMS in a UL Type E application, you must also use part numbers BZ0TKUAB (short-circuit contact block) and BZ0TCRE (line side terminal cover).



BM3VHB-xxx Models (55mm wide)

Rated current: 10 to 63A

Rated insulation voltage: 1000V

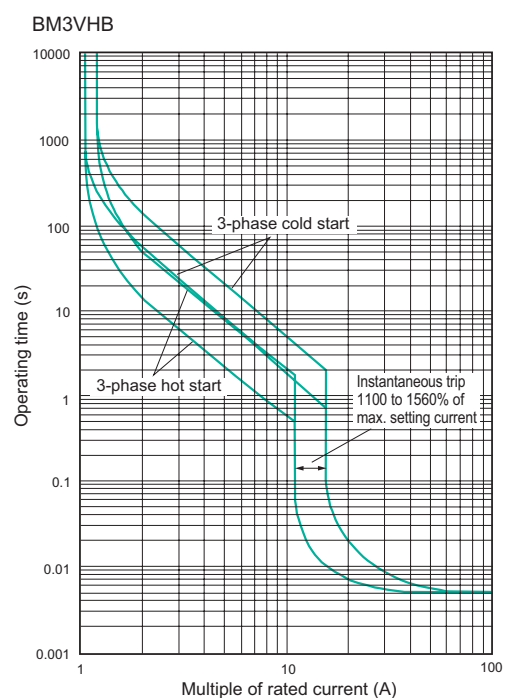
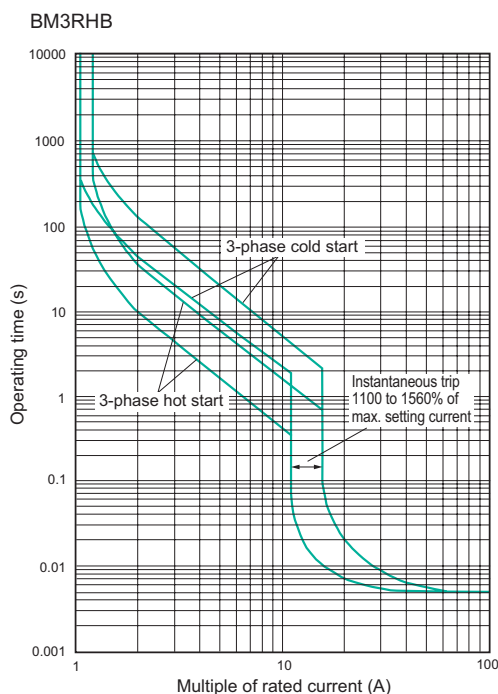
Operation handle: Rotary

Short circuit current rating:

- 100 kA at 240 VAC
- 50 kA at 480 VAC

NOTE: When using BM3VHB-xxx MMS in a UL Type E application, you must also use part number BZ0TKUAB (short-circuit contact block).

Characteristic curves



Fuji Duo Series Manual Motor Starters

BM3RHB-xxx Specifications



General Specifications: 45mm Frame Width - BM3RHB-xxx Series											
Part Number	Price	Adjustable Current Range	UL/CSA 3-Phase HP Rating ¹				Instantaneous Trip Current (A)	UL/CSA Short Circuit Current Rating (kA) ²			Max. Listed Branch Circuit Protection - Fuse or MCCB (A) ²
		I _e : Min.-Max. (A)	200-208VAC	220-240VAC	440-480VAC	550-600VAC		240VAC	480VAC	600VAC	
BM3RHB-P16	\$75.00	0.1-0.16	Rated to motor full-load amperage				2.1	100	50	10	500
BM3RHB-P25	\$75.00	0.16-0.25					3.3	100	50	10	500
BM3RHB-P40	\$75.00	0.25-0.4					5.2	100	50	10	500
BM3RHB-P63	\$75.00	0.4-0.63					8.2	100	50	10	500
BM3RHB-001	\$75.00	0.63-1					13	100	50	10	500
BM3RHB-1P6	\$75.00	1-1.6					20.8	100	50	10	500
BM3RHB-2P5	\$75.00	1.6-2.5	1/2	1/2	1	1-1/2	32.5	100	50	10	500
BM3RHB-004	\$75.00	2.5-4	3/4	3/4	2	3	52	100	50	10	500
BM3RHB-6P3	\$75.00	4-6.3	1	1-1/2	3	5	81.9	100	50	10	500
BM3RHB-010	\$79.00	6.3-10	2	3	5	7-1/2	130	100	50	10	500
BM3RHB-013	\$79.00	9-13	3	3	7-1/2	10	169	100	50	10	500
BM3RHB-016	\$79.00	11-16	3	5	10	10	208	100	50	10	500
BM3RHB-020	\$79.00	14-20	5	5	10	15	260	100	50	10	500
BM3RHB-025	\$95.00	19-25	7-1/2	7-1/2	15	20	325	100	50	10	500
BM3RHB-032	\$120.00	24-32	10	10	20	30	416	100	50	10	500

Note 1: BM3RHB-xxx are cUL listed as HP rated motor controllers.

Note 2: BM3RHB-xxx are cUL listed for group installation per NEC430-53(C).

General Specifications: 45mm Frame Width - BM3RHB-xxx Series - continued											
Features		Adjustable thermal-magnetic trip type									
Number of Poles		3									
Handle Type		Rotary									
Rated Current I _e (A)		0.16 to 32									
Rated Operational Voltage U _e (V)		200 to 690									
Rated Frequency (Hz)		50/60									
Rated insulation Voltage U _i (V)		690									
Rated Impulse Withstand Voltage U _{imp} (kV)		6									
Utilization	IEC 60947-2 Circuit Breaker	Cat. A									
Category	IEC 60947-4-1 Motor Starter	AC-3									
Trip Class IEC 60947-4-1		10									
Instantaneous Trip Characteristic		13 x I _e max.									
Power Loss (total of 3-pole)		7W: I _n =0.16 to 25A 8.5W: I _n =32A									
Mechanical Durability (operations)		100,000: I _n =0.16 to 25A 70,000: I _n =32A									
Electrical Durability (operations)		100,000: I _n =0.16 to 25A 70,000: I _n =32A									
Max. Operations per Hour (motor start-up)		25									
Phase-loss Protection		Provided									
Trip Indicator		Provided									
Test Trip Function		Provided									
Dimensions (mm) WxHxD		45x90x79									
Weight (oz/g)		13.05 / 370									
Optional Accessories	Auxiliary Contact Block	Yes									
	Alarm Contact Block	Yes									
	Auxiliary and Alarm Contact Block	Yes									
	Short-Circuit Alarm Contact Block	Yes									
	Shunt Trip Device	Yes									
	Undervoltage Trip Device	Yes									
Standards & Agency Approvals		IEC 60947-1, 60947-2, 60947-4-1, UL 508 file E163944, CSA C22.2 No.14 file 20479									

