CWC Series Miniature Contactors

The CWC series mini contactors are a complete solution for switching and controlling motors. The CWC's compact dimensions for its IEC current rating, up to 22A, AC-3 utilization category, allows it to take up less space inside electrical enclosures while still maintaining a powerful 15hp @ 460V. Dimensions of the 7A to 16A contactors are the same for both AC or DC coil voltages, making the panel design and assembly easier. DC models feature low consumption coils allowing the CWC to be operated directly from a PLC without interface relays.

Features

- Rated up to 15hp @ 460V
- Direct mounting to the WEG RW17D overload relay
- Frame size is identical for AC and DC coil contactors up to 16A (CWC07-16).
- CWC025 frame available with AC coil only
- Heavy-duty operation
- Tool-free DIN-rail mounting
- WEG 18-month warranty
- Snap-on accessories
- DC coil low consumption: 1.7–2.7 W
- DC coil standard consumption: 2.6–3.7 W

Agency Approvals/ Certifications

- cULus listed (File No. E202315/E189202)
- CE marked low voltage directive 2006/95/EC

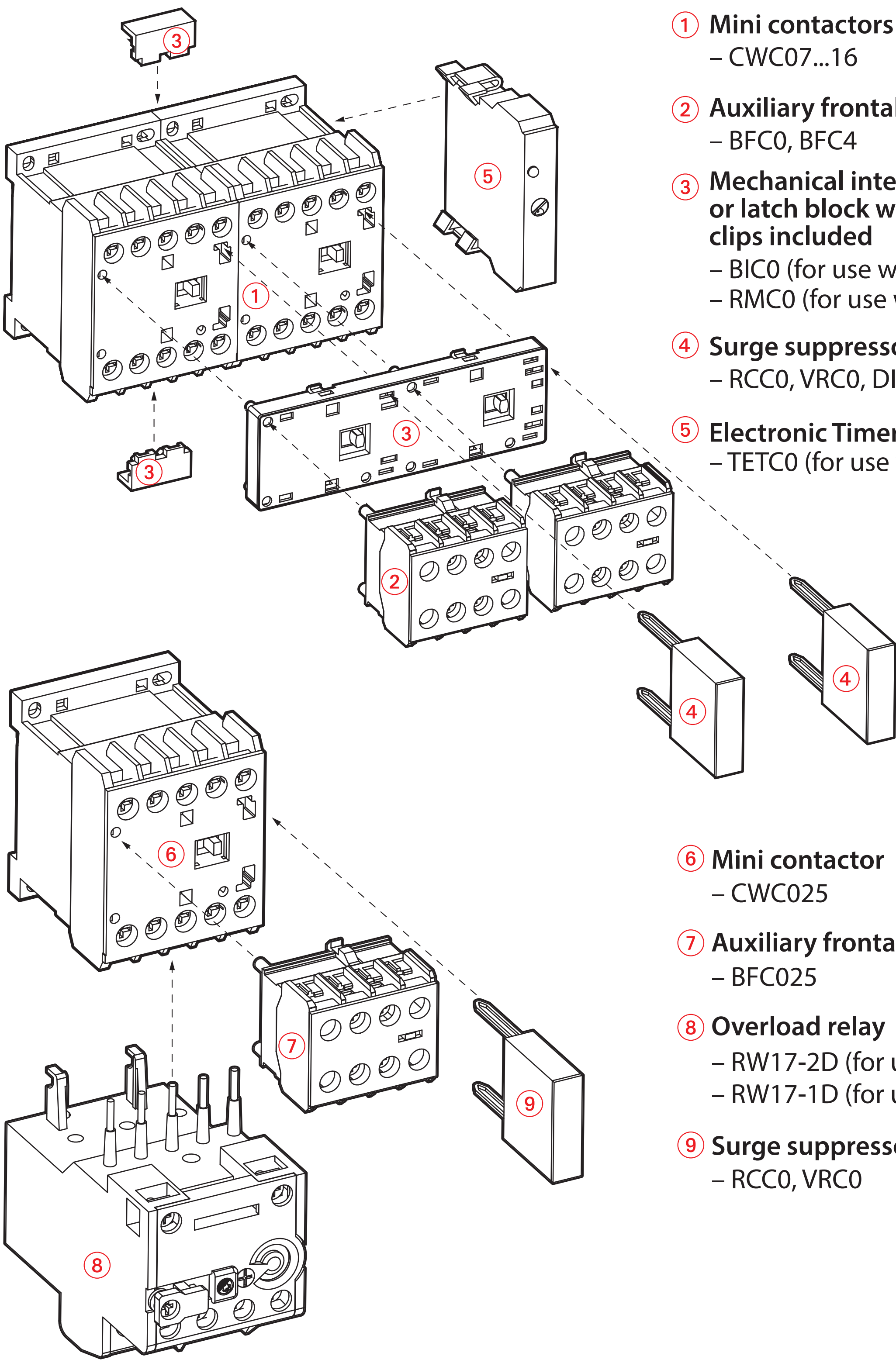
Standards

- IEC/EN 60947-1
- UL 508
- CSA-C22.2 No. 14

More Horsepower in a Smaller Frame

CWC Series Miniature Contactors

Overview



① **Mini contactors**
– CWC07...16

② **Auxiliary frontal contact block**
– BFC0, BFC4

③ **Mechanical interlock block or latch block with connecting clips included**
– BIC0 (for use with CWC07...16)
– RMC0 (for use with CWC07...16)

④ **Surge suppressor blocks**
– RCC0, VRC0, DIC0

⑤ **Electronic Timers**
– TETC0 (for use with CWC07...25)

⑥ **Mini contactor**
– CWC025

⑦ **Auxiliary frontal contact block**
– BFC025

⑧ **Overload relay**
– RW17-2D (for use with CWC025)
– RW17-1D (for use with CWC07...16)

⑨ **Surge suppressor blocks**
– RCC0, VRC0

CWC Series Miniature Contactors Configuration

Three-Pole Contactors

Part Number	Price	Current Rating		Maximum Rated Operational Power kW [hp]						Number of Contacts			Coil Voltage and Frequency
		AC-3 (A)	AC-1 (A)	220V 230V	380V	400V 415V	440V	500V	660V 690V	Main	Built-in Aux Contacts N.O.	Built-in Aux Contacts N.C.	
Three-Pole Mini Contactors with AC Coil (IEC/EN – 60947-1)													
CWC07-10-30V04	$14.50	7	18	1.5 [2]	3 [4]	3 [4]	3.7 [5]	3.7 [5]	3 [4]	3	1	–	24VAC 60Hz
CWC07-10-30V18	$14.50									3	1	–	120VAC 60Hz/110VAC 50Hz
CWC07-10-30V24	$14.50									3	1	–	208-240 VAC 60Hz
CWC07-10-30V47	$14.50									3	1	–	480VAC 60Hz/400-415 VAC 50Hz
CWC07-01-30V04	$14.50									3	–	1	24VAC 60Hz
CWC07-01-30V18	$14.50									3	–	1	120VAC 60Hz/110VAC 50Hz
CWC07-01-30V24	$14.50									3	–	1	208-240 VAC 60Hz
CWC07-01-30V47	$14.50									3	–	1	480VAC 60Hz/400-415 VAC 50Hz
CWC09-10-30V04	$15.50	9	20	2.2 [3]	4 [5.4]	4 [5.4]	4.5 [6]	4.5 [6]	4 [5.4]	3	1	–	24VAC 60Hz
CWC09-10-30V18	$15.50									3	1	–	120VAC 60Hz/110VAC 50Hz
CWC09-10-30V24	$15.50									3	1	–	208-240 VAC 60Hz
CWC09-10-30V47	$15.50									3	1	–	480VAC 60Hz/400-415 VAC 50Hz
CWC09-01-30V04	$15.50									3	–	1	24VAC 60Hz
CWC09-01-30V18	$15.50									3	–	1	120VAC 60Hz/110VAC 50Hz
CWC09-01-30V24	$15.50									3	–	1	208-240 VAC 60Hz
CWC012-10-30V04	$18.50	12	22	3 [4]	5.5 [7.5]	5.5 [7.5]	5.5 [7.5]	5.5 [7.5]	5.5 [7.5]	3	1	–	24VAC 60Hz
CWC012-10-30V18	$18.50									3	1	–	120VAC 60Hz/110VAC 50Hz
CWC012-10-30V24	$18.50									3	1	–	208-240 VAC 60Hz
CWC012-10-30V47	$18.50									3	1	–	480VAC 60Hz/400-415 VAC 50Hz
CWC012-01-30V04	$18.50									3	–	1	24VAC 60Hz
CWC012-01-30V18	$18.50									3	–	1	120VAC 60Hz/110VAC 50Hz
CWC012-01-30V24	$18.50									3	–	1	208-240 VAC 60Hz
CWC012-01-30V47	$18.50									3	–	1	480VAC 60Hz/400-415 VAC 50Hz
CWC016-10-30V04	$21.00	16	22	4 [5.4]	7.5 [10]	7.5 [10]	7.5 [10]	7.5 [10]	7.5 [10]	3	1	–	24VAC 60Hz
CWC016-10-30V18	$21.00									3	1	–	120VAC 60Hz/110VAC 50Hz
CWC016-10-30V24	$21.00									3	1	–	208-240 VAC 60Hz
CWC016-10-30V47	$21.00									3	1	–	480VAC 60Hz/400-415 VAC 50Hz
CWC016-01-30V04	$21.00									3	–	1	24VAC 60Hz
CWC016-01-30V18	$21.00									3	–	1	120VAC 60Hz/110VAC 50Hz
CWC016-01-30V24	$21.00									3	–	1	208-240 VAC 60Hz
CWC016-01-30V47	$21.00									3	–	1	480VAC 60Hz/400-415 VAC 50Hz
CWC025-00-30V04	$24.00	22	32	5.5 [7.5]	11 [15]	11 [15]	11 [15]	11 [15]	11 [15]	3	–	–	24VAC 60Hz
CWC025-00-30V18	$24.00									3	–	–	120VAC 60Hz/110VAC 50Hz
CWC025-00-30V24	$24.00									3	–	–	208-240 VAC 60Hz
CWC025-00-30V47	$24.00									3	–	–	480VAC 60Hz/400-415 VAC 50Hz
Three-Pole Mini Contactors with DC Coil (IEC/EN – 60947-1)													
CWC07-10-30L02	$18.50	7	18	1.5 [2]	3 [4]	3 [4]	3.7 [5]	3.7 [5]	3 [4]	3	1	–	12VDC low consumption
CWC07-10-30L03	$18.50									3	1	–	24VDC low consumption
CWC07-01-30L02	$18.50									3	–	1	12VDC low consumption
CWC07-01-30L03	$18.50									3	–	1	24VDC low consumption
CWC09-10-30L02	$20.50	9	20	2.2 [3]	4 [5.4]	4 [5.4]	4.5 [6]	4.5 [6]	4 [5.4]	3	1	–	12VDC low consumption
CWC09-10-30L03	$20.50									3	1	–	24VDC low consumption
CWC09-01-30L02	Retired									3	–	1	12VDC low consumption
CWC09-01-30L03	$20.50									3	–	1	24VDC low consumption
CWC012-10-30L02	$22.00	12	22	3 [4]	5.5 [7.5]	5.5 [7.5]	5.5 [7.5]	5.5 [7.5]	5.5 [7.5]	3	1	–	12VDC low consumption
CWC012-10-30L03	$22.00									3	1	–	24VDC low consumption
CWC012-01-30L02	$22.00									3	–	1	12VDC low consumption
CWC012-01-30L03	$22.00									3	–	1	24VDC low consumption
CWC016-10-30L02	$24.00	16	22	4 [5.4]	7.5 [10]	7.5 [10]	7.5 [10]	7.5 [10]	7.5 [10]	3	1	–	12VDC low consumption
CWC016-10-30L03	$24.00									3	1	–	24VDC low consumption
CWC016-01-30L02	$24.00									3	–	1	12VDC low consumption
CWC016-01-30L03	$24.00									3	–	1	24VDC low consumption

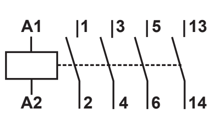
Note: Low consumption 12VDC and 24VDC contactors can only use 2-pole auxiliary contact blocks.

CWC Series Miniature Contactors Configuration

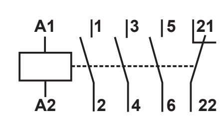
Four-Pole Contactors

Part Number	Price	Current Rating AC-3 (A)	Current Rating AC-1 (A)	Maximum Rated Operational Power KW [hp] 230V 230V	380V	400V 415V	440V	500V	660V 690V	Number of Main Contacts NO	NC	Coil Voltage and Frequency
Four-Pole Mini Contactors with AC Coil (IEC/EN – 60947-1)												
CWC07-00-40V04	$16.00	7	18	1.5 [2]	3 [4]	3 [4]	3.7 [5]	3.7 [5]	3 [4]	4	–	24VAC 60Hz
CWC07-00-40V18	$16.00									4	–	120VAC 60Hz/110VAC 50Hz
CWC07-00-40V24	$16.00									4	–	208-240 VAC 60Hz
CWC07-00-40V47	$16.00									4	–	480VAC 60Hz/400-415 VAC 50Hz
CWC07-00-22V04	$16.00									2	2	24VAC 60Hz
CWC07-00-22V18	$16.00									2	2	120VAC 60Hz/110VAC 50Hz
CWC07-00-22V24	$16.00									2	2	208-240 VAC 60Hz
CWC07-00-22V47	$16.00									2	2	480VAC 60Hz/400-415 VAC 50Hz
CWC09-00-40V04	$17.50	9	20	2.2 [3]	4 [5.4]	4 [5.4]	4.5 [6]	4.5 [6]	4 [5.4]	4	–	24VAC 60Hz
CWC09-00-40V18	$17.50									4	–	120VAC 60Hz/110VAC 50Hz
CWC09-00-40V24	$17.50									4	–	208-240 VAC 60Hz
CWC09-00-40V47	$17.50									4	–	480VAC 60Hz/400-415 VAC 50Hz
CWC09-00-22V04	$17.50									2	2	24VAC 60Hz
CWC09-00-22V18	$17.50									2	2	120VAC 60Hz/110VAC 50Hz
CWC09-00-22V24	$17.50									2	2	208-240 VAC 60Hz
CWC09-00-22V47	Retired									2	2	480VAC 60Hz/400-415 VAC 50Hz
CWC016-00-40V04	$23.50	16	22	4 [5.4]	7.5 [10]	7.5 [10]	7.5 [10]	7.5 [10]	7.5 [10]	4	–	24VAC 60Hz
CWC016-00-40V18	$23.50									4	–	120VAC 60Hz/110VAC 50Hz
CWC016-00-40V24	$23.50									4	–	208-240 VAC 60Hz
CWC016-00-40V47	$23.50									4	–	480VAC 60Hz/400-415 VAC 50Hz
CWC016-00-22V04	$23.50									2	2	24VAC 60Hz
CWC016-00-22V18	$23.50									2	2	120VAC 60Hz/110VAC 50Hz
CWC016-00-22V24	$23.50									2	2	208-240 VAC 60Hz
CWC016-00-22V47	$23.50									2	2	480VAC 60Hz/400-415 VAC 50Hz
Four-Pole Mini Contactors with DC Coil (IEC/EN – 60947-1)												
CWC07-00-40L02	Retired	7	18	1.5 [2]	3 [4]	3 [4]	3.7 [5]	3.7 [5]	3 [4]	4	–	12VDC Low consumption
CWC07-00-40L03	$19.50									4	–	24VDC Low consumption
CWC07-00-22R02	Retired									2	2	12VDC Standard consumption
CWC07-00-22R03	$19.50									2	2	24VDC Standard consumption
CWC09-00-40L02	$21.00	9	20	2.2 [3]	4 [5.4]	4 [5.4]	4.5 [6]	4.5 [6]	4 [5.4]	4	–	12VDC Low consumption
CWC09-00-40L03	$21.00									4	–	24VDC Low consumption
CWC09-00-22R02	$21.00									2	2	12VDC Standard consumption
CWC09-00-22R03	$21.00									2	2	24VDC Standard consumption
CWC016-00-40L02	$27.00	16	22	4 [5.4]	7.5 [10]	7.5 [10]	7.5 [10]	7.5 [10]	7.5 [10]	4	–	12VDC Low consumption
CWC016-00-40L03	$27.00									4	–	24VDC Low consumption
CWC016-00-22R02	$27.00									2	2	12VDC Standard consumption
CWC016-00-22R03	$27.00									2	2	24VDC Standard consumption

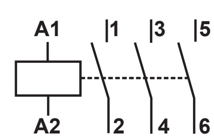
Note: Low consumption 12VDC and 24VDC contactors can only use 2-pole auxiliary contact blocks.



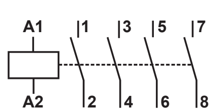
CWC07-10...cwc016-10



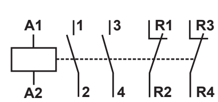
CWC07-01...cwc016-01



CWC025-00



CWC07-00-40...cwc016-00-40



CWC07-00-22...cwc016-00-22

CWC Series Miniature Contactors Configuration

How to Identify Your Part Number

CWC	09	-	10	-	30	V18

MINIATURE CONTACTOR SERIES CWC

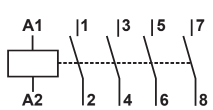
FRAME RATING	
07	7A
09	9A
012	12A
016	16A
025	22A

BUILT-IN AUXILIARY CONTACTS	
00	None
10	1 NO (13 – 14 NO)
01	1 NC (21 – 22 NC)

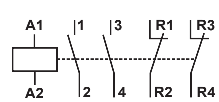
POWER POLE	
30	CWC0 with 3 NO Power Poles (L1/T1, L2/T2, L3/T3)
22	CWC0 with 2 NO + 2 NC Power Poles (L1/T1, L2/T2, L3/T3, L4/T4)
40	CWCO with 4 NO Power Poles (L1/T1, L2/T2, L3/T3, L4/T4)

COIL VOLTAGE	
VAC COIL	
V04	24VAC 60Hz
V18	120VAC 60Hz
V24	208-240 VAC 60Hz
V47	480VAC 60Hz
VDC Coil (std consumption)	
R02	12VDC
R03	24VDC
VDC Coil (low consumption)	
L02	12VDC
L03	24VDC

Note: For reference only. Not intended to build a part number.



CWC07-00-40...cwc016-00-40



CWC07-00-22...cwc016-00-22

CWC Series Miniature Contactors Technical Characteristics

CWC Miniature Contactors General Technical Characteristics

Contactor Part Numbers			CWC07	CWC09	CWC012	CWC016	CWC025
Standards			IEC/EN 60947-1, IEC/EN 60947-4, DIN VDE 0660(102), UL508				
Rated Insulation Voltage U_i (Pollution Degree 3)	IEC/EN 60947-4-1, VDE 0660	(V)	690				
	UL, CSA	(V)	600				
Rated Impulse Withstand Voltage U_{imp}	(IEC/EN 60947-1)	(kV)	4				
Rated Operational Frequency (Contact Switchable)		(Hz)	25–400				
Mechanical Lifespan	AC coil	Ops x 10^6	10				3
	DC coil	Ops x 10^6	12				–
Electrical Lifespan	I_e AC-3	Ops x 10^6	1.4	1.3	1.2	1.1	0.6
Degree of Protection (VDE 0160)	Main circuits		IP20				
	Control circuits and auxiliary contacts		IP20				
Mounting			Screw or DIN-rail 35mm (EN 50022)				
Coil Terminals			2				
Vibration Resistance	Contactor open	(g)	2				
	Contactor closed	(g)	4				
Mechanical Shock Resistance (½ sinusoid = 11ms)	Contactor open	(g)	6				
	Contactor closed	(g)	10				
Ambient Temperature	Operation		-25 to +55°C [-13 to +131°F]				
	Storage		-55 to +80°C [-67 to +176°F]				
Maximum Operating Altitude (Without Derating)			Up to 3000m [9842.5 ft]				
Altitude derating	0.72 x rated hp		3000 – 4000 m [9842.5 – 13123.4 ft]				
	0.60 x rated hp		4000 – 5000 m [13123.4 – 16404.2 ft]				

UL508 and IEC/EN Specifications

Contactor part numbers			CWC07	CWC09	CWC012	CWC016	CWC025
Standards			UL508/CSA Ratings				
Rated Operating Voltage		(V)	600				
UL General Purpose Rating		(A)	18	20	22	22	30
Switching Motor Loads Full Voltage		(Hz)	50/60				
1-phase	115V	(A)	7.2	7.2	9.8	16	20
	230V	(A)	6.9	8	12	12	17
	115V	(hp)	1/3	1/3	1/2	1	1-1/2
	230V	(hp)	3/4	1	2	2	3
3-phase	208V	(A)	6.9	7.8	11	11	17.5
	230V	(A)	6	9.6	9.6	15.2	22
	460V	(A)	7.6	7.6	11	14	21
	575V	(A)	6.1	9	9	11	17
	208V	(hp)	1-1/2	2	3	3	5
	230V	(hp)	1-1/2	3	3	5	7-1/2
	460V	(hp)	5	5	7-1/2	10	15
	575V	(hp)	5	7-1/2	7-1/2	10	15
Short Circuit Current Rating (SCCR)	600V	(kA)	5	5	5	5	5
Standards			IEC Ratings (IEC/EN 60947)				
Rated Operating Voltage		(V)	690				
Rated Thermal Current I_{th}	AC-1 (≤55°C)	(A)	18	20	22	22	32
	AC-3 (U_e ≤ 440V)	(A)	7	9	12	16	22
Switching Motor Loads		(Hz)	50/60				
3-phase	220-240 V	(A)	7	9	12	16	22
	380-400 V	(A)	7	9	12	16	22
	415-440 V	(A)	7	9	12	16	22
	500V	(A)	6.2	7.5	8.8	13	16
	660-690 V	(A)	4.5	5.5	6.6	10	13
	220-240 V	(kW)	1.5	2.2	3	3.7	5.5
	380-400 V	(kW)	3	3.7	5.5	7.5	11
	415-440 V	(kW)	3.7	4.5	5.5	7.5	11
	500V	(kW)	3.7	4.5	5.5	7.5	11
	660-690 V	(kW)	3	3.7	5.5	7.5	11

CWC Series Miniature Contactors Technical Characteristics

Control Circuit - Alternating Current (AC)							
Contactor part numbers			CWC07	CWC09	CWC012	CWC016	CWC025
Rated Insulation Voltage U_i (Pollution Degree 3)	IEC/EN 60947-4-1, VDE 0660	(V)	1000				
	UL, CSA	(V)	600				
Coils Rated Voltage	50Hz	(V)	10-550				
	60Hz	(V)	12-660				
	50/60 Hz	(V)	12-660				
Coil operating limits							
Coil 60Hz	Pick up percent of voltage	(%)	40–76				
	Drop out percent of voltage	(%)	25–65				
Coil 50/60 Hz	Pick up percent of voltage	(%)	50–80				
	Drop out percent of voltage	(%)	20–60				
Average consumption							
Coil 60Hz	Magnetic circuit closed	(VA)	2.5–3.5				10.8–13.2
	Power factor	(cos φ)	0.28				0.32
	Power dissipation per pole	(W)	2.6				–
	Magnetic circuit closing	(VA)	35				72
	Power factor	(cos φ)	0.85				0.93
Coil 50/60 Hz	Magnetic circuit closed	(VA)	2–3				4.56–5.8
	Magnetic circuit closing	(VA)	30				58
Average Time	Closing NO contacts	(ms)	8–20				13–16
	Opening NO contacts	(ms)	6–13				13.5–17

Control Circuit - Direct Current (DC)					
Contactor Part Numbers			CWC07, CWC09, CWC012, CWC016		
Coil Type			Standard	Low consumption	4P (2P/2R)
Rated Insulation Voltage U_i (Pollution Degree 3)	IEC/EN 60947-4-1, VDE 0660	(V)	1000		
	UL, CSA	(V)	600		
Standard Voltages		(V)	12–440		
Coil operating limits					
Coil Operating Limits	Pick up percent of voltage	(%)	40–70		
	Drop out percent of voltage	(%)	15–40		
Power consumption					
Power Consumption	Magnetic circuit closed	(W)	2.6–3.7	1.7–2.7	2.9–4
	Magnetic circuit closing	(W)	2.6–3.7	1.7–2.7	2.9–4
Operation Time	Closing NO contacts	(ms)	35–45		
	Opening NO contacts	(ms)	7–12		

CWC Series Miniature Contactors Technical Characteristics

CWC Series Miniature Contactors Power Circuit							
Contactor Part Numbers			CWC07	CWC09	CWC012	CWC016	CWC025
Rated Operational Current I_e	AC-3 ($U_e \leq$ 440V)	(A)	7	9	12	16	22
	AC-4 ($U_e \leq$ 440V)	(A)	2.8	3.5	4.5	5	9
	AC-1 (θ m 55°C, $U_e \leq$ 690V)	(A)	18	20	22	22	32
Rated Operational Voltage U_e	IEC/EN 60947-4-1, VDE 0660	(V)	690				
	UL, CSA[1]	(V)	600				
Rated Thermal Current I_{th} (θ ≤ 55°C)		(A)	18	20	22	22	32
Making capacity - IEC/EN 60947		(A)	70	90	120	160	250
Breaking Capacity IEC/EN 60947	($U_e \leq$ 400V)	(A)	50	72	96	128	200
	(U_e = 500V)	(A)	50	72	96	128	200
	(U_e = 690V)	(A)	35	54	72	96	150
Short-time Current (No Current Flowing During Recovery Time of 10 min and θ ≤ 40°C)	1 sec	(A)	250	250	250	250	–
	5 sec	(A)	125	125	125	125	–
	10 sec	(A)	95	95	95	95	–
	30 sec	(A)	70	70	70	70	–
	1 min	(A)	50	50	50	50	–
	3 min	(A)	40	40	40	40	–
Protection Against Short-Circuits With Fuses (IEC gL/gG)[2] or UL Class CC	@ 600V - UL/CSA[1]	(kA)	5				
	Coordination type 1	(A)	35	35	35	35	50
	Coordination type 2	(A)	20	20	25	25	35
Average Impedance Per Pole		(mh)	6	6	5	5	6
Average Power Dissipation Per Pole	AC-1	(W)	1.9	2.4	2.4	2.4	6.1
	AC-3	(W)	0.3	0.5	0.7	1.3	3.8
Utilization Category AC-3							
Rated Operational Current I_e (θ ≤ 55°C)	($U_e \leq$ 440V)	(A)	7	9	12	16	22
	($U_e \leq$ 500V)	(A)	6.2	7.5	8.8	13	16
	($U_e \leq$ 690V)	(A)	4.5	5.5	6.6	10	13
	($U_e \leq$ 1000V)	(A)	Not available				
Rated Operational Power	220/230 V	(kW)	1.5	2.2	3	3.7	5.5
		(hp)	2	3	4	5	7.5
	380V	(kW)	3	3.7	5.5	7.5	11
		(hp)	4	5	7.5	10	15
	400/415 V	(kW)	3	3.7	5.5	7.5	11
		(hp)	4	5	7.5	10	15
	440V	(kW)	3.7	4.5	5.5	7.5	11
		(hp)	5	6	7.5	10	15
	500V	(kW)	3.7	4.5	5.5	7.5	11
		(hp)	5	6	7.5	10	15
	660/690 V	(kW)	3	3.7	5.5	7.5	11
		(hp)	4	5	7.5	10	15
Maximum Electrical Operations per Hour	600 ops/hr	(%)	100	100	100	100	100
	1200 ops/hr	(%)	75	75	75	75	75
	3000 ops/hr	(%)	50	50	50	50	50
Utilization Category AC-4							
Rated Operational Current I_e AC-4 ($U_e \leq$ 440 V)		(A)	2.8	3.5	4.5	5	9
Rated Operational Power (200,000 Operations)	220/230 V	(kW)	0.55	0.75	0.75	1.1	2.2
		(hp)	0.7	1	1	1.5	2.9
	380/400 V	(kW)	1.1	1.1	1.8	2.2	4
		(hp)	1.5	1.5	2.4	2.9	5.4
	415V	(kW)	1.1	1.5	2.2	2.2	4.5
		(hp)	1.5	2	2.9	2.9	6
	440V	(kW)	1.1	1.5	2.2	2.2	4.5
		(hp)	1.5	2	2.9	2.9	6
	500V	(kW)	1.1	1.5	2.2	2.2	4.5
		(hp)	1.5	2	2.9	2.9	6
	660/690 V	(kW)	1.1	1.5	2.2	2.2	4.5
		(hp)	1.5	2	2.9	2.9	6

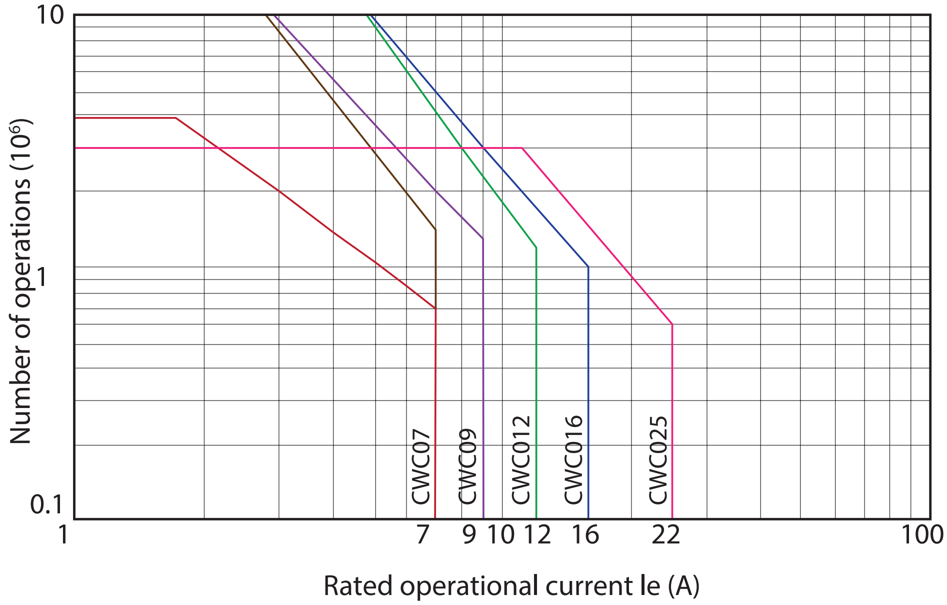
[1]Note: Specifications only valid for 50/60 Hz three-phase, 4 poles WEG standard motors.
[2]Note: Not sold by Automation Direct.

CWC Series Miniature Contactors Technical Characteristics

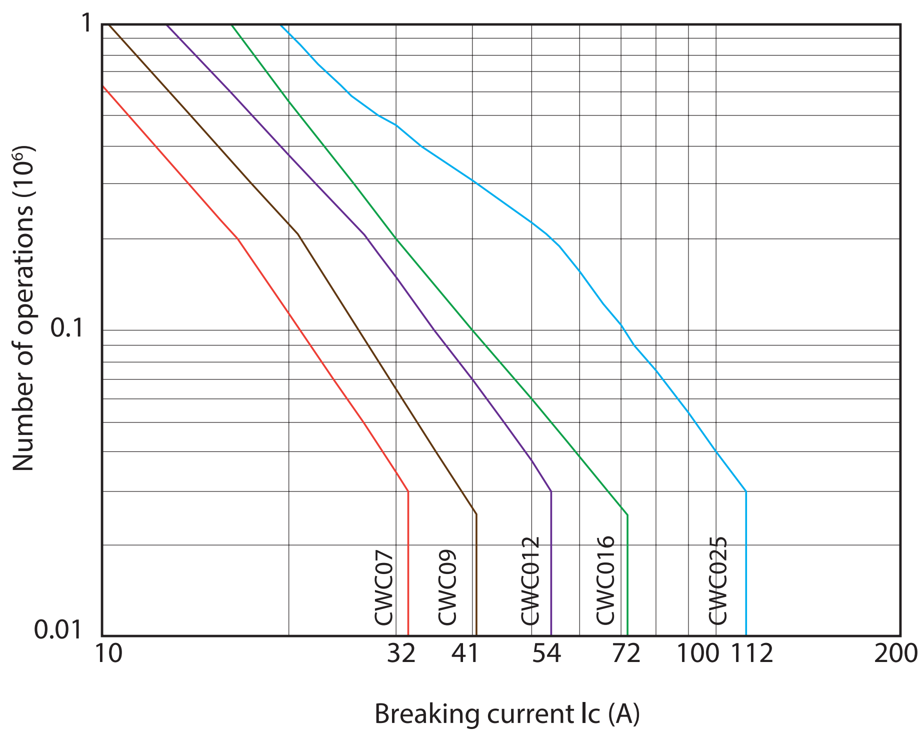
Built-In Auxiliary Contacts Technical Characteristics			
Standards	*IEC 60947-5-1, IEC 60947-4-1*		
Rated Insulation Voltage U_i (Pollution Degree 3)	*IEC, VDE 0660*	*(V)*	690
	UL, CSA	*(V)*	600
Rated Operational Voltage U_e	*IEC, VDE 0660*	*(V)*	690
	UL, CSA	*(V)*	600
Rated Thermal Current I_{th} ($\theta \leq 55°C$)		*(A)*	10
Rated Operational Current I_e			
AC-15 (IEC 60947-5-1)	*U_e ≤240V*	*(A)*	10
	380–400 V	*(A)*	6
	415–440 V	*(A)*	6
	500V	*(A)*	4
	660–690 V	*(A)*	2
UL/CSA			A600
DC-13 (IEC 60947-5-1)	*24V*	*(A)*	6
	60V	*(A)*	2
	110V	*(A)*	1
	220–240 V	*(A)*	0.3
UL/CSA			Q600
Making Capacity (rms)	*U_e 400 V 50/60 Hz - AC-15*	*(A)*	10 x I_e (AC-15)
Breaking Capacity (rms)	*U_e 400 V 50/60 Hz - AC-15*	*(A)*	10 x I_e (AC-15)
Maximum IEC Fuse Class gL/gG Without Welding (Short-Circuit Protection) gL/gG		*(A)*	10
Control Circuit Reliability		*(V/mA)*	17 / 5
Electrical Endurance	*(Millions operations)*		1
Mechanical Endurance	*(Milions operations)*		10

CWC Series Miniature Contactors Electrical Durability

AC-3 ($U_e \leq$ 440VAC)



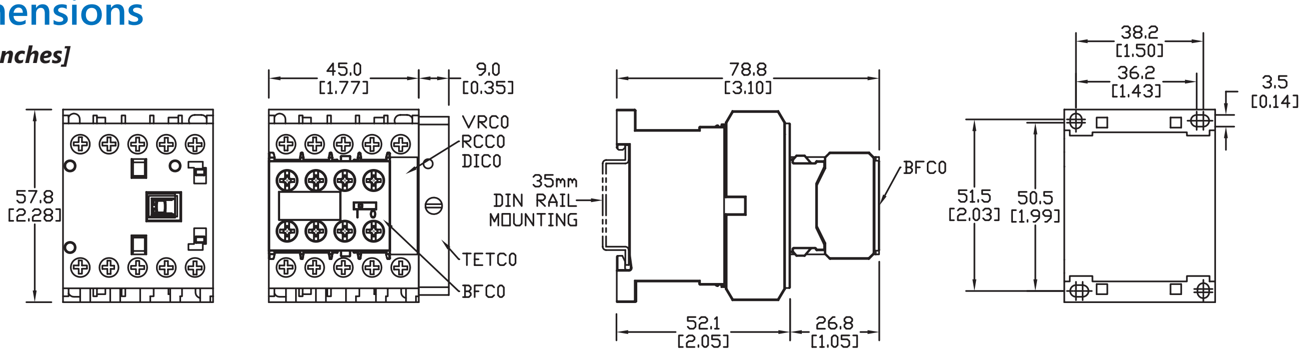
AC-4 ($U_e \leq$ 440VAC)



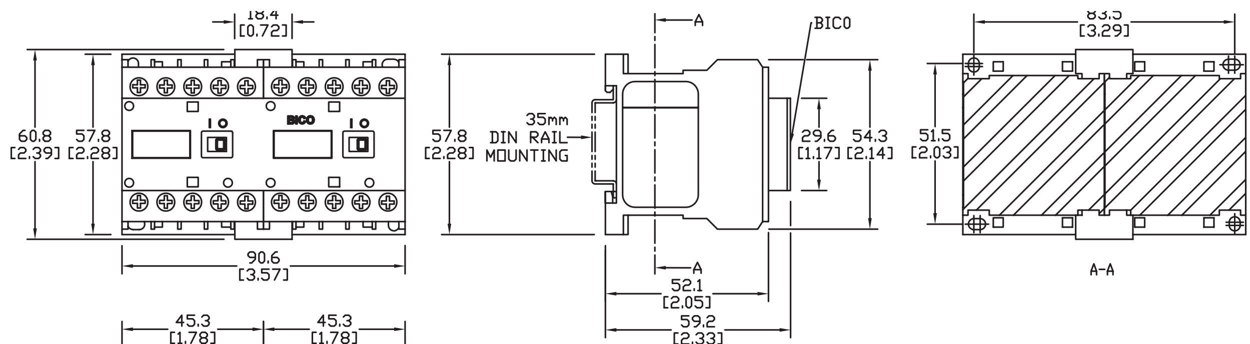
CWC Series Miniature Contactors Dimensions

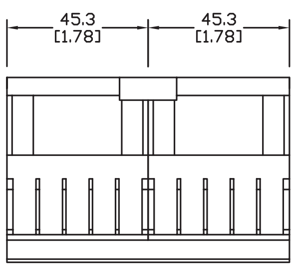
Dimensions

mm [inches]

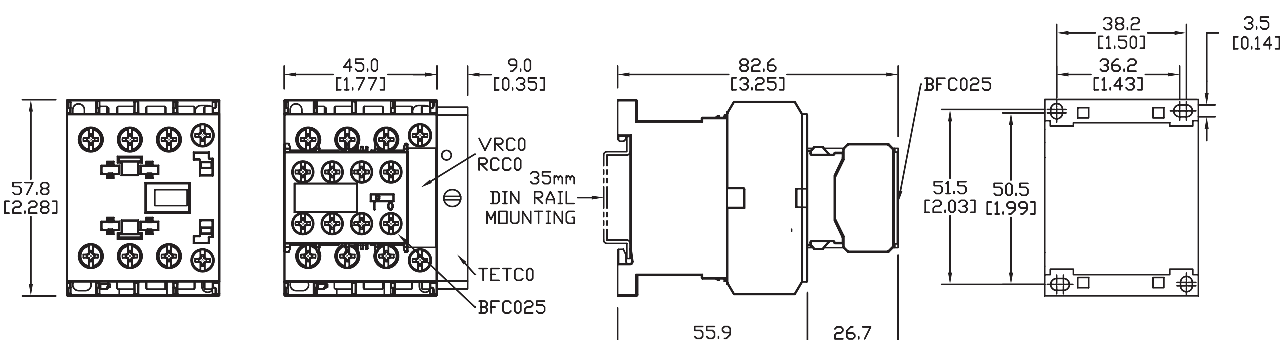


CWC07, CWC09, CWC012, CWC016 + VRCO/RCCO/DICO



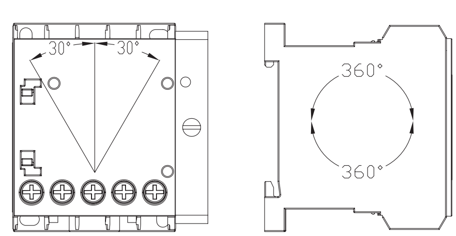


CWC07-16 + bico/RMCO



CWC025

Mounting position for CWC miniature contactors



CWC Series Miniature Contactors Accessories

Front Mounting Auxiliary Contact Blocks

Auxiliary Contact Blocks

Use With	Maximum # of Contacts	Auxiliary Contacts N.O.	Auxiliary Contacts N.C.	Terminal Markings	Part Number	Price
Three-Pole Contactors (CWC07, CWC09, CWC012, CWC016)	2	2	0	23 33 / 24 34	BFC0-20*	$5.00
	2	1	1	23 31 / 24 32	BFC0-11*	$5.00
	2	0	2	21 31 / 22 32	BFC0-02*	$5.00
	4	4	0	23 33 43 53 / 24 34 44 54	BFC0-40	$8.00
	4	2	2	23 31 41 53 / 24 32 42 54	BFC0-22	$8.00
	4	0	4	21 31 41 51 / 22 32 42 52	BFC0-04	$8.25
	4	3	1	23 31 43 53 / 24 32 44 54	BFC0-31	$8.00
	4	1	3	23 31 41 51 / 24 32 42 52	BFC0-13	$8.00
Three-Pole Contactors CWC025	2	2	0	23 33 / 24 34	BFC025-20	$5.00
	2	1	1	23 31 / 24 32	BFC025-11	$5.00
	2	0	2	21 31 / 22 32	BFC025-02	$5.00

