

What Fuji Motor Control Do I Need?

There are four basic motor control options available: Basic contactors, traditional starters, manual motor starters, or combination starters. Follow these 3 steps to choose the best fit.

1

What does the application require?

Basic Contactors Only



Contactors

Typical applications:

- Electronic switching
- Lighting
- Resistive loads
- Non-motor-related inductive loads
- Disconnect switches
- VFD bypass/isolation



Traditional Starters



Contactors and overload relay

Typical applications:

- Inductive motor starting and control
- NEC 430 and 409 fulfillment
- Nm starter replacement/retrofit



Manual Motor Starters



Manual motor starter (MMS)

Typical applications:

- Inductive motor starting and manual control
- NEC 430 fulfillment
- Lockout/tagout
- UL 508, type E
- Not AC-4 rated



Combination Starters



Manual motor starter, contactor, link module, and base plate

Typical applications:

- Inductive motor starting and control
- NEC 430 and 409 fulfillment
- Lockout/tagout
- UL 508, type F



2

Consider these factors when selecting components:

- Load type: Resistive (AC-1) or inductive (AC-3)
- Duty cycle: One direction, reversing, plugging (AC-4); Refer to IEC Utilization Chart on page 16-76
- Horsepower (HP) and full load amperage (FLA); Refer to motor data plate information.

3

Select your components.

Duo Series

SC-E Contactor *See page 16-5*
 • 0.37 to 75kw @ 480 V
 • 9-150 A (AC3)

Odyssey Series

3N Contactor *See page 16-50*
 • 45 to 225kw
 • 180-361 A (AC3)

Duo Series

SC-E Contactor *See page 16-5*
 TK-E Overload relay *See page 16-19*
 • 0.37 to 75kw @ 480 V

Odyssey Series

3N Contactor *See page 16-50*
 3N Overload relay *See page 16-53*
 • 45 to 225kw

Duo Series

BM3 Manual motor starter
 • 0.37 to 30kw @ 480 V *See page 16-26*

Duo Series

BM3 Manual motor starter *See page 16-26*
 SC-E Contactor *See page 16-5*
 BZOL link module *See page 16-41*
 BZOBP base plate
 • 0.37 to 30kw @ 480 V

Fuji Duo Series SC-E Contactors

Features

- 3.7 to 75kw at 480 VAC
- cULus and CSA approval, CE mark, meets JIS and IEC standards.
- Models SC-E02-xxx to SC-E4-xxx have 3-pole main circuits and come in three sizes with widths of 43 mm, 54 mm, and 67 mm.
- Models SC-E1-xxx to SC-E7-xxx employ a box terminal structure; allowing wires to be connected directly to the main circuit.
- Has a finger-protection terminal structure that prevents the exposure of live parts.
- Models SC-E5-xxx to SC-E7-xxx use a SUPERMAGNET™ (AC-input/DC-output operation) for high operating reliability and requires no surge suppressor.

Standards & Approvals

- UL listed, file E42419, Standard UL 508
- cUL listed, file E42419, Standard CSA C 22.2 No.14
- IEC 60947-4-1,
- EN 60947-4-1
- VDE 0660
- JIS C 8201-4-1
- CE compliant



SC-E2S



SC-E7

Small Size

- SC-E02-xxx to E05-xxx: 43mm wide
- SC-E1-xxx to E25-xxx: 54mm wide
- SC-E3-xxx, E4-xxx: 67mm wide
- SC-E5-xxx: 88mm wide

Safety

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

Utility

- Box lug terminal construction
- Long electrical life
- Easy to wire

Environmental

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

Optional accessories

- Auxiliary contact blocks
- Coil surge suppression units
- Replacement coils for contactor sizes SC-E5 and larger