Fuji Duo Series Manual Motor Starters

BM3VHB-xxx Specifications

General Specifications: 55mm Frame Width - BM3VHB-xxx Series											
Part Number	Price	Adjustable Current Range	UL/CSA 3-Phase hp Rating ¹				Instantaneous Trip Current (A)	UL/CSA Short Circuit Current Rating (kA) ²			Max. Listed Branch Circuit Protection - Fuse or MCCB (A) ²
		I _e : Min.-Max. (A)	200-208VAC	220-240VAC	440-480VAC	550-600VAC		240VAC	480VAC	600VAC	
BM3VHB-010	\$184.00	6.3-10	2	3	5	7-1/2	130	100	50	10	600
BM3VHB-013	\$184.00	9-13	3	3	7-1/2	10	169	100	50	10	600
BM3VHB-016	\$184.00	11-16	3	5	10	10	208	100	50	10	600
BM3VHB-020	\$184.00	14-20	5	5	10	15	260	100	50	10	600
BM3VHB-025	\$216.00	19-25	7-1/2	7-1/2	15	20	325	100	50	10	600
BM3VHB-032	\$228.00	24-32	10	10	20	30	416	100	50	10	600
BM3VHB-040	\$228.00	28-40	10	10	30	30	520	100	50	10	600
BM3VHB-050	\$237.00	35-50	15	15	30	40	650	100	50	10	600
BM3VHB-063	\$237.00	45-63	20	20	40	60	819	100	50	10	600

Note 1: BM3VHB-xxx are cUL listed as HP rated motor controllers.

Note 2: BM3VHB-xxx are cUL listed for group installation per NEC430-53(C).

General Specifications: 55mm Frame Width - BM3VHB-xxx Series - continued			
Features		Adjustable thermal-magnetic trip type	
Number of Poles		3	
Handle Type		Rotary	
Rated Current I _e (A)		10 to 63	
Rated Operational Voltage U _e (V)		200 to 690	
Rated Frequency (Hz)		50/60	
Rated Insulation Voltage U _i (V)		1,000	
Rated Impulse Withstand Voltage U _{imp} (kV)		8	
Utilization	IEC 60947-2 Circuit Breaker	Cat. A	
Category	IEC 60947-4-1 Motor Starter	AC-3	
Trip Class IEC 60947-4-1		10	
Instantaneous Trip Characteristic		13 x I _e max.	
Power Loss (total of 3-pole)		11W: I _n = 10 to 32A 15W: I _n = 40 to 50A 17W: I _n = 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	
Dimensions (mm) WxHxD		55x110x96	
Weight (oz/g)		27.51 / 780	
Optional Accessories	Auxiliary Contact Block	Yes	
	Alarm Contact Block	Yes	
	Auxiliary and Alarm Contact Block	Yes	
	Short-Circuit Alarm Contact Block	Yes	
	Shunt Trip Device	Yes	
	Undervoltage Trip Device	Yes	
	External Operating Handle	Yes	
Standards & Agency Approvals		IEC 60947-1, 60947-2, 60947-4-1, UL 508 file E163944, CSA C22.2 No.14 file 20479	

Fuji Duo Series Manual Motor Starters

DIN-rail mounting

The MMS can be mounted to a 35 mm DIN rail. Secure the rail with screws at mounting pitch of less than 400 mm for the BM3R type and less than 300 mm for the BM3V type.

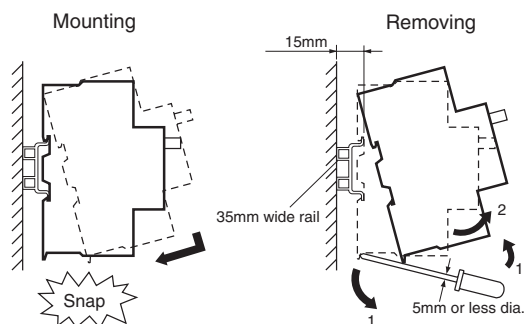
Applicable rail:

Use a 15 mm-high DIN rail, such as our DN-R35HS1, which conforms to EN-50022 and IEC715.

The standard DIN rail mounting direction is horizontal. When using the MMS on vertically mounted DIN rail, use end clamps.

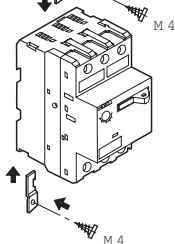
Screw mounting

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.

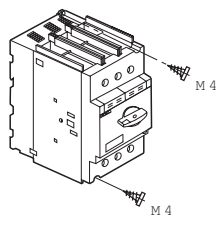


BM3RHB-xxx

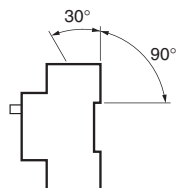
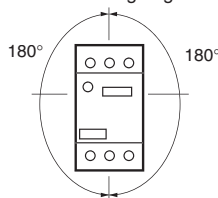
Push-in lug
BZ0SET



BM3VHB-xxx



Mounting angle



Wiring

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

Environmental Specifications

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/s2	No abnormal shock or vibration.
Shock	50m/s2	

Wiring Specifications

Wire Size and Tightening Torque

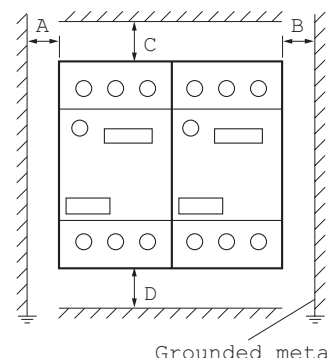
Type	BM3RHB-xxx	BM3VHB-xxx	BZ0 Accessories
Solid Wire (mm)	1.6 to 2.6 dia.	1.6 to 2.6 dia.	1 to 1.6 dia.
Stranded Wire (mm2)	Single-wire 1 to 10	1 to 25	0.5 to 2.5
	2-wire 1 to 6	1 to 16	0.5 to 2.5
AWG	Single-wire 18 to 8	18 to 4	18 to 14
	2-wire 18 to 10	18 to 4	18 to 14
Sheath Stripping Length (mm)	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.

Arc Space Requirements

Part Number	Rated operational voltage U_e	Minimum distance to grounded metal (mm)	
	(V)	A,B	C,D
BM3RHB-xxx	Up to 500	15	30
	Up to 690	40	50
BM3VHB-xxx	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 carrying 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.