Use With	Maximum # of Contacts	Auxiliary Contacts N.O.	Auxiliary Contacts N.C.	Terminal Markings	Part Number	Price
Four-Pole Contactors (CWC07, CWC09, CWC016)	2	2	0	13 23 / 14 24	BFC4-20*	$5.00
	2	1	1	13 21 / 14 22	BFC4-11*	$5.00
	2	0	2	11 21 / 12 22	BFC4-02*	$5.00
	4	4	0	13 23 33 43 / 14 24 34 44	BFC4-40	$8.00
	4	2	2	13 21 31 43 / 14 22 32 44	BFC4-22	$8.00
	4	0	4	11 21 31 41 / 12 22 32 42	BFC4-04	$8.00
	4	3	1	13 21 33 43 / 14 22 34 44	BFC4-31	$8.00
	4	1	3	13 21 31 41 / 14 22 32 42	BFC4-13	$8.00

*Note: Low consumption 12VDC and 24VDC contactors can only use 2-pole auxiliary contact blocks

BFC0-11

CWC Series Miniature Contactors Accessories

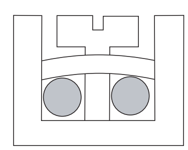
Auxiliary Contact Blocks Technical Specifications

Auxiliary Contacts BFC0/BFC4/BFC025 Technical Specifications			
Standards	***IEC 60947-5-1, IEC 60947-4-1***		
Rated Insulation Voltage U_i (Pollution Degree 3)	IEC, VDE 0660	(V)	1000
	UL, CSA	(V)	600
Rated Operational Voltage U_e	IEC, VDE 0660	(V)	690
	UL, CSA	(V)	600
Rated Thermal Current I_{th} ($\theta \leq 55°C$)		(A)	10
Making Capacity (rms)	Ue 400V 50/60 Hz - AC-15	(A)	30
Breaking Capacity (rms)	Ue 400V 50/60 Hz - AC-15	(A)	3
Maximum IEC Fuse Class gL/gG Without Welding (Short-Circuit Protection)		(A)	10
Minimum Switching Capacity		(V/mA)	17 / 5
Electrical Endurance	(Millions operations)		1
Mechanical Endurance	(Millions operations)		10

AC Auxiliary Contact Block Ratings UL/CSA											
Contact Rating Code Designation	***Thermal Continuous Current (A)***	***Maximum Current (A)***								***Maximum Apparent Power (VA)***	
		120V		***240V***		***480V***		***600V***			
		Make	***Break***	***Make***	***Break***	***Make***	***Break***	***Make***	***Break***	***Make***	***Break***
A600	10	60	6	30	3	15	1.5	12	1.2	7200	720
C600	2.5	15	1.5	7.5	0.75	3.75	0.375	3	0.3	1800	180

DC Auxiliary Contact Block Ratings UL/CSA				
Contact Rating Code Designation	***Thermal Continuous Current (A)***	***Maximum Make or Break Current (A)***		***Maximum Make or Break Apparent Power (VA)***
		125V	***250V***	
Q600	2.5	0.55	0.27	69
R300	1	0.22	0.11	28

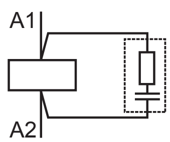
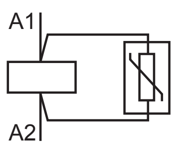
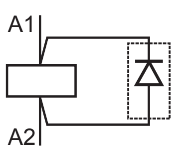
Terminals Capacity and Tightening Torque – Power, Control Circuits, and Auxiliary Contact Blocks

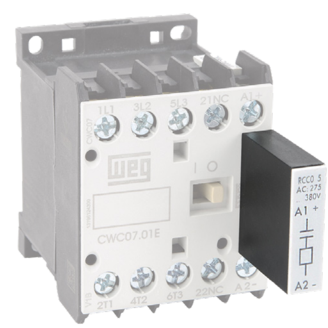


Terminals Capacity and Tightening Torque - Power, Control Circuits and Auxiliary Contact Blocks						
Terminal Type		***CWC07...16***		***CWC025***		***BFC0/BFC4/BFC025***
		Main Contacts	***Auxiliary Contacts***	***Main Contacts***	***Auxiliary Contacts***	***Auxiliary Contacts***
Solid Cable	***mm^2***	1x 0.5–2.5	2x 0.5–2.5	1x 0.5–2.5	2x 0.5–2.5 1x 4	–
		2x 0.5–2.5		2x 0.5–2.5		–
Cable Without Ferrule	***mm^2***	1x 0.75–2.5	2x 0.5–2.6	2x 1–2.5	1x 0.75–2.5	1x 0.75–4
		2x 0.75–2.5		2x 2.5–6	2x 0.75–2.5	2x 0.75–2.5
Cable With Ferrule	***mm^2***	1x 2.5	–	2x 1–2.5	1x 0.5–2.5	1x 0.5–4
		2x 2.5		2x 2.5–6	2x 0.5–2.5	2x 0.5–2.5
Wire Gauge	***AWG***	1 or 2x 18–12	22–14	1 or 2x 18–10	22–14	22–14
Terminal Screws		M3 flat/philips	M3.5 flat/philips	M3 flat/philips	M3.5 flat/philips	M3.5 flat/philips
Tightening Torque	***N·m [lb·in]***	1–1.5 [8.85–13.28]	1–1.7 [8.85–15.05]	1.4–1.7 [12.39–15.05]	1–1.5 [8.85–13.28]	0.8–1.5 [7.08–13.28]

CWC Series Miniature Contactors Accessories

Surge Suppressors

Surge Suppressors						
Part Number	**Price**	**Circuit Diagram**	**Voltage**	**Max. Clamping Voltage @ Current (Ip)**	**For Use With**	
RCC0-1D49	$4.25		12-24 VAC 50/60 Hz	N/A	RC Resistor/ Capacitor AC Loads (The capacitor is used to absorb the voltage spike)	CWC07 CWC09 CWC012 CWC016 CWC025
RCC0-2D53	$4.25		24-48 VAC 50/60 Hz			
RCC0-3D55	$4.25		50-127 VAC 50/60 Hz			
RCC0-4D63	$4.25		130-250 VAC 50/60 Hz			
RCC0-5D84	$4.25		275-380 VAC 50/60 Hz			
RCC0-6D73	$4.25		400-510 VAC 50/60 Hz			
VRC0-1E49	$4.25		12-48 VAC 50/60 Hz / 12-60 VDC	135V @ 10A	MOV Varistor AC or DC Loads The voltage surge is limited to 3 times the voltage rating of the suppressor (300% of the rated coil voltage). Clamps voltage	CWC07 CWC09 CWC012 CWC016 CWC025
VRC0-2E34	$4.25		50-127 VAC 50/60 Hz / 60-180 VDC	395V @ 10A		
VRC0-3E50	$4.25		130-250 VAC 50/60 Hz / 180-300 VDC	710V @ 10A		
VRC0-5D73	Retired		400-510 VAC 50/60 Hz	775V @ 10A		
DIC0-1C33	$4.25		12-600 VDC (1N4007)	N/A	Diode DC Loads The diode allows the reminiscent current to flow from a DC coil very smoothly and avoids an increase in voltage through the coil. Flyback suppression	CWC07 CWC09 CWC012 CWC016



RCC0-5D84

Electronic Timing Relays

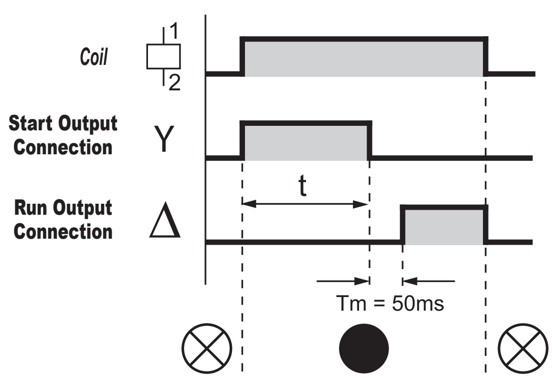
(CWC07...CWC025)

Star-Delta (TETCO) with LED Status Indication				
Part Number	**Price**	**Voltage**	**Timing**	**Function**
TETC0-U030S-D52	$41.50	24-28 VDC 50/60 Hz	3 to 30 seconds	Star-Delta
TETC0-U030S-D61	$41.50	110-130 VDC 50/60 Hz		
TETC0-U030S-D66	Retired	220-240 VDC 50/60 Hz		

Note: Right side mounting

TETC0-U030S-xxx

Timing Diagram

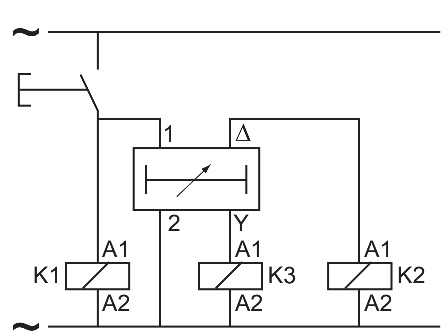


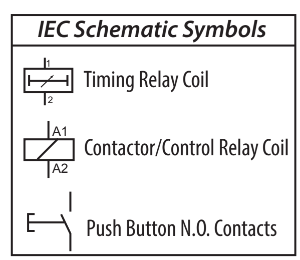
LED Off

LED On

Tm = Change over time

IEC Wiring Diagram





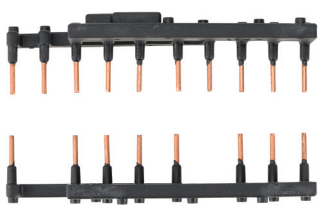
CWC Series Miniature Contactors Accessories

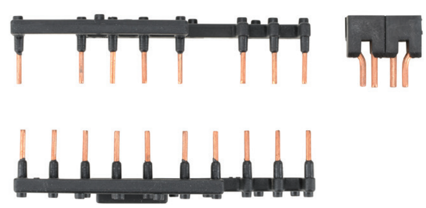
Wiring Kits (Jumper Assemblies)

- Quick and easy assembly for wye-delta and reversing starters
- Allows assembly of WEG overload relay RW17D

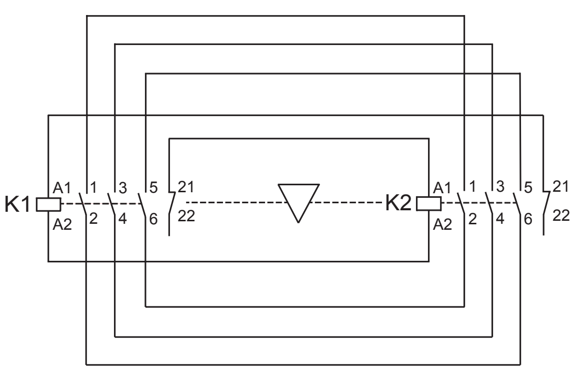
Reversing Wiring Kit for Mini Contactors CWC07 to CWC016									
PartNumber	Price	Max Rated Operational Power of Three-Phase Motors 50/60 Hz kW [hp]						Rated Operational Current I_e AC-3 ($U_e \le 440V$)	Mini Contactors
		220V 230V	380V	400V 415V	440V	500V	660V 690V		K1 = K2
ECC0-R	$11.00	1.5 [2]	3 [4]	3 [4]	3.7 [5]	3.7 [5]	3 [4]	7	CWC07
		2.2 [3]	4 [5.4]	4 [5.4]	4.5 [6]	4.5 [6]	4 [5.4]	9	CWC09
		3 [4]	5.5 [7.5]	5.5 [7.5]	5.5 [7.5]	5.5 [7.5]	5.5 [7.5]	12	CWC012
		4 [5.4]	7.5 [10]	7.5 [10]	7.5 [10]	7.5 [10]	7.5 [10]	16	CWC016

Star-Delta Wiring Kit for Mini Contactors CWC07 to CWC016							
Part Number	Price	Max Rated Operational Power of Three-Phase Motors 50/60 Hz kW [hp]			Rated Operational Current Ie AC-3 ($U_e \le 440V$)	Mini Contactors	
		220–230 V	400–415 V	660–690 V		K1 = K2	K3
ECC0-SD	$12.00	3.7 [5]	5.5 [7.5]	5.5 [7.5]	12	CWC07	CWC07
		3.7 [5]	7.5 [10]	9.2 [12.5]	18	CWC012	
		5.5 [7.5]	11 [15]	15 [20]	25	CWC016	CWC09

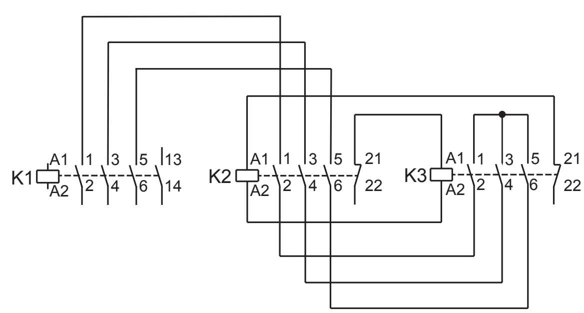




ECC0-R Wiring Diagram



ECC0-SD Wiring Diagram



CWC Series Miniature Contactors Accessories

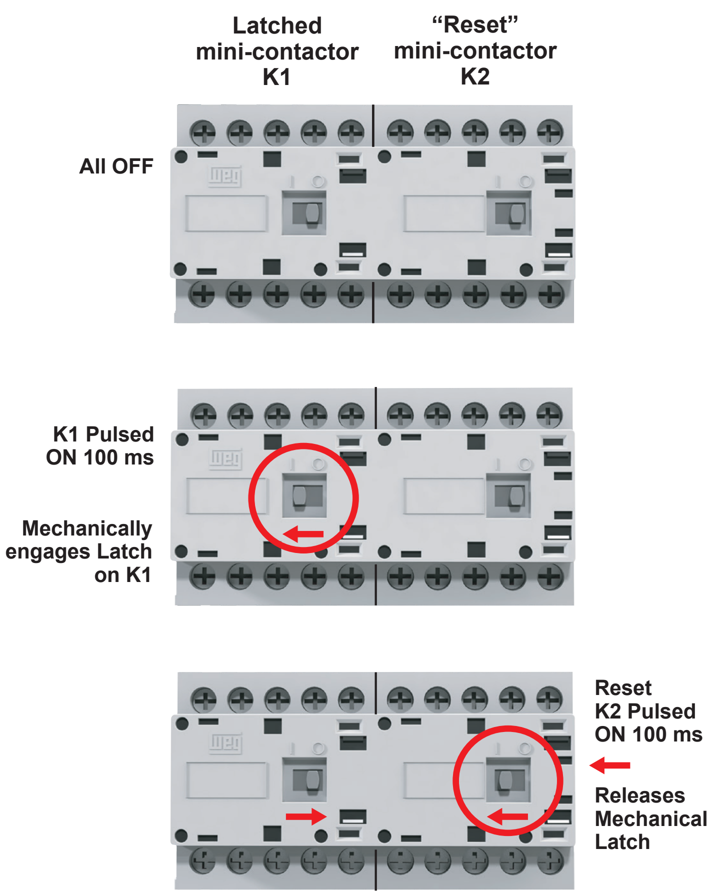
Mechanical Interlock Block and Latch Block

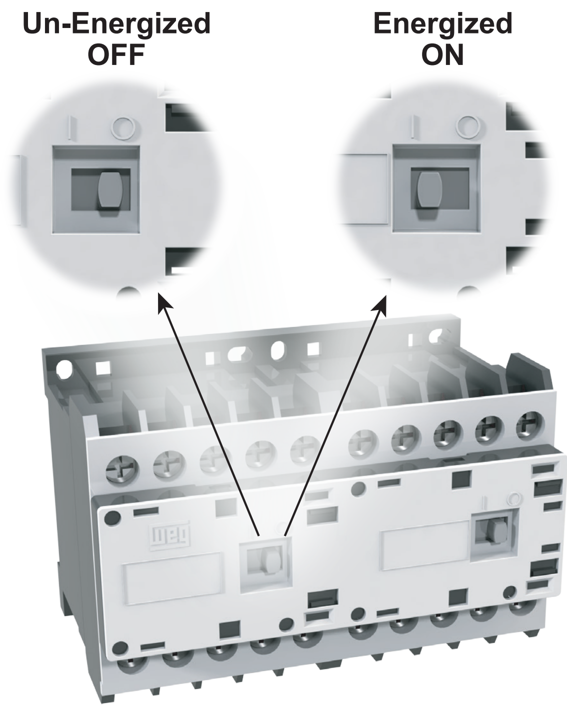
Mechanical Interlock Block and Latch Block			
Part Number	*Price*	*Description*	*For Use With*
BIC0	$3.50	Mechanical interlock, front mounted, use with any CWC07 through CWC016 series miniature contactor. Mechanically connects two CWC series mini contactors and prevents both contactors from being pulled in at the same time. For reversing contactors.	CWC07 CWC09 CWC012 CWC016
RMC0	$4.00	Latch block, front mounted, use with any CWC07 through CWC016 series miniature contactor. Mechanically connects two CWC series mini contactors and enables one contactor to operate with a pulse input signal. Retention block for contactor.	

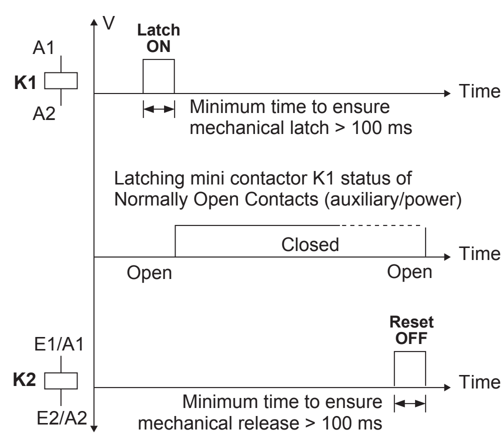
BIC0

Note: Do not use BIC0 or RMC0 accessory with mini contactors with low consumption DC coils.

Operation Description of Latched Block RMCO







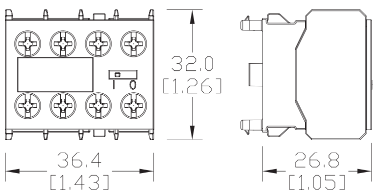
- After a minimum pulse of 100ms on mini contactor's coil (K1), the RMC0 will keep K1 contactor switched on;
- The mini contactor K1 will only return to rest position after miniature contactor's coil (K2) has been energized by a releasing pulse of 100ms;
- The mechanical latch only ocurrs when mini contactor (K1) is energized (ON).

Note: If RESET miniature contactor's coil (K2) remains energized, the latching of mini contactor (K1) is not enabled.

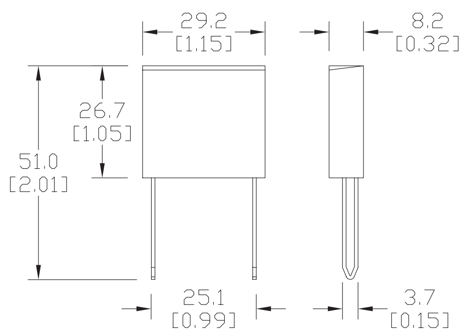
CWC Series Miniature Contactors Accessories - Dimensions

Dimensions

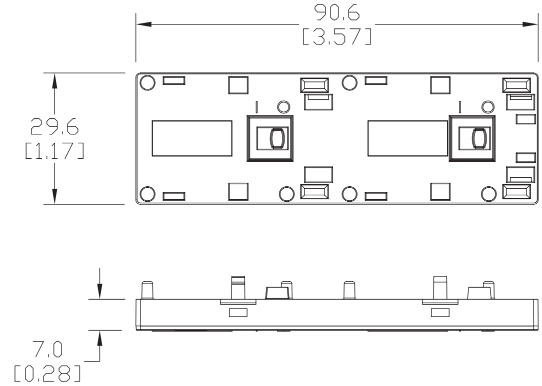
mm [in]



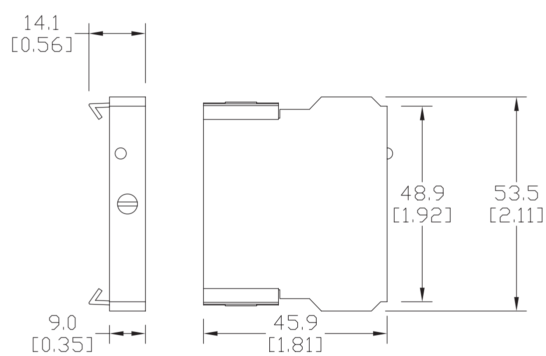
BFC0-xx, BFC4-xx, BFC025-xx



RCC0-xxxx, VRC0-xxxx, DIC0-xxxx

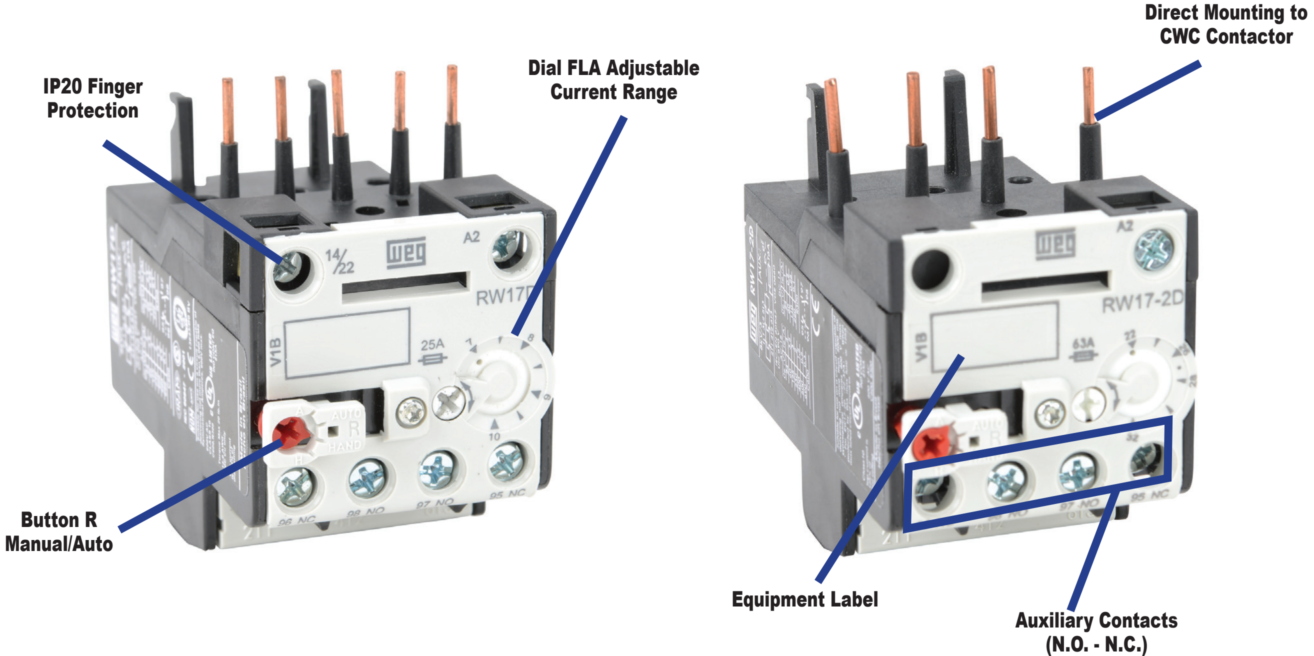


BIC0, RMC0



TETC0-U030S-Dxx

RW Series Overload Relays For CWC Miniature Contactors



Overload Relays Features

RW overload relays are an important part of WEG controls' range of products. As usual in WEG products, an extended operational service life is one of the main features you can find in RW overload relays.

WEG's RW class 10 thermal overload relays are designed for use with, and as perfect complement to, the CWC miniature contactors.

RW relays are available in compact frame sizes from 0.28 A to 32A. Mounting an RW series overload relay directly to a WEG CWC miniature contactor creates an across-the-line starter capable of controlling motors from fractional to 15hp @ 460V.

Standards and Approvals

- IEC 60947 and VDE 0660.
- cULus listed file no. E189202
- CE marked low voltage directive 2006/95/EC
- Marine

Modern Architecture

Previous models of open overloads with "heaters" encounter problems in the field, including:

- Inaccurate trip point, because of uneven screw tightness when installed on individual phases
- Ambient problems, such as dust and other contaminants, because of their open design
- Inability to protect in case of single phase failure
- Nuisance tripping, because no temperature compensation is possible.

The modern design of WEG overload relays solves all of these problems. RW overload relays are fitted with fixed bimetallic elements, which eliminate any need for heater elements for field installation or future upgrading to a more efficient motor. All sizes provide complete motor protection by offering:

- Ambient temperature compensation (-4°F to +140°F)
- Phase loss sensitivity protection
- Current unbalance sensitivity

Dial FLA Setting

The trip-current is set via an adjustable dial designed with the motor's full load current (FLA) in mind.

Temperature Compensation

Because RW overload relays include a fourth bimetallic strip in addition to the three that are directly heated by the motor current, ambient temperature variations in the range of -4ºF to +140ºF are no obstacle for accurate protection of your motors even in the toughest conditions.

Phase Loss Sensitivity

WEG overload relays include standard phase failure sensitivity protection. This feature ensures fast tripping in case of phase loss, protecting your motor and avoiding expensive repairs.

Multi Function Button "R"

The programmable RESET button can be selected to operate in a Manual or Automatic mode, with or without TEST capabilities of the isolated "trip" N.C. and "alarm" N.O. auxiliary contacts. The "R" multifunction RESET / TEST button can be set in four different positions:

- H (manual RESET only)
- HAND (manual RESET/TEST)
- AUTO (automatic RESET/TEST)
- A (automatic RESET only)

In HAND and AUTO positions, when gray R button is pushed, both N.O. 97-98 and N.C. 95-96 contacts change state.

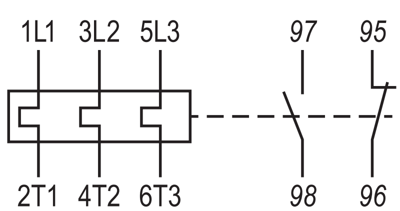
RW Series Thermal Overload Relays For CWC Miniature Contactors

Thermal Overload Relays Features

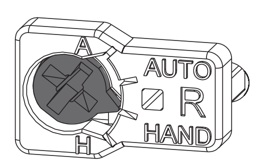
- Adjustable tripping current
- Phase-loss sensitivity (All phases must be connected. See motor wiring diagrams.)
- Tripping class 10
- Auxiliary contacts 1 N.O. + 1 N.C.
- Temperature compensation from -20° to +60°C [-4°F to +140°F]
- Hand/Auto/Reset button
- Equipment Label

Thermal Overload Relay Selection Guide						
Part Number	Price	For Use With	Setting Range of OverloadRelease (A)	*Short-Circuit Protective Device		
				IEC Max Fuse	UL Max Fuse	UL Max Breaker
RW17-1D3-D004	$21.00	CWC07 CWC09 CWC012 CWC016	0.28–0.4	2	15	15
RW17-1D3-C063	$21.00		0.4–0.63	2	15	15
RW17-1D3-D008	$21.00		0.56–0.8	2	15	15
RW17-1D3-D012	$21.00		0.8–1.2	4	15	15
RW17-1D3-D018	$21.00		1.2–1.8	6	15	15
RW17-1D3-D028	$21.00		1.8–2.8	6	15	15
RW17-1D3-U004	$21.00		2.8–4.0	10	15	15
RW17-1D3-D063	$21.00		4.0–6.3	16	25	25
RW17-1D3-U008	$21.00		5.6–8.0	20	30	30
RW17-1D3-U010	$21.00		7.0–10	25	40	40
RW17-1D3-D125	$21.00		8.0–12.5	25	50	50
RW17-1D3-U015	$21.00		10.0–15.0	35	60	60
RW17-1D3-U017	$21.00		11.0–17.0	35	60	60
RW17-2D3-U010	$21.00	CWC025	7–10	25	40	40
RW17-2D3-D125	$21.00		8–12.5	25	50	50
RW17-2D3-U015	$21.00		10–15	35	60	60
RW17-2D3-U017	$21.00		11–17	35	60	60
RW17-2D3-U023	$21.00		15–23	50	90	90
RW17-2D3-U032	$21.00		22–32	63	90	125

*** Note: Type 2 short-circuit coordination per IEC 60947-4-1. UL fuse type class CC.**



Circuit Diagram



Hand/Auto/Reset Button

RW Series Thermal Overload Relays For CWC Miniature Contactors

Thermal Overload Relays Technical Characteristics

RW Series Thermal Overload Relays General Ratings		
Standards		*IEC 60947-1 / 60947-4-1, EN 60947-1 / 60947-4-1, UL 508; CSA C.22.2/14; VDE 0660/102*
Number of Poles		3
Tripping Class		10
Phase Loss Sensitive		Yes
Termperature Compensation		Yes
Rated Insulation Voltage IEC 60947-4-1		690V
Rated Insulation Voltage UL/CSA		600V
Rated Operation Voltage U_e IEC 60947-4-1		690V
Rated Operation Voltage U_e UL/CSA		600V
Rated Impulse Voltage U_{imp}		6kV
Current	***Direct***	Yes
	Alternating	up to 400Hz
Degree of Protection - protection against contact acc. VDE 0160 - Part 100		IP20
Ambient Temperature	***Storage***	-50 to +80ºC [-58 to 176ºF]
	Operating	-20 to +70ºC [-4 to 158ºF]
	Ambient temperature compensation	-20 to +60ºC [-4 to 140ºF]
Pollution Degree per IEC 60947-4-1		3
Mounting		Direct on contactor
Current Heat Loss	***Lower value of setting range***	0.9 W
	Higher value of setting range	1.4 W
Weight		0.15kg [0.33lb]
Shock Resistance IEC 60068-2-27		8g [10ms]
Main Terminals Capacity (Cross / Slotted Combination)	***Fine - stranded with sleeve (ferrule)***	1.5–10 mm²
	Coarse - stranded / solid	1.5–6.0 mm²
	Stranded / solid (UL / CSA)	14–6 AWG
Tightening Torque		1.4–2.3 N·m [12.4–20.4 lb·in]
Short-Circuit Rating 600V		5kA

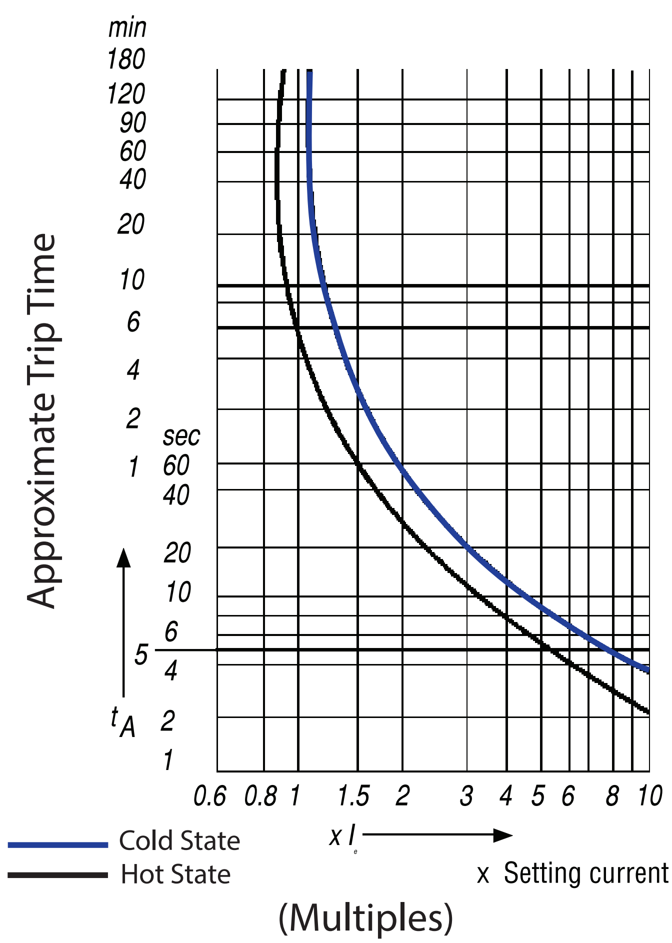
RW Series Thermal Overload Relays For CWC Miniature Contactors

Thermal Overload Relays Technical Characteristics

Auxiliary Contacts General Ratings RW17D			
Front auxiliary contact	1 NO + 1 NC		
Rated Auxiliary Contacts IEC/EN 60947			
AC-14/15	24V	(A)	4.0
	60V	(A)	3.5
	125V	(A)	3.0
	230V	(A)	2.0
	400V	(A)	1.5
	500V	(A)	0.5
	690V	(A)	0.3
DC-13/14	24V	(A)	1.0
	60V	(A)	0.5
	110V	(A)	0.25
	220V	(A)	0.1
Rated Thermal Current		(A)	6
Short Circuit Protection			
Fuses Type gL/gG		(A)	6
Auxiliary Terminals Capacity			
Fine - Stranded With Ferrule		(mm^2)	1.0 – 2.5
Coarse - Stranded/Solid		(mm^2)	1.0 – 2.5
Stranded/solid (UL/CSA)		(AWG)	16 – 12
Tightening Torque		(N·m)	1.0 – 1.5
		(lb·in)	8.9 – 13.3

RW Overload Relays Tripping Characteristics

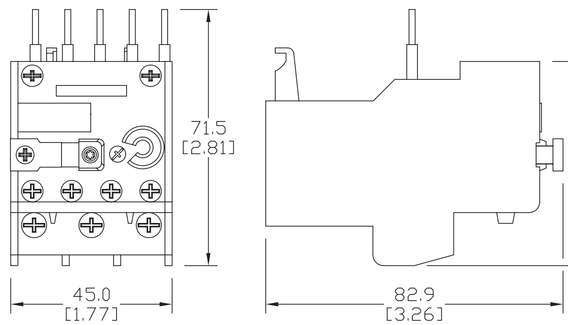
These tripping characteristics show the tripping of RW overload relays in relation to the current. They show the mean values of the tolerance ranges at an ambient temperature of 20°C (68°F), starting from cold state. The tripping time of the overload releases at operational temperature is reduced to approximately 25% of the values shown. Under normal operational conditions, all three phases of the RW relays should be loaded.



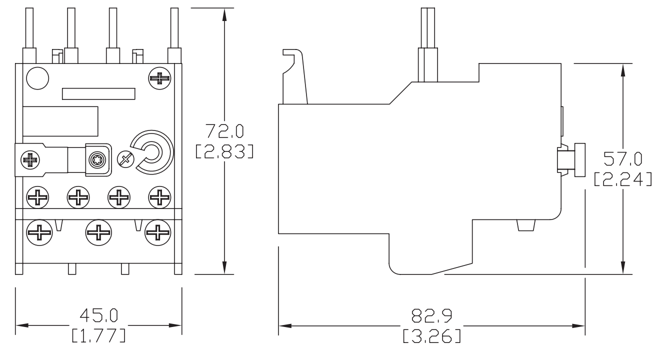
RW Series Overload Relays For CWC Miniature Contactors

Overload Relays Dimensions

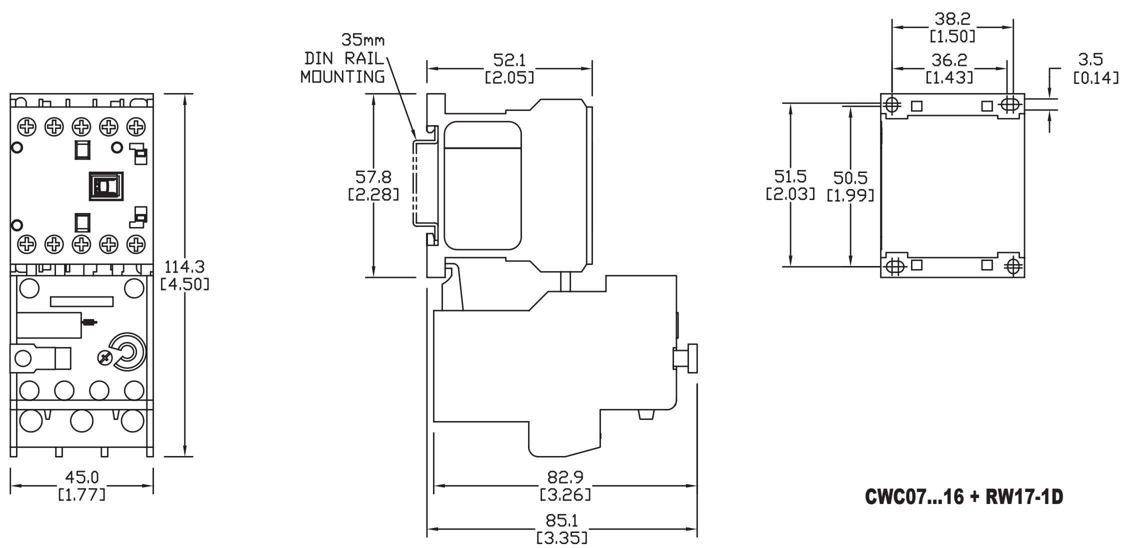
Dimensions mm [inches]



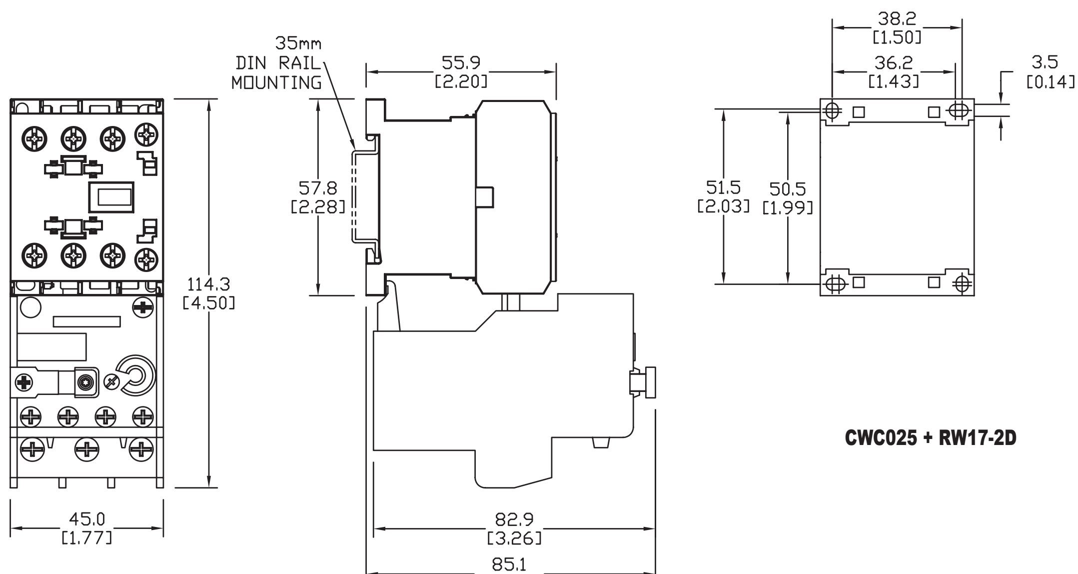
RW17-1D



RW17-2D



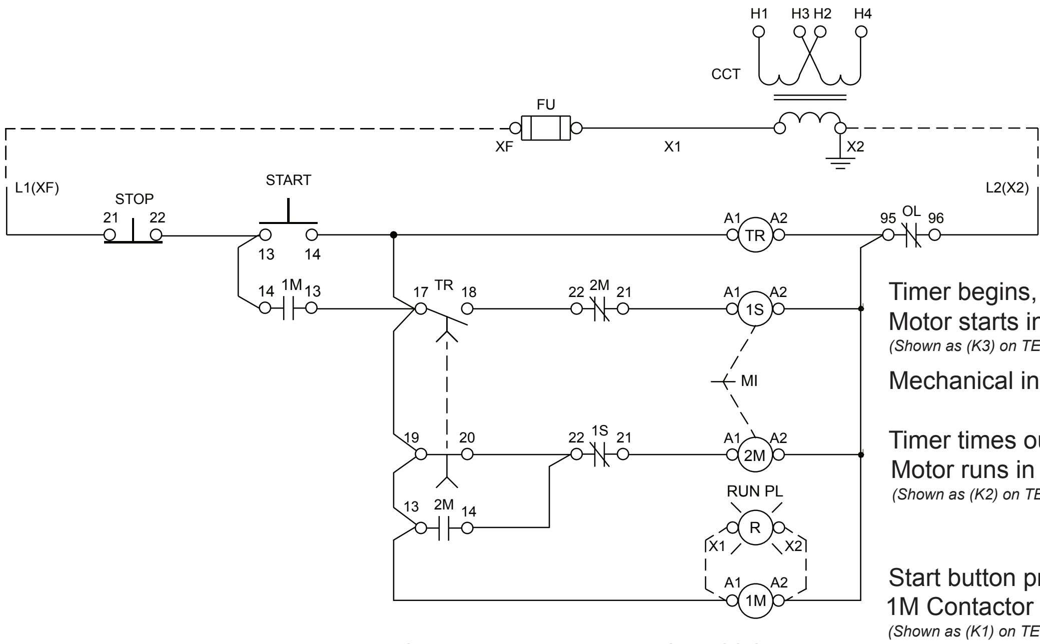
CWC07...16 + RW17-1D



CWC025 + RW17-2D

WEG Wiring Diagrams

Reduced Voltage Starters – Wye Delta



Start Button pressed
TR Timer begins.