SC-E Series Contactors 9 - 40A					
Part Number	Coil Voltage	Current Rating: 3-Phase Motor, AC-3 (A)	Current Rating: Resistive Load, AC-1 (A)	Frame Width	
SC-E02-24VAC	24VAC	9	20	43mm	
SC-E02-110VAC	110VAC	9	20		
SC-E02-220VAC	220VAC	9	20		
SC-E02G-24VDC	24VDC	9	20		
SC-E03-24VAC	24VAC	12	20		
SC-E03-110VAC	110VAC	12	20		
SC-E03-220VAC	220VAC	12	20		
SC-E03G-24VDC	24VDC	12	20		
SC-E04-24VAC	24VAC	18	25		
SC-E04-110VAC	110VAC	18	25		
SC-E04-220VAC	220VAC	18	25		
SC-E04G-24VDC	24VDC	18	25		
SC-E05-24VAC	24VAC	25	32		
SC-E05-110VAC	110VAC	25	32		
SC-E05-220VAC	220VAC	25	32		
SC-E05G-24VDC	24VDC	25	32		
SC-E1-24VAC	24VAC	32	50	54mm	
SC-E1-110VAC	110VAC	32	50		
SC-E1-220VAC	220VAC	32	50		
SC-E1G-24VDC	24VDC	32	50		
SC-E2-24VAC	24VAC	40	60		
SC-E2-110VAC	110VAC	40	60		
SC-E2-220VAC	220VAC	40	60		
SC-E2G-24VDC	24VDC	40	60		

SC-E Series Contactors 50 - 150A							
Part Number	Coil Voltage	Current Rating: 3-Phase Motor, AC-3 (A)	Current Rating: Resistive Load, AC-1 (A)	Frame Width			
SC-E2S-24VAC	24VAC	50	65	54mm			
SC-E2S-110VAC	110VAC	50	65				
SC-E2S-220VAC	220VAC	50	65				
SC-E2SG-24VDC	24VDC	50	65				
SC-E3-24VAC	24VAC	68	100	67mm			
SC-E3-110VAC	110VAC	68	100				
SC-E3-220VAC	220VAC	68	100				
SC-E3G-24VDC	24VDC	68	100				
SC-E4-24VAC	24VAC	80	105				
SC-E4-110VAC	110VAC	80	105				
SC-E4-220VAC	220VAC	80	105				
SC-E4G-24VDC	24VDC	80	105				
SC-E5-24V	24VAC/VDC	105	150			88mm	
SC-E5-100V	110VAC/VDC	105	150				
SC-E5-200V	220VAC/VDC	105	150				
SC-E6-24V	24VAC/VDC	125	150	100mm			
SC-E6-100V	110VAC/VDC	125	150				
SC-E6-200V	220VAC/VDC	125	150				
SC-E7-24V	24VAC/VDC	150	200			115mm	
SC-E7-100V	110VAC/VDC	150	200				
SC-E7-200V	220VAC/VDC	150	200				

Fuji Odyssey Series 3N Contactors



Description

- 180 - 361A rating (AC3)
- Provides higher current and horsepower capabilities than SC-E series. Designed for reliable use in applications requiring constant switching, reduced coil consumption, and increased horsepower capabilities.
- Available in 154 mm and 169 mm frame widths
- SUPERMAGNET™ for high operating reliability.
- Use with Odyssey 3N series overload relays.

- Chatter-free operation eliminates contact welding and coil burning
- SUPERMAGNET™ coil operates on either AC or DC voltage

Agency approvals

- UL508 UL/cUL, file E42419
- CE: Meets LVD EN60947-4-1
- SEMI F47-0200

Ecology

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



3NC4H0122

Optional accessories

- Replacement coils
- Terminal covers

Features

- Equipped with 2 N.O. and 2 N.C. auxiliary contacts

Odyssey 3N Series Contactors 180 - 221A					
Part Number	Coil Voltage	Current Rating: AC-3	Current Rating: AC-1	Frame Width	
3NC4Q0E22	24VAC/VDC	180	260	154mm	
3NC4Q0122	110VAC/VDC	180	260		
3NC4Q0222	220VAC/VDC	180	260		
3NC4H0E22	24VAC/VDC	221	260		
3NC4H0122	110VAC/VDC	221	260		
3NC4H0222	220VAC/VDC	221	260		