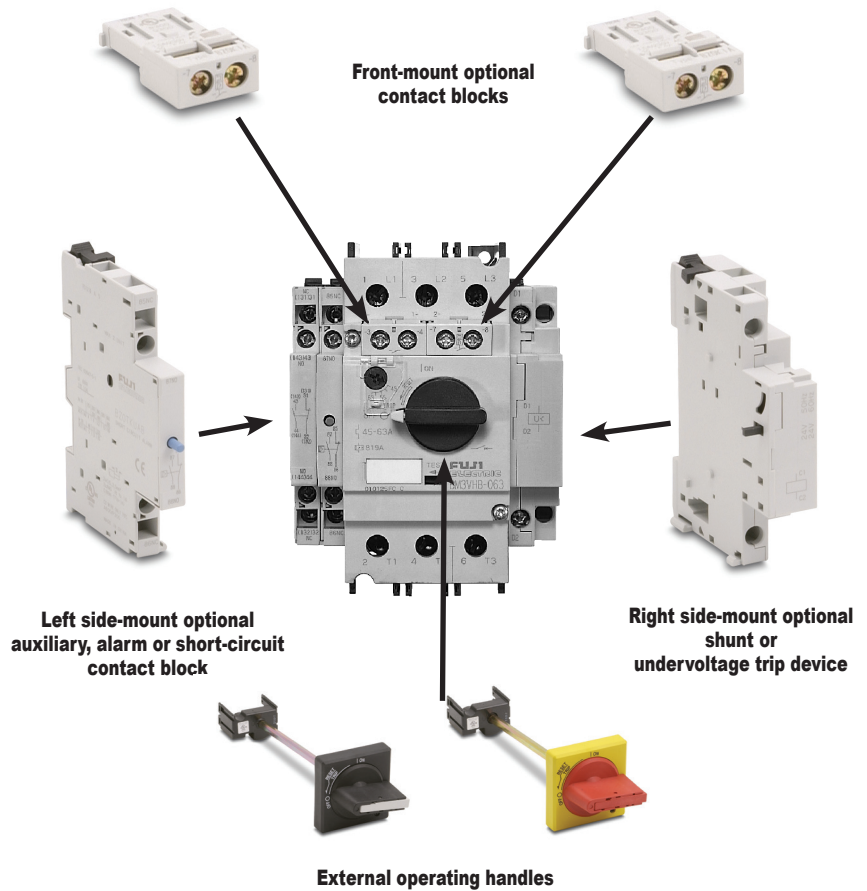
Fuji Duo Series Manual Motor Starters Accessories

Optional accessories

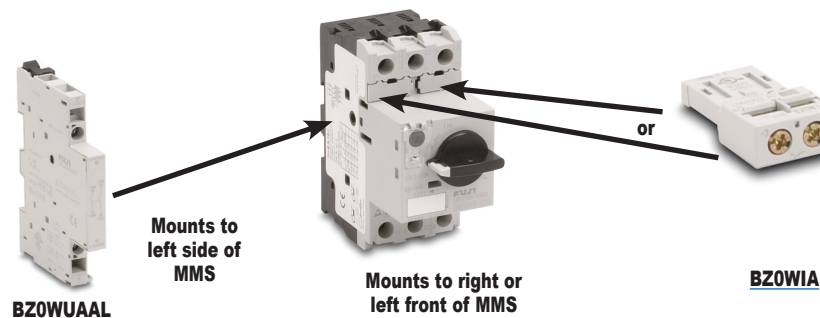
- All accessories can be used with BM3R (45 mm wide) and BM3V (55 mm wide) frames
- Accessories are easily mounted
- Internally-mountable auxiliary contact blocks and alarm contact blocks can be front mounted
- Side-mountable auxiliary contact blocks can be mounted on the left side
- Shunt trip and undervoltage trip devices are available in a wide operating coil voltage range and mount on the right side
- Standard and emergency external handles are available
- IP20 terminal cover helps prevent accidental contact with electrically charged parts
- Optional front mounted contact and alarm blocks eliminate horizontal space needed with the DIN rail



Installation of optional contact blocks and trip devices



Auxiliary contact blocks



Auxiliary Contact Blocks						
Part Number	Price	Description	Starter Type	Mounting	Contact Arrangement	Weight (g/lb)
BZ0WIA	\$8.75	These contact blocks do not discriminate between OFF, overload, phase-loss, or short circuit. The blocks are linked to the ON/OFF operation of the MMS, and also operate in the event of an overload, phase-loss, or short circuit. Up to two contact blocks can be mounted to the right/left front, and up to two contact blocks can be mounted to the left sides.	BM3RHB-xxx BM3VHB-xxx	Front	1NO	9/0.02
BZ0WIB	\$8.75				1NC	
BZ0WUAAL	\$12.50			Left side	2NO	45/0.1
BZ0WUABL	\$12.50				1NO + 1NC	
BZ0WUBBL	\$12.50				2NC	

Fuji Duo Series Manual Motor Starters Accessories



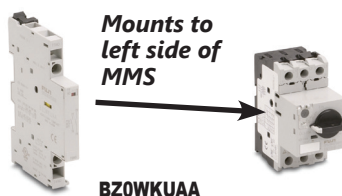
Accessories (continued)

Alarm contact blocks

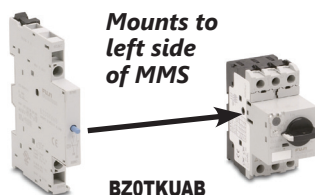


Alarm Contact Blocks						
Part Number	Price	Description	Starter Type	Mounting	Contact Arrangement	Weight (g/lb)
BZ0KIA	\$8.75	This block operates when the MMS trips due to overload, phase-loss, or short-circuit. It is not linked to the ON/OFF operation of the MMS. Note: Operation can be checked with the test trip function.	BM3RHB-xxx BM3VHB-xxx	Front (Right side only)	1NO	9/0.02
BZ0KIB	\$8.75				1NC	

Auxiliary and alarm contact blocks



Combination Auxiliary/Alarm Contact Blocks						
Part Number	Price	Description	Starter Type	Mounting	Contact Arrangement	Weight (g/lb)
BZ0WKUAA	\$15.50	- This contact block combines an auxiliary contact and an alarm contact that operates 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.	BM3RHB-xxx BM3VHB-xxx	Left	1NO (Aux.) + 1NO (Alarm)	45/0.1



Note 1: Required when using MMS in a UL Type E application.
Note 2: Do not configure this with an auxiliary contact block; the contact will only close when a short circuit occurs.