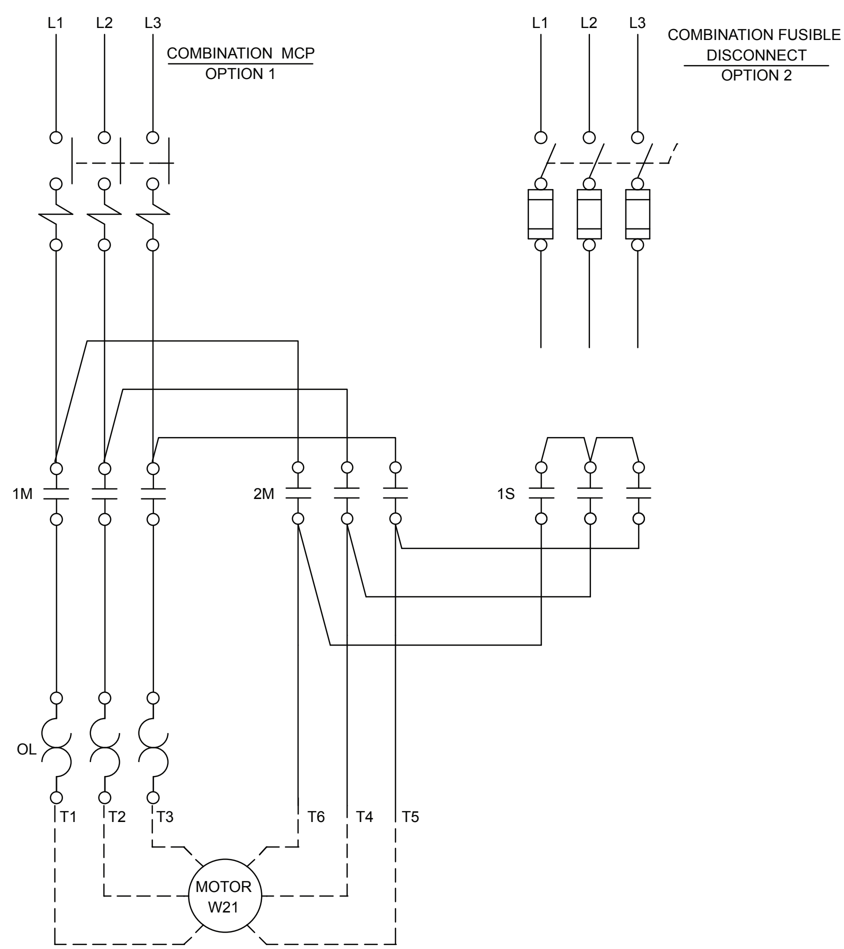
Timer begins, N.O. Contacts close.
Motor starts in WYE configuration.
(Shown as (K3) on TETCO)

Mechanical interlock

Timer times out closing TR N.C.
Motor runs in Delta configuration.
(Shown as (K2) on TETCO)

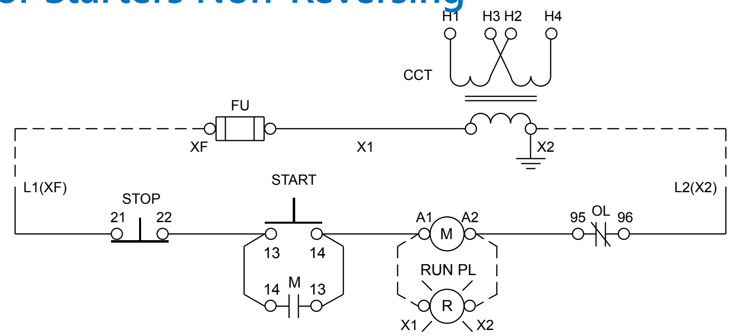
Start button pressed
1M Contactor energized.
(Shown as (K1) on TETCO)

NOTE: Diagram shown using WEG TETCO Series Timers.

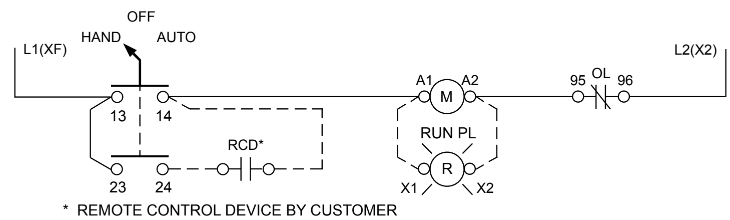


Wiring Diagrams

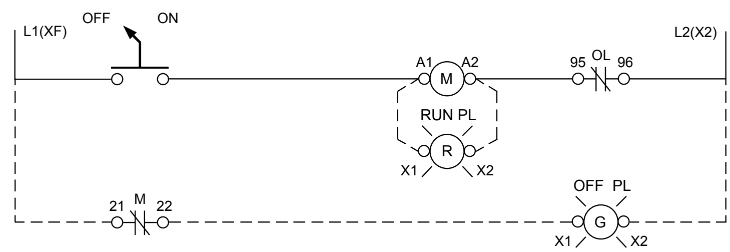
Motor Starters Non-Reversing

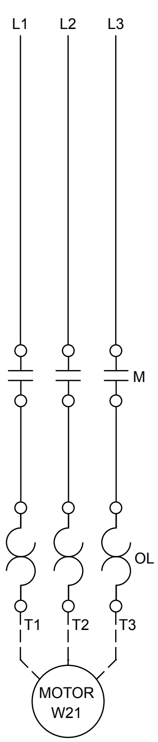


START - STOP -PUSHBUTTONS

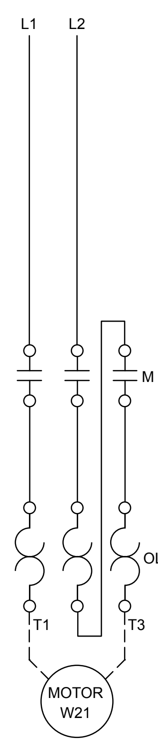


HAND - OFF - AUTO SELECTOR SWITCH

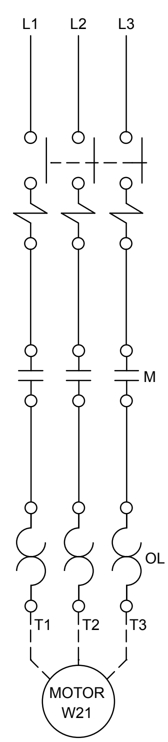




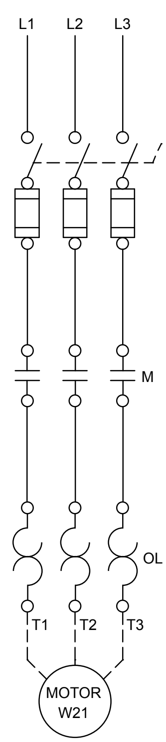
NON COMBINATION 3-PHASE



NON COMBINATION 1-PHASE



COMBINATION MCP



COMBINATION FUS / NON FUS. DISC.

Schneider Electric Easy TeSys Contactors

DPE09BL

DPE18BL

DPE38BL

UL file # E164862
CSA file # 164581

Schneider Electric's Easy TeSys Series Contactors provide an easy solution for OEMs, panel builders, contractors and system integrators who have a need for motor control, resistive load switching, and isolation applications. They are well suited for use in a wide range of applications:

- Conveyors
- Packaging
- Pumps
- Compressors
- HVAC
- Refrigeration
- Furnace applications
- Similar applications

Easy TeSys contactors have an operational life of approximately 1 million electrical operations, plus UL/CSA-approved rated current up to 52A and 25HP/600VAC.

They are suitable for the utilization categories specified in standard IEC 60947:

- AC-1: Non-inductive loads or slightly inductive loads, resistance furnaces
- AC-3: Squirrel cage motors – motor starting and breaking while running. Example: Standard squirrel cage motors, pumps, and fans.
- AC-4: Squirrel cage or slip ring motors – applications with reverse current braking and inching.
- AC-8a: Control of sealed refrigeration compressor motors with manual reset of overload trips.
- AC-8b: Control of sealed refrigeration compressor motors with automatic reset of overload trips.

Easy TeSys 3-Pole Contactors Selection Guide

Part Number	Price	Coil voltage	HP	Weight lb [kg]	Drawing
DPE09B7	$29.50	24VAC	3	0.705 [0.320]	PDF
DPE09BL	$35.00	24VDC			PDF
DPE09G7	$29.50	120VAC			PDF
DPE09U7	$29.50	240VAC			PDF
DPE12B7	$33.50	24VAC	5	0.717 [0.325]	PDF
DPE12BL	$36.00	24VDC			PDF
DPE12G7	$33.50	120VAC			PDF
DPE12U7	$33.50	240VAC			PDF
DPE18B7	$43.50	24VAC	7.5	0.728 [0.330]	PDF
DPE18BL	$48.00	24VDC			PDF
DPE18G7	$43.50	120VAC			PDF
DPE18U7	$43.50	240VAC			PDF
DPE25B7	$55.00	24VAC	10	0.816 [0.370]	PDF
DPE25BL	$58.00	24VDC			PDF
DPE25G7	$55.00	120VAC			PDF
DPE25U7	$55.00	240VAC			PDF
DPE32B7	$73.00	24VAC	15	0.827 [0.375]	PDF
DPE32BL	$76.00	24VDC			PDF
DPE32G7	$73.00	120VAC			PDF
DPE32U7	$73.00	240VAC			PDF
DPE38B7	$73.00	24VAC	20	0.838 [0.380]	PDF
DPE38BL	$76.00	24VDC			PDF
DPE38G7	$73.00	120VAC			PDF
DPE38U7	$73.00	240VAC			PDF

Schneider Electric Easy TeSys Contactors

Easy TeSys 3-Pole Contactors Utilization Category AC-3

Part Number	Standard Power Ratings of 3-Phase Motors 50/60 Hz (Θ≤140°F [60°C]) [kW]						Rated Operational Current 440V	Instantaneous Auxiliary Contact
	220V 230V	380V 400 (kW)	415V (kW)	440V (kW)	500V (kW)	660V 690V (kW)		
DPE09xx	2.2	4	4	4	5.5	5.5	9	1
DPE12xx	3	5.5	5.5	5.5	7.5	7.5	12	1
DPE18xx	4	7.5	9	9	10	10	18	1
DPE25xx	5.5	11	11	11	15	15	25	1
DPE32xx	7.5	15	15	15	18.5	18.5	32	1
DPE38xx	9	18.5	18.5	18.5	18.5	18.5	38	1

Easy TeSys 3-Pole Contactors Conforming to UL and CSA Standards (North American Market)

Part Number	Standard Power Ratings of 3-Phase Motors 50/60 Hz (Θ<140°F [60°C]) [hp]						Associated Cable Type 75°C - Cu [AWG]	Continuous Current [A]
	115V	230V 240V	200V 208V	230V 240V	460V 480V	575V 600V		
	Single-phase		3-phase					
DPE09xx	1/3	1	2	2	3	7.5	18 - 10	20
DPE12xx	1/3	1	2	2	5	7.5		25
DPE18xx	1/2	2	3	3	7.5	10		25
DPE25xx	1	3	5	5	10	15	18 - 8	32
DPE32xx	2	3	7.5	7.5	15	20	14 - 6	40
DPE38xx	2	5	10	10	20	25		52

Utilization category AC-1

Part Number [1, 2]	Non-Inductive Loads Maximum Current (Θ≤140°F [60°C]) (A)	Instantaneous Auxiliary Contact
DPE09xx	20	1
DPE12xx	25	1
DPE18xx	32	1
DPE25xx	40	1
DPE32xx	50	1
DPE38xx	50	1

Coil Voltages and Code

	AC Supply (V)		
Volts 50/60 Hz	24 B7	120 G7	240 U7
	DC Supply [3]		
Volts	24 BL		

Notes:

1) The weights indicated are for contactors with AC control circuit. For DC or low consumption control circuit, add 0.160 kg for part numbers DPE09xx to DPE38xx.

(2) Built-in suppression device (bi-directional peak limiting diode).

(3) BL is for part numbers DPE09xx through DPE38xx.

Schneider Electric Easy TeSys Contactors

Schneider Electric

Environmental Characteristics

Contactor Type		DPE09xx-DPE25xx	DPE32xx-DPE38xx
Rated Insulation Voltage (U_I)	Conforming to IEC 60947-4-1, Overvoltage category III, Degree of pollution: 3	690V	
	Conforming to UL, CSA	600V	
Rated Impulse Withstand Voltage (U_{imp})	Conforming to IEC 60947	6kV	
Conforming to Standards		IEC/EN 60947-4-1, UL 60947-4-1, CSA C22.2 No. 60947-4-1	
Product Certifications		UL,E164862, CSA 164581	
Degree of Protection [1] (Front Face Only)	Power Connection	Protection against direct finger contact IP 2X	
	Coil Connection	Protection against direct finger contact IP 2X	
IP Degree of Protection	Conforming to IEC 60529	IP20	
Ambient Air Temperature Around the Device	Storage	-76 to 176°F [-60 to 80ºC]	
	Operation	23 to 140°F [-5 to 60ºC]	
	Permissible	140 to 158°F [60 to 70ºC], for operation at U_c	
Maximum Operating Altitude	Without derating	6561.68 ft [2000m]	
Operating Positions	Without derating	±30° occasional, in relation to normal vertical mounting plane	
Flame Resistance	Conforming to UL 95	V1	
	Conforming to IEC 60695-2-1	1562°F [850°C]	
Shock Resistance [2] 1/2 Sine Wave = 11ms	Contactor open	8gn	6.4 gn
	Contactor closed	12gn	12gn
Vibration Resistance [2] 5 - 300 Hz	Contactor open	1.6 gn	1.6 gn
	Contactor closed	3.2 gn	3.2 gn

Power Circuit Connection Characteristics (Connection by Cable)

Contactor Type		DPE09xx - DPE18xx	DPE25xx	DPE32xx	DPE38xx
Wire Size and Tightening Torque (Screw Terminals)					
Flexible Cable Without Cable End [mm²]	1 conductor	1 - 4	1.5 - 6	1.5 - 10	2.5 - 10
	2 conductor	1 - 4	1.5 - 6	1.5 - 6	2.5 - 10
Flexible Cable With Cable Ends [mm²]	1 conductor	1 - 4	1 - 6	1 - 6	1 - 10
	2 conductor	1 - 2.5	1 - 4	1 - 4	1.5 - 6
Solid Cable Without Cable Ends [mm²]	1 conductor	1 - 4	1.5 - 6	1.5 - 6	1.5 - 10
	2 conductor	1 - 4	1.5 - 6	1.5 - 6	2.5 - 10
Screwdriver	Philips	No. 2			
	Flat screwdriver Ø	Ø6			
Tightening Torque		15.05 Lbf • in [1.7 N • m]			
AWG		14 - 6			

Control Circuit Connection Characteristics (Screw Clamp Connections)

Contactor Type		DPE09xx - DPE18xx	DPE25xx	DPE32xx	DPE38xx
Wire Size and Tightening Torque (Screw Clamp Connections)					
Flexible Cable Without Cable End [mm²]	1 conductor	1 - 4	1 - 4	1 - 4	1 - 4
	2 conductor	1 - 4	1 - 4	1 - 4	1 - 4
Flexible Cable With Cable Ends [mm²]	1 conductor	1 - 4	1 - 4	1 - 4	1 - 4
	2 conductor	1 - 2.5	1 - 2.5	1 - 2.5	1 - 2.5
Solid Cable Without Cable Ends [mm²]	1 conductor	1 - 4	1 - 4	1 - 4	1 - 4
	2 conductor	1 - 4	1 - 4	1 - 4	1 - 4
Screwdriver	Philips	No. 2			
	Flat screwdriver Ø	Ø6			
Tightening Torque		15.05 Lbf • in [1.7 N • m]		22.13 Lbf • in [2.5N • m]	
AWG		10 - 18			

Notes:
(1) Protection provided for the cabling c.s.a. and for connection by cable.
(2) Without modifying the contact states, in the most unfavorable direction (coil energized at U_e).

Schneider Electric Easy TeSys Contactors

Schneider Electric

Power Circuit Characteristics

Contactor Type			DPE09xx	DPE12xx	DPE18xx	DPE25xx	DPE32xx	DPE38xx
Rated Operational Current (I_e) ($U_e \leq 440$ V)	In AC-3, Θ ≤ 140ºF (60ºC) (A)		9	12	18	25	32	38
	In AC-1, Θ ≤140ºF (60ºC) (A)		20	25	32	40	50	50
Electrical Durability At Rated Operational Current	@ 600V		1 million operation cycles					
Rated Operational Voltage (U_e)	Up to... (V)		690					
Frequency Limits of the Operating Current	(Hz)		25 - 400					
Conventional Thermal Current (I_{th})	Θ 140ºF [60ºC] (A)		25	25	32	40	50	50
Rated Making Capacity (400V)	Conforming to IEC 60947		250	250	300	450	550	550
Rated Breaking Capacity (400V)	Conforming to IEC 60947		250	250	300	450	550	550
Permissible Short Time Rating No current flowing for preceding 15 minutes with Θ ≤ 104°F [40°C]	For 1s (A)		210	210	240	380	430	430
	For 10s (A)		105	105	145	240	260	310
	For 1min (A)		61	61	84	120	138	150
	For 10min (A)		30	30	40	50	60	60
Protection By Fuses Short-Circuit Protection U ≤ 690V	Without thermal overload relay, gG fuse	Type 1 (A)	25	40	50	63	63	63
		Type 2 (A)	20	25	35	40	63	63
Average Impedance Per Pole	At I_{th} and 50Hz (mΩ)		2.5	2.5	2.5	2	2	2
Power Dissipated Per Pole for the Above Operational Currents	AC-3 (W)		0.20	0.36	0.8	1.25	2	3
	AC-1 (W)		1.56	1.56	2.5	3.2	5	5

Applications With High-Fault Short-Circuit Current Ratings

High Fault Short-Circuit Current Rating With Fuses

Part Number	Maximum Current	Maximum Voltage	Maximum Class J Fuse Size
DPE09xx	100kA	600VAC	25A
DPE12xx			25A
DPE18xx			30A
DPE25xx			40A
DPE32xx			60A
DPE38xx			80A

High Fault Short-Circuit Current Rating With Circuit Breakers

Part Number	Maximum Current	Maximum Voltage	Maximum Listed Circuit Breaker Size
DPE09xx	35kA	480VAC	35A
DPE12xx			35A
DPE18xx			35A
DPE25xx			60A
DPE32xx			60A
DPE38xx			60A

High Fault Short-Circuit Current Rating With Circuit Breakers

Part Number	Maximum Current	Maximum Voltage	Maximum Listed Circuit Breaker Size
DPE09xx	18kA	600VAC	35A
DPE12xx			35A
DPE18xx			35A
DPE25xx			35A
DPE32xx			60A
DPE38xx			60A

Schneider Electric Easy TeSys Contactors

Control Circuit Characteristics, AC at 140°F [60°C] Supply

Contactor Type				DPE09xx - DPE38xx
Rated Control Circuit Voltage (U_c)	50/60 Hz			24 - 240 VAC
Control Voltage Limits	Coils 50/60 Hz		Operation	0.9 - 1.1 U_c at 50HZ and 0.85 - 1.1 U_c at 60Hz and at 140ºF [60ºC]
			Drop-out	0.3 - 0.6 U_c at 140ºF [60ºC]
Average Consumption at 68ºF (20ºC) and at U_c	50Hz	Inrush	CosΦ	0.75
			50/60 Hz coil	70VA
		Sealed	CosΦ	0.3
			50/60 Hz coil	7 VA
	60Hz	Inrush	CosΦ	0.75
			50/60 Hz coil	70VA
		Sealed	CosΦ	0.3
			50/60 Hz coil	7.5 VA
Heat Dissipation			50/60 Hz coil	2 - 3 W
Operating Time[1,2]			Closing "C"	12 - 22 ms
			Opening "O"	4 - 19 ms
Mechanical Durability			50 or 60 Hz coils	–
			50/60 Hz coil at 60Hz	10 million operating cycles
Maximum Operating Rate at Ambient Temperature ≤140ºF [60ºC]				3600 operating cycles per hour

(1) The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles.
(2) The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

Control Circuit Characteristics, DC Supply

Contactor Type			DPE09xx - DPE38xx
Rated Control Circuit Voltage (U_c)			24V
Rated Insulation Voltage		Conforming to IEC 60947-1	690V
		Conforming to UL, CSA	600V
Control Voltage Limits		Operation	0.7 - 1.25 U_c at 140ºF [60ºC]
		Dropout	0.1 - 0.25 U_c at 140ºF [60ºC]
Average Consumption at 68ºF [20ºC] and at U_c		Inrush	5.4 W
		Sealed	5.4 W
Operating Time[1]		Closing "C"	63ms ± 15%
		Opening "O"	63ms ± 15%
Time Constant (L/R)		Closing "C"	28ms
Mechanical Durability at U_c			30 million operating cycles
Maximum Operating Rate at Ambient Temperature ≤140ºF [60ºC]			3600 operating cycles per hour

(1) The arcing time depends on the circuit switched by the poles. For all normal 3-phase applications, the arcing time is less than 10ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.

Characteristics of Auxiliary Contacts Incorporated in the Contactor

Rated Operational Voltage (U_c)		Up to 690V
Rated Insulation Voltage (U_i)	Conforming to IEC 60947-1	690V
	Conforming to UL, CSA	600V
Conventional Thermal Current Ith For Ambient Temperature ≤140ºF [60ºC]		10A
Frequency of the Operational Current		25 - 400 Hz
Minimum Switching Capacity $\lambda=10^{-8}$	U min	17V
	I min	5mA
Short-Circuit Protection Conforming to IEC 60947-5-1		gG fuse: 10A
Rated Making Capacity Conforming to IEC 60947-5-1, I rms		140 - 250 A
Short-Time Rating		Permissible for 1s: 100A Permissible for 500ms: 120A Permissible for 100ms: 140A
Insulation Resistance		>10MΩ

Schneider Electric Easy TeSys Contactors

Rated Operational Power of Auxiliary Contacts (Conforming to IEC 60947-5-1)

AC Supply, Categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet:
Making power (cos φ 0.7) = 10 times the power broken (cos φ 0.4).

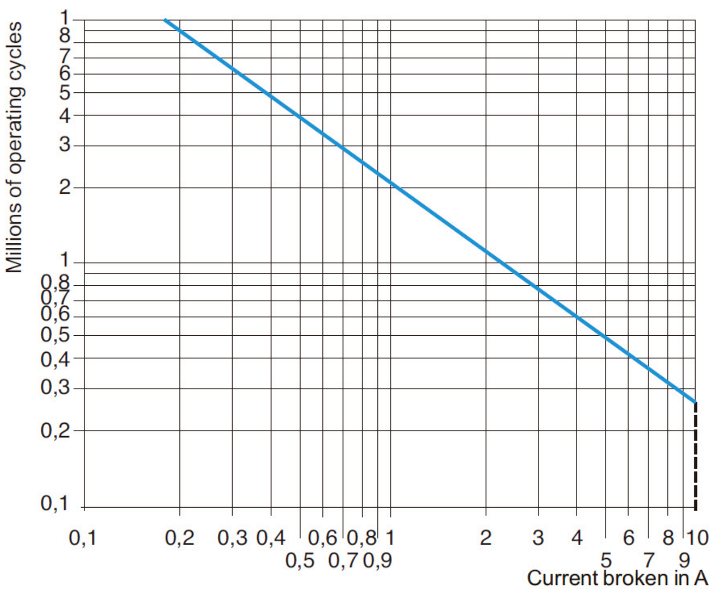
Operating Cycles	V	24	48	115	230	400	440	600
1 million operating cycles	VA	60	120	280	560	960	1050	1440
3 million operating cycles	VA	16	32	80	160	280	300	420
10 million operating cycles	VA	4	8	20	40	70	80	100

DC Supply, Category DC-13

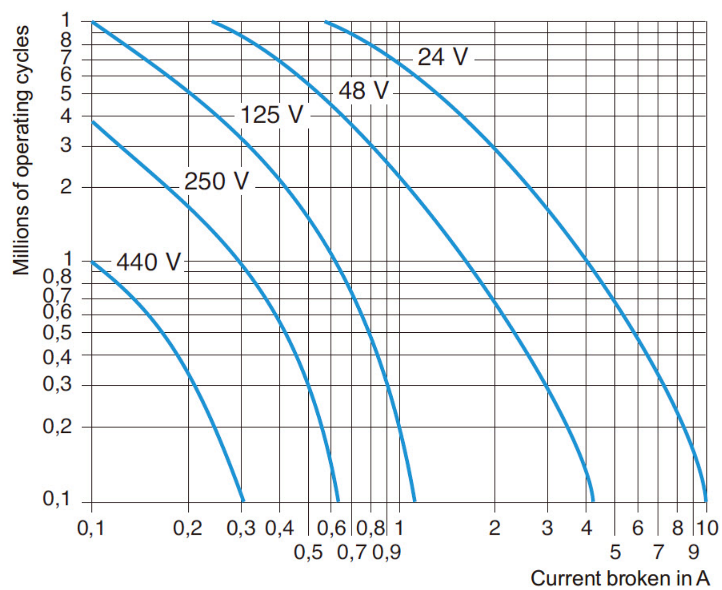
Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the power.

Operating Cycles	V	24	48	125	250	440
1 million operating cycles	VA	96	76	76	76	44
3 million operating cycles	VA	48	38	38	32	–
10 million operating cycles	VA	14	12	12	–	–

AC-15



DC-13



Schneider Electric Easy TeSys Contactors Auxiliary Contact Block

Easy TeSys Auxiliary Contact Block Selection Guide					
Part Number	**Price**	**Description**	**Number of Contacts Per Block**	**Weight lb [kg]**	**Drawing**
DPEAN11	$13.00	Auxiliary contact block, clip on, front mount	2 (1 NO and 1 NC)	0.066 [0.030]	PDF

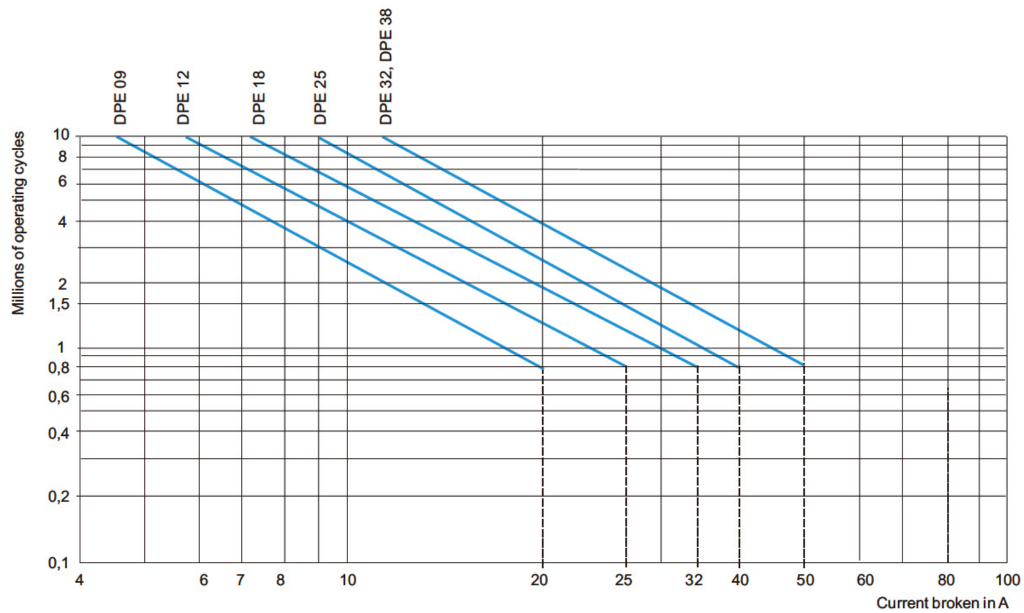
DPEAN11

Auxiliary Contact Block Environmental Characteristics (For Use in Normal Operating Environments)	
Conforming to Standards	IEC 60947-5-1, NF C 63-140, EN 60947-5-1, UL 60947-5-1 and CSA C22.2 No.60947-5-1
Product Certifications	UL, CSA
Protective Treatment	Conforming to IEC 60068
Degree of Protection (Conforming to VDE 0106)	Protection against direct finger contact IP 2X
Ambient Air Temperature Around the Device	Storage: -76 to 176°F [-60 to 80°C]
	Operation: 23 to 140°F [-5 to 60°C]
	Permissible for operation at Uc: -40 to 158°F [-40 to 70°C]
Maximum Operating Altitude Without Derating	6561.28 ft [2000m]
Connection By Cable **Philips No. 2 and Ø 0.236 (6mm)** **Flexible or Rigid Cable With or Without Cable End**	Minimum 1x1 mm^2 Maximum 2x2.5 mm^2

Characteristics of Instantaneous Contacts		
Number of Contacts		2
Rated Operational Voltage (U_e)		690V
Rated Insulation Voltage (U_i)	**Conforming to IEC 60947-5-1**	690V
	Conforming to UL, CSA	600V
Conventional Thermal Current (Ith) **For Ambient Temperature ≤140ºF [60ºC]**		10A
Frequency of the Operational Current		25 - 400 Hz
Minimum Switching Capacity	**U min**	17V
	I min	5mA
Short-Circuit Protection **Conforming to IEC 60947-5-1 and VDE 0660**		gG fuse: 10A
Rated Making Capacity **Conforming to IEC 60947-5-1, 1ms**		AC: 140A DC: 250A
Short-Time Rating		Permissible for 1s: 100A Permissible for 500ms: 120A Permissible for 100ms: 140A
Insulation Resistance		>10mΩ
Mechanical Durability		30 million operating cycles

Schneider Electric Easy TeSys Contactors Auxiliary Contact Block

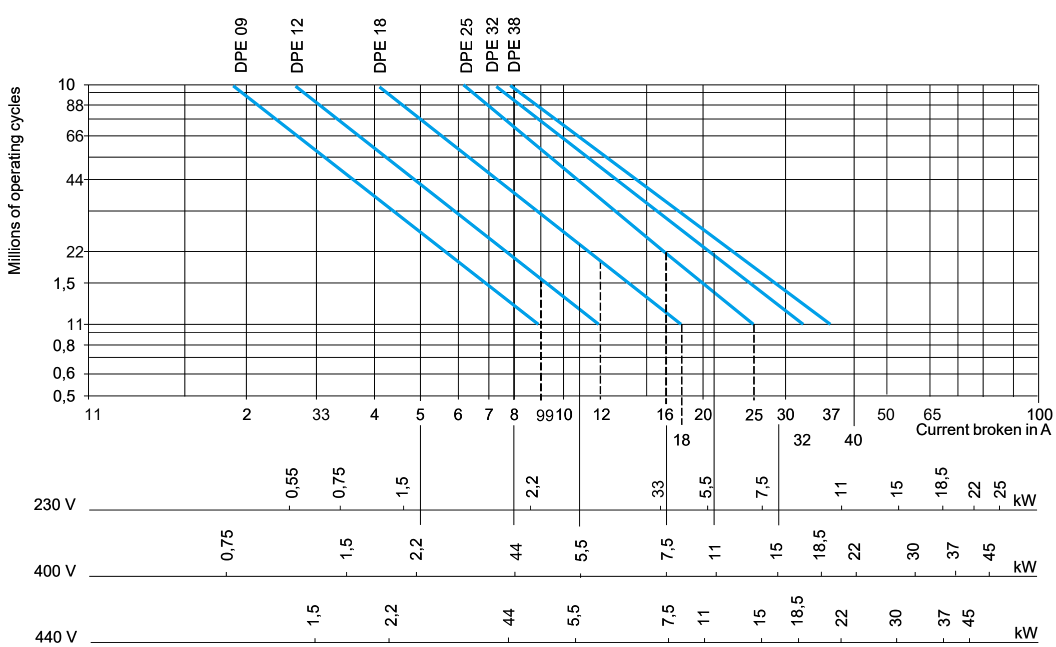
Use in Category AC-1 (Ue ≤ 440 V)



Control of resistive circuits (cos φ ≥ 0.95).
The current broken (Ic) in category AC-1 is equal to the current (Ie) normally drawn by the load.

Example:
Ue = 400 V - Ie = 25 A - θ ≤ 104°F (40°C) - Ic = 25 A
1.5 million operating cycles required
The above selection curves show the contactor rating needed: DPE 25

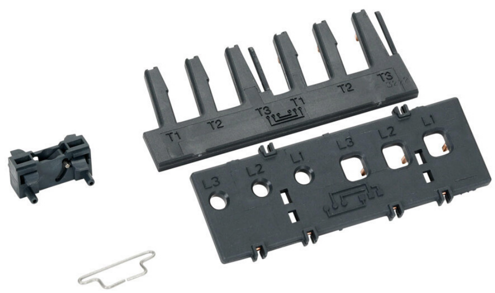
Use in Category AC-3 (Ue ≤ 440 V)



Control of 3-phase asynchronous squirrel cage motors with breaking while running. The current broken (Ic) in category AC-3 is equal to the rated operational current of the motor.

Example:
Asynchronous motor with P = 5.5 kW - Ue = 400 V - Ie = 11 A - Ic = Ie = 11 A
or asynchronous motor with P = 5.5 kW - Ue = 415 V - Ie = 11 A - Ic = Ie = 11 A
2 million operating cycles required
The above selection curves show the contactor rating needed: DPE 18

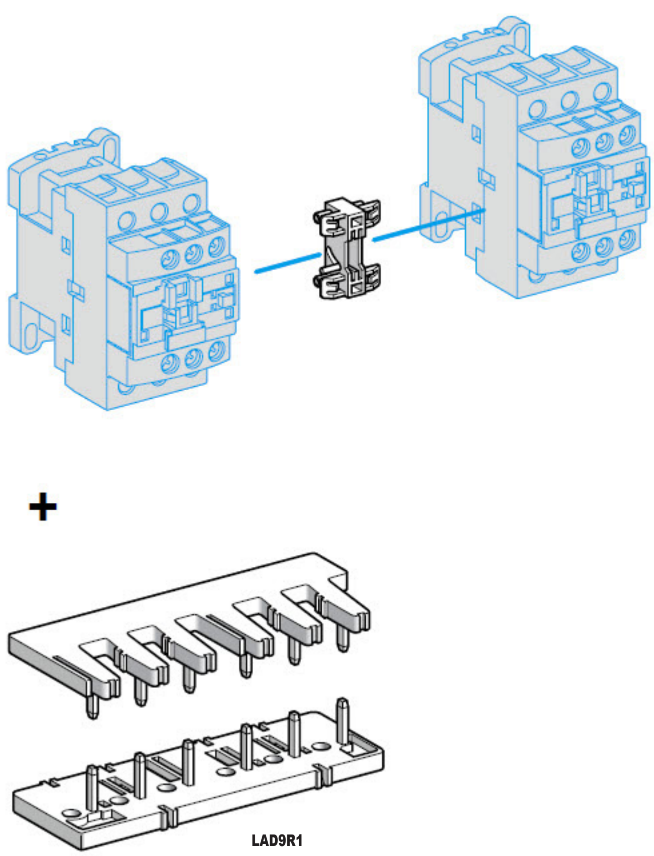
Schneider Electric Easy TeSys Contactors Accessories



LAD9R1

Easy TeSys Contactors Accessories Selection Guide (For 3-Pole Reversing Contactors for Motor Control [1])				
Part Number	***Price***	***Description***	***Weight lb [kg]***	***Drawing***
LAD9R1	$44.50	Kit includes 1 mechanical interlock without electrical interlocking plus 1 set of power connections.	0.099 [0.045 kg]	PDF

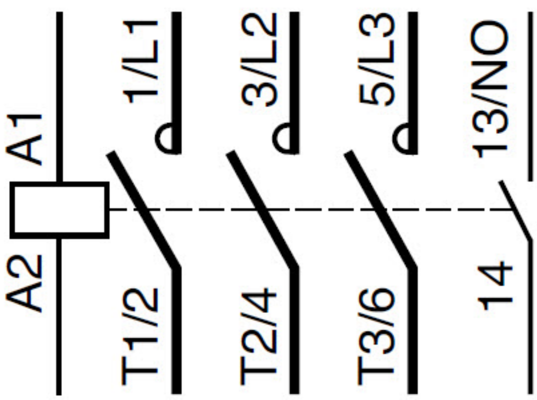
(1) Horizontally mounted, assembled by the customer using 2 identical contactors.



Schneider Electric Easy TeSys Contactors Contact Configurations

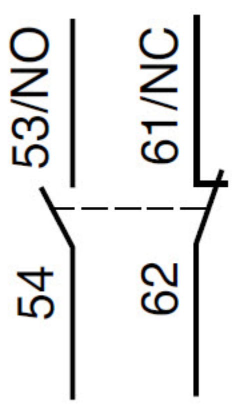
Contact Configurations

3-Pole Contactors
DPE09xx - DPE38xx



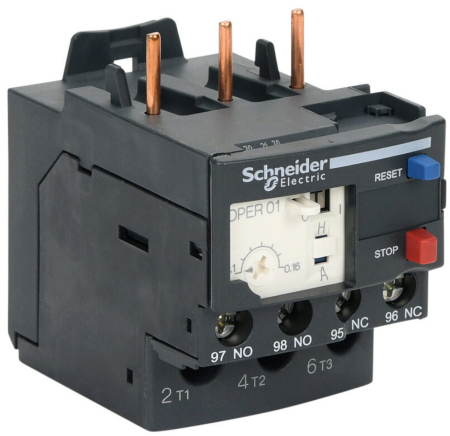
Front Mounted Add-on Contact Blocks - Instantaneous Auxiliary Contacts

1 NO + 1 NC (DPEAN11)



Schneider Electric Easy TeSys 3-Pole Thermal Overload Relays

Schneider Electric



DPER01

Easy TeSys 3-pole thermal overload relays are designed for direct connection to Easy TeSys contactors. These thermal overload relays protect AC circuits and motors against overloads, phase failures, long starting times, and prolonged stalled rotor conditions.

The thermal relay permanently controls the current driven by the motor. When this current exceeds the setting, its auxiliary contacts will change state, causing the motor to stop.

These compensated overload relays, with manual or automatic reset, are designed for AC use with fuses or circuit breakers.

These overload relays feature a relay trip indicator.

Features

- Adjustment dial I_r
- Test button
- Operation of the Test button allows:
  - Checking of control circuit wiring
  - Simulation of relay tripping (actuates both the NO and NC contacts)
- Stop button. Actuates the NC contact; does not affect the NO contact
- Reset button
- Trip indicator
- Lockable settings dial cover
- Selector for manual or automatic reset

Easy TeSys overload relays are supplied with the selector in the manual position, protected by a cover.

Deliberate action is required to move it to the automatic position.