Odyssey 3N Series Contactors 285 - 361A					
Part Number	Coil Voltage	Current Rating: AC-3	Current Rating: AC-1	Frame Width	
3NC5F0E22	24VAC/VDC	285	350	169mm	
3NC5F0122	110VAC/VDC	285	350		
3NC5F0222	220VAC/VDC	285	350		
3NC5H0E22	24VAC/VDC	361	450		
3NC5H0122	110VAC/VDC	361	450		
3NC5H0222	220VAC/VDC	361	450		

Specifications

Electrical Specifications - UL File No. E42419											
Part Number	1-Phase Ratings (hp)		3-Phase Ratings (kw)				AC-1 (A)	AC-3 (A)	Qty. of Aux. Contacts		SCCR Ratings (kA)
	120V	240V	200V	220V	440V	550V			NO	NC	
			208V	240V	480V	600V					
3NC4Q0#22	-	-	45	45	112	112	260	180	2	2	10
3NC4H0#22	-	-	55	55	112	150	260	221	2	2	10
3NC5F0#22	-	-	75	75	150	188	350	285	2	2	18
3NC5H0#22	-	-	94	112	225	263	450	361	2	2	18

Contactor Coil Characteristics - AC Input							
Part Number	Power Consumption (VA)		Pick-up Voltage (V)	Drop-out Voltage (V)	Operating Time (ms)		
	Inrush	Sealed			Coil ON to Contact ON	Coil OFF to Contact OFF	
3NC4Qxxxx, 3NC4Hxxxx	277	5.4	70-80	35-50	35-41	37-45	
3NC5Fxxxx, 3NC5Hxxxx	265	5.9	70-80	35-50	40-47	36-43	

NOTE: This data is based on 100-120V SUPERMAGNET™ coil, tested at 120VAC, 60Hz.

Contactor Coil Characteristics - DC Input - 110VDC							
Part Number	Power Consumption (watts)		Pick-up Voltage (V)	Drop-out Voltage (V)	Operating Time (ms)		
	Inrush	Sealed			Coil ON to Contact ON	Coil OFF to Contact OFF	
3NC4Qxxxx, 3NC4Hxxxx	324	4.1	77-88	28-44	35-41	37-45	
3NC5Fxxxx, 3NC5Hxxxx	340	4.5	77-88	28-44	40-47	36-43	

NOTE: This data is based on 100-120V SUPERMAGNET™ coil, tested at 110VDC.