Short-circuit alarm contact blocks

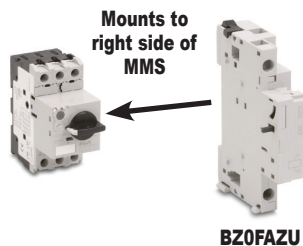
Short-Circuit Alarm Contact Block						
Part Number	Price	Description	Starter Type	Mounting	Contact Arrangement	Weight (g/lb)
BZ0TKUAB	\$19.50	- The contacts operate only when the MMS has tripped due to a short-circuit (cannot be checked with trip test function). - When these contacts operate, the blue 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: Be sure to press the reset button before mounting to the MMS.	BM3RHB-xxx BM3VHB-xxx	Left	1NO + 1NC	45/0.1

Contact Status					
Contact Type		Device Condition			
		OFF	ON	Tripped	
				Overload or Phase-loss	Short Circuit
AUX CONTACT, BZ0WIA, BZ0WIB, BZ0WUAA, BZ0WUBBL, BZ0WUABL	NO	Open	Closed	Opens	
	NC	Closed	Open	Closes	
ALARM CONTACT BZ0KIA, BZ0KIB	NO	Open (no change)	Open (no change)	Closes	
	NC	Closed (no change)	Closed (no change)	Opens	
AUX & ALARM CONTACT BZ0WKUAA	NO (AUX)	Open	Closed	Opens	
	NO (ALM)	Open (no change)	Open (no change)	Closes	
SHORT-CIRCUIT CONTACT BZ0TKUAB	NO	Open (no change)	Open (no change)	Open (no change)	Closes
	NC	Closed (no change)	Closed (no change)	Closed (no change)	Opens

Fuji Duo Series Manual Motor Starters

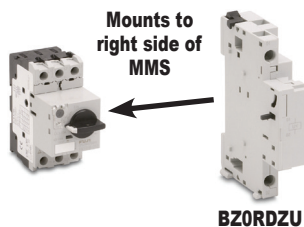
Accessories

Accessories (continued)



Shunt trip devices

Shunt Trip Devices						
Part Number	Price	Description	Starter Type	Mounting	Contact Arrangement	Weight (g/lb)
BZ0FAZU BZ0FDZU	\$26.00	This device is used to remotely trip the MMS. 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.	BM3RHB-xxx BM3VHB-xxx	Right	110-127V 50Hz/120V 60Hz	115/0.25
BZ0FKZUD	\$26.00				24-60VDC (time rating of coil is 5s)	



Undervoltage trip devices

Undervoltage Trip Devices						
Part Number	Price	Description	Starter Type	Mounting	Contact Arrangement	Weight (g/lb)
BZ0RDZU	\$26.00	This device automatically trips the MMS when the control circuit voltage drops below the specified value. 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.	BM3RHB-xxx BM3VHB-xxx	Right	110-127V 50Hz/120V 60Hz	115/0.25
BZ0R4ZU	\$26.00				415-440V 50Hz/460-480V 60Hz	



Push-in lug

Push-in Lug				
Part Number	Price	Description	Starter type	Weight (g/lb)
BZ0SET	\$8.75	Push-in mounting lug. Required for screw mounting of MMS; qty: 10/pkg	BM3RHB-xxx	2.0/.004

Note: See page MRC-tMRC-73 for installation instructions



Terminal Cover

Terminal Cover			
Part Number	Price	Description	Starter Type
BZ0TCRE	\$15.00	Line side terminal cover.	BM3RHB-xxx

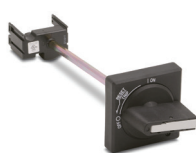
Notes: BZ0TCRE required only when using BM3RHB-xxx MMS in a UL Type E application (along with short circuit alarm contact block **BZ0TKUAB**).
If using BZ0TCRE terminal cover with BM3R series MMS, the busbar system and front mounted contacts cannot be used.

Fuji Duo Series Manual Motor Starters

Accessories

Accessories (continued)

External operating handles

**BZ0VBBL****BZ0VYRL**

External Operating Handles					
Part Number	Price	Description	Starter Type	Handle Type	Weight (g/lb)
<u>BZ0VBBL</u>	\$38.00	- 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. - Door interlock function - OFF lock function - Can be locked OFF with up to three padlocks. Note: Padlocks are to be provided by the customer. - Release screw allows the door to be opened with the handle in the ON position. - IP54 enclosure	BM3RHB-xxx	Standard (black)	160/0.35
<u>BZ0VYRL</u>	\$39.50			Emergency (red/yellow)	160/0.35
<u>BZ0VBBM</u>	\$38.00		BM3VHB-xxx	Standard (black)	160/0.35
<u>BZ0VYRM</u>	\$39.50			Emergency (red/yellow)	160/0.35

NOTE: Premade MMS enclosures are currently not available.

Accessory Specifications

Trip Device Specifications				
Accessory Type and Part Number		Shunt trip device	Undervoltage device	
		BZ0Fxxx	BZ0Rxxx	
Standard		IEC 60947-1, UL 508		
Rated Insulation Voltage (VAC)	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 1.1 Ue	0.35 to 0.7 Ue	
	Closing Voltage (V)	-	0.85 to 1.1 Ue	
Time Rating of Coil (s)		AC: Continuous	AC: Continuous	
		DC: 5		

Fuji Duo Series Manual Motor Starters

Accessories

Accessory specifications (continued)

Contact Block Specifications						
Accessory Type and Part Number		Auxiliary contact block/front	Auxiliary contact block/side	Alarm contact block	Aux. and alarm contact block	Short-circuit alarm contact block
		<u>BZ0WIA, BZ0WIB</u> (note 3)	<u>BZ0WUAA</u> <u>BZ0WUABL</u> <u>BZ0WUBBL</u>	<u>BZ0KIA, BZ0KIB</u> (note 3)	<u>BZ0WKUAA</u>	<u>BZ0TKUAB</u>
Standard		IEC 60947-5-1, UL 508				
Rated Operational Current (A)	48VAC AC-15 (note 2)	5	6	5	6	6
	125VAC	3	4	3	4	4
	230VAC	1.5	4	1.5	4	4
	400VAC	(note 3)	2.2	(note 3)	2.2	2.2
	500VAC		1.5		1.5	1.5
	690VAC		0.6		0.6	0.6
	48VDC DC-13 (note 2)	1.38	5	1.38	5	5
	110VDC	0.55	1.3	0.55	1.3	1.3
	220VDC	0.27	0.5	0.27	0.5	0.5
Contact Rating Code UL 508 (note 1)		AC	B300	A600	B300	A600
		DC	Q300	P300	Q300	P300
Min. Voltage and Current		17V / 5mA				

Note 1: NEMA ICS 5-2000. For more information, refer to Control Circuit Contact Electrical Ratings, page MRC-tMRC-130.