DPER16

DPER32

Easy TeSys Thermal Overload Relays Selection Guide (Class 10[1] for Connection Using Screw Clamp Terminals)

Part Number	Price	Relay Setting Range (A)	Fuses To Be Used aM (A)	Fuses To Be Used gG (A)	For Use With Contactor	Weight lb [kg]	Drawing
DPER01	$29.50	0.10 - 0.16	0.25	2	DPE09xx - DPE32xx	0.287 [0.13]	PDF
DPER02	$29.50	0.16 - 0.25	0.5	2			PDF
DPER03	$29.50	0.25 - 0.40	1	2			PDF
DPER04	$29.50	0.40 - 0.63	1	2			PDF
DPER05	$29.50	0.63 - 1	2	4			PDF
DPER06	$29.50	1 - 1.6	2	4			PDF
DPER07	$29.50	1.6 - 2.5	4	6			PDF
DPER08	$29.50	2.5 - 4	6	10			PDF
DPER10	$29.50	4 - 6	8	16			PDF
DPER12	$29.50	5.5 - 8	12	20			PDF
DPER14	$29.50	7 - 10	12	20			PDF
DPER16	$29.50	9 - 13	16	25	DPE12xx - DPE32xx		PDF
DPER21	$29.50	12 - 18	20	35	DPE18xx - DPE32xx		PDF
DPER22	$29.50	16 - 24	25	50	DPE25xx - DPE32xx		PDF
DPER32	$45.00	23 - 32	40	63			PDF

(1) Standard UL 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R: Class 10, between 4 and 10 seconds.

Schneider Electric Easy TeSys 3-Pole Thermal Overload Relays

Power Circuit Characteristics		
Relay Type	**DPER01 - DPER21**	**DPER22 - DPER32**
Size	1	
Tripping Class (Conforming to IEC 60947-4-1)	10	
Rated Insulation Voltage (Conforming to IEC 60947-4-1)	690V	
Rated impulse withstand voltage (U_{imp})	6kV	
Frequency Limits of Operating Current	50-60 Hz	
Setting Range	0.1 - 18 A	16 - 38 A

Power Circuit Connections (Connection by Screw Clamp Terminals)		
Relay Type	**DPER01 - DPER21**	**DPER22 - DPER32**
	Minimum/Maximum C.S.A.	
Flexible cable without cable end - 1 conductor	1.5 - 6 mm^2 AWG 16 - 10	2.5 - 10 mm^2 AWG 14 - 8
Flexible cable with cable end - 1 conductor	1 - 4 mm^2 AWG 18 - 10	1.5 - 6 mm^2 AWG 16 - 10
Solid cable without cable end - 1 conductor	1 - 6 mm^2 AWG 18 - 10	2.5 - 10 mm^2 AWG 14 - 8
Tightening torque	15.05 in•lb [1.7 N•m]	22.13 in•lb (25 N•m)

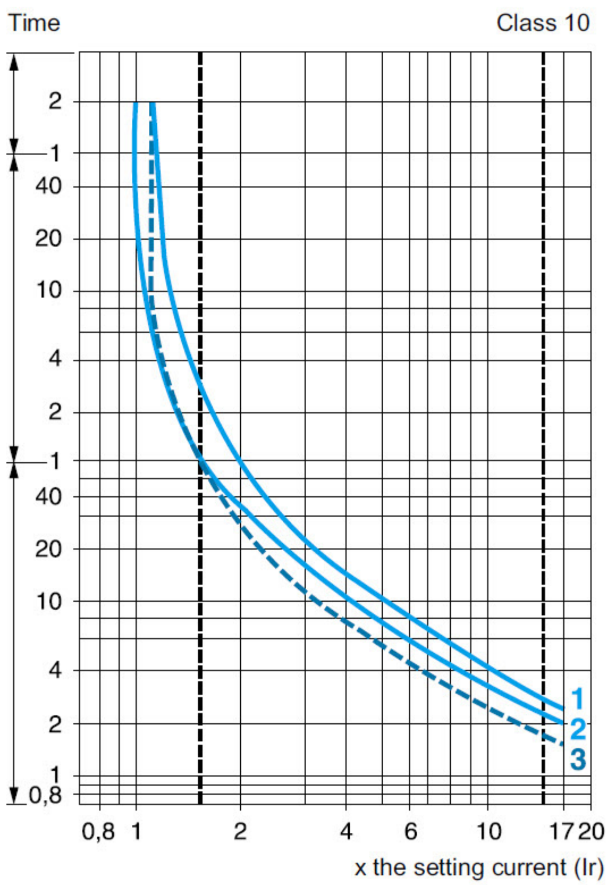
Auxiliary Contact Characteristics		
Relay Type		**DPER01 - DPER32**
Conforming to Standard		IEC 60947-4-1, IEC 60947-5-1, UL 60947-4-1, CSA C22.2 No. 60947-4-1
Product Certifications		cUL, UL Listed
Degree of Protection (Conforming to IEC 60529)		IP2X
Protective Treatment		IEC 60068
Ambient Air Temperature	**Storage**	-76 to 176°F [-60 to 80ºC]
	Normal operation without derating (IEC 60947-4-1)	-4 to 140°F [-20 to 60ºC]
	Minimum/maximum operating temperature (with derating)	-4 to 158°F [-20 to 70ºC]
Operating Positions Without Derating (Relative to Normal Vertical Mounting Plane)		Any position
Flame Resistance		1562°F [850ºC]
Shock Resistance		6gn - 11ms
Vibration Resistance		3gn
Dielectric Strength at 50Hz (Conforming to IEC 60255-5)		6kV
Surge Withstand (Conforming to IEC 60801-5)		6kV

Operating Characteristics	
Relay Type	**DPER01 - DPER32**
Temperature Compensation	-4 to 140°F [-20 to 60ºC]
Tripping Threshold (Conforming to IEC 60947-4-1)	$1.14 \pm 0.06\ I_r$
Sensitivity to Phase Failure (Conforming to IEC 60947-4-1)	Tripping current 130% of Ir on two-phase, the last one at 0
Surge Withstand (Conforming to IEC 60801-5)	6kV

Schneider Electric Easy TeSys 3-Pole Thermal Overload Relays

Tripping Curves

Average Operating Time Related to Multiples of the Setting Current



1 Balanced operation, 3-phase, without prior current flow (cold state)
2 2-phase operation, without prior current flow (cold state)
3 Balanced operation, 3-phase, after a long period at the set current (hot state)

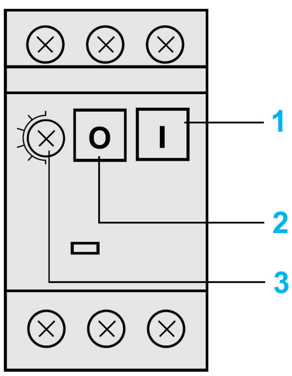
Schneider Electric Easy TeSys 3-Pole Thermal Overload Relays Panel Mount Accessory

LAD7B106

Easy TeSys Thermal Overload Relays Accessory Selection Guide						
Part Number	***Price***	***Description***	***For Use With Overload Relay***	***Package Quantity***	***Weight lb [kg]***	***Drawing***
LAD7B106	$12.00	35mm DIN rail/panel mount adapter	DPER01 - DPER32	1	0.22 lb [0.1 kg]	PDF

Schneider Electric Easy TeSys Manual Motor Controllers

GP2E01



The Easy TeSys line-up of motor controllers includes 3-pole thermal-magnetic circuit breakers conforming to IEC 60947-2 and IEC 60947-4-1. These devices also conform to UL 60947-4-1 as manual motor controllers and are suitable for use as the motor disconnect. Easy TeSys manual motor controllers are designed to control and protect motors.

Connection

These circuit breakers are designed for connection by screw clamp terminals. This technique ensures secure, permanent, and durable clamping that is resistant to harsh environments, vibration and impact and is even more effective when conductors without cable ends are used. Each connection can take two independent conductors.

Push button control

Energization is controlled manually by operating the Start button "I" [1]. De-energization is controlled manually by operating the Stop button "O" [2] or automatically by the thermal-magnetic protection elements or by a voltage trip attachment.

Protection of motors

Motor protection is provided by the thermal-magnetic protection elements incorporated into the motor circuit breaker. As per IEC 60947-4-1 the magnetic elements (short-circuit protection) have a non-adjustable tripping threshold, which is equal to about 13 times the maximum setting current of the thermal trips.

The thermal elements (overload protection) include automatic compensation for ambient temperature variations. The rated operational current of the motor is specified and displayed by means of a graduated knob [3]. All live parts are protected against direct finger contact.

Easy TeSys manual motor controllers are easily mounted on DIN rail or directly to the panel.

Easy TeSys Manual Motor Controller Selection Guide

Part Number	Price	Setting Range Of Thermal Trips	Weight lb [kg]	Drawing
GP2E01	$69.00	0.10 - 0.16	0.573 [0.260 kg]	PDF
GP2E02	$69.00	0.16 - 0.25		PDF
GP2E03	$69.00	0.25 - 0.40		PDF
GP2E04	$69.00	0.40 - 0.63		PDF
GP2E05	$69.00	0.63 - 1		PDF
GP2E06	$69.00	1 - 1.6		PDF
GP2E07	$69.00	1.6 - 2.5		PDF
GP2E08	$69.00	2.5 - 4		PDF
GP2E10	$69.00	4 - 6.3		PDF
GP2E14	$74.00	6 - 10		PDF
GP2E16	$74.00	9 - 14		PDF
GP2E20	$74.00	13 - 18		PDF
GP2E21	$74.00	17 - 23		PDF
GP2E22	$88.00	20 - 25		PDF
GP2E32	$111.00	24 - 32		PDF

Schneider Electric Easy TeSys Manual Motor Controllers

Easy TeSys Manual Motor Controller Power Ratings

Part Number	Standard Power Ratings of 3-Phase Motors (50/60 Hz) in Category AC-3 [kW]					Setting Range of Thermal Trips	Magnetic Tripping Current Id ±20%
	230V	400V	440V	500V	690V		
GP2E01	–	–	–	–	–	0.10 - 0.16	1.5
GP2E02	–	–	–	–	–	0.16 - 0.25	2.4
GP2E03	–	–	–	–	–	0.25 - 0.40	5
GP2E04	–	–	–	–	0.37	0.40 - 0.63	8
GP2E05	–	–	–	0.37	0.55	0.63 - 1	13
GP2E06	–	0.37	0.55	0.75	1.1	1 - 1.6	22.5
GP2E07	0.37	0.75	1.1	1.1	1.5	1.6 - 2.5	33.5
GP2E08	0.75	1.5	1.5	2.2	3	2.5 - 4	51
GP2E10	1.1	2.2	3	3.7	4	4 - 6.3	78
GP2E14	2.2	4	4	5.5	7.5	6 - 10	138
GP2E16	–	5.5	5.5	9	11	9 - 14	170
GP2E20	4	7.5	9	10	15	13 - 18	223
GP2E21	5.5	9	11	11	18.5	17 - 23	327
GP2E22	5.5	11	11	15	22	20 - 25	327
GP2E32	7.5	15	15	18.5	22	24 - 32	416

Easy TeSys Manual Motor Controllers From 3/4 to 20HP / 460V (Screw Terminals)

Part Number	Thermal Setting (A)	Maximum Horsepower Ratings								Group Motor Applications
		Single-Phase			3-Phase					Max Fuse or Circuit Breaker (A)
		120V	200V	230V	115V	200V	230V	460V	575V	
GP2E01	0.10 - 0.16	–	–	–	–	–	–	–	–	450
GP2E02	0.16 - 0.25	–	–	–	–	–	–	–	–	
GP2E03	0.25 - 0.40	–	–	–	–	–	–	–	–	
GP2E04	0.40 - 0.63	–	–	–	–	–	–	–	–	
GP2E05	0.63 - 1	–	–	–	–	–	–	–	1/2	
GP2E06	1 - 1.6	–	–	1/10	–	–	–	3/4	3/4	
GP2E07	1.6 - 2.5	–	1/6	1/6	–	1/2	1/2	1	1.5	
GP2E08	2.5 - 4	1/8	1/4	1/3	–	3/4	3/4	2	3	
GP2E10	4 - 6.3	1/4	1/2	1/2	3/4	1	1.5	3	5	
GP2E14	6 - 10	1/2	1	1.5	1	2	3	5	7.5	
GP2E16	9 - 14	3/4	2	2	2	3	3	10	10	
GP2E20	13 - 18	1	2	3	2	5	5	10	15	
GP2E21	17 - 23	1.5	3	3	3	5	7.5	15	20	
GP2E22	20 - 25	2	–	–	–	7.5	7.5	15	20	
GP2E32	24 - 32	2	5	5	5	7.5	10	20	25	

Easy TeSys Manual Motor Controller North American Short Circuit and Motor Group Ratings

Part Number	Overload Range	Maximum RMS Short-Circuit Current [kA]		
		240V*	480V*	600V*
GP2E01	0.10 - 0.16	35	35	18
GP2E02	0.16 - 0.25	35	35	18
GP2E03	0.25 - 0.40	35	35	18
GP2E04	0.40 - 0.63	35	35	18
GP2E05	0.63 - 1	35	35	18
GP2E06	1 - 1.6	35	35	18
GP2E07	1.6 - 2.5	35	35	18
GP2E08	2.5 - 4	35	35	18
GP2E10	4 - 6.3	35	35	18
GP2E14	6 - 10	30	30	18
GP2E16	9 - 14	25	25	10
GP2E20	13 - 18	25	25	10
GP2E21	17 - 23	25	10	10
GP2E22	20 - 25	25	10	10
GP2E32	24 - 32	25	10	10

* Nominal System Voltage

Easy TeSys contactors may be used on the load side of Easy TeSys Manual Motor Controllers in group installations on a circuit with an available short-circuit current no greater than shown in the table below when protected by fuses or circuit breakers:

Easy TeSys Manual Motor Controller Use on the Load Side

Part Number	Maximum RMS Short-Circuit Current [kA]	
	480VAC	600VAC
GP2E01	22	22
GP2E02	22	22
GP2E03	22	22
GP2E04	22	22
GP2E05	22	22
GP2E06	22	22
GP2E07	22	22
GP2E08	22	22
GP2E10	22	22
GP2E14	22	22
GP2E16	22	10
GP2E20	22	10
GP2E21	10	10
GP2E22	10	10

The above Group Installations may be used with Schneider's GV2Gx45 busbar and/or GV1G09 terminal block adapter.

Schneider Electric Easy TeSys Manual Motor Controllers

Schneider Electric

Easy TeSys Manual Motor Controller Environmental Characteristics

		Circuit Breaker Type	GP2Exx
Conforming to Standards			IEC 60947-2, IEC 60947-4-1, UL 60947-4-1, CSA C22.2 No. 60947-4-1
Product Certifications			cUL, UL Listed
Protective Treatment (Conforming to IEC 60068-2-30)			IEC60068-2-30 Test Db, Variant 2
Degree of Protection			In GV2 MC01 enclosure: IP 41 In GV2 MC02 enclosure: IP 55
Ambient Air Temperature		Storage	-40 to 176°F [-40 to 80ºC]
		Operation	-4 to 140°F [-20 to 60ºC]
Flame Resistance (Conforming to IEC 80695-2-1)			1760 [960ºC]
Maximum Operating Altitude			6561.68 ft [2000m]
Cabling (Number of conductors and C.S.A.)		Solid cable	Min: 2x1 mm^2 Max: 2x6 mm^2
		Flexible cable without cable end	Min: 2x1.5 mm^2 Max: 2x6 mm^2
		Flexible cable with cable end	Min: 2x1 mm^2 Max: 2x4 mm^2
		AWG 75°C CU	8 - 18
Suitable For Isolation (Conforming to IEC 60947-1 § 7-1-6)			Yes
Tightening Torque			15.05 lbf•in [1.7 N•m]
Rated Operational Voltage (U_e) (Conforming to IEC 60947-2)			690V
Rated Insulation Voltage (U_i) (Conforming to IEC 60947-2)			690V
Rated Operational Frequency (Conforming to IEC 60947-2)			50/60 Hz
Rated Impulse Withstand Voltage (U_{imp}) (Conforming to IEC 60947-2)			6kV
Total Power Dissipated Per Pole			2.5 W
Mechanical Durability			100,000 C.O. [C.O.: closing, opening]
Electrical Durability for AC-3 Duty			100,000 C.O. [C.O.: closing, opening]
Duty Class (Maximum Operating Rate)			25 C.O. [C.O.: closing, opening] per hour

Easy TeSys Manual Motor Controller Breaking Capacity

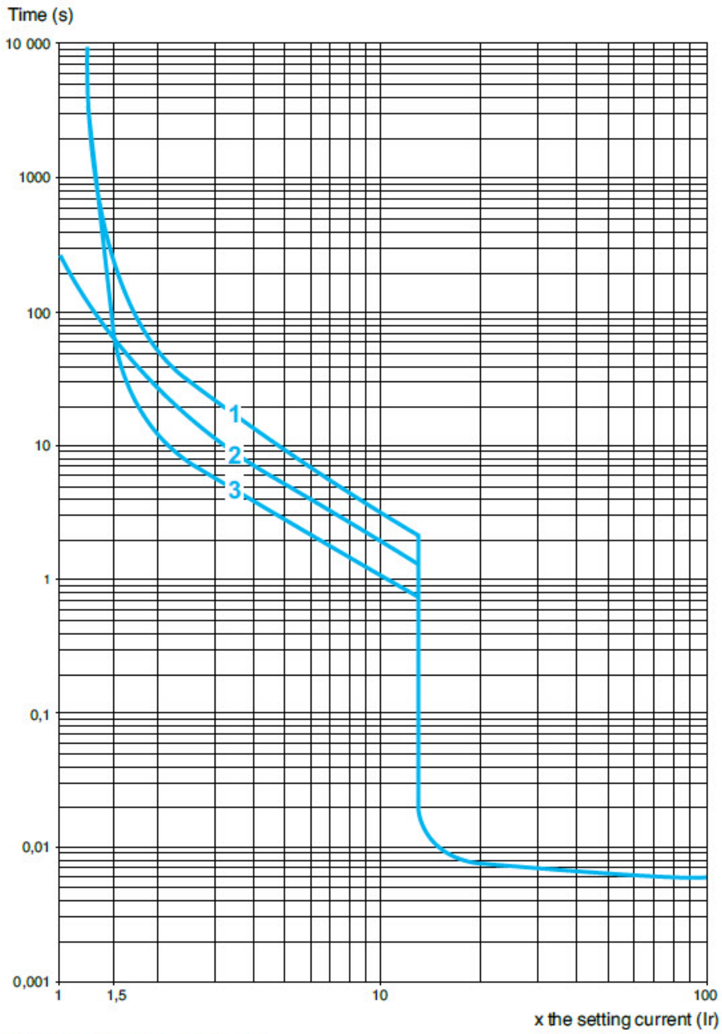
Breaking Capacity Rating (Conforming to IEC 60947-2)		Circuit Breaker Type GP2Exx								
		01 to 06	07	08	10	14	16	20	21	22 to 32
Rating (A)		0.1 to 1.6	2.5	4	6.3	10	14	18	23	25 to 32
230/240 V	I_{cu} [kA]	*	*	*	*	*	*	*	30	30
	I_{cs}% [1]	*	*	*	*	*	*	*	100	100
400/415 V	I_{cu} [kA]	*	*	*	*	*	10	10	10	10
	I_{cs}% [1]	*	*	*	*	*	50	50	50	50
440V	I_{cu} [kA]	*	*	*	30	10	6	6	5	5
	I_{cs}% [1]	*	*	*	100	100	50	50	50	50
500V	I_{cu} [kA]	*	*	*	30	8	5	5	3	3
	I_{cs}% [1]	*	*	*	100	100	75	75	75	75
690V	I_{cu} [kA]	*	2	2	2	2	2	2	2	2
	I_{cs}% [1]	*	75	75	75	75	75	75	75	75

* >100kA
(1) As % of Icu

Schneider Electric Easy TeSys Manual Motor Controllers

Tripping Curves

Average Operating Times at 20°C Related to Multiples of the Setting Current



1 3 poles from cold state
2 2 poles from cold state
3 3 poles from hot state

Schneider Electric Easy TeSys Manual Motor Controllers

GPEFC11

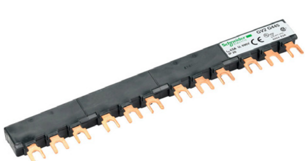
Easy TeSys Manual Motor Controller Contact Blocks Selection Guide

Part Number	Price	Description	Maximum Number	Type of Contacts	Weight lb [kg]	Drawing
GPEFC11	$13.00	Instantaneous auxiliary contacts, front mount	2	NO + NC	0.11 lb [0.050 kg]	PDF

GV2MC02

Easy TeSys Manual Motor Controller Enclosures Selection Guide

Part Number	Price	Description	Degree of Protection	Weight lb [kg]	Drawing
GV2MC01	$64.00	Enclosure, surface mounting, double insulated, with protective sealable cover	IP41	0.639 lb [0.290 kg]	PDF
GV2MC02	$92.00		IP55		PDF



GV2G445

Easy TeSys Manual Motor Controller Busbar Accessories Selection Guide

Part Number	Price	Description	Number of Tap-offs	Pitch	Drawing
GV2G245	$27.50	3-pole 63A busbar	2	1.77 in [45mm]	PDF
GV2G345	$34.00		3		PDF
GV2G445	$40.50		4		PDF

GV1G09

Easy TeSys Manual Motor Controller Terminal Block Accessories Selection Guide

Part Number	Price	Description	Package Quantity	Drawing
GV1G09	$40.50	Terminal block, top feed incoming power	1	PDF
GV2AF3	$4.00	Combination block (between GP2E and contactor DPE09 to DPE38	10	PDF

Fuji Electric IEC Motor Controls

AUTOMATIONDIRECT has cooperated with Fuji Electric to offer a complete line of IEC electric motor controls.

The DUO line (SC-E contactors and TK-E overloads) is fully integrated so multiple motor speed controller solutions are possible with a minimum number of components. The conventional motor starters in the DUO line can accommodate electric motors up to 100 horsepower at 480VAC. The larger motor contactors feature the SUPERMAGNET™ coil for greater reliability and positive pick-up and drop-out.

The Odyssey Series of contactors and overload relays also features the SUPERMAGNET™ coil and come in sizes up to 361 A, AC-3 operation (300 horsepower at 480 VAC). Odyssey Series contactors are available in four sizes with overload relays to match any motor to 300 horsepower.

Both the DUO and Odyssey lines are available in 24 VAC, 24 VDC, 120 VAC, 240 VAC, 380-575 VAC. The motor contactors are rated up to 690 VAC, 3-phase.

Conformance to IEC standards:
- Short-circuit protective coordination between protective devices and the equipment to be protected

Response to the international market:
- Conformance to CE, IEC, UL, CSA and other international standards

Safety and environmental consideration:
- Application of international standards in safety features such as terminals with finger protection
- Use of recycled materials

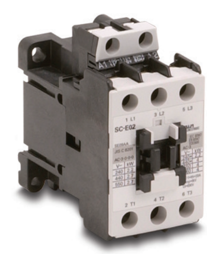
Use contactors for:
- Electronic switching
- Lighting
- Resistive loads
- Non-motor related inductive loads
- Disconnect switches
- VFD bypass/isolation

Use starters for:
- Inductive motor starting and control
- Fulfillment of NEC 430 and 409
- NEMA starter replacement/retrofit

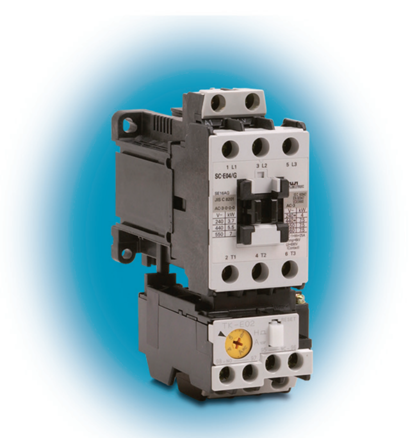
DUO Series: SC-E series contactors and TK-E series overload relays

1/2 to 100 hp
9 - 150A (AC3) rated current

SC-E Series Contactor Features
- 5 to 100 hp 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, and67 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 SUPERMAGNETTM (AC-input/DC-output operation) for high operating reliability



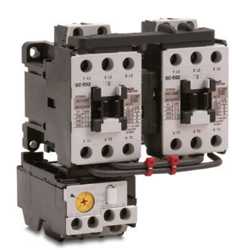
TK-E Series Overload Features
- Isolated NO and NC contacts can be used with different potentials
- A high-precision scale for the current adjustment dial enables easy and exact current setting
- The operating status can be visually checked with ease
- The relays can be manually tripped. A tripfree mechanism is also provided
- Base unit can be added to enable separate mounting of the TK26E, E2 and E3-xxx models
- IEC/EN 60947-1, UL508, CSA-C22.2 No. 14, CE



Traditional starters

Fuji's DUO line offers a complete range of components for building a traditional starter utilizing overload relays, auxiliary and alarm contacts, and mechanical interlocks to create a reversing unit.

Build a reversing starter with DUO line components



Fuji Electric IEC Motor Controls

Odyssey 3N series contactors and matching overload relays

The Odyssey series, from 60 to 300 hp at 480 V, uses Fuji's unique SUPERMAGNET technology for greater reliability. The SUPERMAGNET holds without chattering even if the line voltage drops to 65% of its rated value, preventing contact and coil damage.

60 to 300 hp at 480 V
180 - 361A (AC3) rated current

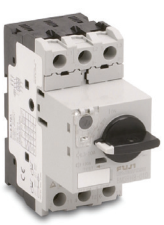
3N Series Contactor Features

- Provides higher current and horsepower capabilities than SC-E series. Designed for reliable use in applications requiring constant switching, reduced coil energy 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.
- IEC-947, UL, CSA, CE

3N Series Overload Features

- Overload, phase loss protection
- Isolated NO and
- NC contacts
- Ambient temperature compensation
- Trip indicator
- Finger protection terminals
- IEC-947, UL, CSA, CE

Use Odyssey components to build a traditional starter

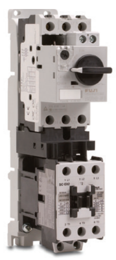


Manual Motor Starters (MMS)

Circuit breakers for motor use that provide optimal protection by integrating the functions of a molded case circuit breaker and thermal overload relay into a compact unit.

BM3 Series

- Rated Current: 0.16 to 32A, 10 to 63A
- Short Circuit Current Rating: 100 kA at 240V, 50 kA at 480V, 10 kA at 600V
- Widths: 45 mm and 55 mm



Combination Starters

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

Accessories

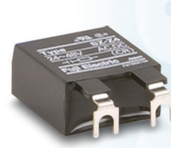
Auxiliary contact blocks

Mechanical interlocks

Reversing kits

Terminal Covers

Surge suppressors



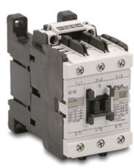
and more!

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 three steps to choose the best fit.

1 What does the application require?

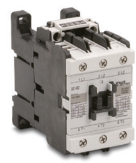
Basic Contactors Only



Contactor
Typical applications:

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

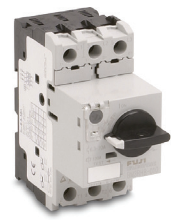
Traditional Starters



Contactor and overload relay
Typical applications:

- Inductive motor starting and control
- NEC 430 and 409 fulfillment
- NEMA 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 tMRC-131
- Horsepower (HP) and full load amperage (FLA); Refer to motor data plate information.

3 Select your components.

Duo Series
SC-E Contactor

- 1/2 to 100 hp @ 480 V
- 9-150 A (AC3)

Odyssey Series
3N Contactor

- 60 to 300 hp
- 180-361 A (AC3)

Duo Series
SC-E Contactor

TK-E Overload relay

- 1/2 to 100 hp @ 480 V

Odyssey Series
3N Contactor

3N Overload relay

- 60 to 300 hp

Duo Series
BM3 Manual motor starter

- 1/2 to 40 hp @ 480 V

Duo Series
BM3 Manual motor starter

SC-EContactor
BZ0L link module

BZ0BP base plate

- 1/2 to 40 hp @ 480 V

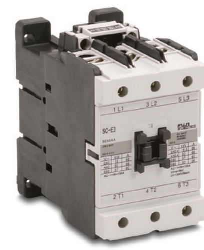
Fuji Duo Series SC-E Contactors

Features

- 5 to 100 hp at 480VAC
- 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 43mm, 54mm, and 67mm.
- 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 SUPERMAGNETTM (AC-input/DC-output operation) for high operating reliability and requires no surge suppressor.

Small Size

- SC-E02-xxx to E05-xxx: 43mm wide
- SC-E1-xxx to E2S-xxx: 54mm wide
- SC-E3-xxx, E4-xxx: 67mm wide
- SC-E5-xxx: 88mm wide



SC-E2S

Fuji Electric

SC-E7

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

Standards & Approvals

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

Optional accessories

- Auxiliary contact blocks
- Coil surge suppression units

SC-E Series Contactors Specifications - UL and CSA

Part Number	Price	Nominal Coil Voltage	Rated Capacity (HP) 3-Phase Motor 200V	Rated Capacity (HP) 3-Phase Motor 220 to 240V	Rated Capacity (HP) 3-Phase Motor 440 to 480V	Rated Capacity (HP) 3-Phase Motor 550 to 600V	Rated Capacity (HP) 1-Phase Motor 100 to 120V	Rated Capacity (HP) 1-Phase Motor 220 to 240V	Rated AC-3 Current (A) [note 1]	Rated AC-1 Thermal Current (A) [note 2]	SCCR Ratings (KA)	Rated Insulation Voltage (V)	Frame Width (mm)
SC-E02P-24VAC	$26.50	24VAC	2	2	5	5	1/3	1	9	20	5	690	43
SC-E02P-110VAC	$26.50	110VAC											
SC-E02P-220VAC	$26.50	220VAC											
SC-E02P-440VAC	$26.50	440-480VAC											
SC-E02P-500VAC	$26.50	500-550VAC											
SC-E02PG-24VDC	$30.50	24VDC											
SC-E03P-24VAC	$33.50	24VAC	3	3	7.5	7.5	1/2	2	12	20			
SC-E03P-110VAC	$33.50	110VAC											
SC-E03P-220VAC	$33.50	220VAC											
SC-E03P-440VAC	$33.50	440-480VAC											
SC-E03PG-24VDC	$48.50	24VDC											
SC-E04P-24VAC	$42.00	24VAC	5	5	10	10	1	3	18	25			
SC-E04P-110VAC	$42.00	110VAC											
SC-E04P-220VAC	$42.00	220VAC											
SC-E04P-440VAC	$42.00	440-480VAC											
SC-E04P-500VAC	$42.00	500-550VAC											
SC-E04PG-24VDC	$59.00	24VDC											
SC-E05P-24VAC	$54.00	24VAC	5	7.5	15	15	2	3	25	32			
SC-E05P-110VAC	$54.00	110VAC											
SC-E05P-220VAC	$54.00	220VAC											
SC-E05P-440VAC	$54.00	440-480VAC											
SC-E05P-500VAC	$54.00	500-550VAC											
SC-E05PG-24VDC	$69.00	24VDC											

TABLE CONTINUED NEXT PAGE

Notes: 1. AC3 type loads consist of squirrel cage three-phase motors; occasional, limited jogging duty.
2. AC1 non-inductive or slightly inductive loads. Typically resistive loads (i.e. furnaces, ovens, etc.)

Fuji Duo Series SC-E Contactors

Fuji Electric

SC-E Series Contactors Specifications - UL and CSA

Model	Price	Nominal Coil Voltage	Rated Capacity (HP) 3-Phase Motor 200V	3-Phase Motor 220–240V	3-Phase Motor 440–480V	3-Phase Motor 550–600V	1-Phase Motor 100–20V	1-Phase Motor 220–240V	Rated AC-3 Current (A) [note 1]	Rated AC-1 Thermal Current (A) [note 2]	SCCR Ratings (KA)	Rated Insulation Voltage (V)	Frame Width (mm)
SC-E1-24VAC	$72.00	24VAC	7.5	10	25	25	2	3	32	50	5	690	54
SC-E1-110VAC	$72.00	110VAC											
SC-E1-220VAC	$72.00	220VAC											
SC-E1-440VAC	$72.00	440-480VAC											
SC-E1-500VAC	$72.00	500-550VAC											
SC-E1G-24VDC	$85.00	24VDC											
SC-E2-24VAC	$102.00	24VAC	10	15	30	30	3	5	40	60			
SC-E2-110VAC	$102.00	110VAC											
SC-E2-220VAC	$102.00	220VAC											
SC-E2-440VAC	$102.00	440-480VAC											
SC-E2G-24VDC	$124.00	24VDC											
SC-E2S-24VAC	$124.00	24VAC	15	20	30	30	3	10	50	65			
SC-E2S-110VAC	$124.00	110VAC											
SC-E2S-220VAC	$124.00	220VAC											
SC-E2S-440VAC	$124.00	440-480VAC											
SC-E2S-500VAC	$124.00	500-550VAC											
SC-E2SG-24VDC	$146.00	24VDC											
SC-E3-24VAC	$140.00	24VAC	20	25	50	50	5	15	65	100			67
SC-E3-110VAC	$140.00	110VAC											
SC-E3-220VAC	$140.00	220VAC											
SC-E3-440VAC	$140.00	440-480VAC											
SC-E3G-24VDC	$171.00	24VDC											
SC-E4-24VAC	$142.00	24VAC	25	30	50	50	5	15	80	105			
SC-E4-110VAC	$142.00	110VAC											
SC-E4-220VAC	$142.00	220VAC											
SC-E4-440VAC	$142.00	440-480VAC											
SC-E4-500VAC	$142.00	500-550VAC											
SC-E4G-24VDC	$177.00	24VDC											
SC-E5-24V	$356.00	24VAC/VDC	30	30	60	75	7.5	15	105	150	10		88
SC-E5-100V	$356.00	110VAC/VDC											
SC-E5-200V	$356.00	220VAC/VDC											
SC-E5-400V	$356.00	380-450VAC											
SC-E5-500V	$356.00	460-575VAC											
SC-E6-24V	$457.00	24VAC/VDC	40	40	75	100	10	20	125	150	10		100 100
SC-E6-100V	$457.00	110VAC/VDC											
SC-E6-200V	$457.00	220VAC/VDC											
SC-E6-500V	$457.00	460-575VAC											
SC-E7-24V	$531.00	24VAC/VDC	50	50	100	125	15	25	150	200	10		115
SC-E7-100V	$531.00	110VAC/VDC											
SC-E7-200V	$531.00	220VAC/VDC											
SC-E7-400V	$531.00	380-450VAC											
SC-E7-500V	$531.00	460-575VAC											

Notes: 1. AC3 type loads consist of squirrel cage three-phase motors; occasional, limited jogging duty.
2. AC1 non-inductive or slightly inductive loads. Typically resistive loads (i.e. furnaces, ovens, etc.)

Fuji Duo Series SC-E Contactors

Fuji Electric

SC-E Series Contactors Specifications - IEC												
Contactor Type	Rated Capacity (kW)				Rated Operating Current (A)						Rated Thermal Current (A)	Internal Auxilliary Contact Arrangement
	3-Phase Motor AC-3 / AC-4				3-Phase Motor AC-3 / AC-4				Resistive Load AC-1			
	200-240V	380-440V	500-550V	600-690V	200-240V	380-440V	500-550V	600-690V	200-240V	380-440V		
SC-E02(G)-xxx	2.2 / 2.2	4 / 4	4 / NA	4 / NA	9 / 9	9 / 9	7 / NA	5 / NA	20	20	20	-
SC-E03(G)-xxx	3 / 3	5.5 / 5.5	5.5 / NA	5.5 / NA	12 / 12	12 / 12	9 / NA	7 / NA	20	20	20	-
SC-E04(G)-xxx	4 / 4	7.5 / 7.5	7.5 / NA	7.5 / NA	18 / 18	18 / 18	13 / NA	9 / NA	25	25	25	-
SC-E05(G)-xxx	5.5 / 4	11 / 7.5	11 / NA	7.5 / NA	25 / 18	25 / 18	17 / NA	9 / NA	32	32	32	-
SC-E1(G)-xxx	7.5 / 7.5	15 / 15	15 / NA	11 / NA	32 / 32	32 / 32	24 / NA	15 / NA	50	50	50	-
SC-E2(G)-xxx	11 / 11	18.5 / 18.5	18.5 / NA	15 / NA	40 / 40	40 / 40	29 / NA	19 / NA	60	60	60	-
SC-E2S(G)-xxx	15 / 11	22 / 18.5	25 / NA	22 / NA	50 / 40	50 / 40	38 / NA	26 / NA	65	65	65	-
SC-E3(G)-xxx	18.5 / 18.5	30 / 30	37 / NA	30 / NA	68 / 68	65 / 65	60 / NA	38 / NA	100	100	100	-
SC-E4(G)-xxx	22 / 18.5	40 / 30	37 / NA	37 / NA	80 / 68	80 / 65	60 / NA	44 / NA	105	105	105	-
SC-E5-xxx	30 / 30	55 / 55	5 5/ NA	55 / NA	105 / 105	105 / 105	85 / NA	64 / NA	150	150	150	2NO+2NC
SC-E6-xxx	37 / 37	60 / 60	6 0 / NA	60 / NA	125 / 125	125 / 125	90 / NA	72 / NA	150	150	150	2NO+2NC
SC-E7-xxx	45 / 45	75 / 75	75 / NA	90 / NA	150 / 150	150 / 150	120 / NA	103 / NA	200	200	200	2NO+2NC

Internal Auxiliary Contact Ratings

Internal Auxiliary Contact Ratings - UL and CSA						
Frame Size (note 1)	Rated Insulation Voltage (V)	NEMA ICS 5-2000 Ratings (note 2)				
		AC Ratings			DC Ratings	
		Designation	Making VA	Breaking VA	Designation	Making/Breaking VA
E5 to E7-xxx	690	A600	7200	720	Q300	69

Notes:
1. E02(G) to E4(G) do not have internal auxiliary contact.
2. NEMA ICS 5-2000. For more information, refer to Control Circuit Contact Electrical Ratings, see page tMRC-130.

Internal Auxiliary Contact Ratings - IEC, JIS									
Based on IEC 60974-4-1, EN 60947-4-1, JIS C 8201-4-1									
Frame Size (note 1)	Rated Insulation Voltage (V)	Rated Thermal Current (A)	Making and Breaking Capacity (A)		Rated Operational Current (A)				Minimum Operating Voltage and Current
			AC Voltage	Amps	AC Voltage	AC-15 (Ind. load)	DC Voltage	DC-13 (Ind. load)	
E5 to E7-xxx	690	10	120V	60	120V	6	24V	3	5VDC, 3mA
			220V	30	220V	3	48V	1.5	
			440V	15	440V	1.5	110V	0.55	
			600V	12	600V	1.2	220V	0.27	

Note 1: E02(G) to E4(G) do not have internal auxiliary contact.