Fuji Duo Series Contactor and Overload Relay Selection Tables

220-240V Three Phase Motor (0.37 to 37kw)¹

Motor Rating		A				B	
kW	Motor Full Load Amperage (FLA) ²	Contactor (choose coil voltage below)				Overload Relay	
		24VAC Coil	110-120VAC Coil	220-240VAC Coil	24VDC Coil	Part Number	Adjustable Current Range
0.37	2.2	SC-E02-24VAC	SC-E02-110VAC	SC-E02-220VAC	SC-E02G-24VDC	TK-E02-260	1.7 to 2.6 Amps
0.55	3.5					TK-E02-420	2.8 to 4.2 Amps
0.75	4.2					TK-E02-600	4 to 6 Amps
1.1	6					TK-E02-800	5 to 8 Amps
1.5	6.8					TK-E02-900	6 to 9 Amps
2.2	9.6	SC-E03-24VAC	SC-E03-110VAC	SC-E03-220VAC	SC-E03G-24VDC	TK-E02-1300	9 to 13 Amps
3.7	15.2	SC-E04-24VAC	SC-E04-110VAC	SC-E04-220VAC	SC-E04G-24VDC	TK-E02-1800	12 to 18 Amps
5.5	22	SC-E05-24VAC	SC-E05-110VAC	SC-E05-220VAC	SC-E05G-24VDC	TK-E02-2500	20 to 25 Amps
7.5	28	SC-E1-24VAC	SC-E1-110VAC	SC-E1-220VAC	SC-E1G-24VDC	TK-E2-3600	24 to 36 Amps
11	42	SC-E2-24VAC	SC-E2-110VAC	SC-E2-220VAC	SC-E2G-24VDC	TK-E2-4200	32 to 42 Amps
15	54	SC-E3-24VAC	SC-E3-110VAC	SC-E3-220VAC	SC-E3G-24VDC	TK-E3-6500	45 to 65 Amps
18	68	SC-E4-24VAC	SC-E4-110VAC	SC-E4-220VAC	SC-E4G-24VDC	TK-E3-6800	48 to 68 Amps
22	80	SC-E5-24V*	SC-E5-100V*	SC-E5-200V*	SC-E5-24V*	TK-E5-9500	65 to 95 Amps
30	104	SC-E6-24V*	SC-E6-100V*	SC-E6-200V*	SC-E6-24V*	TK-E6-12500	85 to 125 Amps
37	130	SC-E7-24V*	SC-E7-100V*	SC-E7-200V*	SC-E7-24V*	TK-E6-16000	110 to 160 Amps

* SUPERMAGNET coil operates with AC or DC voltage.

¹ For 220-240 V three-phase motors up to 110kw refer to the Fuji Odyssey series.

² Per NEC 2005 table 430.250

440-480V Three Phase Motor (0.37 to 75kw)¹

Motor Rating		A				B	
HP	Motor Full Load Amperage (FLA) ²	Contactor (choose coil voltage below)				Overload Relay	
		24VAC Coil	110-120VAC Coil	220-240VAC Coil	24VDC Coil	Part Number	Adjustable Current Range
0.37	1.1	SC-E02-24VAC	SC-E02-110VAC	SC-E02-220VAC	SC-E02G-24VDC	TK-E02-145	0.95 to 1.45 Amps
0.55	1.6	SC-E02-24VAC	SC-E02-110VAC	SC-E02-220VAC	SC-E02G-24VDC	TK-E02-220	1.4 to 2.2 Amps
0.75	2.1	SC-E02-24VAC	SC-E02-110VAC	SC-E02-220VAC	SC-E02G-24VDC	TK-E02-260	1.7 to 2.6 Amps
1.1	3.0	SC-E02-24VAC	SC-E02-110VAC	SC-E02-220VAC	SC-E02G-24VDC	TK-E02-420	2.8 to 4.2 Amps
1.5	3.4	SC-E02-24VAC	SC-E02-110VAC	SC-E02-220VAC	SC-E02G-24VDC	TK-E02-420	2.8 to 4.2 Amps
2.2	4.8	SC-E02-24VAC	SC-E02-110VAC	SC-E02-220VAC	SC-E02G-24VDC	TK-E02-600	4 to 6 Amps
3.75	7.6	SC-E02-24VAC	SC-E02-110VAC	SC-E02-220VAC	SC-E02G-24VDC	TK-E02-900	6 to 9 Amps
5.5	11	SC-E03-24VAC	SC-E03-110VAC	SC-E03-220VAC	SC-E03G-24VDC	TK-E02-1300	9 to 13 Amps
7.5	14	SC-E04-24VAC	SC-E04-110VAC	SC-E04-220VAC	SC-E04G-24VDC	TK-E02-1800	12 to 18 Amps
11	21	SC-E05-24VAC	SC-E05-110VAC	SC-E05-220VAC	SC-E05G-24VDC	TK-E02-2500	20 to 25 Amps
15	27	SC-E1-24VAC	SC-E1-110VAC	SC-E1-220VAC	SC-E1G-24VDC	TK-E2-3600	24 to 36 Amps
18	34	SC-E1-24VAC	SC-E1-110VAC	SC-E1-220VAC	SC-E1G-24VDC	TK-E2-4200	32 to 42 Amps
22	40	SC-E2-24VAC	SC-E2-110VAC	SC-E2-220VAC	SC-E2G-24VDC	TK-E2-4200	32 to 42 Amps
30	52	SC-E3-24VAC	SC-E3-110VAC	SC-E3-220VAC	SC-E3G-24VDC	TK-E3-6500	45 to 65 Amps
37	65	SC-E5-24VAC	SC-E4-110VAC	SC-E4-220VAC	SC-E4G-24VDC	TK-E3-6800	48 to 68 Amps
45	77	SC-E5-24V*	SC-E5-100V*	SC-E5-200V*	SC-E5-24V*	TK-E5-9500	65 to 95 Amps
55	96	SC-E6-24V*	SC-E6-100V*	SC-E6-200V*	SC-E6-24V*	TK-E6-12500	85 to 125 Amps
75	124	SC-E7-24V*	SC-E7-100V*	SC-E7-200V*	SC-E7-24V*	TK-E6-16000	110 to 160 Amps