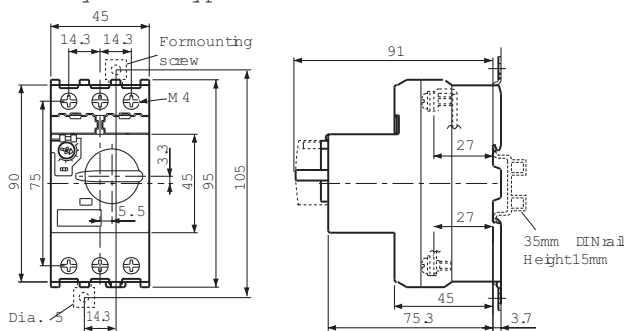
Note 2: IEC utilization category. For more information, refer to page MRC-tMRC-131.

Note 3: The indicated contacts should not be used in control circuits higher than 300V.

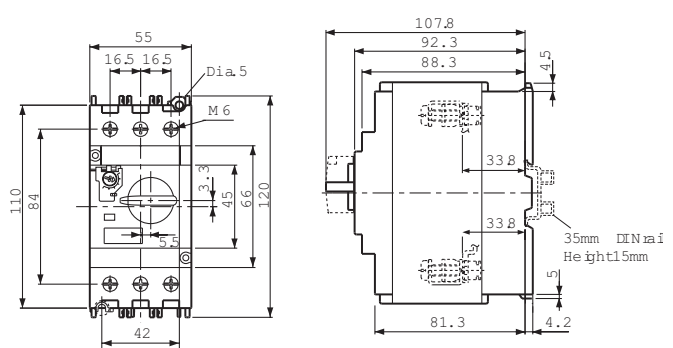
Dimensions [mm]

Manual motor starters

Rotary handletypes BM3HB-xxx



Rotary handletypes BM3VHB-xxx



Fuji Duo Series Manual Motor Starters

Accessories

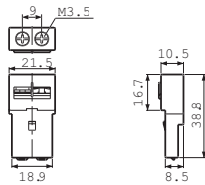
Dimensions (continued)

[mm]

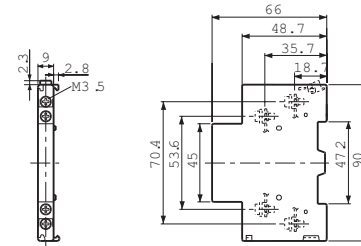
Accessories



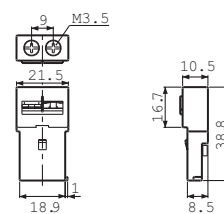
Auxiliary contacts front mounting
BZ0WIA, BZ0WIB



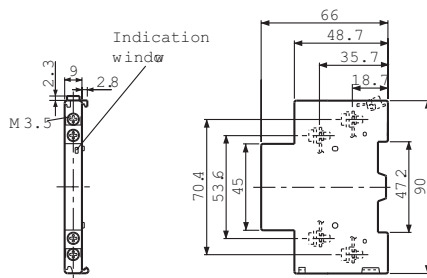
Auxiliary contacts side mounting
BZ0WU AAL, BZ0WU ABL, BZ0WUBBL



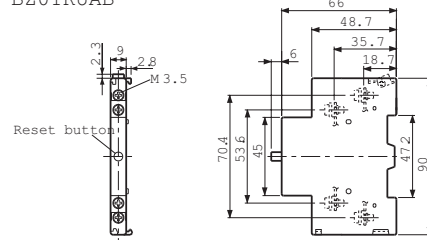
Alarm contacts front mounting
BZ0KIA, BZ0KIB



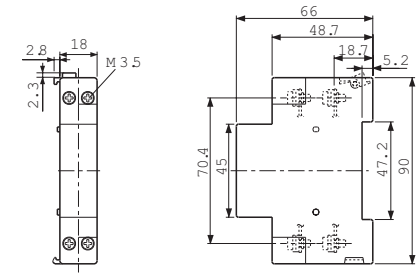
Auxiliary and alarm contacts front mounting
BZ0WKU AA



Short-circuit alarm contact block
BZ0TKUAB

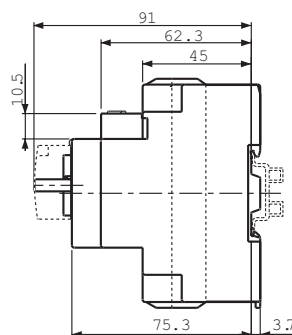
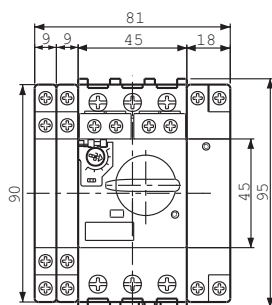


Shunt trip devices BZ0Fxxxx
Undervoltage trip devices BZ0Vxxxx

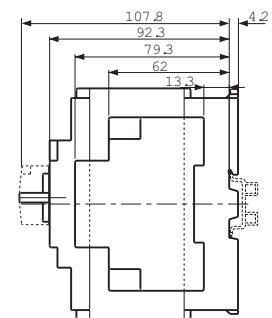
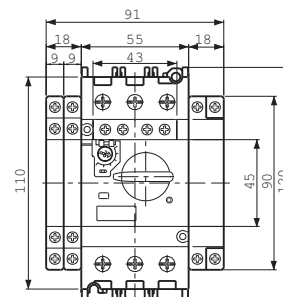


MMS with accessories

BM3RHB-xxx + BZ0xxxxxx



BM3VHB-xxx + BZ0xxxxxx



Fuji Duo Series Manual Motor Starters Accessories

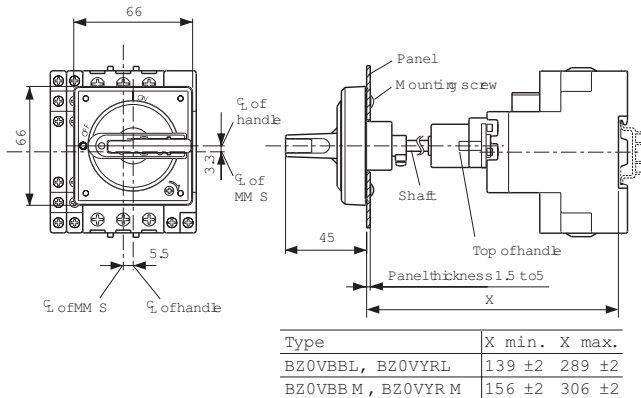
Dimensions (continued)

[mm]