Fuji Duo Series SC-E Contactors

Coil Characteristics

AC Coil Characteristics

Frame Size	Power Consumption (VA) Inrush 50/60Hz	Power Consumption (VA) Sealed 50/60Hz	Power Loss (W) 50Hz	Power Loss (W) 60Hz	Pick-Up Voltage (V)	Drop-Out Voltage (V)	Operating Time (ms) Coil ON to Contact ON	Operating Time (ms) Coil OFF to Contact OFF
E02 to E05-xxx	90/95	9/9	2.7	2.8	0.85 - 1.1 x U.S. rated coil voltage	0.2 - 0.75 x U.S. rated coil voltage	9-20	5-16
E1 to E2S-xxx	120/135	12.7/12.4	3.6	3.8	0.85 - 1.1 x U.S. rated coil voltage	0.2 - 0.75 x U.S. rated coil voltage	10-17	6-13
E3, E4-xxx	180/190	13.3/13.4	4.5	5	0.85 - 1.1 x U.S. rated coil voltage	0.2 - 0.75 x U.S. rated coil voltage	10-18	8-18
E5-xxx	80/95	4/4.6	3.2	3.6	0.85 - 1.1 x U.S. rated coil voltage	0.2 - 0.75 x U.S. rated coil voltage	39-45	27-33
E6, E7-xxx	190/230	4.9/5.8	3.4	3.7	0.8 - 1.1 x U.S. rated coil voltage	0.1 - 0.65 x U.S. rated coil voltage	31-37	30-36

DC Coil Characteristics

Frame Size	Power Consumption (W) Inrush	Power Consumption (W) Sealed	Pick-Up Voltage (V)	Drop-Out Voltage (V)	Operating Time (ms) Coil ON to Contact ON	Operating Time (ms) Coil OFF to Contact OFF
E02G to E05G-xxx	7	7	0.85 - 1.1 x U.S. rated coil voltage	0.1 - 0.75 x U.S. rated coil voltage	45-49	10-26
E1G to E2SG-xxx	9	9	0.85 - 1.1 x U.S. rated coil voltage	0.1 - 0.75 x U.S. rated coil voltage	40-50	8-17
E3G, E4G-xxx	12	12	0.85 - 1.1 x U.S. rated coil voltage	0.1 - 0.75 x U.S. rated coil voltage	60-70	14-21
E5-xxx	90	2.8	0.85 - 1.1 x U.S. rated coil voltage	0.1 - 0.75 x U.S. rated coil voltage	35-41	26-32
E6, E7-xxx	225	3.2	0.8 - 1.1 x U.S. rated coil voltage	0.1 - 0.65 x U.S. rated coil voltage	28-34	27-33

Operating Coil

AC Coil, SC-E02-xxx to SC-E4-xxx

Voltage Code	Coil Operating Voltage / Frequency
24VAC	24VAC 50Hz / 24-26VAC 60Hz
110VAC	100-110VAC 50Hz / 110-120VAC 60Hz
220VAC	200-220VAC 50Hz / 220-240VAC 60Hz
440VAC	415-440VAC 50Hz / 440-480VAC 60Hz
500VAC	480-500VAC 50Hz / 500-550VAC 60Hz

Operating Coil

AC/DC Coil (SUPERMAGNET), SC-E5-xxx to SC-E7-xxx

Voltage Code	Coil Operating Voltage/Frequency
24V	24-25VAC 50/60Hz; 24VDC
100V	100-127VAC 50/60Hz; 100-120VDC
200V	200-250VAC 50/60Hz; 200-240VDC
400V	380-450VAC 50/60Hz
500V	460-575VAC 50/60Hz

Operating Coil

DC Coil, SC-E02G-xxx to SC-E4G-xxx

Voltage Code	Coil Operating Voltage
24VDC	24VDC

Performance Data

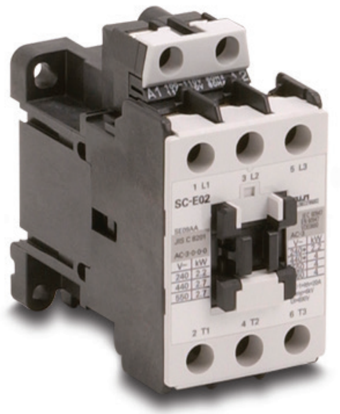
Frame size	Making current (A) 220V	Making current (A) 440V	Breaking current (A) 220V	Breaking current (A) 440V	Operating cycles per hour	Durability (operations) Electrical	Durability (operations) Mechanical
SC-E02	108	108	90	90	1800	2 million	10 million
SC-E03	144	144	120	120	1800	1.5 million	10 million
SC-E04	216	216	180	180	1800	1.5 million	10 million
SC-E05	250	250	200	200	1200	1.5 million	10 million
SC-E1	384	384	320	320	1200	1.5 million	10 million
SC-E2	480	480	400	400	1200	1.5 million	10 million
SC-E2S	500	500	400	400	1200	1.5 million	10 million
SC-E3	816	780	680	650	1200	1.5 million	5 million
SC-E4	816	800	680	650	1200	1 million	5 million
SC-E5	1260	1260	1050	1050	1200	1 million	5 million
SC-E6	1500	1500	1250	1250	1200	1 million	5 million
SC-E7	1800	1800	1500	1500	1200	1 million	5 million

Fuji Duo Series SC-E Contactors

Fuji Electric

Standard operating conditions

The magnetic contactors are manufactured for use in the standard operating conditions given in the table.



Standard Operating Conditions	
Ambient Temperature	Operating: -5 to 55°C [23 to 131°F] No sudden temperature changes resulting in condensation or icing (The average temperature over a 24-hour period must not exceed 35°C [95°F) Storage: -40 to 65°C [-40 to 149°F]
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	35mm IEC DIN rail mounting (SC-E02 to SC-E4), screw mounting
Mounting Angle	
Standard	IEC 947-4-1, EN 60947-4-1, VDE 0660 JIS C 8201-4-1, JEM 1038 UL 508, file E42419; CSA C22.2, file 20479

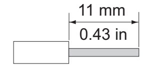
Wiring

Be sure to perform wiring correctly with reference to the wiring diagrams. 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 and crimping a sleeve (ferrule) onto them before connecting.

Tightening torque

If wires are not tightened sufficiently, they may become hot or loosen, resulting in a fire, short-circuit, electric shock, or other potentially dangerous situation. Tighten wires to the torques specified in these tables.

Wire Sizes, Tightening Torques - Control Circuit		
Solid or Stranded Wire (mm^2)	***One***	0.75 to 2.5 (1 to 1.6 mm diameter)
	Two	0.75 to 2.5 (1 to 1.6 mm diameter)
Stranded Wire Flexible Stranded Wire	***mm [in]***	0.75 to 2.5 [0.03 to 0.10]
	AWG	18 to 14
Ring Terminal [SC-E0x(P) only]	***mm [in]***	7.7 [0.30]
AWG	***One***	18 to 14
	Two	18 to 14
Insulation Stripping Length		 10 mm 0.39 in
Fork Terminal		Max. 7.7mm wide
Terminal Screw Size		M3.5
Tool		Phillips screwdriver, H-type, No. 2 (ISO 8764); ADC part number TW-SD-VPH-1 or TW-SD-VPH-2
		Flat-blade screwdriver, 1 x 5.5 x L-type, B (ISO 2830); ADC part number TW-SD-VSL-4
Tightening Torque (N.m)		0.8 to 1

Wire Sizes, Tightening Torques - Main Circuit					
Contactor Type		***SC-E02-xxx***	***SC-E03-xxx***	***SC-E04-xxx***	***SC-E05-xxx***
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) Flexible Stranded Wire	***mm [in]***	0.75 to 10 [0.03 to 0.39]			
	AWG	18 to 8			
Ring Terminal [SC-E0x(P) only]	***mm [in]***	Maximum 9.7 mm [0.38 in] wide			
AWG	***One***	12 maximum		10 maximum	
	Two	12 maximum		10 maximum	
Insulation Stripping Length		 11 mm 0.43 in			
Terminal Screw Size		M4			
Tool		Phillips screwdriver, H-type, No. 2 (ISO 8764); ADC part number TW-SD-VPH-1 or TW-SD-VPH-2			
		Flat-blade screwdriver, 1 x 5.5 x L-type, B (ISO 2830); ADC part number TW-SD-VSL-4			
Tightening Torque (N.m)		1.2 to 1.5			

Fuji Duo Series SC-E Contactors

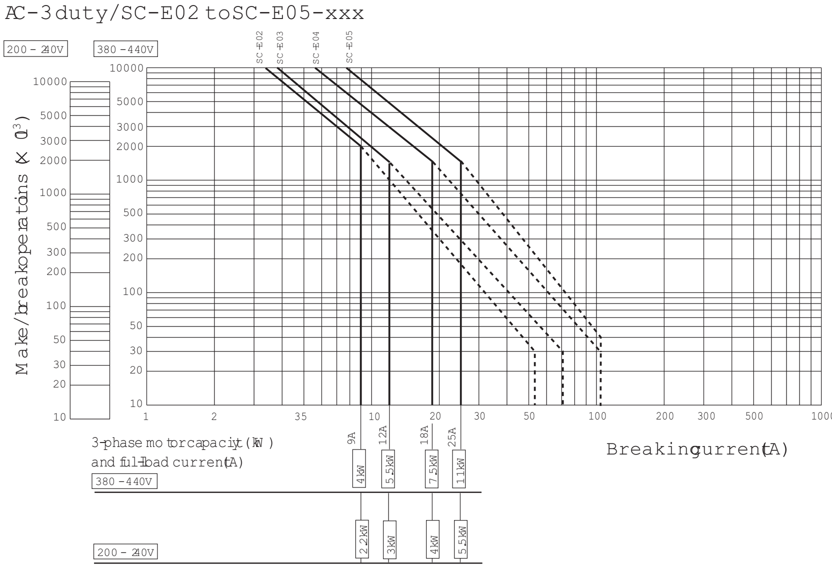
Wire Sizes, Tightening Torques - Main Circuit						
Contactor Type			*SC-E1, E2, E2S-xxx*	*SC-E3, E4-xxx*	*SC-E5, E6-xxx*	*SC-E7-xxx*
Top-Only Connection	***Solid or stranded wire (mm^2) [1]***		0.75 to 35	1.5 to 70	4 to 70	4 to 120
	Flexible stranded wire with sleeve (mm^2) [1]		0.75 to 25	1.5 to 50	2.5 to 50	2.5 to 95
	Flexible stranded wire without sleeve (mm^2)		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)		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)	***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); ADC part number DN-SP1 or DN-SP2	Hex. wrench 4 (ISO 2936)		
			Flat-blade screwdriver, 1 x 5, 5xL-type, B (ISO 2830); ADC part number DN-SS5			
Tightening Torque (N•m)			2.5	8		10
Self-locking Torque (N•m)[2]			1	2		

Note 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.
Note 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 loosen.

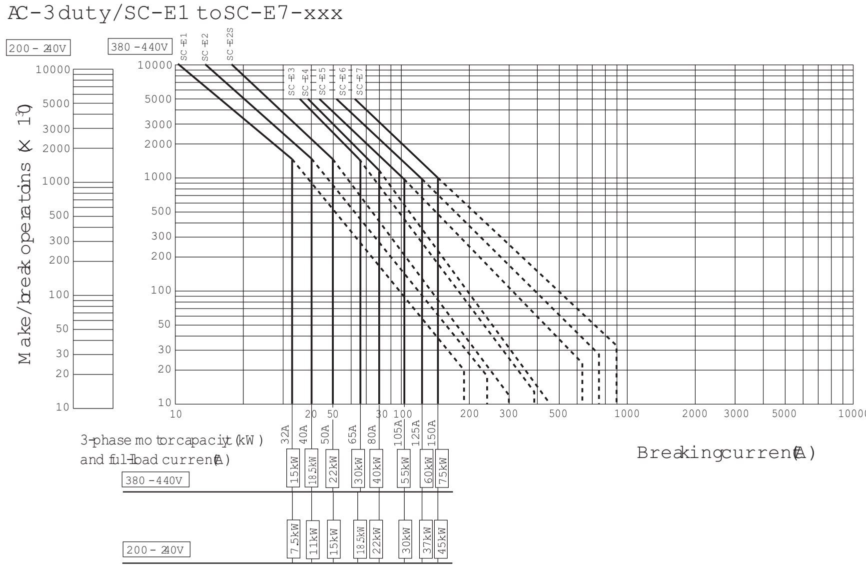
Fuji Duo Series SC-E Contactors

Electrical durability

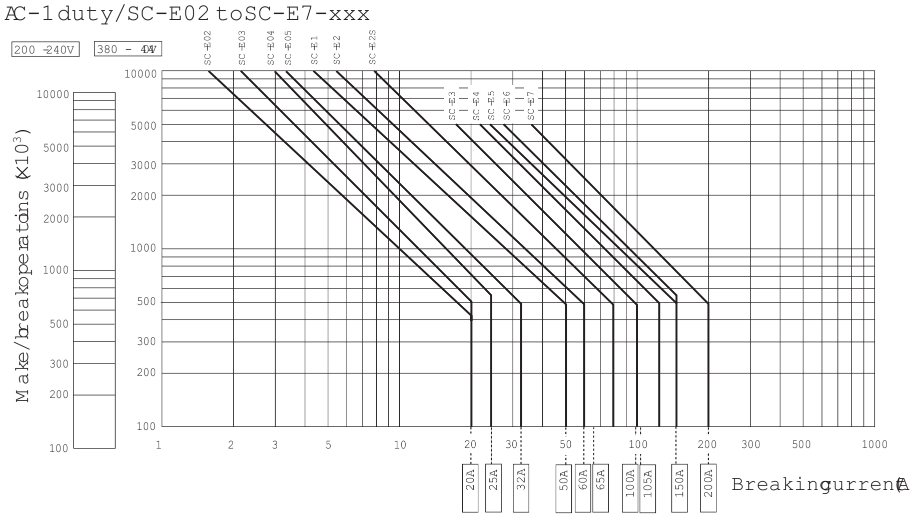
AC-3 duty/SC-E02 to SC-E05-xxx



AC-3 duty/SC-E1 to SC-E7-xxx

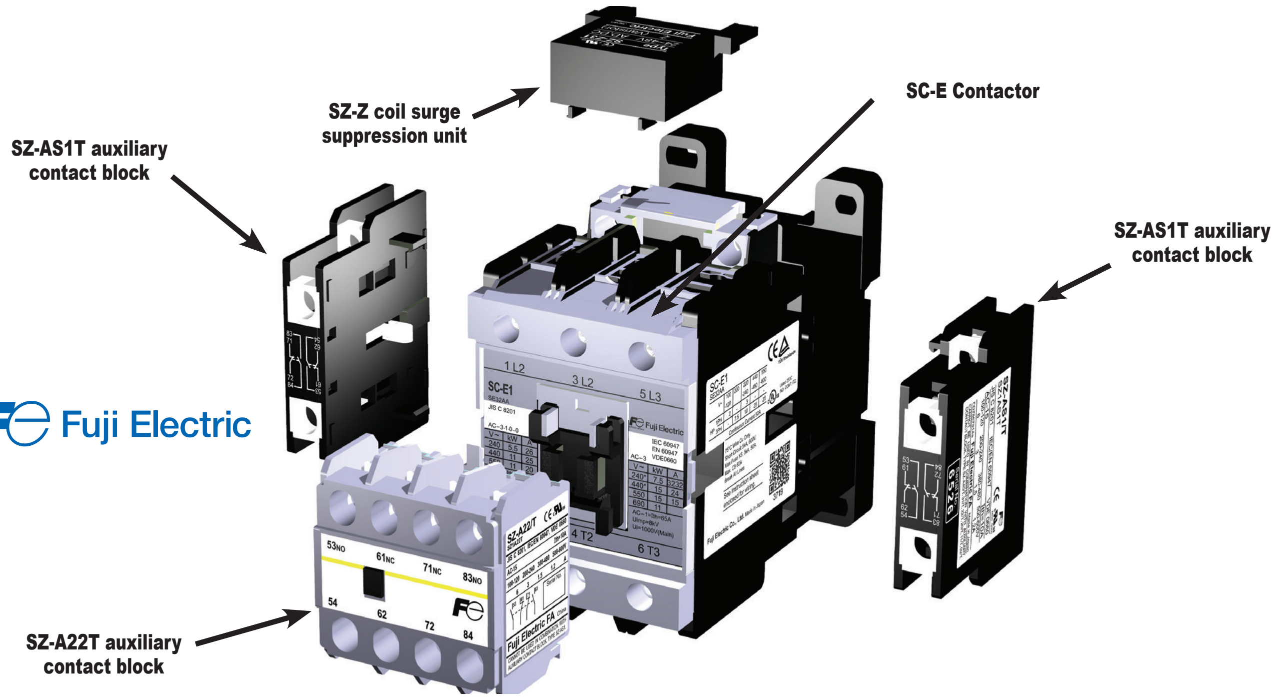


AC-1 duty/SC-E02 to SC-E7-xxx



Fuji Duo Series SC-E Contactors Accessories

Optional accessories



Auxiliary contact blocks with terminal covers

Maximum auxiliary contact blocks:

2 side mounted (1 per side) OR 1 front mounted. The front and side blocks cannot be mounted together on the same contactor.


SZ-A22T


SZ-A11T


SZ-AS1T


SZ-AS2T

Caution on use:

1. Front mounting auxiliary contact block and side mounting block cannot be attached to one contactor at the same time.
2. Only one front mounting block can be attached to one contactor.
3. Where interlock unit is already attached, side mounting auxiliary contact block can be attached on one side only.

Auxiliary Contact Blocks with Terminal Covers					
Part Number	***Price***	***Applicable Contactor***	***Mounting***	***Number of Contacts***	***Contact Arrangement***
SZ-A22T	$25.00	SC-E02(G)-xxx to E4(G)-xxx	Front mounting	4	2NO + 2NC
SZ-A20T	$16.50			2	2NO
SZ-A11T	$16.50				1NO + 1NC
SZ-AS1T	$25.00	SC-E02(G)-xxx to E4(G)-xxx	Side mounting	2	1NO + 1NC
SZ-AS2T	$25.00	SC-E5, E6, E7-xxx, SC-N4, N5, N6, N7, N8, N10, N11, N12, SC-E5(G)-xxx to E7(G)-xxx		2	1NO + 1NC

Accessory Auxiliary Contact Ratings - UL and CSA				
NEMA ICS 5-2000 Ratings (note 1)				
AC Ratings			DC Ratings	
Designation	Making VA	Breaking VA	Designation	Making/Breaking VA
A600	7200	720	Q300	69

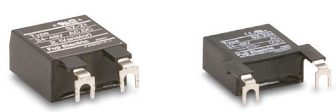
Note: For more information, refer to Control Circuit Contact Electrical Ratings

Accessory Auxiliary Contact Ratings - IEC and JIS continued on next page.

Fuji Duo Series SC-E Contactors Accessories

Accessory Auxiliary Contact Ratings - IEC and JIS								
Rated Thermal Current (A)	Making and Breaking Capacity at AC (A)		Rated operational current (A)					Minimum Operating Voltage and Current
			AC		DC			
			Voltage	AC-15 (Ind. load)	Voltage	DC-13 (Ind. load)		
10	120V	60	120V	6	24V	3		5VDC, 3mA
	220V	30	220V	3	48V	1.5		
	440V	15	440V	1.5	110V	0.55		
	600V	12	600V	1.2	220V	0.27		

Coil surge suppression units



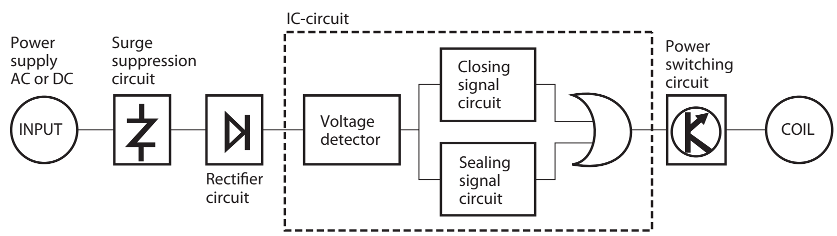
SZ-Z1 SZ-Z37

Suppress surge voltage due to contactor ON-OFF operations; easily connect to contactor coil terminals.

Important: When driving 24VDC Fuji contactors with a PLC solid-state output, we recommend using diode terminal block part number DN-D10DR-A or ZL-TSD8-24. Please see application note AN-MISC-032 for additional information located on Automationdirect.com/technotes.

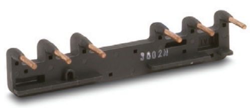
Coil Surge Suppression Units					
Part Number	Price	Applicable Contactor: AC Operated	Applicable Contactor: DC Operated	Operating Coil Voltage	Device
SZ-Z1	$20.00	SC-E02-xxx to E05-xxx	SC-E02G-xxx to E05G-xxx	24-48V AC/DC	varistor
SZ-Z2	$20.00			100-250V AC/DC	
SZ-Z31	$22.00	SC-E1-xxx to -E4xxx	SC-E1G-xxx to E4G-xxx	24-48V AC/DC	
SZ-Z32	$22.00			100-250V AC/DC	
SZ-Z4	$18.50	SC-E02-xxx to E05-xxx	SC-E02G-xxx to E05G-xxx	24-48V AC/DC	capacitor / resistor
SZ-Z5	$22.00			100-250V AC/DC	
SZ-Z34	$22.00	SC-E1-xxx to E4-xxx	-	24-48V AC/DC	
SZ-Z35	$22.00			100-250V AC/DC	
SZ-Z36	$22.00	-	SC-E1G-xxx to E4G-xxx	24-48V AC/DC	
SZ-Z37	$22.00			100-250V AC/DC	
SC-E02 to E05				380-440V AC/DC	
SC-E1 to E4				380-440V AC/DC	

Note: Super Magnet Coils on SC-E5, SC-E6, and SC-E7 contactors have internal surge suppression. See diagram below.

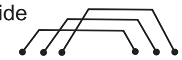


Fuji Duo Series SC-E Accessories

Connection kits for reversing SC-E contactors

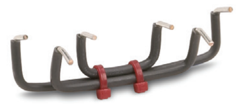


SZ-ERW1A

Line Side Wiring 

SZ-ERW1B

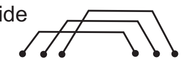
Load Side Wiring 

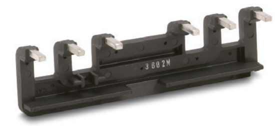


SZ-ERW1D

Load Side Wiring 

SZ-ERW2A

Line Side Wiring 

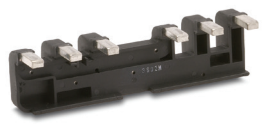


SZ-ERW2B

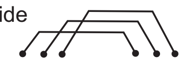
Load Side Wiring 

SZ-ERW2D

Load Side Wiring 



SZ-ERW3A

Line Side Wiring 

SZ-ERW3B

Load Side Wiring 

SZ-ERW3D

Load Side Wiring 

Connection Kits			
Part Number	***Price***	***Description***	***Use with Contactors***
SZ-ERW1A	$10.00	Line side reversing connection kit.	SC-E02-xxx to SC-E05-xxx
SZ-ERW1B*	$10.00	Load side reversing connection kit. For wiring load side when using contactors only or with a MMS device.	SC-E02-xxx to SC-E05-xxx
SZ-ERW1D	$10.00	Load side reversing connection kit. For wiring load side when using two contactors with a thermal overload relay.	SC-E02-xxx to SC-E05-xxx
SZ-ERW2A	$20.00	Line side reversing connection kit.	SC-E1-xxx to SC-E2S-xxx
SZ-ERW2B*	$20.00	Load side reversing connection kit. For wiring load side when using contactors only or with a MMS device.	SC-E1-xxx to SC-E2S-xxx
SZ-ERW2D	$20.00	Load side reversing connection kit. For wiring load side when using two contactors with a thermal overload relay.	SC-E1-xxx to SC-E2S-xxx
SZ-ERW3A	$35.50	Line side reversing connection kit.	SC-E3-xxx to SC-E4-xxx
SZ-ERW3B*	$35.50	Load side reversing connection kit. For wiring load side when using contactors only or with a MMS device.	SC-E3-xxx to SC-E4-xxx
SZ-ERW3D	$35.50	Load side reversing connection kit. For wiring load side when using two contactors with a thermal overload relay.	SC-E3-xxx to SC-E4-xxx

** When using the SZ-ERWxB, a TK-E thermal overload relay must be separately mounted and wired using an SZ-HxE base. To assemble a TK-E overload directly to the contactor use a SZ-ERWxD load side connection kit.*

Mechanical interlock unit

SZ-RM

Mechanical Interlock Unit			
Part Number	***Price***	***Description***	***Use with Contactors***
SZ-RM	$21.00	Used when building a reversing starter. Prevents both contactors from being pulled in at once.	SC-E02-xxx to SC-E4-xxx

NOTE: Mechanical interlock unit cannot be used with SC-E5-xxx through E7-xxx contactors.

Parts for reversing Fuji SC-E contactors

- SC-E (Contactors - qty. 2)
- SZ-ERWxA (Line side connection kit - qty. 1)
- SZ-ERWxB* (Load side connection kit - qty. 1)
- SZ-RM (Mechanical interlock - qty. 1)
- SZ-AxxT (Auxiliary contact blocks - qty. 1)

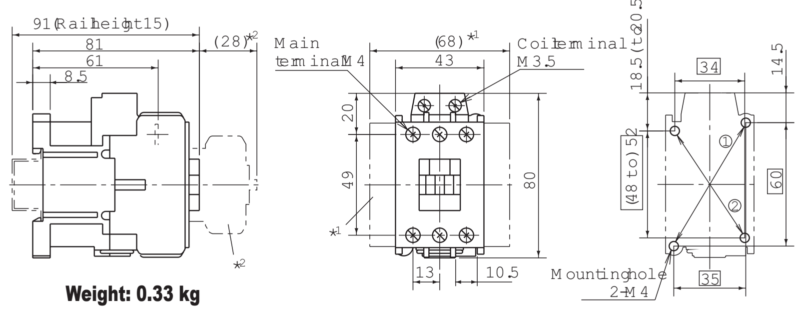
Fuji Electric

Fuji Duo Series SC-E Contactors

Dimensions (mm)

Contactors

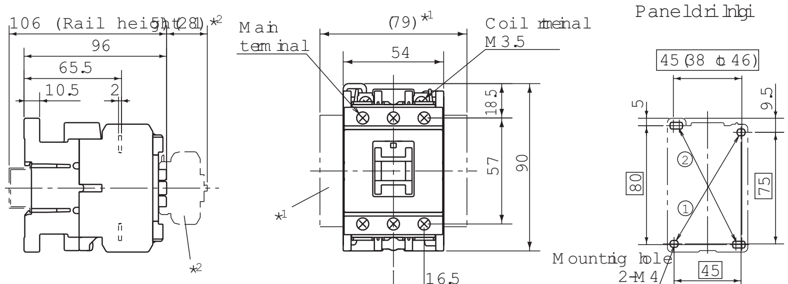
SC-E02, E03, E04, E05-xxx



Weight: 0.33 kg

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

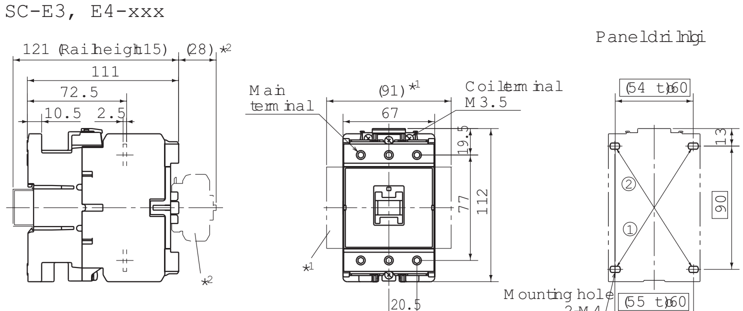
SC-E1, E2, E2S-xxx



Weight: 0.58 kg

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-xxx



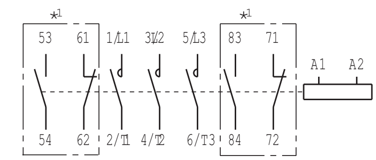
Weight: 1.1 kg

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

Wiring diagrams

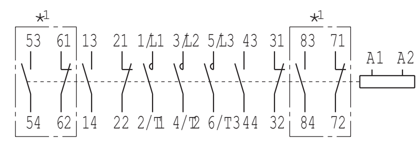
Contactors

SC-E02 to E05-xxx
SC-E1 to E4-xxx
SC-E02G to E05G-xxx
SC-E1G to E4G-xxx
SC-E2S, E2SG-xxx



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

SC-E5, E6, E7-xxx



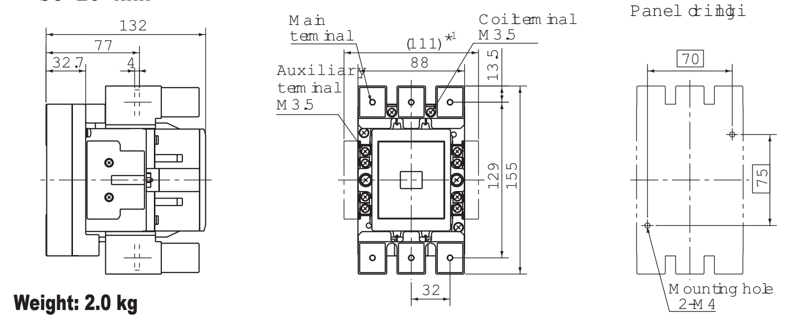
*1 In case of aux. contact 4NO+4NC

Fuji Duo Series SC-E Contactors

Dimensions (mm)

Contactors

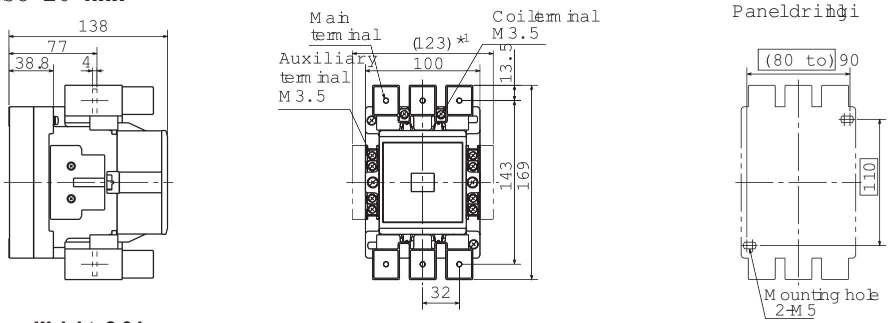
SC-E5-xxx



Weight: 2.0 kg

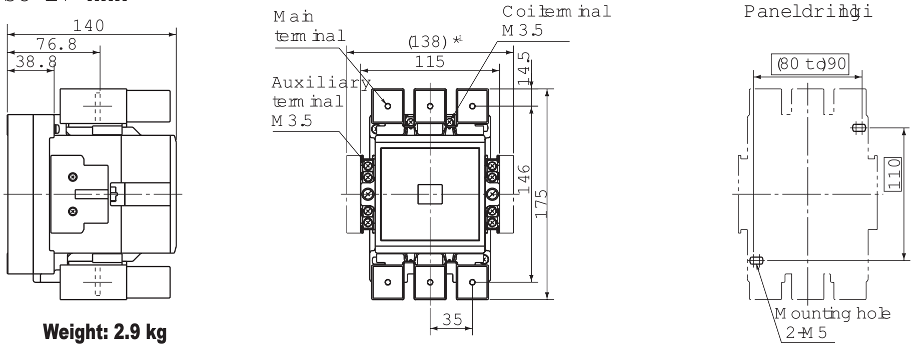
*1 Side mounting aux. contact block
*2 Front mounting aux. contact block

SC-E6-xxx



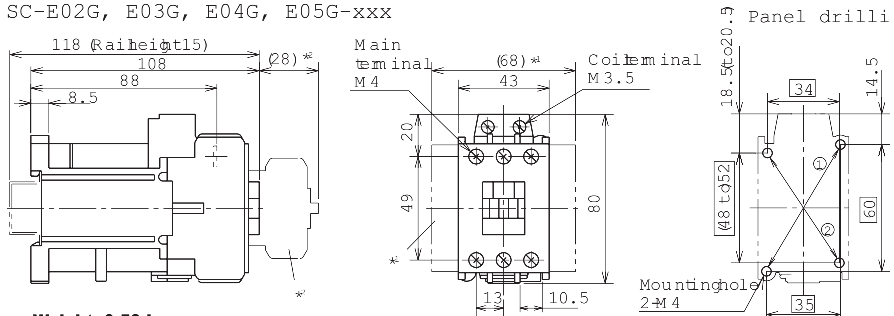
Weight: 2.6 kg

SC-E7-xxx



Weight: 2.9 kg

SC-E02G, E03G, E04G, E05G-xxx



Weight: 0.59 kg

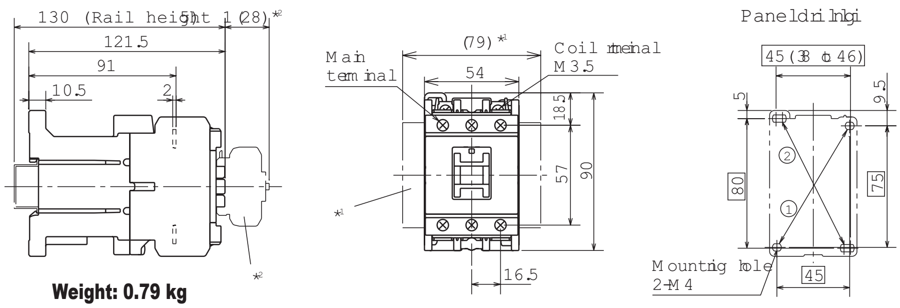
Use the two mounting holes on a diagonal line
① or ② to mount contactor
① 35 × 60 ②: 35 × (48 to) 52

Fuji Duo Series SC-E Contactors

Dimensions [mm]

Contactors

SC-E1G, E2G, E2SG-xxx

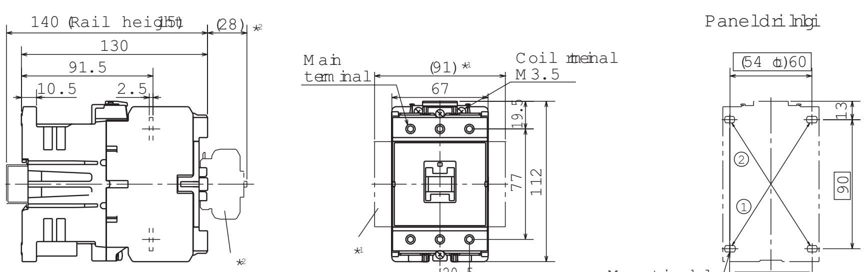


Weight: 0.79 kg

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

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-E3G, E4G-xxx



Weight: 1.4 kg

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

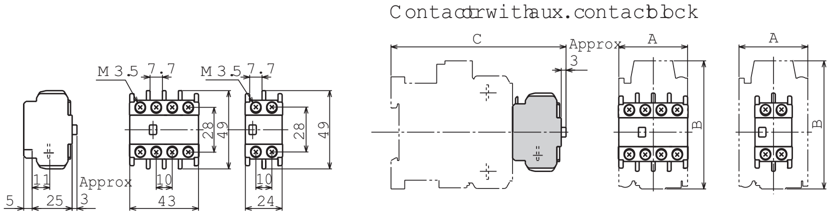
Use the two mounting holes on a diagonal line ① or ② to mount contactor.
①: (55 to) 60 × 90 ②: (54 to) 60 × 90

Dimensions [mm]

Auxiliary contact blocks - front mounting

SZ-A22T, A20T, A11T for SC-E02 (G)-xxx to E4 (G)-xxx

Contactor with aux. contact block



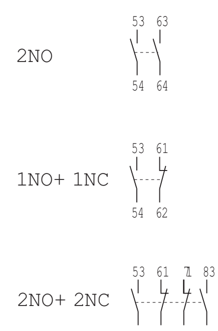
A22T **Weight: 36 g**
SZ-A20T, A11T **Weight: 20 g**

Type	A	B	C
SC-E02, E03, E04, E05-xxx	43	80	109
SC-E1, E2, E2S-xxx	54	90	124
SC-E3, E4-xxx	67	112	139
SC-E02G, E03G, E04G, E05(G)-xxx	43	80	136
SC-E1G, E2G, E2SG-xxx	54	90	149.5
SC-E3G, E4G-xxx	67	112	158

Fuji Electric

Wiring Diagrams

SZ-A22T, A20T, A11T



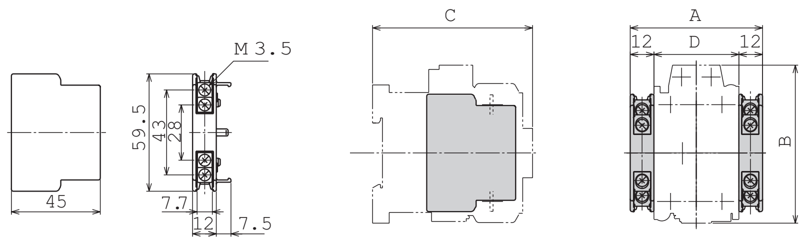
Fuji Duo Series SC-E Contactors

Dimensions (mm)

Auxiliary contact blocks - side mounting

SZ-AS1T for SC-E02(G)-xxx to E4(G)-xxx

Contactor with aux. contact block



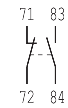
Weight: 28 g

Type	A	B	C	D
SC-E02,E03,E04,E05-xxx	67	80	81	43
SC-E1,E2,E2S-xxx	78	90	54	54
SC-E3,E4-xxx	91	112	67	67
SC-E02G,E03G,E04G,E05(G)-xxx	67	80	108	43
SC-E1G,E2G,E2SG-xxx	78	90	121.5	54
SC-E3G,E4G-xxx	91	112	130	67

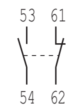
Wiring Diagrams

1 N.O. + 1 N.C.

Mounted on right

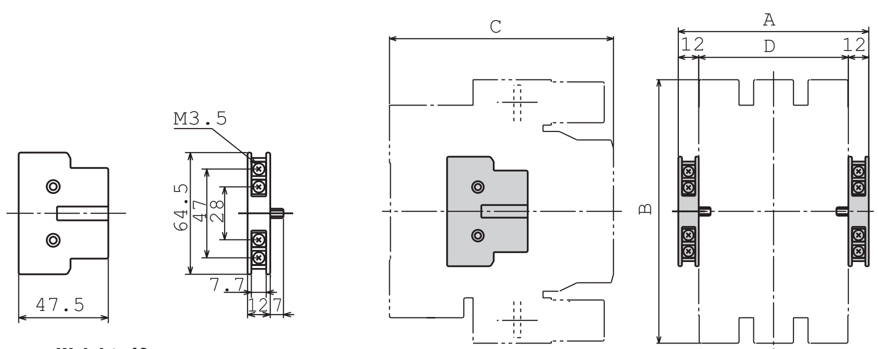


Mounted on left side



SZ-AS2T for SC-E5 to E7-xxx

Contactor with aux. contact block

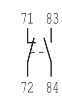


Weight: 40 g

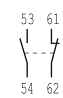
Type	A	B	C	D
SC-E5-xxx	112	155	132	88
SC-E6-xxx	124	169	138	100
SC-E7-xxx	139	175	140	115

1 N.O. + 1 N.C.

Mounted on right



Mounted on left side

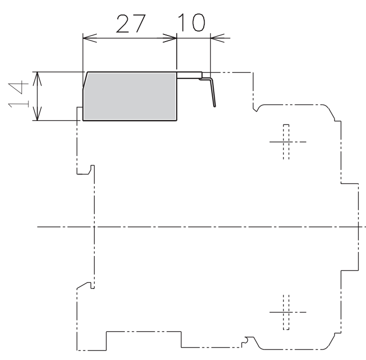


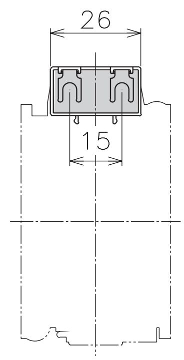
Fuji Duo Series SC-E Contactors

Dimensions (mm)

Coil surge suppression units

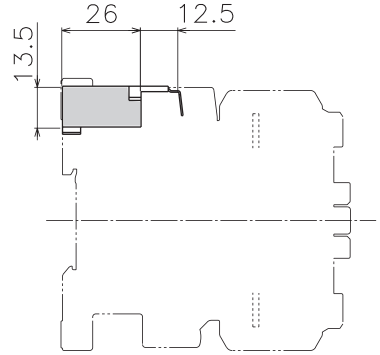
SZ-Z1, Z2, Z4, Z5

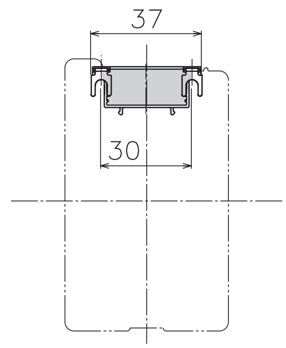




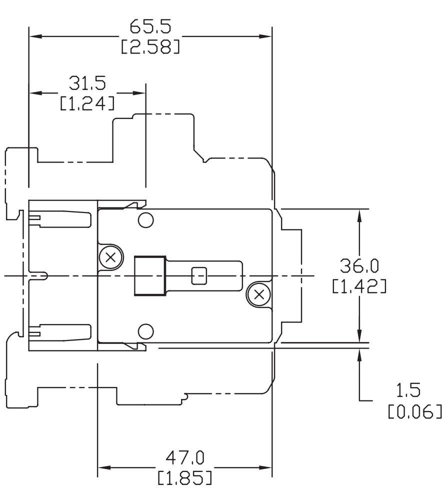
Weight: 14g

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

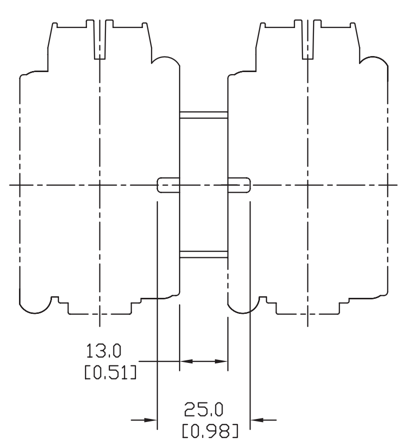


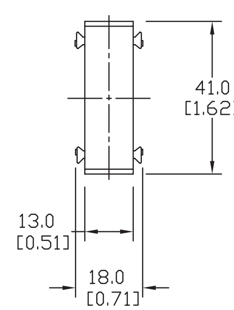


Weight: 15g



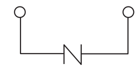
SZ-RM



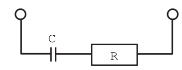


Wiring Diagrams

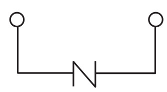
SC-E02 to E05-xxx + SZ-Z
(Built-in varistor)