* SUPERMAGNET coil operates with AC or DC voltage.

¹ For 440-480 V three-phase motors up to 225kw refer to the Fuji Odyssey series.

² Per NEC 2005 table 430.250

Fuji Duo Series Manual Motor Starters



BM3RHB-xxx Specifications

General Specifications: 45 mm Frame Width - BM3RHB-XXX Series											
Part Number	Adjustable Current Range <i>I_e</i> : Min.-Max. (A)	UL/CSA 3-Phase kw Rating ¹				In aneous Trip Current (A)	UL/CSA Short Circuit Current Rating (kA) ²			Max. Listed Branch Circuit Protection - Fuse or MCCB (A) ²	
		200- 208VAC	220- 240VAC	440- 480VAC	550- 600VAC		240VAC	480VAC	600VAC		
BM3RHB-P16	0.1-0.16	Rated to motor full-load amperage				In accordance with motor full-load current	2.1	100	50	10	500
BM3RHB-P2	0.16-0.25						3.3	100	50	10	500
BM3RHB-P4	0.25-0.4						5.2	100	50	10	500
BM3RHB-P6	0.4-0.63						8.2	100	50	10	500
BM3RHB-001	0.63-1						0.37	0.37	13	100	50
BM3RHB-	1-1.6	0.18	0.22	0.55	0.55	20.8	100	50	10	500	
BM3RHB-2P5	1.6-2.5	0.55	0.55	0.75	1.1	32.5	100	50	10	500	
BM3RHB-004	2.5-4	0.55	0.55	2.2	2.2	52	100	50	10	500	
BM3RHB-6P3	4-6.3	0.75	1.1	3.7	3.7	81.9	100	50	10	500	
BM3RHB-010	6.3-10	1.5	2.2	5.5	5.5	130	100	50	10	500	
BM3RHB-013	9-13	2.2	2.2	7.5	7.5	169	100	50	10	500	
BM3RHB-016	11-16	2.2	3.7	7.5	7.5	208	100	50	10	500	
BM3RHB-020	14-20	3.7	3.7	11	11	260	100	50	10	500	
BM3RHB-025	19-25	5.5	5.5	15	15	325	100	50	10	500	
BM3RHB-032	24-32	7.5	7.5	22	22	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: 45 mm Frame Width - BM3RHB-XXX Series - continued		
Features	Adjustable thermal-magnetic trip type	
Number of Poles	3	
Handle Type	Rotary	
Rated Current <i>I_e</i> (A)	0.16 to 32	
Rated Operational Voltage <i>U_e</i> (V)	200 to 690	
Rated Frequency (Hz)	50/60	
Rated insulation Voltage <i>U_i</i> (V)	690	
Rated Impulse Withstand Voltage <i>U_{imp}</i> (kV)	6	
Utilization	IEC 60947-2 Circuit Breaker	
Category	IEC 60947-4-1 Motor Starter	
Trip Class IEC 60947-4-1	10	
Instantaneous Trip Characteristic	13 x <i>I_e</i> max.	
Power Loss (total of 3-pole)	7W: <i>I_n</i> =0.16 to 25A 8.5W: <i>I_n</i> =32A	
Mechanical Durability (operations)	100,000: <i>I_n</i> =0.16 to 25A 70,000: <i>I_n</i> =32A	
Electrical Durability (operations)	100,000: <i>I_n</i> =0.16 to 25A 70,000: <i>I_n</i> =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
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