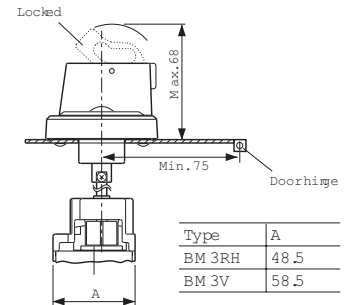
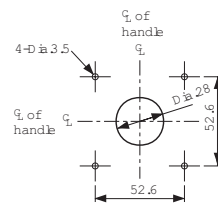
Accessories



External operation handle BZ0Vxxx

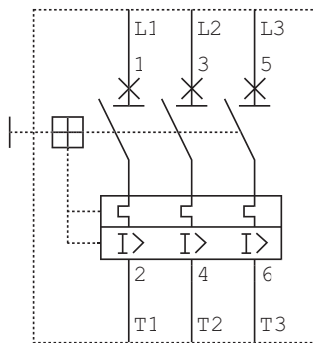
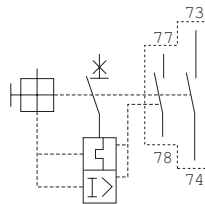


Panel drilling



Wiring Diagrams

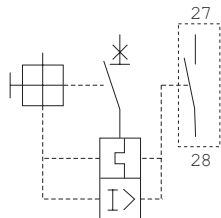
MMS

Auxiliary and alarm contact blocks
BZ0WKU AA

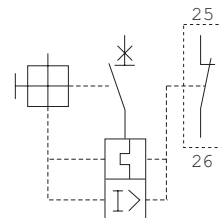
Alarm contact blocks

Front mounting

BZ0KIA



BZ0KIB



For control circuit design, see design standards such as NEC 430 "Electrical Arrangement of control Circuits" or UL508A Section 38 "Wiring methods, wire routing, and separation of circuits for internal wiring of a control circuit."

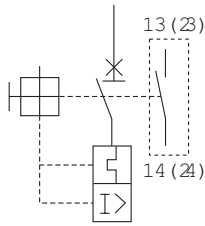
Fuji Duo Series Manual Motor Starters Accessories

Wiring Diagrams (continued)

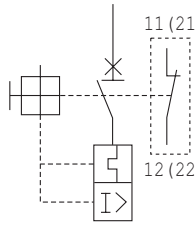
Auxiliary contact blocks

Front mounting

BZ0WIA

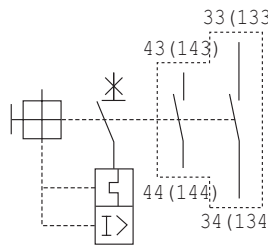


BZ0WIB

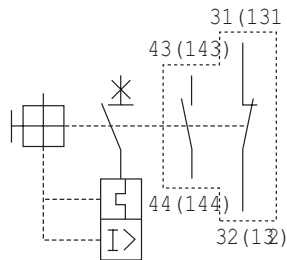


Side mounting

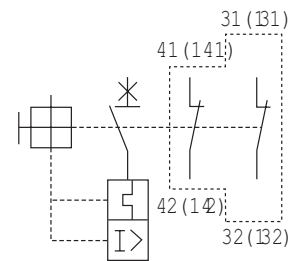
BZ0WUABL



BZ0WUABL

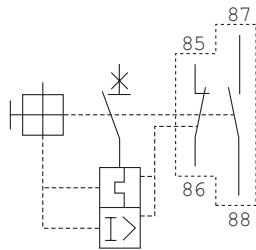


BZ0WUBBL



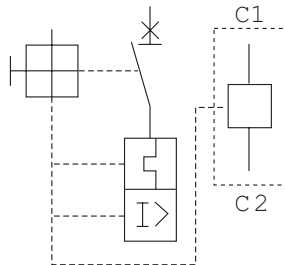
Short-circuit and
contact blocks

BZ0TKUAB



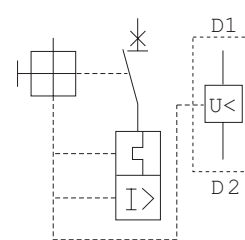
Shunt trip devices

BZ0Fxxxx



Undervoltage trip devices

BZ0Rxxxx



For control circuit design, see design standards such as NEC 430 "Electrical Arrangement of control Circuits" or UL508A section 38 "Wiring methods, wire routing, and separation of circuits for internal wiring of a control circuit."

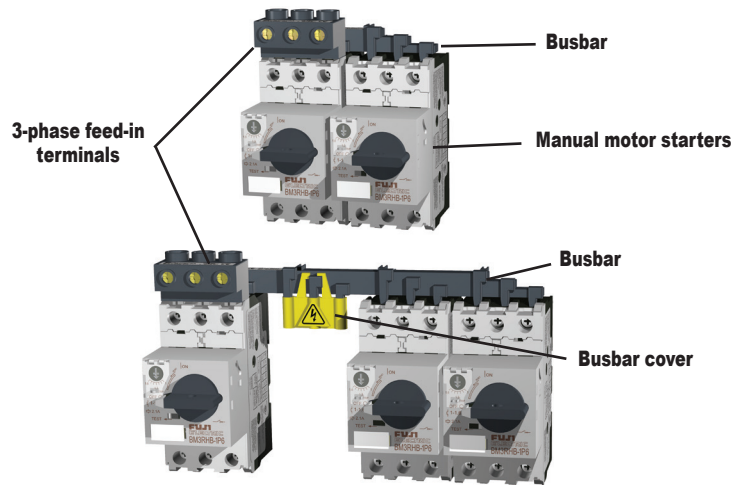
Fuji Duo Series Manual Motor Starters

Accessories

Busbar system

Features

- The busbar system reduces wiring time and saves floor space.
- 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 touching of nonconnected busbar terminals (charged parts).
- If using BZ0TCRE terminal cover with BM3R series MMS, the busbar system can not be used.

**BZ0BR02A****BZ0BR03A****BZ0BR04A****BZ0BR05A****BZ0BR12A****BZ0BR13A****BZ0BR14A****BZ0BR15A****BZ0BV02A****BZ0BV03A**

Note: Busbar photos continued on next page.