SC-E02 to E05-xxx + SZ-Z4,
(Built-in capacitor/resis

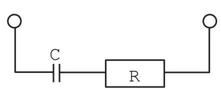


SC-E1 to E4-xxx + SZ31, Z
(Built-in varistor)



SC-E1 to E4-xxx + SZ34, Z35
(Built-in capacitor/resisto

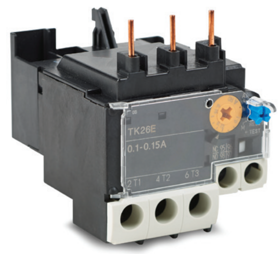
SC-E1G to E4G-xxx + SZ36, Z
(Built-in capacitor/resisto



Fuji Duo Series TK-E Overload Relays

TK-E series thermal overload relays with open-phase protective device

Fuji Electric



TK26E-P10

TK-E2-800

TK-E3-5000

TK-E5-4000

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)
- Isolated NO and NC contacts can be used with different potentials
- 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 of the TK26E, E2, and E3-xxx models

Standards

- UL listed, file E44592, Standard UL 508
- cUL listed, file E44592, CSA C22.2 No. 14
- IEC 60947-4-1, EN60947-4-1
- VDE 0660, JIS C 8201-4-1
- CE Compliant

TK26E Series Overloads

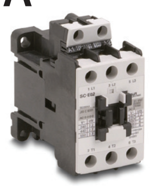
Part Number	Price	Amperage Adjustment Range (A)	Frame Width / Contactor
TK26E-P10	$47.50	0.1 - 0.15	43mm SC-E02(G) through SC-E05(G) For separate mounting, use with optional base unit TZ1H26E
TK26E-P13	$47.50	0.13 - 0.2	
TK26E-P18	$47.50	0.18 - 0.27	
TK26E-P24	$47.50	0.24 - 0.36	
TK26E-P34	$47.50	0.34 - 0.52	
TK26E-P48	$47.50	0.48 - 0.72	
TK26E-P64	$47.50	0.64 - 0.96	
TK26E-P80	$47.50	0.8 - 1.2	
TK26E-P95	$47.50	0.95 - 1.45	
TK26E-1P1	$47.50	1.1-1.65	
TK26E-1P4	$47.50	1.4 - 2.1	
TK26E-1P7	$47.50	1.7 - 2.6	
TK26E-2P2	$47.50	2.2 - 3.4	
TK26E-2P8	$47.50	2.8 - 4.2	
TK26E-004	$47.50	4.0 - 6.0	
TK26E-005	$47.50	5.0 - 7.5	
TK26E-006	$47.50	6.0 - 9.0	
TK26E-007	$47.50	7.0 - 10.5	
TK26E-009	$47.50	9.0 - 13.0	
TK26E-012	$47.50	12 - 18	
TK26E-016	$47.50	16 - 22	
TK26E-020	$47.50	20 - 26	

TK-E Series Overloads

Part Number	Price	Amperage Adjustment Range (A)	Frame Width/ Contactor
TK-E2-600	$78.00	4 - 6	54mm SC-E1(G) through SC-E2S(G) For separate mounting, use with optional base unit SZ-HDE
TK-E2-800	$78.00	5 - 8	
TK-E2-900	$78.00	6 - 9	
TK-E2-1100	$78.00	7 - 11	
TK-E2-1300	$78.00	9 - 13	
TK-E2-1800	$78.00	12 - 18	
TK-E2-2600	$78.00	18 - 26	
TK-E2-3600	$78.00	24 - 36	
TK-E2-4200	$78.00	32 - 42	
TK-E2-5000	$78.00	40 - 50	
TK-E2-5400	$78.00	44 - 54	
TK-E3-1800	$97.00	12 - 18	67mm SC-E3(G) through SC-E4(G) For separate mounting, use with optional base unit SZ-HEE
TK-E3-2600	$97.00	18 - 26	
TK-E3-3600	$97.00	24 - 36	
TK-E3-4000	$97.00	28 - 40	
TK-E3-5000	$97.00	34 - 50	
TK-E3-6500	$97.00	45 - 65	
TK-E3-6800	$97.00	48 - 68	
TK-E3-8000	$97.00	64 - 80	
TK-E5-5000	$106.00	34 - 50	88mm SC-E5
TK-E5-6500	$106.00	45 - 65	
TK-E5-9500	$106.00	65 - 95	
TK-E5-10500	$106.00	85 - 105	
TK-E6-8000	$183.00	53 - 80	100mm/ 115mm SC-E6 SC-E7
TK-E6-9500	$183.00	65 - 95	
TK-E6-12500	$183.00	85 - 125	
TK-E6-16000	$183.00	110 - 160	

Fuji Duo Series Contactor and Overload Relay Selection Tables

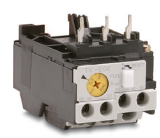
A



SC-E Contactor

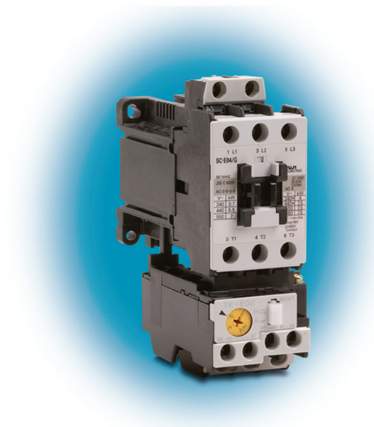
\+

B



TK-E Overload Relay

=



Fuji Electric

100-240V Single Phase Motor (1/3 to 25 hp)

Step 1. Using the "SC-E Series Contactors" table, select a contactor based on motor voltage and horsepower.

Step 2. Using the "TK26E Series Overloads" or "TK-E Series Overloads" table, select an overload relay based on motor full load current.

Check the data plate on the motor for the hp, volts and full-rated amps.

Motor							
HP	5	Volts	460	Phase	3	Type	P
RPM	1725	Amps	7.6	Hz	60	SF	1.15
Design	B	AMB	40°C	Insul Class			F
Duty	Cont	Encl	TEFC	Code		K	

Motor horsepower

Motor voltage

Motor full-load rated amperage (FLA)

Three Phase Motors - Refer to tables on following page

Step 1. Select a SC-E contactor from Column A based on motor voltage and horsepower.

Step 2. Select a TK-E overload relay from Column B to work with the SC-E contactor selected in Step 1. The motor full load current (FLA) should be within the adjustable current range of the overload relay.

Fuji Duo Series Overload Relay Selection Tables

220-240V 3-Phase Motor (0.5 to 50hp)[1]

Overload Relay Selection for 220–240V 3-phase motors				
Motor Rating		A	B	
Motor HP	Motor Full Load Amperage (FLA) [2]	Contactor	Overload Relay: Part Number	Overload Relay: Adjustable Current Range
1/2	2.2	SC-E02-xxxx	TK26E-1P7	1.7 to 2.6A
3/4	3.2		TK26E-2P8	2.8 to 4.2A
1	4.2		TK26E-004	4 to 6A
1-1/2	6		TK26E-005	5 to 7.5A
2	6.8		TK26E-006	6 to 9A
3	9.6	SC-E03-xxxx	TK26E-009	9 to 13A
5	15.2	SC-E04-xxxx	TK26E-012	12 to 18A
7-1/2	22	SC-E05-xxxx	TK26E-020	20 to 26A
10	28	SC-E1-xxxx	TK-E2-3600	24 to 36A
15	42	SC-E2-xxxx	TK-E2-4200	32 to 42A
20	54	SC-E3-xxxx	TK-E3-6500	45 to 65A
25	68	SC-E4-xxxx	TK-E3-6800	48 to 68A
30	80	SC-E5-xxxx	TK-E5-9500	65 to 95A
40	104	SC-E6-xxxx	TK-E6-12500	85 to 125A
50	130	SC-E7-xxxx	TK-E6-16000	110 to 160A

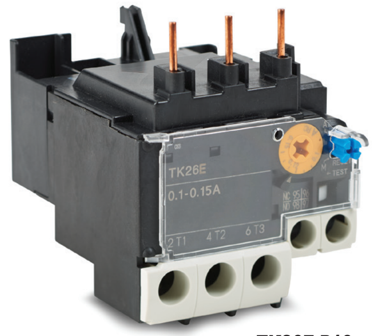
Note 1: For 220-240 V three-phase motors up to 150 hp refer to the Fuji Odyssey series.
Note 2: Per NEC 2017 table 430.250 column for 230VAC

440-480V 3-Phase Motor (0.5 to 100hp)[1]

Overload Relay Selection for 440–480V 3-phase motors				
Motor Rating		A	B	
Motor HP	Motor Full Load Amperage (FLA) 2	Contactor	Overload Relay: Part Number	Overload Relay: Adjustable Current Range
1/2	1.1	SC-E02-xxxx	TK26E-P95	0.95 to 1.45A
3/4	1.6	SC-E02-xxxx	TK26E-1P1	1.1 to 1.65A
3/4	1.6	SC-E02-xxxx	TK26E-1P4	1.4 to 2.1A
1	2.1	SC-E02-xxxx	TK26E-1P7	1.7 to 2.6A
1-1/2	3.0	SC-E02-xxxx	TK26E-2P8	2.8 to 4.2A
2	3.4	SC-E02-xxxx	TK26E-2P8	2.8 to 4.2A
3	4.8	SC-E02-xxxx	TK26E-004	4 to 6A
5	7.6	SC-E02-xxxx	TK26E-006	6 to 9A
7 1/2	11	SC-E03-xxxx	TK26E-009	9 to 13A
10	14	SC-E04-xxxx	TK26E-012	12 to 18A
15	21	SC-E05-xxxx	TK26E-020	20 to 26A
20	27	SC-E1-xxxx	TK-E2-3600	24 to 36A
25	34	SC-E1-xxxx	TK-E2-4200	32 to 42A
30	40	SC-E2-xxxx	TK-E2-4200	32 to 42A
40	52	SC-E3-xxxx	TK-E3-6500	45 to 65A
50	65	SC-E4-xxxx	TK-E3-6800	48 to 68A
60	77	SC-E5-xxxx	TK-E5-9500	65 to 95A
75	96	SC-E6-xxxx	TK-E6-12500	85 to 125A
100	124	SC-E7-xxxx	TK-E6-16000	110 to 160A

Note 1: For 440-480V three-phase motors up to 300 hp refer to the Fuji Odyssey series.
Note 2: Per NEC 2017 table 430.250 column for 460VAC

Fuji Duo Series TK-E Overload Relays



TK26E-P10

Standard Operating Conditions	
Ambient Temperature	*Operating: -10 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
Mounting	Vertical, permissive angle 30 degrees

Specifications

Model	*Applicable Contactor Non-reversing*	*Auxilliary Contact*	*Trip Class IEC 60947-4-1*	*Number of Heater Elements*	*Power Consumption per Pole (VA)*	*SCCR (kA)*	*Features*
TK26E-xxx	SC-E02(G), E03(G), E04(G), E05(G)-xxx	1NO+1NC	10A	3	1.7	5	Overload, open-phase protection Ambient temperature compensation Manual/auto reset selectable Manual trip mechanism Trip indicator
TK-E2-xxx	SC-E1(G), E2(G), E2S(G)-xxx				3.8	5	
TK-E3-xxx	SC-E3(G), E4(G)-xxx				6.6	5	
TK-E5-xxx	SC-E5-xxx				6.6	10	
TK-E6-xxx	SC-E6, E7-xxx				8.0	10	

Auxiliary Contact Ratings - UL and CSA

Model	*Rated Insulation Voltage (V)*	*NEMA ICS 5-2000 Ratings (note 1)*				
		AC Ratings (Max)			*DC Ratings (Max)*	
		Designation	*Making VA*	*Breaking VA*	*Designation*	*Making/Breaking VA*
TK26E-xxx to TK-E6-xxx	600	B600	3600	360	R300	28

Notes:
1. NEMA ICS 5-2000. For more information, refer to Control Circuit Contact Electrical Ratings, page MRC-111.

Auxiliary contact ratings - JIS and IEC

Model	*Rated Insulation Voltage (A)*	*Rated Thermal Current (A)*	*Rated Operational Current (A)*				*Minimum Voltage and Current*
			AC Voltage (V)	*AC15 (Ind. load)*	*DC Voltage (V)*	*DC13 (Ind. load)*	
TK26E-xxx	690	5	24	3 (0.5) *	24	1.1 (0.3)	5VDC, 3mA
			100-120	2.5 (0.5) *	100-120	0.28	
			200-240	2 (0.5) *	200-240	0.14	
			380-440	1 (0.5) *			
			500-600	0.6 (0.5) *			
TK-E2-xxx	690	5	24	3 (0.5) *	24	1.1 (0.3)	3VDC, 5mA
TK-E3-xxx			100-120	2.5 (0.5) *	100-120	0.28	
TK-E5-xxx			200-240	2 (0.5) *	200-240	0.14	
TK-E6-xxx			380-440	1 (0.5) *			
			500-600	0.6 (0.5) *			

Note: * In case of auto-reset type NO contact.

Fuji Duo Series TK-E Overload Relays

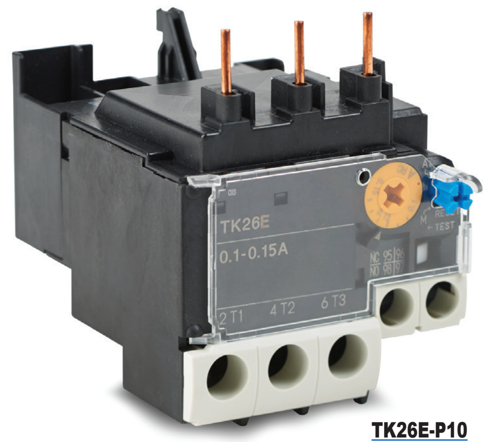
Fuji Electric

Wiring

Be sure to wire the relays correctly using the wiring diagrams on the supplied installation sheets. Main terminals for models TK26E-xxx to TK-E6-xxx are wired using solid wires or stranded wires. Stranded wires or flexible stranded wires can be connected by twisting them together and crimping a sleeve (ferrule) onto them before connecting.

Tightening torque

If wires are not tightened sufficiently, they may become hot or loosen 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 these tables.



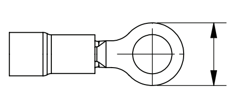
TK26E-P10

Wire Sizes, Tightening Torques - Main Circuit

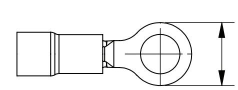
Thermal Overload Relay Model	TK-E2-xxx	TK-E3-xxx	TK-E5-xxx	TK-E6-xxx
Single Stranded Wire (mm^2)	0.75 to 16	1.5 to 35		16 to 70
Flexible Stranded Wire with Sleeve (mm^2)	0.75 to 16	1.5 to 35		16 to 70
Flexible Stranded Wire without Sleeve (mm^2)	0.75 to 16	1.5 to 35		16 to 70
AWG 75°C Cu only	6 max.	2 max.		00 max.
Insulation Stripping Length	18 mm	21 mm		23 mm
Tool	Phillips screwdriver, H-type, No. 2 (ISO 8764); ADC part number TW-SD-VPH-2	Hex. wrench 4 (ISO 2936)		
	Flat-blade screwdriver, 1 x 5.5 x L-type, B (ISO 2830); ADC part number TW-SD-VSL-4			
Tightening Torque (N•m)	2.5	6		10

Note: 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 wires than the above.

Wire Sizes, Tightening Torques - Main Circuit

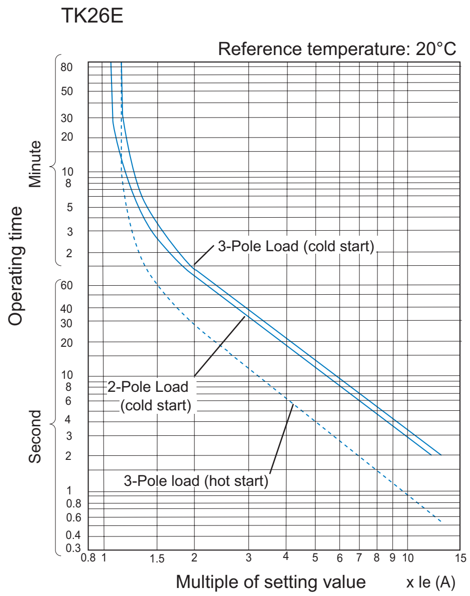
Thermal Overload Relay Type		TK26E-xxx
Solid Wire (mm^2)	One	0.75 to 4
	Two	1 to 4
Stranded Wire (mm^2)	One	0.75 to 4
	Two	1 to 4
AWG 75°C Cu only	One	18 to 12
	Two	18 to 12
Insulation Stripping Length (mm)		11 mm 0.43 in
Maximum Crimp Terminal Width		Max. 9.7 mm (0.38 inches) wide 
Terminal Screw Size		M4
Tool		Phillips screwdriver, H-type, No. 2 (ISO 8764); ADC part number TW-SD-VPH-2
		Flat-blade screwdriver, 1 x 5.5 x L-type, B (ISO 2830); ADC part number TW-SD-VSL-4
Tightening Torque [N•m (lb•in)]		1.2 to 1.5 (11 to 13)

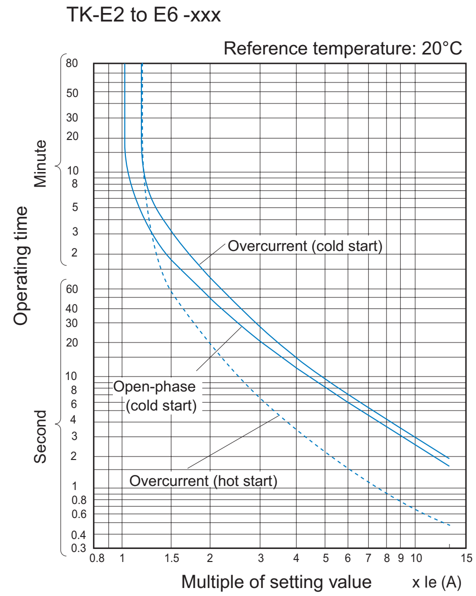
Wire Sizes, Tightening Torques - Control Circuit

Single Stranded Wire (mm^2)	One	0.75 to 2.5 (ø 1 to ø 1.6)
	Two	0.75 to 2.5
AWG 75°C Cu only	One	18 to 14
	Two	18 to 14
Insulation Stripping Length (mm)		10 mm 0.39 in
Maximum Crimp Terminal Width		 Max. 7.7 mm (0.30 in) wide (R2-3.5)
Terminal Screw Size		M3.5
Tool		Phillips screwdriver, H-type, No. 2 (ISO 8764); ADC part number TW-SD-VPH-2
		Flat-blade screwdriver, 1 x 5.5 x L-type, B (ISO 2830); ADC part number TW-SD-VSL-4
Tightening Torque [N•m (lb•in)]		0.8 to 1 (7 to 9)

Fuji Duo Series TK-E Overload Relays

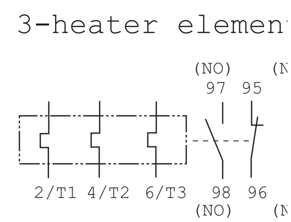
Operating characteristics





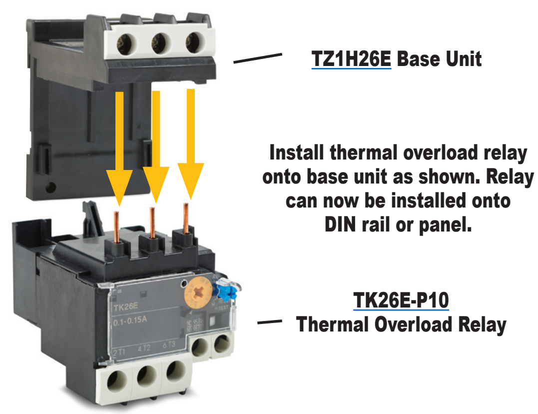
Fuji Electric

Wiring diagram



Optional accessories

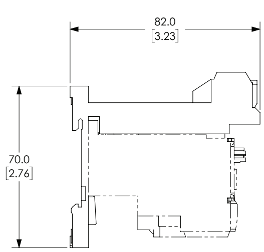
Base units for separate mounting
Allows TK26E, E2, and E3 series thermal overload relays to be separately mounted to 35mm wide DIN rail, or screw mounted to panel.

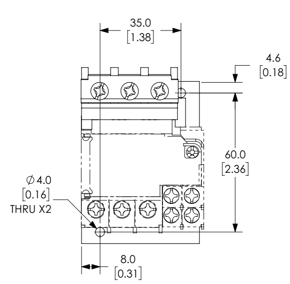


Mounting Base Unit		
Part Number	***Applicable Overload Relays***	***Price***
TZ1H26E	TK26E-xxx	$12.50
SZ-HDE	TK-E2-xxx	$20.00
SZ-HEE	TK-E3-xxx	$23.00

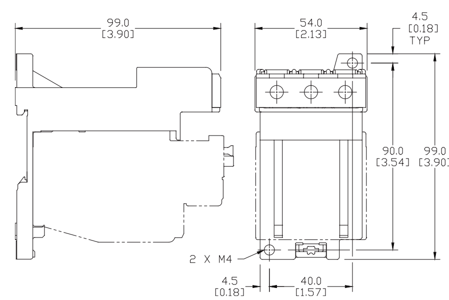
Dimensions mm [inches]

TZ1H26E

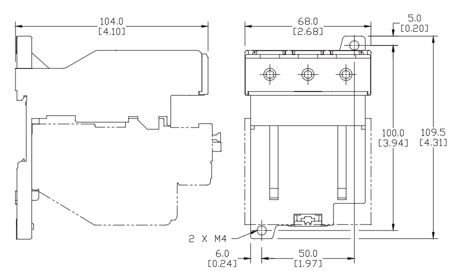




SZ-HDE



SZ-HEE



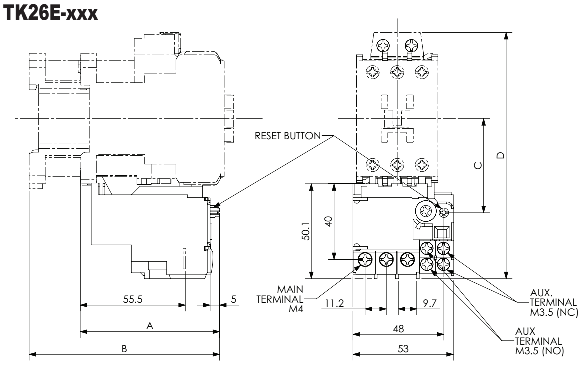
Please see our website www.AutomationDirect.com for complete engineering drawings.

Fuji Duo Series TK-E Overload Relays

Dimensions [inches (mm)]

Overload relays

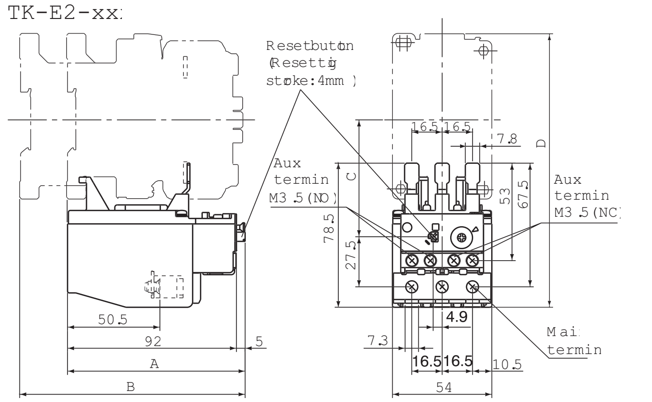
TK26E-xxx



CONTACTOR	A	B	C	D
SC-E02 TO 05	2.89 (73.5)	–	1.99 (50.5)	5.12 (130)
SC-E02G TO 05G	–	3.96 (100.5)	1.99 (50.5)	5.12 (130)

Weight: 0.24 lb (0.11 kg)

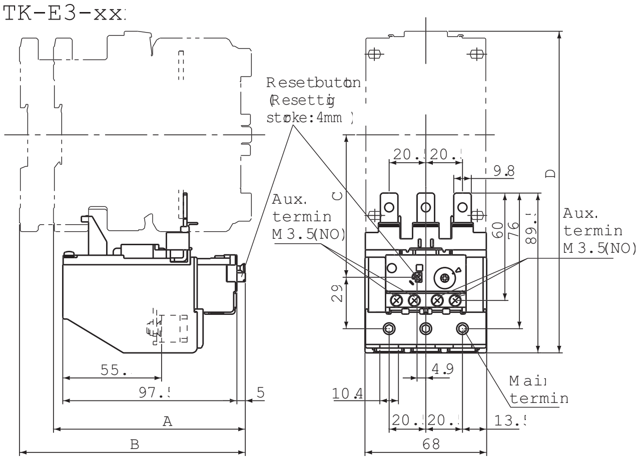
TK-E2-xx



CONTACTOR	A	B	C	D
SC-E1 to E2S	3.82 (97)	–	2.5 (63.5)	5.87 (149)
SC-E1G tp E2SG	–	4.82 (123)	2.5 (63.5)	5.87 (149)

Weight: 0.55 lb (0.25 kg)

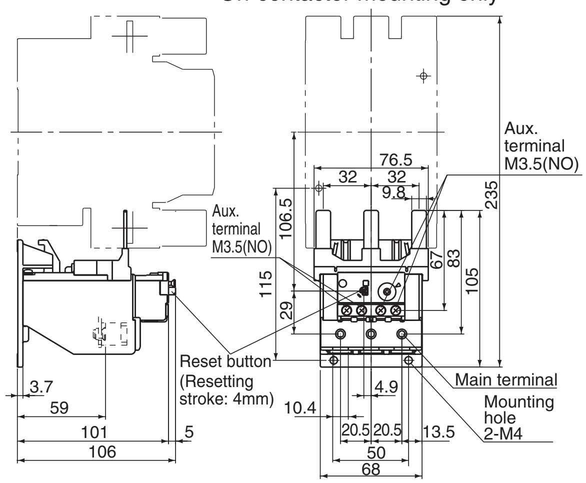
TK-E3-xx



CONTACTOR	A	B	C	D
SC-E3, E4	4.23 (107.5)	–	3.13 (79.5)	7.09 (180)
SC-E3, E4G	–	4.98 (126.5)	3.13 (79.5)	7.09 (180)

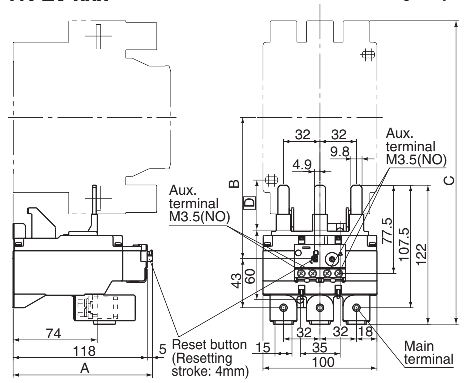
Weight: 0.75 lb (0.34 kg)

TK-E5-xxx On-contactor mounting only



Weight: 0.82 lb (0.37 kg)

TK-E6-xxx On-contactor mounting only



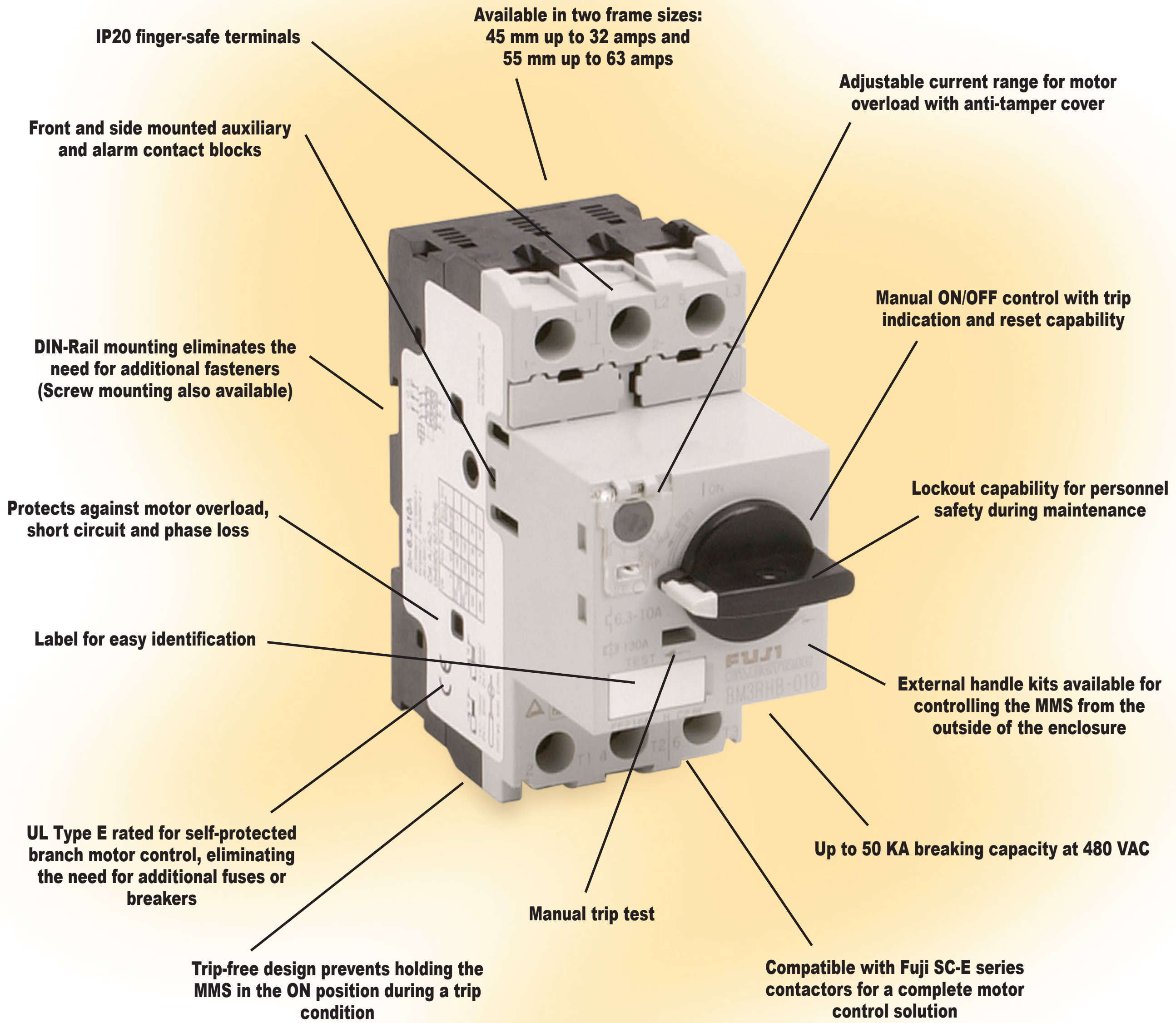
CONTACTOR	A	B	C	D
SC-E6	4.84 (123)	4.88 (124)	10.49 (266.5)	1.77 (45)
SC-E7	4.84 (123)	5.07 (129)	10.79 (274)	1.97 (50)

Weight: 1.57 lb (0.71kg)

Please see our website www.AutomationDirect.com for complete engineering drawings.

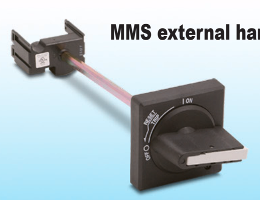
Fuji Duo Series Manual Motor Starters

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

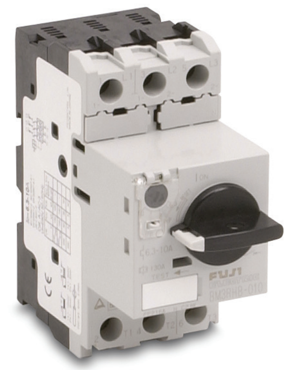
General Information

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

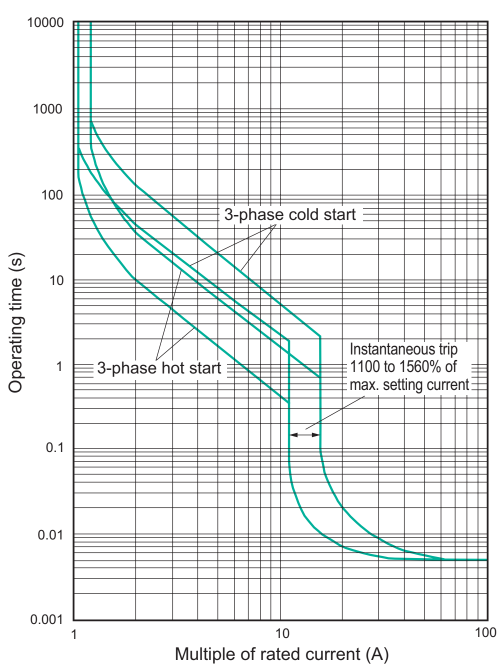
Short circuit current rating:

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

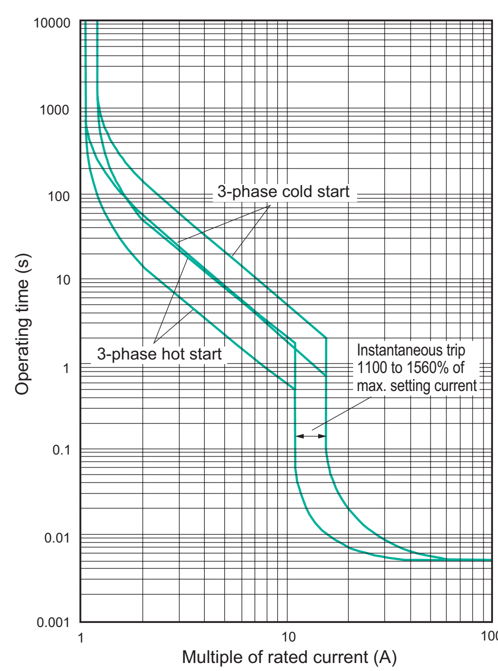
NOTE: When using BM3VHB-xxx MMS in a UL Type E application, you must also use part number BZ0TKUAB (short-circuit contact block).

Characteristic curves

BM3RHB



BM3VHB



Fuji Duo Series Manual Motor Starters

Fuji Electric

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]
		Ie: Min.-Max. (A)	200-208VAC	220-240VAC	440-480VAC	550-600VAC		240VAC	480VAC	600VAC	
BM3RHB-P16	$97.00	0.1-0.16	Rated to motor full-load amperage		In accordance with motor full-load current		2.1	100	50	10	500
BM3RHB-P25	$97.00	0.16-0.25					3.3	100	50	10	500
BM3RHB-P40	$97.00	0.25-0.4					5.2	100	50	10	500
BM3RHB-P63	$97.00	0.4-0.63					8.2	100	50	10	500
BM3RHB-001	$97.00	0.63-1				1/2	13	100	50	10	500
BM3RHB-1P6	$97.00	1-1.6			3/4	3/4	20.8	100	50	10	500
BM3RHB-2P5	$97.00	1.6-2.5	1/2	1/2	1	1-1/2	32.5	100	50	10	500
BM3RHB-004	$97.00	2.5-4	3/4	3/4	2	3	52	100	50	10	500
BM3RHB-6P3	$97.00	4-6.3	1	1-1/2	3	5	81.9	100	50	10	500
BM3RHB-010	$102.00	6.3-10	2	3	5	7-1/2	130	100	50	10	500
BM3RHB-013	$102.00	9-13	3	3	7-1/2	10	169	100	50	10	500
BM3RHB-016	$102.00	11-16	3	5	10	10	208	100	50	10	500
BM3RHB-020	$102.00	14-20	5	5	10	15	260	100	50	10	500
BM3RHB-025	$123.00	19-25	7-1/2	7-1/2	15	20	325	100	50	10	500
BM3RHB-032	$154.00	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 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 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
	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: 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]
		Ie: Min.-Max. (A)	200-208VAC	220-240VAC	440-480VAC	550-600VAC		240VAC	480VAC	600VAC	
BM3VHB-010	$237.00	6.3-10	2	3	5	7-1/2	130	100	50	10	600
BM3VHB-013	$237.00	9-13	3	3	7-1/2	10	169	100	50	10	600
BM3VHB-016	$237.00	11-16	3	5	10	10	208	100	50	10	600
BM3VHB-020	$237.00	14-20	5	5	10	15	260	100	50	10	600
BM3VHB-025	$278.00	19-25	7-1/2	7-1/2	15	20	325	100	50	10	600
BM3VHB-032	$293.00	24-32	10	10	20	30	416	100	50	10	600
BM3VHB-040	$293.00	28-40	10	10	30	30	520	100	50	10	600
BM3VHB-050	$305.00	35-50	15	15	30	40	650	100	50	10	600
BM3VHB-063	$305.00	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 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 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

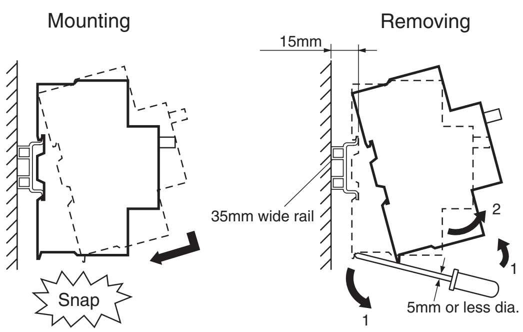
DIN-rail mounting
The MMS can be mounted to a 35 mm DIN rail. Secure the rail with screws at mounting pitch of less than 400 mm for the BM3R type and less than 300 mm for the BM3V type.

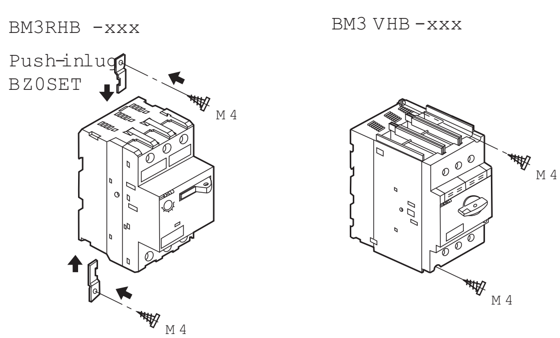
Applicable rail:

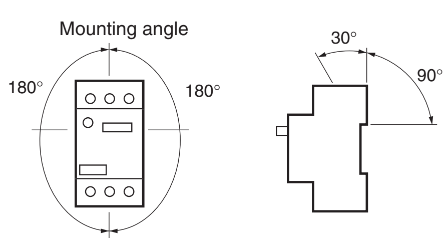
Use a 15 mm-high DIN rail, such as our DN-R35HS1, which conforms to EN-50022 and IEC715.

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.







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

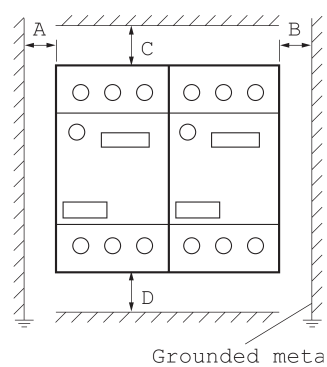
Wire Size and Tightening Torque				
Type		***BM3RHB-xxx***	***BM3VHB-xxx***	***BZ0 Accessories***
Solid Wire (mm)		1.6 to 2.6 dia.	1.6 to 2.6 dia.	1 to 1.6 dia.
Stranded Wire (mm2)	***Single-wire***	1 to 10	1 to 25	0.5 to 2.5
	2-wire	1 to 6	1 to 16	0.5 to 2.5
AWG	***Single-wire***	18 to 8	18 to 4	18 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

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.