BM3VHB-xxx Specifications

General Specifications: 55 mm Frame Width - BM3VHB-XXX Series											
Part Number	Adjustable Current Range <i>I_e</i> : Min.-Max. (A)	UL/CSA 3-Phase kw Rating ¹				Instantaneous Trip Current (A)	UL/CSA Short Circuit Current Rating (kA) ²			Max. Listed Branch Circuit Protection - Fuse or MCCB (A) ²	
		200-208VAC	220-240VAC	440-480VAC	550-600VAC		240VAC	480VAC	600VAC		
BM3VHB-010	6.3-10	1.5	2.2	3.7	5.5	130	100	50	10	600	
BM3VHB-013	9-13	2.2	2.2	5.5	7.5	169	100	50	10	600	
BM3VHB-016	11-16	2.2	3.7	7.5	7.5	208	100	50	10	600	
BM3VHB-020	14-20	3.7	3.7	7.5	11	260	100	50	10	600	
BM3VHB-025	19-25	5.5	5.5	11	15	325	100	50	10	600	
BM3VHB-032	24-32	7.5	7.5	15	22	416	100	50	10	600	
BM3VHB-040	28-40	7.5	7.5	22	22	520	100	50	10	600	
BM3VHB-050	35-50	11	11	22	30	650	100	50	10	600	
BM3VHB-063	45-63	15	15	30	45	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: 55 mm Frame Width - BM3VHB-XXX Series - continued		
Features	Adjustable thermal-magnetic trip type	
Number of Poles	3	
Handle Type	Rotary	
Rated Current <i>I_e</i> (A)	10 to 63	
Rated Operational Voltage <i>U_e</i> (V)	200 to 690	
Rated Frequency (Hz)	50/60	
Rated Insulation Voltage <i>U_i</i> (V)	1,000	
Rated Impulse Withstand Voltage <i>U_{imp}</i> (kV)	8	
Utilization Category	IEC 60947-2 Circuit Breaker IEC 60947-4-1 Motor Starter	
Trip Class IEC 60947-4-1	Cat. A AC-3	
Instantaneous Trip Characteristic	10	
Power Loss (total of 3-pole)	11W: <i>I_n</i> = 10 to 32A 15W: <i>I_n</i> = 40 to 50A 17W: <i>I_n</i> = 63A	
Mechanical Durability (operations)	13 x <i>I_e</i> max.	
Electrical Durability (operations)	50,000	
Max. Operations per Hour (motor start-up)	25,000	
Phase-Loss Protection	25	
Trip Indicator	Provided	
Test Trip Function	Provided	
Dimensions (mm) WxHxD	Provided	
Weight (oz/g)	55x110x96 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.