**BZ0BFRA****BZ0BFVA****BZ0BCRA****BZ0BCVA**

Busbar System Components and Ratings

Part Number	Price	Description	Used with	Specifications	Weight (g)	
BZ0BR02A	\$23.00	Busbar	BM3R	Continuous current: 64A max. pin connection	2-BM3R, modular space: 45mm	30
BZ0BR03A	\$20.50				3-BM3R, modular space: 45mm	50
BZ0BR04A	\$24.50				4-BM3R, modular space: 45mm	70
BZ0BR05A	\$26.00				5-BM3R, modular space: 45mm	90
BZ0BR12A	\$19.50				2-BM3R, modular space: 54mm	30
BZ0BR13A	\$23.50		BM3R+ 1 external accessory, 9mm wide		3-BM3R, modular space: 54mm	55
BZ0BR14A	\$26.00				4-BM3R, modular space: 54mm	80
BZ0BR15A	\$27.50				5-BM3R, modular space: 54mm	105
BZ0BV02A	\$37.00		BM3V	Continuous current: 126A max. pin connection	2-BM3V, modular space: 55mm	140
BZ0BV03A	Retired				3-BM3V, modular space: 55mm	240
BZ0BV04A	\$55.00				4-BM3V, modular space: 55mm	340
BZ0BV12A	\$39.50				2-BM3V, modular space: 64mm	150
BZ0BV13A	Retired				3-BM3V, modular space: 64mm	270
BZ0BV14A	Retired				4-BM3V, modular space: 64mm	380
BZ0BFRA	\$20.50	3-phase feed-in terminal	BM3R	Continuous current: 64A max. Applicable cable size: 25mm ² max.	40	
BZ0BFVA	\$41.50		BM3V	Continuous current: 126A max. Applicable cable size: 50mm ² max.	170	
BZ0BCRA	\$5.50	Busbar cover	BZ0BR	For pin connection	10	
BZ0BCVA	Retired		BZ0BV	NOTE: Some fine tuning and fitting adjustments may be needed.	5	

Fuji Duo Series Manual Motor Starters

Accessories

Busbar system (continued)

Dimensions

(mm)



BZ0BV04A



BZ0BV12A



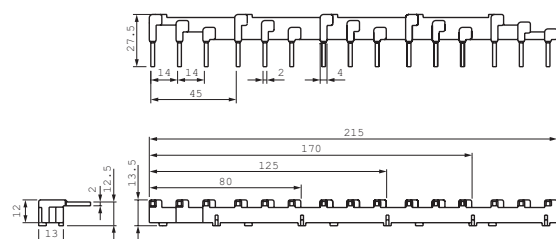
BZ0BV13A



BZ0BV14A

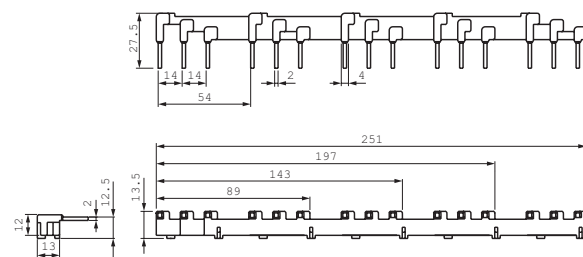
For BM3RHB-xxx

BZ0BR0xx Without external accessory



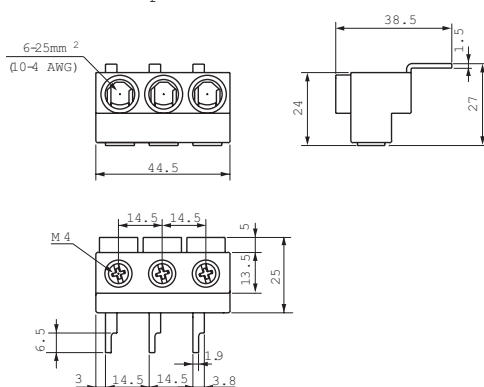
BZ0BR02A: 80 mm
BZ0BR03A: 125 mm
BZ0BR04A: 170 mm
BZ0BR05A: 215 mm

BZ0BR1xx With 1 external accessory



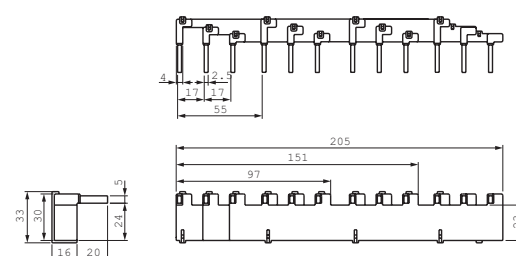
BZ0BR12A: 89 mm
BZ0BR13A: 143mm
BZ0BR14A: 197 mm
BZ0BR15A: 251 mm

BZ0BFRA 3-phase feed-in terminals



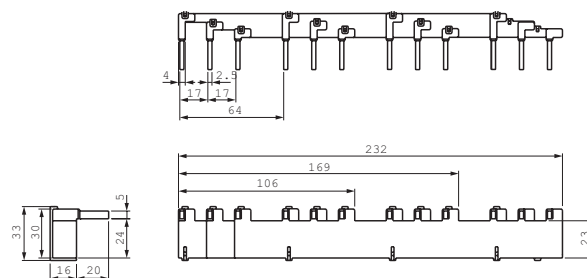
For BM3VHB-xxx

BZ0BV0xx Without external accessory



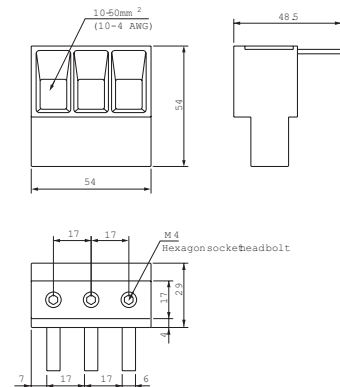
BZ0BV02A: 97 mm
BZ0BV03A: 151 mm
BZ0BV04A: 205 mm

BZ0BV1xx With 1 external accessory, 9mm wide



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

BZ0BFVA



Fuji Duo Series Combination Starter Selection Table - 45mm

Use this selection table to select 45mm frame width (A) Manual Motor Starter, (B) Contactor, (C) Link Module, and (D) Base Plate for a Combination Starter