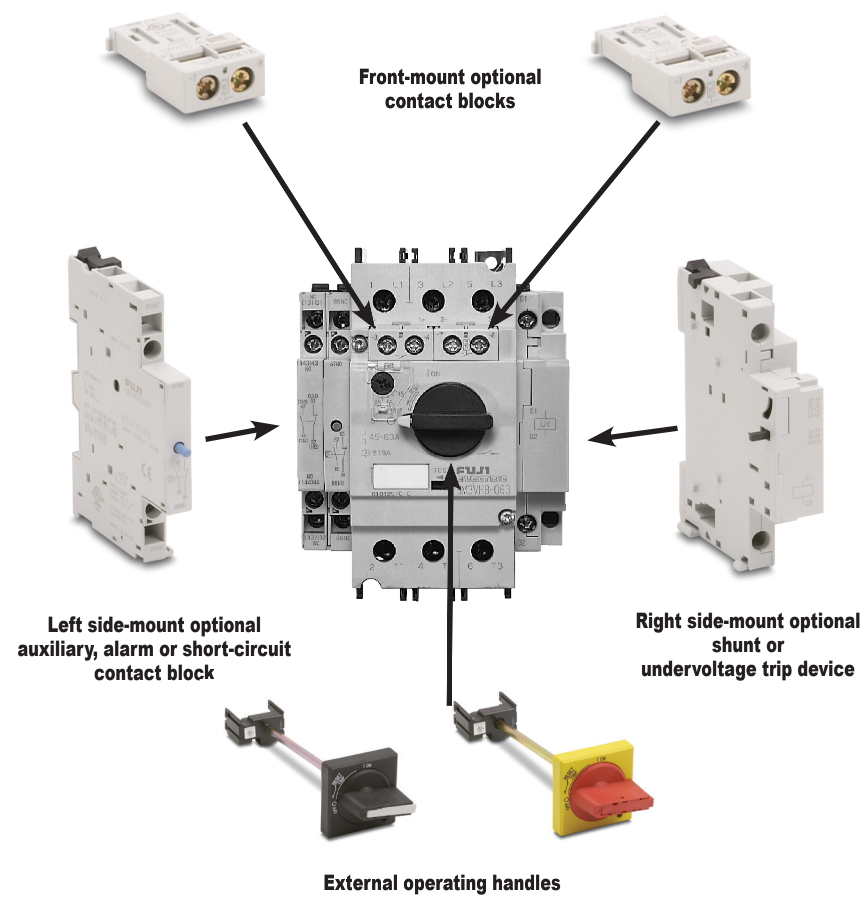


Fuji Duo Series Manual Motor Starters Accessories

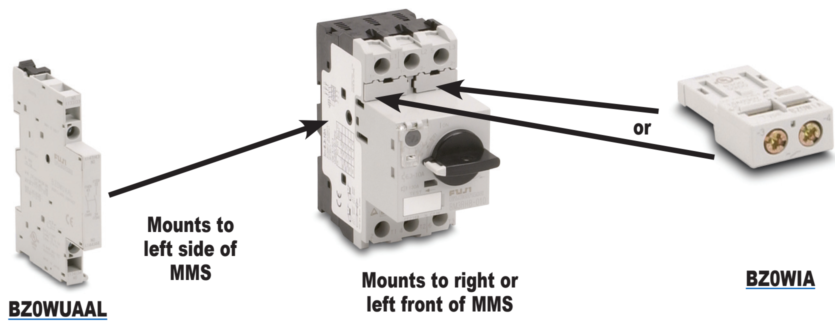
Optional accessories

- 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	$11.50	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	$11.50				1NC	
BZ0WUAAL	$16.50			Left side	2NO	45/0.1
BZ0WUABL	$16.50				1NO + 1NC	
BZ0WUBBL	$16.50				2NC	

Fuji Duo Series Manual Motor Starters Accessories

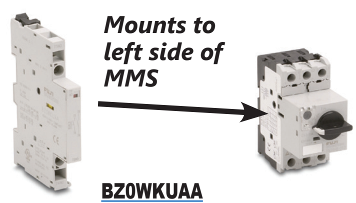
Accessories (continued)

Alarm contact blocks

BZ0KIA

Alarm Contact Blocks						
Part Number	**Price**	**Description**	**Starter Type**	**Mounting**	**Contact Arrangement**	**Weight (g/lb)**
BZ0KIA	$11.50	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	$11.50				1NC	

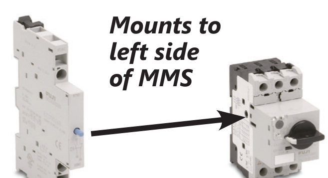
Auxiliary and alarm contact blocks



BZ0WKUAA

Combination Auxiliary/Alarm Contact Blocks						
Part Number	**Price**	**Description**	**Starter Type**	**Mounting**	**Contact Arrangement**	**Weight (g/lb)**
BZ0WKUAA	$20.00	• 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

Short-circuit alarm contact blocks



BZ0TKUAB

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.

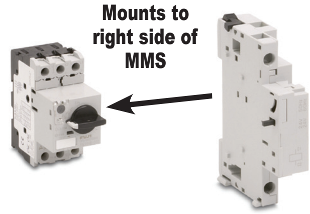
Short-Circuit Alarm Contact Block						
Part Number	**Price**	**Description**	**Starter Type**	**Mounting**	**Contact Arrangement**	**Weight (g/lb)**
BZ0TKUAB	$25.00	• The contacts operate only when the MMS has tripped due to a short-circuit (cannot be checked with trip test function). • When these contacts 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**	**Tripped: Short Circuit**
AUX CONTACT, BZ0WIA, BZ0WIB, BZ0WUAAL, 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)

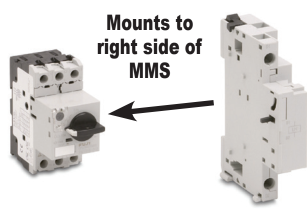
Shunt trip devices



BZ0FAZU

Shunt Trip Devices						
Part Number	*Price*	*Description*	*Starter Type*	*Mounting*	*Contact Arrangement*	*Weight (g/lb)*
BZ0FAZU BZ0FDZU	$33.50	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	$33.50				24-60VDC (time rating of coil is 5s)	

Undervoltage trip devices



BZ0RDZU

Undervoltage Trip Devices						
Part Number	*Price*	*Description*	*Starter Type*	*Mounting*	*Contact Arrangement*	*Weight (g/lb)*
BZ0RDZU	$33.50	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	$33.50				415-440V 50Hz/460-480V 60Hz	

Push-in lug

BZ0SET

Push-in Lug				
Part Number	*Price*	*Description*	*Starter type*	*Weight (g/lb)*
BZ0SET	$11.50	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

BZ0TCRE

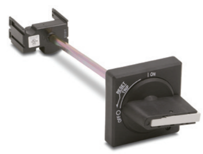
Terminal Cover			
Part Number	*Price*	*Description*	*Starter Type*
BZ0TCRE	$16.00	Line side terminal cover.	BM3RHB-xxx

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.

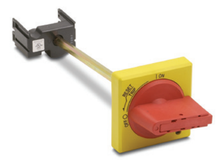
Fuji Duo Series Manual Motor Starters Accessories

Accessories (continued)

External operating handles



BZ0VBBL



BZ0VYRL

Fuji Electric

External Operating Handles					
Part Number	***Price***	***Description***	***Starter Type***	***Handle Type***	***Weight (g/lb)***
BZ0VBBL	$49.00	• 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
BZ0VYRL	$51.00			Emergency (red/yellow)	160/0.35
BZ0VBBM	$49.00		BM3VHB-xxx	Standard (black)	160/0.35
BZ0VYRM	$51.00			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

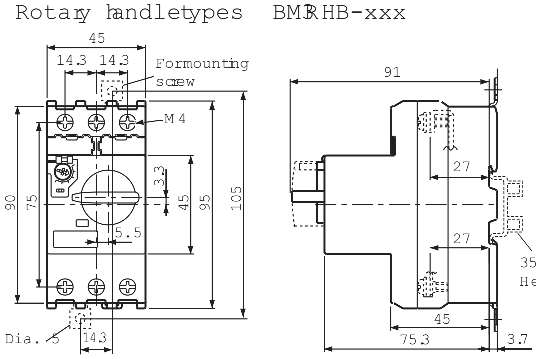
Accessory Type and Part Number		*Auxiliary contact block/front*	*Auxiliary contact block/side*	*Alarm contact block*	*Aux. and alarm contact block*	*Short-circuit alarm contact block*
		BZ0WIA, BZ0WIB (note 3)	*BZ0WUAAL BZ0WUABL BZ0WUBBL*	*BZ0KIA, BZ0KIB (note 3)*	*BZ0WKUAA*	*BZ0TKUAB*
Standard		IEC 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	A600
	DC	Q300	P300	Q300	P300	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.

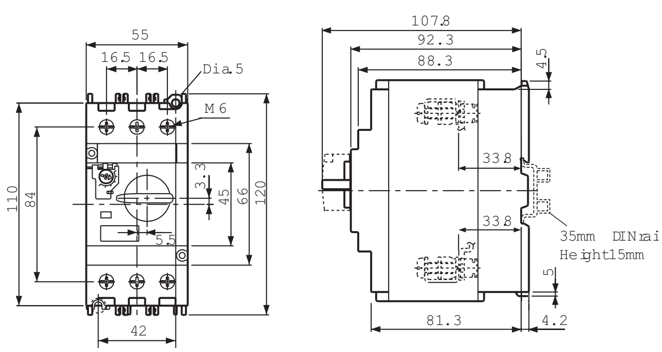
Dimensions [mm]

Manual motor starters

Rotary handle types BM3RHB-xxx



Rotary handle types BM3VHB-xxx

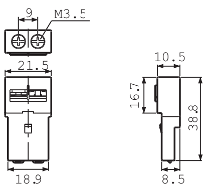


Fuji Duo Series Manual Motor Starters Accessories

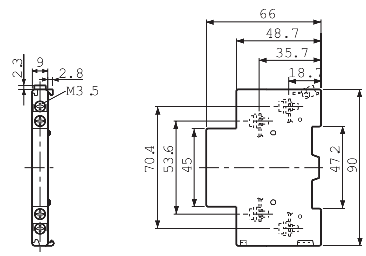
Dimensions (continued) [mm]

Accessories

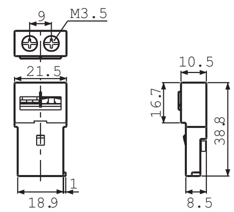
Auxiliary contact blocks, front mounting
BZ0WIA, BZ0WIB



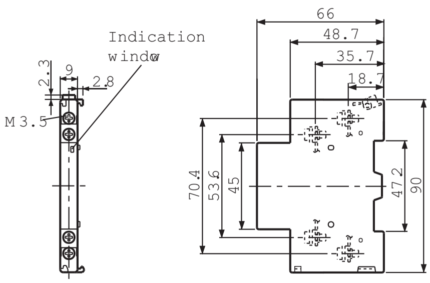
Auxiliary contact blocks, side mounting
BZ0WU AAL, BZ0WU ABL, BZ0WUBBL



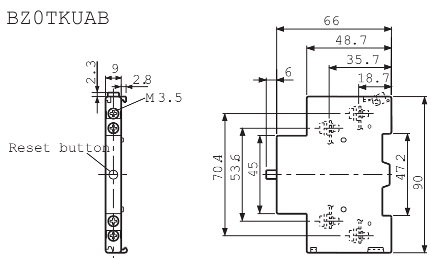
Alarm contact blocks, front mounting
BZ0KIA, BZ0KIB



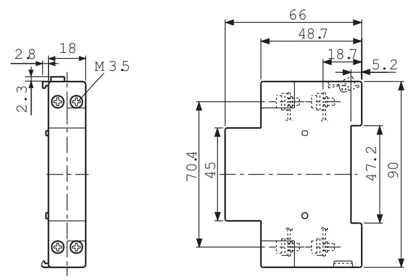
Auxiliary and alarm contact blocks
BZ0WKU AA



Short-circuit alarm contact block
BZ0TKUAB

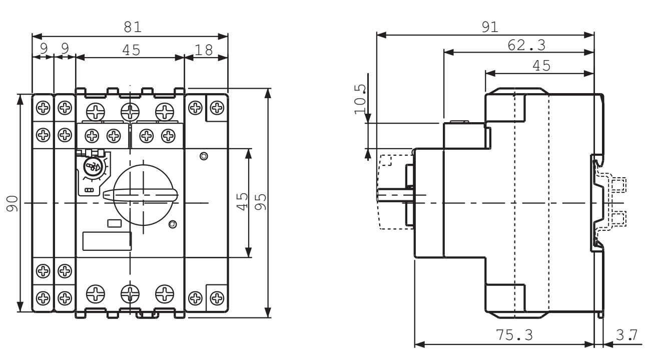


Shunt trip devices BZ0Fxxxx
Undervoltage trip devices RBZ0x

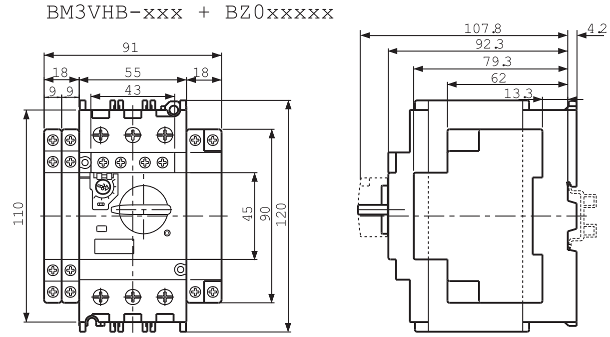


MMS with accessories

BM3RHB-xxx + BZ0xxxxx



BM3VHB-xxx + BZ0xxxxx



Fuji Duo Series Manual Motor Starters Accessories

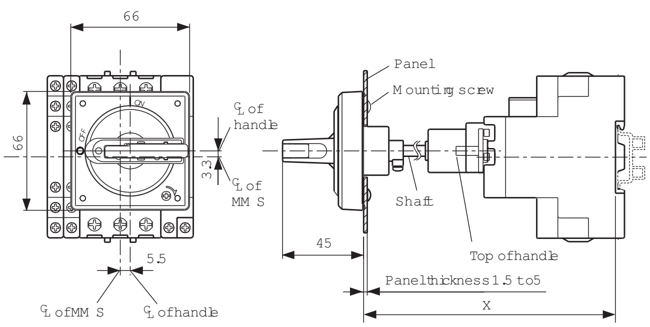
Fuji Electric

Dimensions (continued)

[mm]

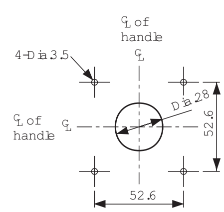
Accessories

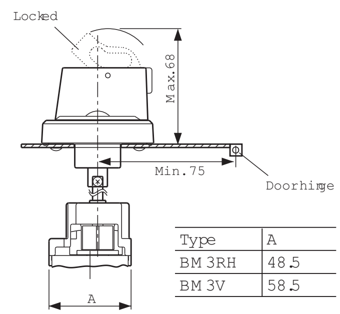
External operation handle BZ0Vxxx



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

Panel drilling

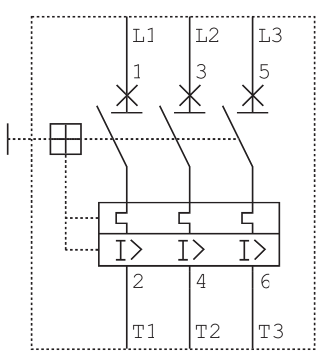




Type	A
BM3RH	48.5
BM3V	58.5

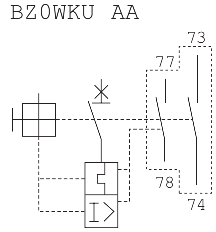
Wiring Diagrams

MMS



Auxiliary and alarm contact blocks

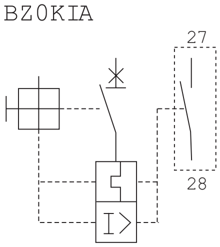
BZ0WKUAA



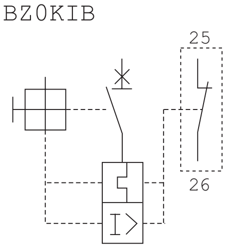
Alarm contact blocks

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."

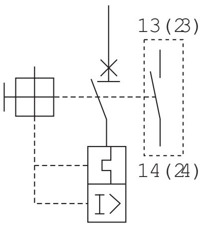
Fuji Duo Series Manual Motor Starters Accessories

Wiring Diagrams (continued)

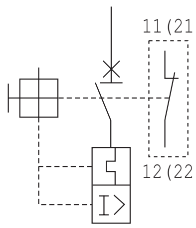
Auxiliary contact blocks

Front mounting

BZ0WIA

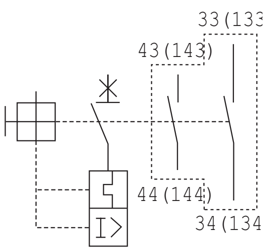


BZ0WIB

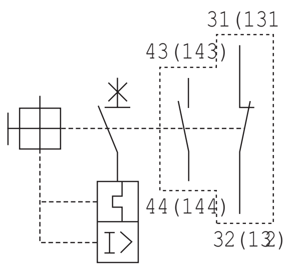


Side mounting

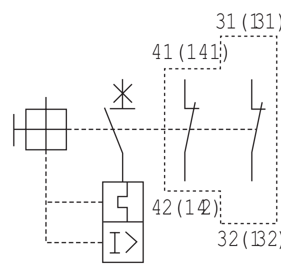
BZ0WUAAL



BZ0WUABL

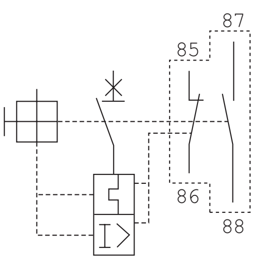


BZ0WUBBL



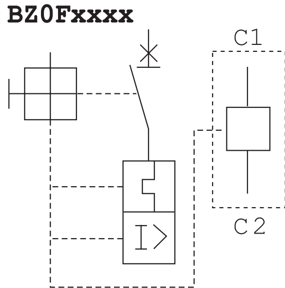
Short-circuit a
contact blocks

BZ0TKUAB



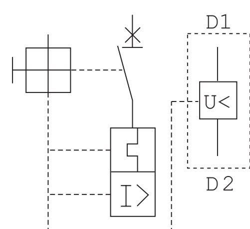
Shunt trip devices

BZ0Fxxxx



Undervoltage trip dev

BZ0Rxxxx



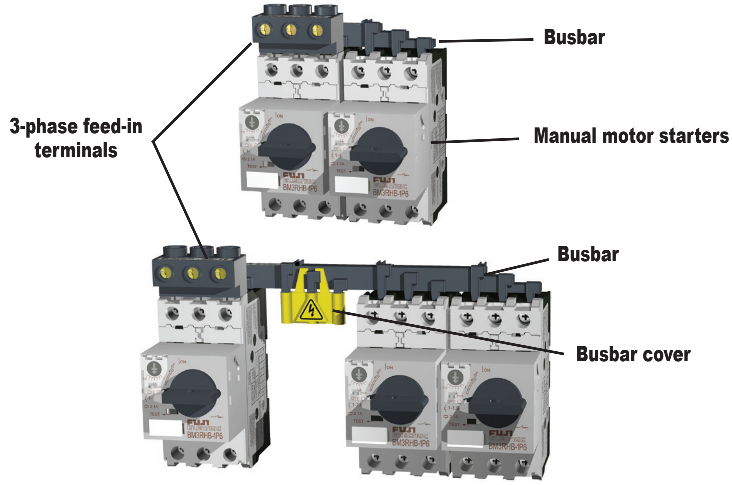
For control circuit design, see design standards such as NEC 430 "Electrical Arrangement of control Circuits" or UL508A section 38 "Wiring methods, wire routing, and separation of circuits for internal wiring of a control circuit."

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.



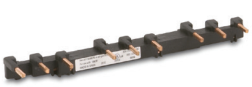
BZ0BR02A

BZ0BR03A

BZ0BR04A

BZ0BR05A

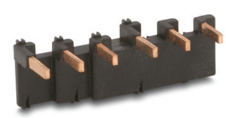
BZ0BR12A



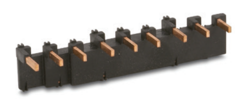
BZ0BR13A

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	$25.00	Busbar	BM3R	Continuous current: 64A max. pin connection	2-BM3R, modular space: 45mm	30
BZ0BR03A	$22.00				3-BM3R, modular space: 45mm	50
BZ0BR04A	$26.50				4-BM3R, modular space: 45mm	70
BZ0BR05A	$28.00				5-BM3R, modular space: 45mm	90
BZ0BR12A	$21.00		BM3R+ 1 external accessory, 9mm wide		2-BM3R, modular space: 54mm	30
BZ0BR13A	$25.50				3-BM3R, modular space: 54mm	55
BZ0BR14A	$28.00				4-BM3R, modular space: 54mm	80
BZ0BR15A	$29.50				5-BM3R, modular space: 54mm	105
BZ0BV02A	$40.00		BM3V	Continuous current: 126A max. pin connection	2-BM3V, modular space: 55mm	140
BZ0BV03A	Retired				3-BM3V, modular space: 55mm	240
BZ0BV04A	$59.00				4-BM3V, modular space: 55mm	340
BZ0BV12A	$42.50		BM3V + 1 external accessory, 9mm wide		2-BM3V, modular space: 64mm	150
BZ0BV13A	Retired				3-BM3V, modular space: 64mm	270
BZ0BV14A	Retired				4-BM3V, modular space: 64mm	380
BZ0BFRA	$22.00	3-phase feed-in terminal	BM3R	Continuous current: 64A max. Applicable cable size: 25mm2 max.		40
BZ0BFVA	$45.00		BM3V	Continuous current: 126A max. Applicable cable size: 50mm2 max.		170
BZ0BCRA	$6.00	Busbar cover	BZ0BR	For pin connection NOTE: Some fine tuning and fitting adjustments may be needed.		10
BZ0BCVA	Retired		BZ0BV			5

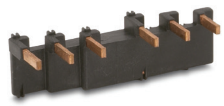
Fuji Duo Series Manual Motor Starters Accessories

Busbar system (continued)

Dimensions

(mm)


BZ0BV04A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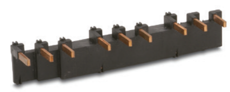
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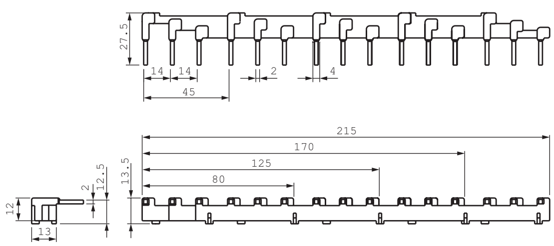
BZ0BV14A

For BM3RHB-xxx

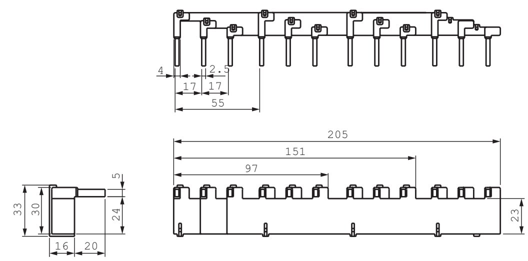
BZ0BR0xx Without external accessory



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

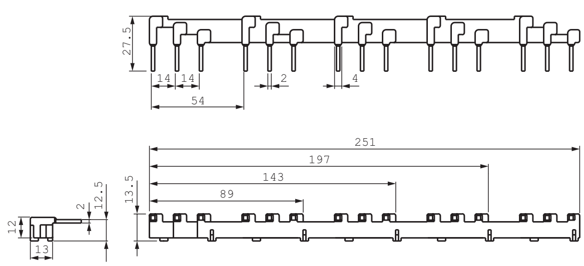
For BM3VHB-xxx

BZ0BV0xx Without external accesssory



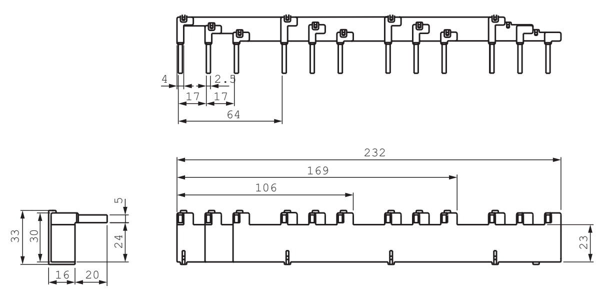
BZ0BV02A: 97 mm
BZ0BV03A: 151 mm
BZ0BV04A: 205 mm

BZ0BR1xx With 1 external accessory



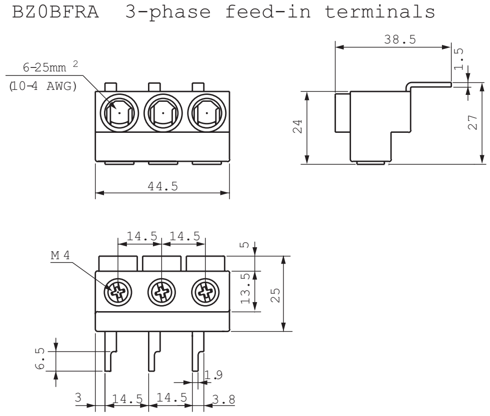
BZ0BR12A: 89 mm
BZ0BR13A: 143mm
BZ0BR14A: 197 mm
BZ0BR15A: 251 mm

BZ0BV1xx With 1 external accessory, 9mm wide

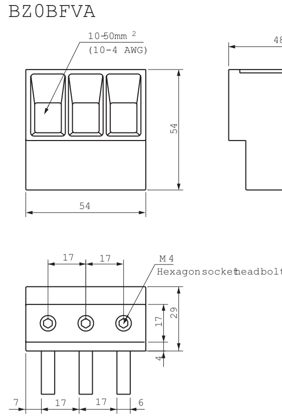


BZ0BV12A: 106 mm
BZ0BV13A: 169 mm
BZ0BV14A: 232 mm

BZ0BFRA 3-phase feed-in terminals



BZ0BFVA



Building a Fuji Duo Series Combination Starter

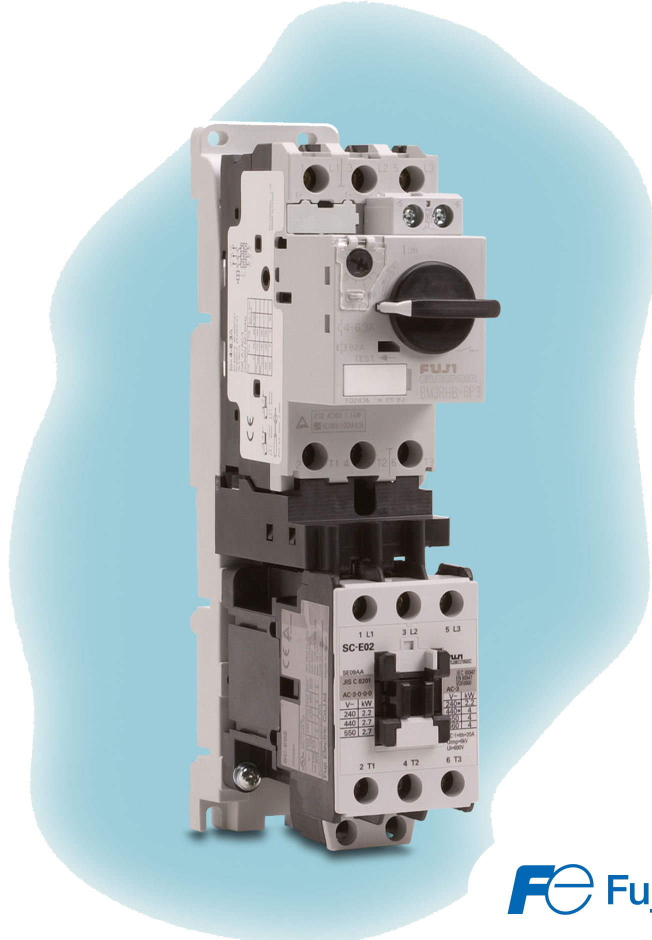
The Fuji SC-E series contactors work with the MMS to create starters for particular applications. The MMS combination starters can accommodate motors up to 40 horsepower at 480 VAC or 60 horsepower at 600 VAC.

Combination starters used for:
- Induction motor starting and control
- Fulfillment of NEC 430
- UL508E, type 2 coordination for group motor rating installation (See parts list for details)

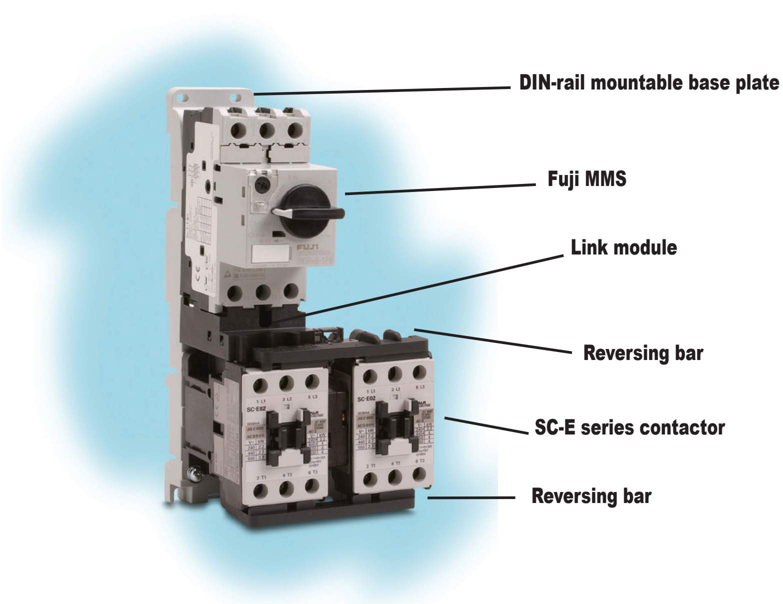
SC-E Series Contactor Features
- 1/2 to 40 hp at 480 V
- AC and DC coils with a wide range of voltages
- Finger protection terminals
- Compact frame sizes (45 mm and 55 mm)
- IEC-947, UL, CSA, CE

Manual Motor Starter Features
- Circuit breaker functions plus overload relay functions in a highly compact unit
- Two frame sizes up to 63A
- Multiple coil voltages
- IEC-947
- UL listed, file E211710, Standard 508
- cUL listed, file E211710, Standard CSA C22.2 No. 14

**1/2 to 40 hp at 480 V
when used with SC-E contactor**



Fuji Electric



MMS Reversing Starter

Build your MMS reversing starter from these Fuji components. Reversing busbars and mechanical interlocks are designed to integrate with the MMS and SC-E series contactors.

Fuji Duo Series Combination Starters

General information

Description

The user can assemble a combination starter by combining a BM3 series manual motor starter and an SC-E series magnetic contactor to achieve a compact motor control that minimizes enclosure space requirements.

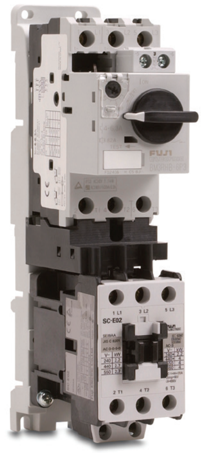
The manual motor starter provides overload, phase-loss, and short-circuit protection for the motor circuit, and incorporates a dial for flexible adjustment to match the full load current of the motor.

The magnetic contactor allows remote ON/OFF operation of the motor circuit with high frequency, and features an electrical durability of one million operations.

The manual motor starter and magnetic contactor are connected with a link module and mounted to a base plate.

Features

- Consists of a manual motor starter and magnetic contactor that can be assembled by the user to achieve a compact motor control circuit.
- Protects the motor from short-circuit and overcurrent accidents in the three-phase motor circuit within a range between 20 hp at 240 VAC and 30 hp at 415 VAC, up to a current level of 50A.
- Conforms to IEC 60947 requirements for magnetic motor starters and circuit breakers of protective coordination types 1 and 2, greatly reducing the possibility of an accident causing damage to other equipment.
- Can be mounted to IEC top hat rail using the base plate.
- Modular wiring system requires less wiring, shortens required mounting time, and decreases the mounting area.



IEC 60947-4-1

UL Type E Self-Protected Manual Motor Starter and Contactor

Type 1:

Coordination requires that, under short-circuit conditions, the contactor or starter shall cause no danger to persons or installation and may not be suitable for further service without repair and replacement of parts.

Type 2:

Coordination requires that, under short-circuit conditions, the contactor or starter shall cause no danger to persons or installation and shall be suitable for further use. The risk of contact welding is recognized, in which case the manufacturer shall indicate the measures to be taken regarding the maintenance of the equipment.

NOTE: Refer to UL 508E and UL 508F for more information.

Fuji Electric

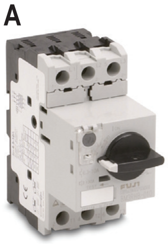
Choosing 45mm or 55mm frame width

The Fuji MMS is available in 45mm and 55 mm frame widths. The 45mm frame size is capable of controlling motors up to 20 horsepower while the 55mm frame size can handle motors up to 40 horsepower at 480 volts AC. The frame sizes overlap in motor sizing though the breaking capacity remains the same.

For controlling a group of motors up to 20 horsepower, the 45mm frame size is the perfect answer. For motor sizes 20 to 40 horsepower @480 VAC, the 55mm frame is specified.

If your motors range from below 20 horsepower to 40 horsepower, consider using the 55mm frame. Though the individual costs per unit is more expensive for the 55mm frame width in sizes below 20 horsepower, construction cost's are reduced by standardizing on the same frame size.

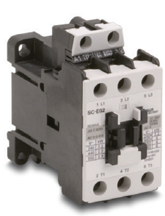
A



BM3 Series Manual Motor Starter

+

B



SC-E Series Contactor

+

C

BZ0L Series Link Module

+

D

BZ0BP Series Base Plate

=

UL Type E Self-Protected Manual Motor Controller and Contactor

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*							
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	BZ0LRE22AA	BZ0BPRE22A	65
						SC-E02G-24VDC	BZ0LRE22GA		
-	-	-	-	0.16 to 0.25	BM3RHB-P25	SC-E02-110VAC	BZ0LRE22AA		65
						SC-E02G-24VDC	BZ0LRE22GA		
-	-	-	-	0.25 to 0.4	BM3RHB-P40	SC-E02-110VAC	BZ0LRE22AA		65
						SC-E02G-24VDC	BZ0LRE22GA		
-	-	-	-	0.4 to 0.63	BM3RHB-P63	SC-E02-110VAC	BZ0LRE22AA		65
						SC-E02G-24VDC	BZ0LRE22GA		
-	-	-	-	0.63 to 1.0	BM3RHB-001	SC-E02-110VAC	BZ0LRE22AA		65
						SC-E02G-24VDC	BZ0LRE22GA		
-	-	0.75	1.6	1.0 to 1.6	BM3RHB-1P6	SC-E02-110VAC	BZ0LRE22AA		65
						SC-E02G-24VDC	BZ0LRE22GA		
0.5	2.2	1	2.1	1.6 to 2.5	BM3RHB-2P5	SC-E02-110VAC	BZ0LRE22AA		65
						SC-E02G-24VDC	BZ0LRE22GA		
0.75	3.2	2	3.4	2.5 to 4.0	BM3RHB-004	SC-E02-110VAC	BZ0LRE22AA		65
						SC-E02G-24VDC	BZ0LRE22GA		
1.5	6	3	4.8	4.0 to 6.3	BM3RHB-6P3	SC-E02-110VAC	BZ0LRE22AA		65
						SC-E02G-24VDC	BZ0LRE22GA		
-	-	5	7.6	6.3 to 10	BM3RHB-010	SC-E02-110VAC	BZ0LRE22AA		65
						SC-E02G-24VDC	BZ0LRE22GA		
3	9.6	7.5	11	9 to 13	BM3RHB-013	SC-E03-110VAC	BZ0LRE22AA		65
						SC-E03G-24VDC	BZ0LRE22GA		
5	15.2	10	14	11 to 16	BM3RHB-016	SC-E04-110VAC	BZ0LRE22AA		65
						SC-E04G-24VDC	BZ0LRE22GA		
5	15.2	10	14	14 to 20	BM3RHB-020	SC-E04-110VAC	BZ0LRE22AA		65
						SC-E04G-24VDC	BZ0LRE22GA		
7.5	22	15	21	19 to 25	BM3RHB-025	SC-E05-110VAC	BZ0LRE22AA		50
						SC-E05G-24VDC	BZ0LRE22GA		
10	28	20	27	24 to 32	BM3RHB-032	SC-E1-110VAC	BZ0LRE32AA	BZ0BPRE32A	50
						SC-E1G-24VDC	BZ0LRE32GA		

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

Fuji Electric

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

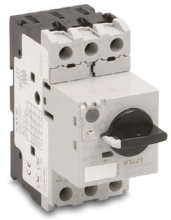
Combination Starter Selection Table - 55mm

Three Phase Motor					*A*	*B*	*C*	*D*	
220-240 Volt		***440-480 Volt***							
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***
3	9.6	5	7.6	6.3 to 10	BM3VHB-010	SC-E1-110VAC	BZ0LVE51AA	BZ0BPVE51A	65
						SC-E1G-24VDC	BZ0LVE51GA		
3	9.6	7.5	11	9 to 13	BM3VHB-013	SC-E1-110VAC	BZ0LVE51AA		65
						SC-E1G-24VDC	BZ0LVE51GA		
5	15.2	10	14	11 to 16	BM3VHB-016	SC-E1-110VAC	BZ0LVE51AA		65
						SC-E1G-24VDC	BZ0LVE51GA		
5	15.2	10	14	14 to 20	BM3VHB-020	SC-E1-110VAC	BZ0LVE51AA		65
						SC-E1G-24VDC	BZ0LVE51GA		
7.5	22	15	21	19 to 25	BM3VHB-025	SC-E1-110VAC	BZ0LVE51AA		65
						SC-E1G-24VDC	BZ0LVE51GA		
10	28	20	27	24 to 32	BM3VHB-032	SC-E1-110VAC	BZ0LVE51AA		65
						SC-E1G-24VDC	BZ0LVE51GA		
10	28	30	40	28 to 40	BM3VHB-040	SC-E2-110VAC	BZ0LVE51AA		65
						SC-E2G-24VDC	BZ0LVE51GA		
15	42	30	40	35 to 50	BM3VHB-050	SC-E2S-110VAC	BZ0LVE51AA		65
						SC-E2SG-24VDC	BZ0LVE51GA		
20	54	40	52	45 to 63	BM3VHB-063	SC-E3-110VAC	BZ0LVE65AA	BZ0BPVE65A	65
						SC-E3G-24VDC	BZ0LVE65GA		

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

Fuji Duo Series Combination Starter

BM3RHB-xxx Manual Motor Starter Prices			
Part Number	**Price**	**Part Number**	**Price**
BM3RHB-P16	$97.00	BM3RHB-6P3	$97.00
BM3RHB-P25	$97.00	BM3RHB-010	$102.00
BM3RHB-P40	$97.00	BM3RHB-013	$102.00
BM3RHB-P63	$97.00	BM3RHB-016	$102.00
BM3RHB-001	$97.00	BM3RHB-020	$102.00
BM3RHB-1P6	$97.00	BM3RHB-025	$123.00
BM3RHB-2P5	$97.00	BM3RHB-032	$154.00
BM3RHB-004	$97.00		

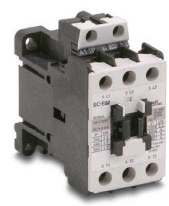


Note: When using BM3RHB-xxx MMS in a UL type E application, you must also use part number BZ0TKUAB (short circuit contact block) and BZ0TCRE (line side terminal cover).

BM3VHB-xxx Manual Motor Starter Prices			
Part Number	**Price**	**Part Number**	**Price**
BM3VHB-010	$237.00	BM3VHB-032	$293.00
BM3VHB-013	$237.00	BM3VHB-040	$293.00
BM3VHB-016	$237.00	BM3VHB-050	$305.00
BM3VHB-020	$237.00	BM3VHB-063	$305.00
BM3VHB-025	$278.00		

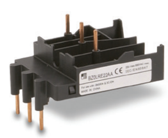
Note: When using BM3VHB-xxx MMS in a UL type E application you must also use part number BZ0TKUAB (short circuit contact block).