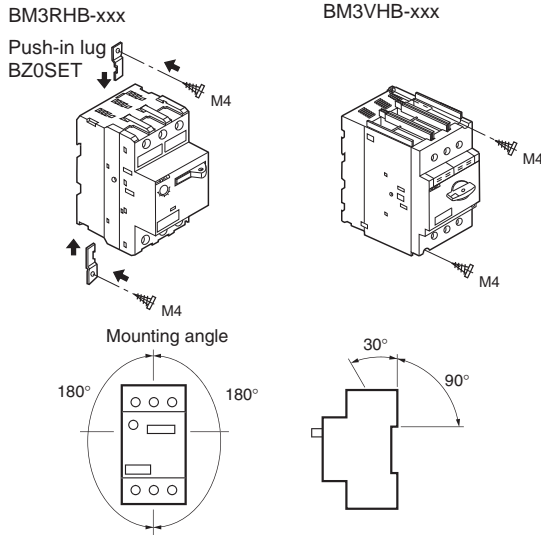
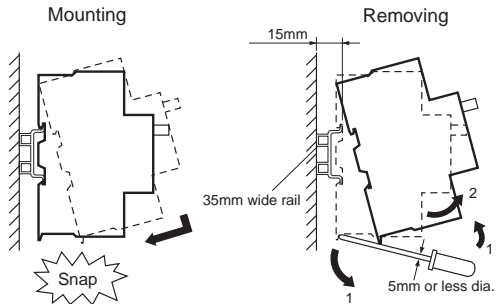
Applicable rail:

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 (BZOSET) is required for screw mounting the BM3R frame. The BM3V frame can be screw mounted directly to the panel.



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/s ²	No abnormal shock or vibration.
Shock	50m/s ²	

Wiring Specifications

Wire Size and Tightening Torque

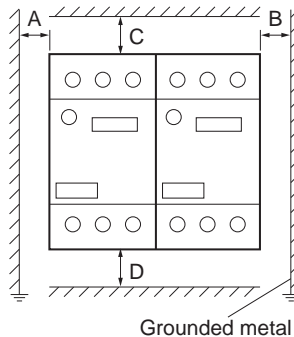
Type	BM3RHB-XXX	BM3VHB-XXX	BZO Accessories
Solid Wire (mm)	1.6 to 2.6 dia.	1.6 to 2.6 dia.	1 to 1.6 dia.
Stranded Wire (mm²)	Single-wire 1 to 10 2-wire 1 to 6	1 to 25 1 to 16	0.5 to 2.5 0.5 to 2.5
AWG	Single-wire 18 to 8 2-wire 18 to 10	18 to 4 18 to 4	18 to 14 18 to 14
Sheath Stripping Length (mm)	Approx.10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

Arc Space Requirements

Part Number	Rated operational voltage U _e (V)	Minimum distance to grounded metal (mm)	
		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 Combination Starter Selection Table - 45 mm

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

Combination Starter Selection Table - 45 mm										
Three Phase Motor					A	B	C	D		
220-240 Volt		440-480 Volt								
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.	Contactor 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	BZOLRE22AA BZOLRE22GA	BZ0BPRE22A	65	
-	-	-	-	0.16 to 0.25	BM3RHB-P25	SC-E02-110VAC SC-E02G-24VDC	BZOLRE22AA BZOLRE22GA		65	
-	-	-	-	0.25 to 0.4	BM3RHB-P40	SC-E02-110VAC SC-E02G-24VDC	BZOLRE22AA BZOLRE22GA		65	
-	-	-	-	0.4 to 0.63	BM3RHB-P63	SC-E02-110VAC SC-E02G-24VDC	BZOLRE22AA BZOLRE22GA		65	
-	-	-	-	0.63 to 1.0	BM3RHB-001	SC-E02-110VAC SC-E02G-24VDC	BZOLRE22AA BZOLRE22GA		65	
-	-	0.75	1.6	1.0 to 1.6	BM3RHB-1P6	SC-E02-110VAC SC-E02G-24VDC	BZOLRE22AA BZOLRE22GA		65	
0.5	2.2	1	2.1	1.6 to 2.5	BM3RHB-2P5	SC-E02-110VAC SC-E02G-24VDC	BZOLRE22AA BZOLRE22GA		65	
0.75	3.2	2	3.4	2.5 to 4.0	BM3RHB-004	SC-E02-110VAC SC-E02G-24VDC	BZOLRE22AA BZOLRE22GA		65	
1.5	6	3	4.8	4.0 to 6.3	BM3RHB-6P3	SC-E02-110VAC SC-E02G-24VDC	BZOLRE22AA BZOLRE22GA		65	
-	-	5	7.6	6.3 to 10	BM3RHB-010	SC-E02-110VAC SC-E02G-24VDC	BZOLRE22AA BZOLRE22GA		65	
3	9.6	7.5	11	9 to 13	BM3RHB-013	SC-E03-110VAC SC-E03G-24VDC	BZOLRE22AA BZOLRE22GA		65	
5	15.2	10	14	11 to 16	BM3RHB-016	SC-E04-110VAC SC-E04G-24VDC	BZOLRE22AA BZOLRE22GA		65	
5	15.2	10	14	14 to 20	BM3RHB-020	SC-E04-110VAC SC-E04G-24VDC	BZOLRE22AA BZOLRE22GA		65	
7.5	22	15	21	19 to 25	BM3RHB-025	SC-E05-110VAC SC-E05G-24VDC	BZOLRE22AA BZOLRE22GA		50	
10	28	20	27	24 to 32	BM3RHB-032	SC-E1-110VAC SC-E1G-24VDC	BZOLRE32AA BZOLRE32GA		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, 3.7kw(5hp) , 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