Combination Starter Selection Table - 45mm									
Three Phase Motor					A	B	C	D	
220-240 Volt		440-480 Volt				Contactor			
Motor Horsepower (hp) See Note 1 below	Motor Full-Load Amperage (FLA) See Note 4 below	Motor Horsepower (hp) See Note 1 below	Motor Full-Load Amperage (FLA) See Note 4 below	Manual Motor Starter Adjustable Current Range (A)	Manual Motor Starter See Note 2 below for UL Type E applications.	The contactor part number needs the coil voltage suffix. See Note 3 below.	Link Module	Base Plate	SCCR at 480Y/277 VAC (kA) type F coordination
-	-	-	-	0.1 to 0.16	BM3RHB-P16	SC-E02-110VAC SC-E02G-24VDC	BZ0LRE22AA BZ0LRE22GA	BZ0BPRE22A	65
-	-	-	-	0.16 to 0.25	BM3RHB-P25	SC-E02-110VAC SC-E02G-24VDC	BZ0LRE22AA BZ0LRE22GA		65
-	-	-	-	0.25 to 0.4	BM3RHB-P40	SC-E02-110VAC SC-E02G-24VDC	BZ0LRE22AA BZ0LRE22GA		65
-	-	-	-	0.4 to 0.63	BM3RHB-P63	SC-E02-110VAC SC-E02G-24VDC	BZ0LRE22AA BZ0LRE22GA		65
-	-	-	-	0.63 to 1.0	BM3RHB-001	SC-E02-110VAC SC-E02G-24VDC	BZ0LRE22AA BZ0LRE22GA		65
-	-	0.75	1.6	1.0 to 1.6	BM3RHB-1P6	SC-E02-110VAC SC-E02G-24VDC	BZ0LRE22AA BZ0LRE22GA		65
0.5	2.2	1	2.1	1.6 to 2.5	BM3RHB-2P5	SC-E02-110VAC SC-E02G-24VDC	BZ0LRE22AA BZ0LRE22GA		65
0.75	3.2	2	3.4	2.5 to 4.0	BM3RHB-004	SC-E02-110VAC SC-E02G-24VDC	BZ0LRE22AA BZ0LRE22GA		65
1.5	6	3	4.8	4.0 to 6.3	BM3RHB-6P3	SC-E02-110VAC SC-E02G-24VDC	BZ0LRE22AA BZ0LRE22GA		65
-	-	5	7.6	6.3 to 10	BM3RHB-010	SC-E02-110VAC SC-E02G-24VDC	BZ0LRE22AA BZ0LRE22GA		65
3	9.6	7.5	11	9 to 13	BM3RHB-013	SC-E03-110VAC SC-E03G-24VDC	BZ0LRE22AA BZ0LRE22GA		65
5	15.2	10	14	11 to 16	BM3RHB-016	SC-E04-110VAC SC-E04G-24VDC	BZ0LRE22AA BZ0LRE22GA		65
5	15.2	10	14	14 to 20	BM3RHB-020	SC-E04-110VAC SC-E04G-24VDC	BZ0LRE22AA BZ0LRE22GA		65
7.5	22	15	21	19 to 25	BM3RHB-025	SC-E05-110VAC SC-E05G-24VDC	BZ0LRE22AA BZ0LRE22GA		50
10	28	20	27	24 to 32	BM3RHB-032	SC-E1-110VAC SC-E1G-24VDC	BZ0LRE32AA BZ0LRE32GA	BZ0BPRE32A	50

Note 1: When a horsepower rating is listed on two rows, the motor full-load amperage must be known so you can select the MMS with the best adjustable current range for your application. For example, if you have a 230V, 5 hp, 15.2A motor, you can select a MMS with either a 11-16A range or a 14-20A range. Consult the motor data plate or motor manufacturer.

Note 2: When using BM3RHB-xxx MMS in a UL Type E application, you must also use part numbers [BZ0TKUAB](#) (short-circuit contact block) and [BZ0TCRE](#) (line side terminal cover).

Note 3: For AC coil voltages other than 110VAC, substitute the "110VAC" in the part number with "220VAC" for 220/240VAC coils or "24VAC" for 24VAC coils. For example, if the table lists a SC-E02-110VAC contactor for your application and you need a contactor with a 220VAC coil, use contactor SC-E02-220VAC.

Note 4: Per NEC 2005 Table 430.250

Note 5: The table above also include the Fuji part numbers with (P). Example: SC-E02-110VAC = SC-E02P-110VAC.

Fuji Duo Series Combination Starter Selection Table - 55mm



Use this selection table to select 55mm frame width (A) Manual Motor Starter, (B) Contactor, (C) Link Module, and (D) Base Plate for a Combination Starter

Combination Starter Selection Table - 55mm									
Three Phase Motor					A	B	C	D	
220-240 Volt		440-480 Volt			Manual Motor Starter	Contactor	Link Module	Base Plate	SCCR at 480Y/277 VAC (kA) type F coordination
Motor horsepower (hp) See Note 1 below	Motor Full-Load Amperage (FLA) See Note 4 below	Motor Horsepower (hp) See Note 1 below	Motor Full-Load Amperage (FLA) See Note 4 below	Manual Motor Starter Adjustable Current Range (A)	See Note 2 below for UL Type E applications.	The contactor part number needs the coil voltage suffix. See Note 3 below.			
3	9.6	5	7.6	6.3 to 10	BM3VHB-010	SC-E1-110VAC SC-E1G-24VDC	BZ0LVE51AA BZ0LVE51GA	BZ0BPVE51A	65
3	9.6	7.5	11	9 to 13	BM3VHB-013	SC-E1-110VAC SC-E1G-24VDC	BZ0LVE51AA BZ0LVE51GA		65
5	15.2	10	14	11 to 16	BM3VHB-016	SC-E1-110VAC SC-E1G-24VDC	BZ0LVE51AA BZ0LVE51GA		65
5	15.2	10	14	14 to 20	BM3VHB-020	SC-E1-110VAC SC-E1G-24VDC	BZ0LVE51AA BZ0LVE51GA		65
7.5	22	15	21	19 to 25	BM3VHB-025	SC-E1-110VAC SC-E1G-24VDC	BZ0LVE51AA BZ0LVE51GA		65
10	28	20	27	24 to 32	BM3VHB-032	SC-E1-110VAC SC-E1G-24VDC	BZ0LVE51AA BZ0LVE51GA		65
10	28	30	40	28 to 40	BM3VHB-040	SC-E2-110VAC SC-E2G-24VDC	BZ0LVE51AA BZ0LVE51GA		65
15	42	30	40	35 to 50	BM3VHB-050	SC-E2S-110VAC SC-E2SG-24VDC	BZ0LVE51AA BZ0LVE51GA		65
20	54	40	52	45 to 63	BM3VHB-063	SC-E3-110VAC SC-E3G-24VDC	BZ0LVE65AA BZ0LVE65GA	BZ0BPVE65A	65

Note 1: When a horsepower rating is listed on two rows, the motor full-load amperage must be known so you can select the MMS with the best adjustable current range for your application. For example, if you have a 230V, 10 hp, 28A motor, you can select a MMS with either a 24-32A range or a 28-40A range. Consult the motor data plate or motor manufacturer.

Note 2: When using BM3VHB-xxx MMS in a UL Type E application, you must also use part number [BZ0TKUAB](#) (short-circuit contact block).

Note 3: For AC coil voltages other than 110VAC, substitute the "110VAC" in the part number with "220VAC" for 220/240VAC coils or "24VAC" for 24VAC coils. For example, if the table lists a SC-E1-110VAC contactor for your application and you need a contactor with a 220VAC coil, use contactor SC-E1-220VAC.

Note 4: Per NEC 2005 Table 430.250