PLC Overview

DL05/06 PLC

DL105 PLC

DL205 PLC

DL305 PLC

DL405 PLC

Field I/O

Software

C-more HMIs

Other HMI

AC Drives

Motors

Steppers/Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pushbuttons/Lights

Process

Relays/Timers

Comm.

TB's & Wiring

Power

Circuit Protection

Enclosures

Appendix

Part Index

Fuji Duo Series Combination Starter Selection Table - 55 mm



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

Combination Starter Selection Table - 55 mm									
Three Phase Motor				Manual Motor Starter Adjustable Current Range (A)	A Manual Motor Starter See Note 2 below for UL Type E applications.	B Contactor The contactor part number needs the coil voltage suffix. See Note 3 below.	C Link Module	D Base Plate	SCCR at 480Y/277 VAC (kA) type F coordination
220-240 Volt		440-480 Volt							
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						
3	9.6	5	7.6	6.3 to 10	BM3VHB-010	SC-E1-110VAC	BZOLVE51AA	BZ0BPVE51A	65
						SC-E1G-24VDC	BZOLVE51GA		
3	9.6	7.5	11	9 to 13	BM3VHB-013	SC-E1-110VAC	BZOLVE51AA		65
						SC-E1G-24VDC	BZOLVE51GA		
5	15.2	10	14	11 to 16	BM3VHB-016	SC-E1-110VAC	BZOLVE51AA		65
						SC-E1G-24VDC	BZOLVE51GA		
5	15.2	10	14	14 to 20	BM3VHB-020	SC-E1-110VAC	BZOLVE51AA		65
						SC-E1G-24VDC	BZOLVE51GA		
7.5	22	15	21	19 to 25	BM3VHB-025	SC-E1-110VAC	BZOLVE51AA		65
						SC-E1G-24VDC	BZOLVE51GA		
10	28	20	27	24 to 32	BM3VHB-032	SC-E1-110VAC	BZOLVE51AA		65
						SC-E1G-24VDC	BZOLVE51GA		
10	28	30	40	28 to 40	BM3VHB-040	SC-E2-110VAC	BZOLVE51AA		65
						SC-E2G-24VDC	BZOLVE51GA		
15	42	30	40	35 to 50	BM3VHB-050	SC-E2S-110VAC	BZOLVE51AA	65	
						SC-E2SG-24VDC	BZOLVE51GA		
20	54	40	52	45 to 63	BM3VHB-063	SC-E3-110VAC	BZOLVE65AA	BZ0BPVE65A	65
						SC-E3G-24VDC	BZOLVE65GA		

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, 7.5kw (10hp) , 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