Contactor Prices							
Part Number	**Price**	**Part Number**	**Price**	**Part Number**	**Price**	**Part Number**	**Price**
SC-E02-24VAC	Retired	SC-E05-24VAC	Retired	SC-E2S-24VAC	$124.00	SC-E5-24V	$356.00
SC-E02-110VAC	Retired	SC-E05-110VAC	Retired	SC-E2S-110VAC	$124.00	SC-E5-100V	$356.00
SC-E02-220VAC	Retired	SC-E05-220VAC	Retired	SC-E2S-220VAC	$124.00	SC-E5-200V	$356.00
SC-E02G-24VDC	Retired	SC-E05G-24VDC	Retired	SC-E2SG-24VDC	$146.00	SC-E6-24V	$457.00
SC-E03-24VAC	Retired	SC-E1-24VAC	$72.00	SC-E3-24VAC	$140.00	SC-E6-100V	$457.00
SC-E03-110VAC	Retired	SC-E1-110VAC	$72.00	SC-E3-110VAC	$140.00	SC-E6-200V	$457.00
SC-E03-220VAC	Retired	SC-E1-220VAC	$72.00	SC-E3-220VAC	$140.00	SC-E7-24V	$531.00
SC-E03G-24VDC	Retired	SC-E1G-24VDC	$85.00	SC-E3G-24VDC	$171.00	SC-E7-100V	$531.00
SC-E04-24VAC	Retired	SC-E2-24VAC	$102.00	SC-E4-24VAC	$142.00	SC-E7-200V	$531.00
SC-E04-110VAC	Retired	SC-E2-110VAC	$102.00	SC-E4-110VAC	$142.00		
SC-E04-220VAC	Retired	SC-E2-220VAC	$102.00	SC-E4-220VAC	$142.00		
SC-E04G-24VDC	Retired	SC-E2G-24VDC	$124.00	SC-E4G-24VDC	$177.00		

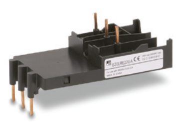


Link Modules and Base Plates

Link Modules

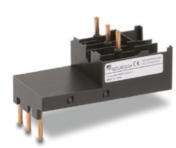


BZ0LRE22AA

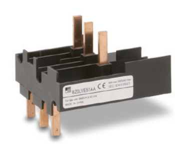


BZ0LRE22GA

BZ0LRE32AA



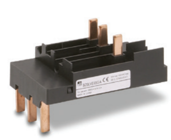
BZ0LRE32GA



BZ0LVE51AA

BZ0LVE51GA

BZ0LVE65AA



BZ0LVE65GA

Link modules						
Part Number	**Price**	**Description**	**Applicable MMS**	**Applicable Magnetic Contactor**	**Operating Coil (V)**	**Weight (g/lb)**
BZ0LRE22AA	$17.00	The link module connects the manual motor starter and magnetic contactor electrically and mechanically.	BM3RHB-xxx	SC-E02, E03, E04, E05-xxxVAC	AC	25/0.055
BZ0LRE22GA	$22.00			SC-E02G, E03G, E04G, E05G-xxxVDC	DC	35/0.077
BZ0LRE32AA	$20.00			SC-E1-xxxVAC	AC	45/0.1
BZ0LRE32GA	$25.00			SC-E1G-xxxVDC	DC	60/0.13
BZ0LVE51AA	$22.00		BM3VHB-xxx	SC-E1, E2, E2S-xxxVAC	AC	45/0.1
BZ0LVE51GA	$26.50			SC-E1G, E2G, E2SG-xxxVDC	DC	60/0.13
BZ0LVE65AA	$26.50			SC-E3-xxxVAC	AC	65/0.14
BZ0LVE65GA	$31.50			SC-E3G-xxxVDC	DC	80/0.176

Fuji Duo Series Combination Starters

Base plates


BZ0BPRE22A


BZ0BPRE32A


BZ0BPVE51A


BZ0BPVE65A

Base Plates						
Part Number	Price	Description	Applicable MMS	Applicable Magnetic Contactor	Operating Coil (V)	Weight (g/lb)
BZ0BPRE22A	$21.00	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.	BM3RHB-xxx	SC-E02, E03, E04, E05, SC-E02G, E03G, E04G, E05G-xxx	AC/DC	100/0.22
BZ0BPRE32A	$22.50			SC-E1, SC-E1G-xxx	AC/DC	160/0.35
BZ0BPVE51A	$25.50		BM3VHB-xxx	SC-E1, E2, E2S, SC-E1G, E2G, E2SG-xxx	AC/DC	160/0.35
BZ0BPVE65A	Retired			SC-E3, SC-E3G-xxx	AC/DC	195/0.43

How to reverse the contactor nameplate

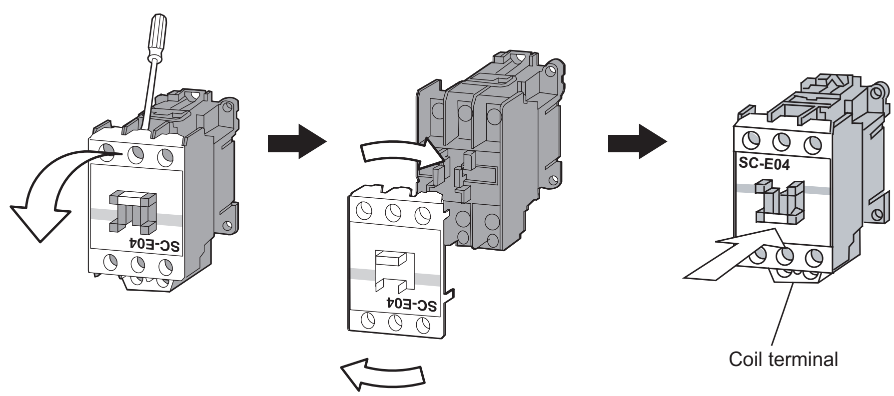
When the manual motor starter and magnetic contactor are configured as a combination starter, the contactor nameplate ends up facing the wrong direction because the coil terminal of the magnetic contactor faces downward. Use the following procedure to turn the nameplate upside down.

Contactor nameplate must be reversed when used in a combination starter configuration.

SC-E2S

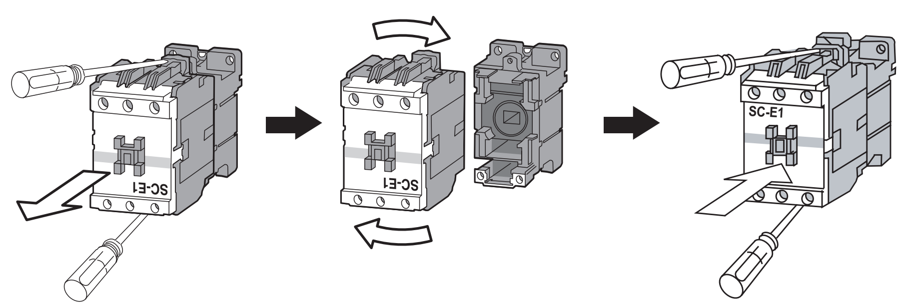
For SC-E02 to SC-E05-xxx contactors

- 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-xxx 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/re-mounting procedure.

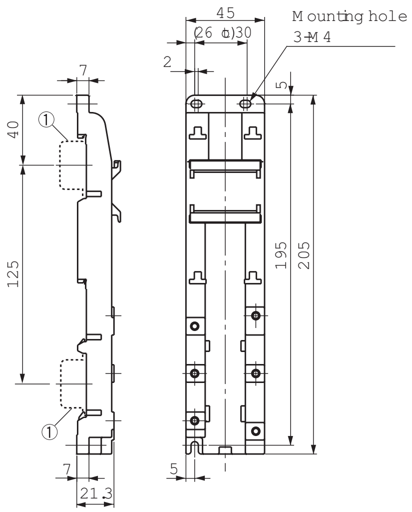


Fuji Duo Series Combination Starters

Dimensions (mm)

Fuji Electric

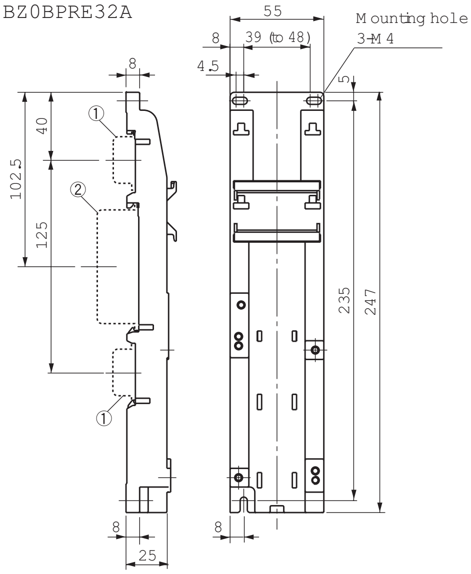
BZ0BPRE22A



①35mm wide rail (height15mm) x 2

Base plate	MMS	Contactor
BZ0BPRE22A	BM3RHB-xxx	SC-E02,E03,E04,E05-xxx E02G,E03G,E04G,E05G-xxx

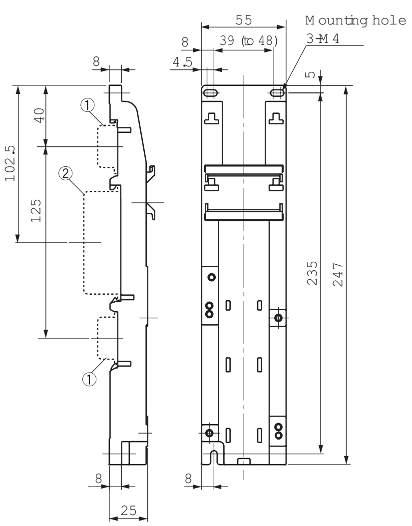
BZ0BPRE32A



①35mm wide rail (height15mm) x 2
②75mm wide rail (height25mm) x 1

Base plate	MMS	Contactor
BZ0BPRE32A	BM3RHB-xxx	SC-E1,E1G-xxx

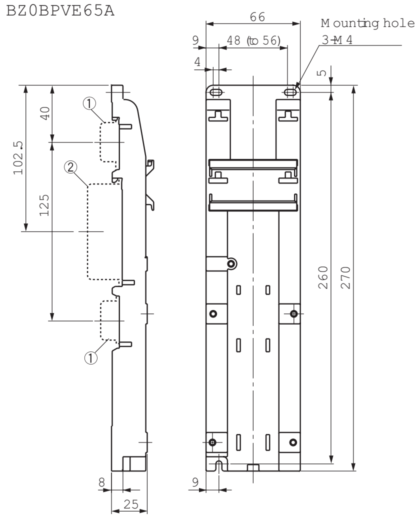
BZ0BPVE51A



①35mm wide rail (height15mm) x 2
②75mm wide rail (height25mm) x 1

Base plate	MMS	Contactor
BZ0BPVE51A	BM3VHB-xxx	SC-E1,E2,E2S-xxx E1G,E2G,E2SG-xxx

BZ0BPVE65A



①35mm wide rail (height15mm) x 2
②75mm wide rail (height25mm) x 1

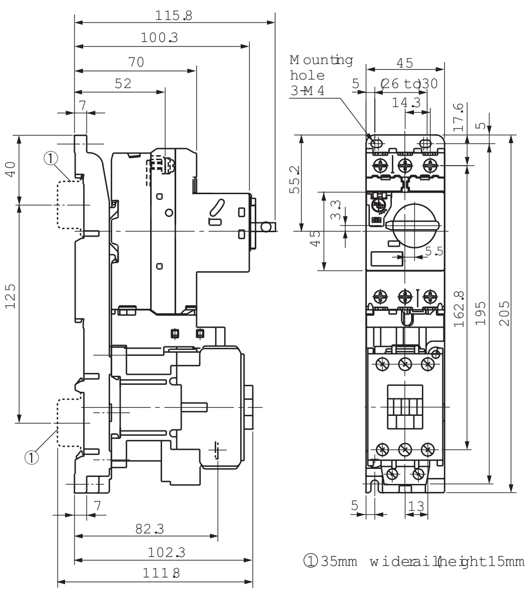
Base plate	MMS	Contactor
BZ0BPVE65A	BM3VHB-xxx	SC-E3,E3G-xxx

Fuji Duo Series Combination Starters

Fuji Electric

Dimensions (mm)

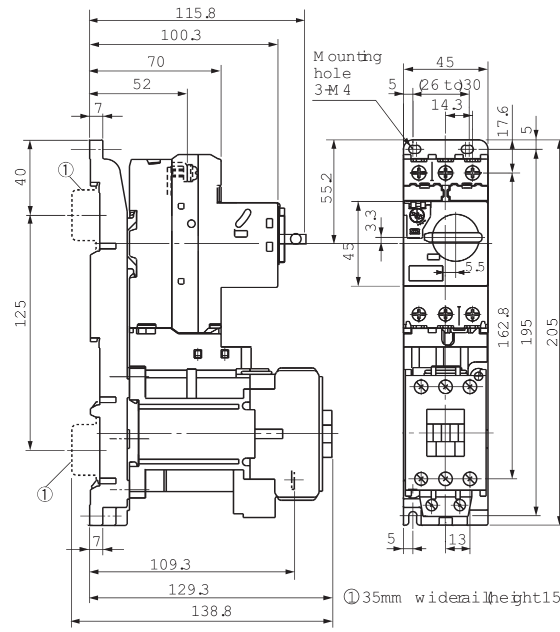
BM3RHB-xxx + SC-E02 to E05-xxx



①35mm wide rail (height15mm) x 2

MMS	Contactors	Link module	Base plate
BM3RHB-xxx	SC-E02, E03, E04, E05-xxx	BZ0LRE22AA	BZ0BPRE22A

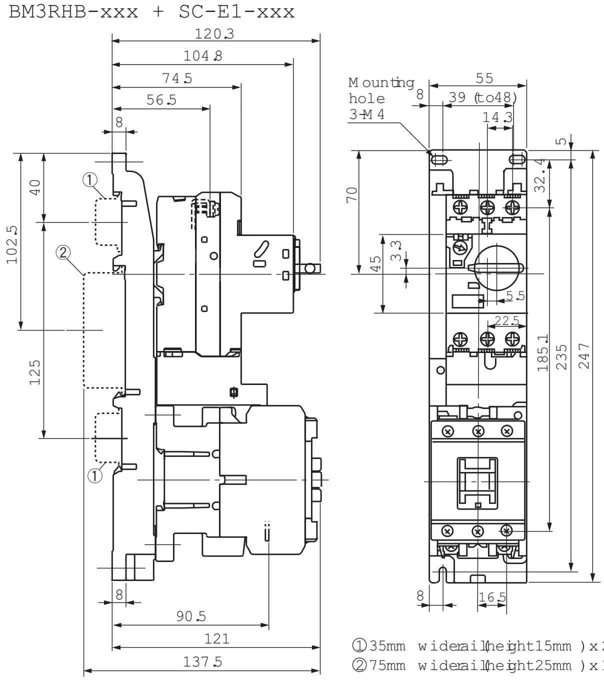
BM3RHB-xxx + SC-E02G to E05G-xxx



①35mm wide rail (height15mm) x 2

MMS	Contactors	Link module	Base plate
BM3RHB-xxx	SC-E02G, E03G, E04G, E05G-xxx	BZ0LRE22GA	BZ0BPRE22A

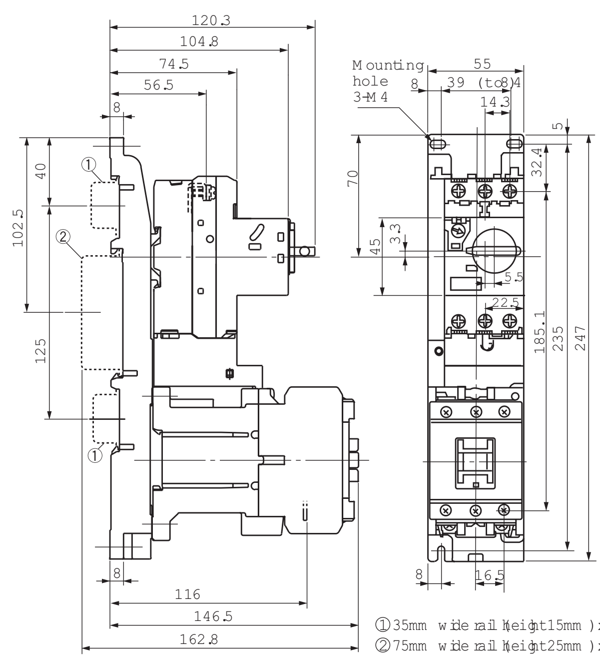
BM3RHB-xxx + SC-E1-xxx



①35mm wide rail (height15mm) x 2
②75mm wide rail (height25mm) x 1

MMS	Contactors	Link module	Base plate
BM3RHB-xxx	SC-E1-xxx	BZ0LRE32AA	BZ0BPRE32A

BM3RHB-xxx + SC-E1G-xxx



①35mm wide rail (height15mm) x 2
②75mm wide rail (height25mm) x 1

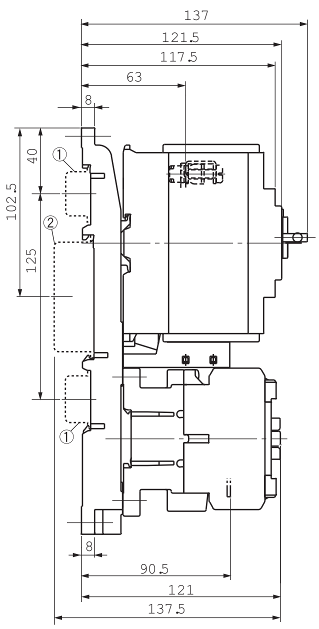
MMS	Contactors	Link module	Base plate
BM3RHB-xxx	SC-E1G-xxx	BZ0LRE32GA	BZ0BPRE32A

Fuji Duo Series Combination Starters

Dimensions (mm)

Fuji Electric

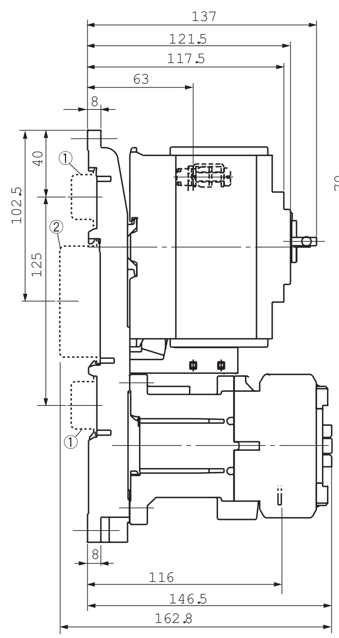
BM3VHB-xxx + SC-E1, E2, E2S-xxx



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

MMS	Contactors	Link module	Base plate
BM3VHB-xxx	SC-E1, E2, E2S-xxx	BZ0LVE51AA	BZ0BPVE51A

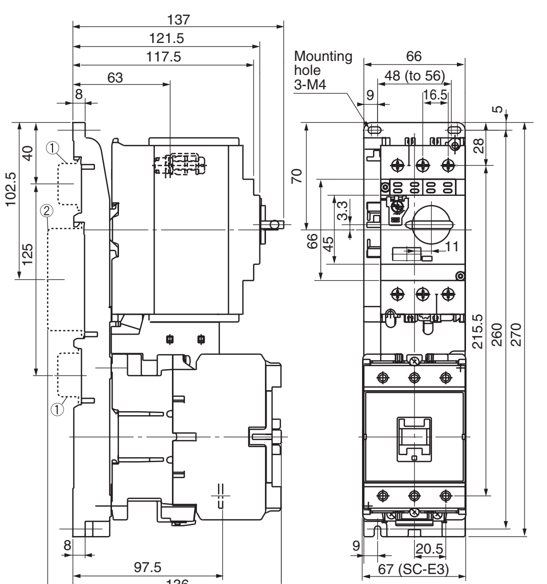
BM3VHB-xxx + SC-E1G, E2G, E2SG-xxx



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

MMS	Contactors	Link module	Base plate
BM3VHB-xxx	SC-E1G, E2G, E2SG-xxx	BZ0LVE51GA	BZ0BPVE51A

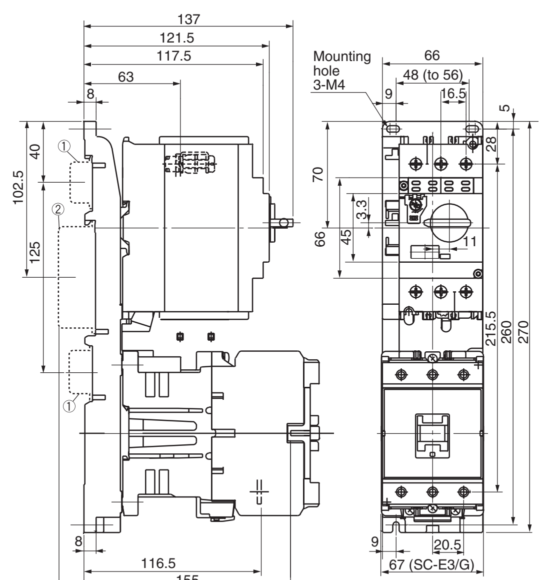
BM3VHB-xxx + SC-E3-xxx



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

MMS	Contactors	Link module	Base plate
BM3VHB-xxx	SC-E3-xxx	BZ0LVE65AA	BZ0BPVE65A

BM3VHB-xxx + SCE3G-xxx



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

MMS	Contactors	Link module	Base plate
BM3VHB-xxx	SC-E3G-xxx	BZ0LVE65GA	BZ0BPVE65A

Fuji Odyssey Series 3N Contactors

Fuji Electric

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 energyconsumption, and increased horsepower capabilities.
- Available in 154mm and 169mm frame widths
- SUPERMAGNET™ for high operating reliability.
- Use with Odyssey 3N series overload relays.

Features
- Equipped with 2 N.O. and 2 N.C. auxiliary contacts
- Chatter-free operation eliminates contact welding and coil burning
- SUPERMAGNET™ coil operates on either AC or DC voltage
- Wire Terminal Connection Type: Crimp ring Terminal

Agency approvals
- UL listed file E42419, Standard UL508
- cUL listed file E42419, Standard CSA C22.2 No. 14
- CE: Meets LVD EN60947-4-1
- SEMI F47-0200

Optional accessories
- Terminal covers
- Auxiliary contacts

3NC4H0122

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

Odyssey 3N Series Contactors 180–361 Amps

Part Number	Fuji Type	Price	Coil Voltage	Rated Motor Capacity (HP)						Rated AC-3 Current (A) [note 1]	Rated AC-1 Thermal Current (A) [note 2]	Quantity of Auxiliary Contacts		SCCR Ratings (KA)	Frame Width (mm)
				3-Phase				1-Phase							
				200–208V	220–240V	440–480V	550–600V	100–120V	220–240V			NO	NC		
3NC4Q0E22	SC-N8	$587.00	24–25VAC / 24VDC	60	60	150	150	N/A		180	260	2	2	10	138
3NC4Q0122		$587.00	100–127VAC / 100–120VDC												
3NC4Q0222		$587.00	200–250VAC / 200–240VDC												
3NC4H0E22	SC-N10	$695.00	24–25VAC / 24VDC	75	75	150	200	N/A		221	260	2	2	10	138
3NC4H0122		$695.00	100–127VAC / 100–120VDC												
3NC4H0222		$695.00	200–250VAC / 200–240VDC												
3NC4H0Q22		$695.00	380–450VAC												
3NC4H0422		$695.00	460–575VAC												
3NC5F0E22	SC-N11	$908.00	24–25VAC / 24VDC	100	100	200	250	N/A		285	350	2	2	18	148
3NC5F0122		$908.00	100–127VAC / 100–120VDC												
3NC5F0222		$908.00	200–250VAC / 200–240VDC												
3NC5H0E22	SC-N12	$993.00	24–25VAC / 24VDC	125	150	300	350	N/A		361	450	2	2	18	148
3NC5H0122		$993.00	100–127VAC / 100–120VDC												
3NC5H0222		$993.00	200–250VAC / 200–240VDC												
3NC5H0Q22		$993.00	380–450VAC												
3NC5H0422		$993.00	460–575VAC												

Notes: 1. AC3 type loads consist of squirrel cage three-phase motors; occasional, limited jogging duty.
2. AC1 non-inductive or slightly inductive loads. Typically resistive loads (i.e. furnaces, ovens, etc.)

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.

Fuji Odyssey Series 3N Contactors

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.

Contactor Coil Characteristics - DC Input - 24VDC

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	250	5.9	17-19.2	6-12	35-41	37-45

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

Contactor Auxiliary Contact Ratings

NEMA ICS 5-2000 Ratings (note 1)				
AC Ratings			DC Ratings	
Designation	Making VA	Breaking VA	Designation	Making/Breaking VA
A600	7200	720	Q300	69

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

Contactor Terminal Tightening Torque Chart

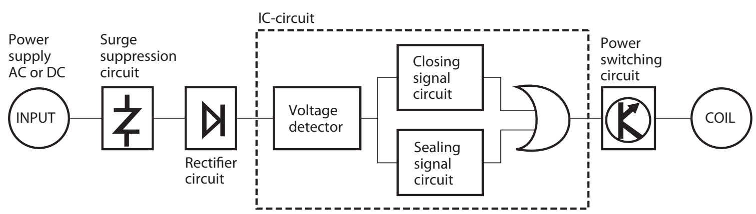
Part Number	Terminal Size	Cable Size Maximum	Applicable Max. Width for Ring Terminal	Tightening Torque
3NC4Q0xxx	M10	300MCM [152mm²]	36.5 mm [1.44 in]	15-20 N·m [133-177 lb·in]
3NC4H0xxx	M10	300MCM [152mm²]	36.5 mm [1.44 in]	15-20 N·m [133-177 lb·in]
3NC5F0xxx 3NC5H0xxx	M12	400MCM [203mm²]	44.5 mm [1.75 in]	35-45 N·m [310-399 lb·in]

Contactor Life Expectancy Performance Data

Model	Current Capacity Make/Break	Operating Cycles per Hour	Life Expectancy (million operations)	
			Electrical	Mechanical
3NC4Qxxxx through 3NC5Fxxxx	12xle/10xle	1200	1	5
3NC5Hxxxx	12xle/10xle	1200	0.5	5

Note: Rated operational current. Electrical life test: Conforming to IEC947-4-1, AC3. The endurance test complies with the requirements of international standard IEC, JIS and JEM.

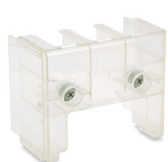
Note: Super Magnet Coils on 3NC4 and 3NC5 series contactors have internal surge suppression. See diagram below.



Optional Accessories

Terminal covers

Prevent contact with electrified terminals.



SZ-N8T

SZ-N11T

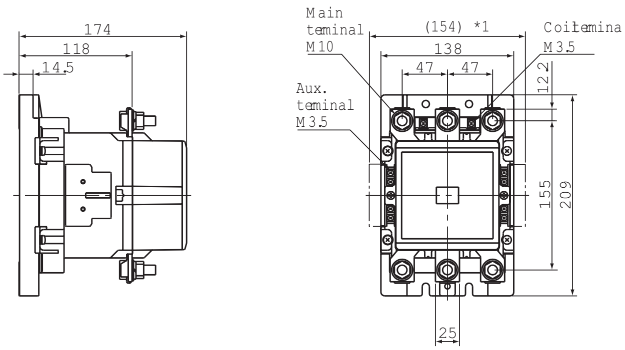
Odyssey Series Contactor Terminal Covers

Part Number	Price	Description	Applicable Contactors
SZ-N8T	$72.00	Terminal cover for line or load side. Prevents contact with electrified contactor terminals.	3NC4Qxxxx, 3NC4Hxxxx contactors
SZ-N11T	$90.00		3NC5Fxxxx, 3NC5Hxxxx contactors

Fuji Odyssey Series 3N Contactors

Dimensions (mm)

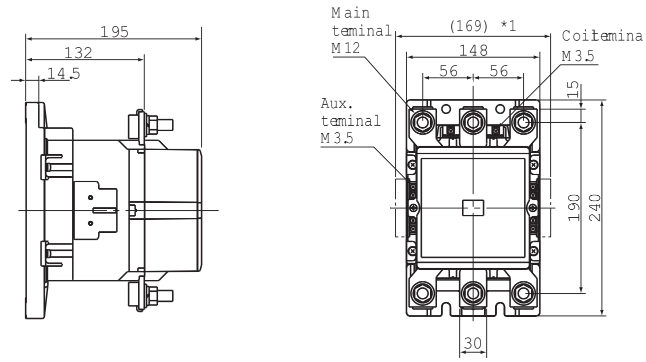
3NC4Q0#22
3NC4H0#22



* 1Aux.contactblock(sidemounted)

Weight: 4.9kg

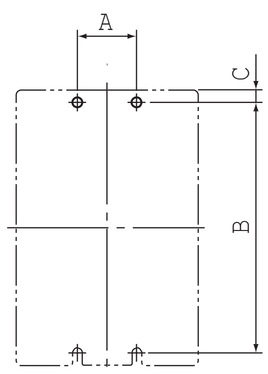
3NC5F0#22
3NC5H0#22



* 1Aux.contactblock(sidemounted)

Weight: 7.8kg

Mounting Dimensions

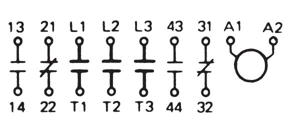


Frame Size	A	B	C	Screw Size
3NC4Qxxxx	45	190	9.5	4-M6
3NC4Hxxxx	45	190	9.5	4-M6
3NC5Fxxxx	60	220	10	4-M8
3NC5Hxxxx	60	220	10	4-M8

Fuji Electric

Wiring Diagrams

Non-reversing Contactors



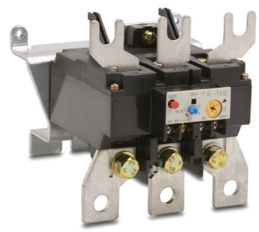
Fuji Odyssey Series 3N Overload Relays

General Information

- Use with Odyssey 3N series contactors.
- Protects motor windings from burning due to overloads, locked rotor currents, or open phases.

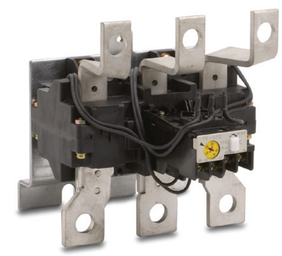
Agency approvals:

- UL listed file E42419, Standard UL 508
- cUL listed file E42419, Standard CSA C22.2 No. 14
- CE: LVD EN60947-4-1



3NK4QL

3NK4HN



3NK5HQ

Odyssey Series Overload Relays						
Part Number	***Fuji Type***	***Price***	***Adjustable Current Range (A)***	***Frame Width***	***CompatibleContactor***	***Trip Class IEC 60947-4-1***
3NK4QL	TK-N8	$218.00	85 - 125	119mm [4.69 in]	3NC4Qxxxx	10A
3NK4QN	TK-N8	$218.00	110 - 160			
3NK4QP	TK-N8	$218.00	125 - 185			
3NK4HP	TK-N10	$259.00	125 - 185	138mm [5.43 in]	3NC4Hxxxx	20
3NK4HQ	TK-N10	$259.00	160 - 240			
3NK5HQ	TK-N12	$428.00	160 - 240	142mm [5.59 in]	3NC5Fxxxx, 3NC5Hxxxx	20
3NK5HR	TK-N12	$428.00	200 - 300			
3NK5HS	TK-N12	$428.00	240 - 360		3NC5Hxxxx	

Specifications

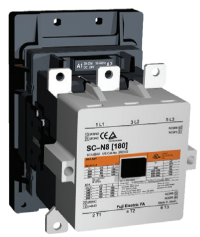
Overload Relay Alarm Contact Ratings				
AC Ratings (note 1)			***DC Ratings (note 1)***	
Designation	Making VA	Breaking VA	Designation	Making/Breaking VA
C600	1800	180	---	---

Notes:
1. NEMA ICS 5-2000. For more information, refer to Control Circuit Contact Electrical Ratings.

Wire Terminal Tightening Torque Chart					
Part Number	***Contactor or Starter***	***Terminal Size***	***Cable Size Maximum***	***Applicable Max. Width for Ring Terminal***	***Tightening Torque***
3NK4Qx	3NC4Q0	M10	300MCM (152mm2)	36.5 mm	133-177 in.lbs., 15-20 Nm
3NK4Hx	3NC4H0	M10	300MCM (152mm2)	36.5 mm	133-177 in.lbs., 15-20 Nm
3NK5Hx	3NC5F0	M12	400MCM (203mm2)	44.5 mm	310-399 in.lbs., 35-45 Nm
	3NC5H0				

Fuji Odyssey Series 3N Overload Relays Selection Tables

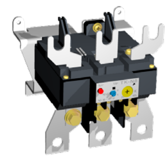
A



3N Contactor

+

B



3N Overload Relay

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Step 1. Select an Odyssey 3N contactor from Column A based on motor voltage and horsepower.

Step 2. Select an Odyssey 3N overload relay from Column B to work with the contactor selected in Step 1. The motor full load current (FLA) should be within the adjustable current range of the overload relay.

220-240V 3-Phase Motor (60 to 150 hp)

Motor Rating		A	B	
			Overload Relay	
HP	Motor Full Load Amperage (FLA) (See Note 1)	Contactor	Part Number	Adjustable Current Range
60	154	3NC4Q0x22	3NK4QN	110 to 160 Amps
75	192	3NC4H0x22	3NK4HQ	160 to 240 Amps
100	248	3NC5F0x22	3NK5HR	200 to 300 Amps
125	312	3NC5H0x22	3NK5HS	240 to 360 Amps
150	360	3NC5H0x22	3NK5HT	300 to 450 Amps

Note 1: Per NEC 2005 Table 430.250

440-480V 3-Phase Motor (125 to 300 hp)

Motor Rating		A	B	
			Overload Relay	
HP	Motor Full Load Amperage (FLA) (See Note 1)	Contactor	Part Number	Adjustable Current Range
125	156	3NC4Q0x22	3NK4QP	125 to 185 Amps
150	180	3NC4H0x22	3NK4HQ	160 to 240 Amps
200	240	3NC5F0x22	3NK5HR	200 to 300 Amps
250	302	3NC5H0x22	3NK5HS	240 to 360 Amps
300	361	3NC5H0x22	3NK5HT	300 to 450 Amps

Note 1: Per NEC 2005 Table 430.250

Fuji Odyssey Series 3N Overload Relays

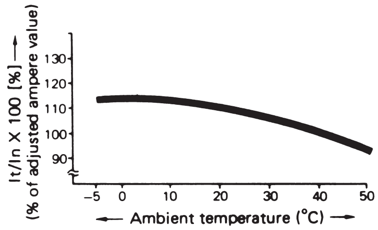
Specifications

Ambient temperature compensator

Overload relays are provided with an ambient temperature compensator. Their characteristics limit current value changes to approximately 10% as the ambient temperature changes between –5°C and 40°C.

Open-phase protection

Compensation characteristics (Average value)

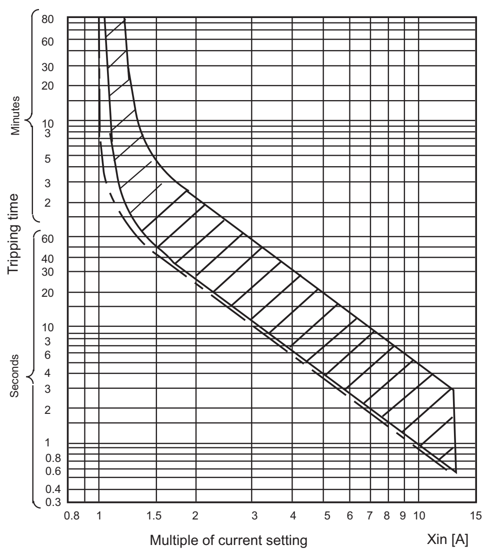


It : Operational current
In : Rated current

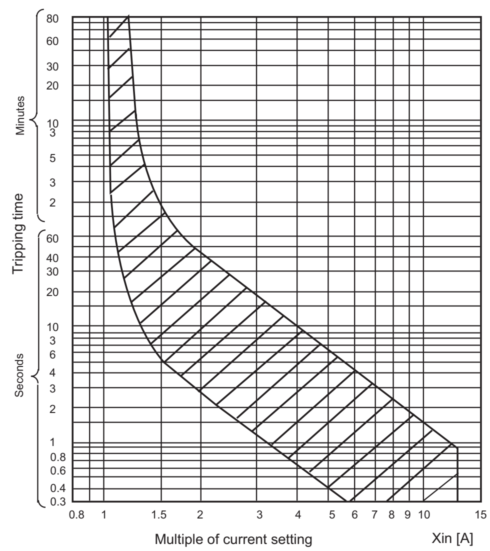
Fuji Electric

3NK4Qx

Cold start

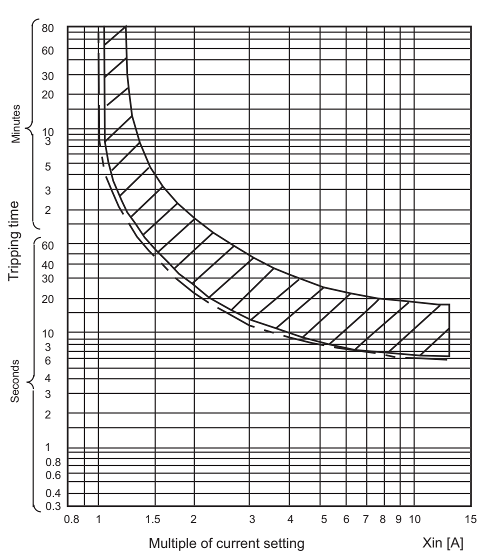


Hot start

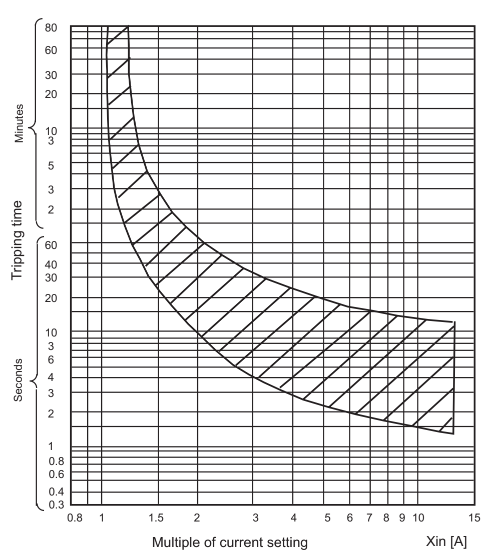


3NK4Hx, 3NK5Hx

Cold start



Hot start



Fuji Odyssey Series 3N Overload Relays

Optional Accessories

Terminal covers

NOTE: Larger terminal covers may require some adjustment for proper fit.

SZ-WN8T

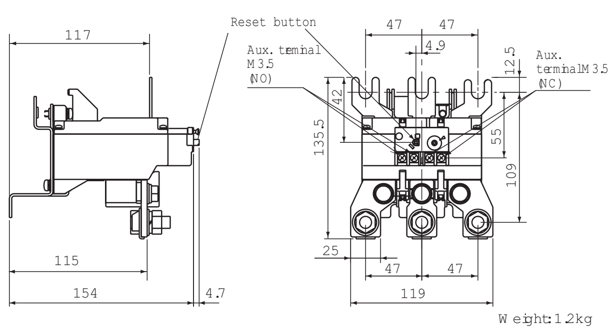
SZ-WN10T

SZ-WN11T

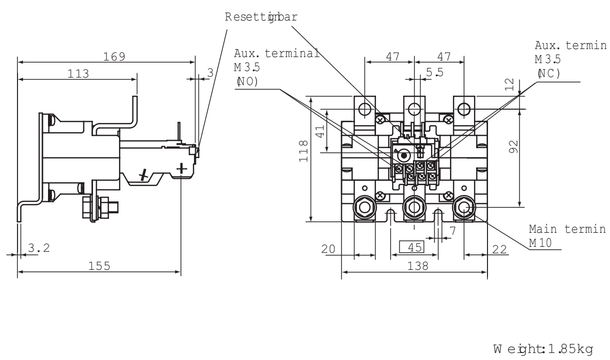
Odyssey Series Overload Relay Terminal Covers			
Part number	***Price***	***Description***	***Applicable Contactors, Overload Relays***
SZ-WN8T	$109.00	Terminal cover for load side. Prevents contact with electrified contactor terminals.	3NK4Qx overload relays
SZ-WN10T	$109.00		3NK4Hx overload relays
SZ-WN11T	$125.00		3NK5Hx overload relays

Dimensions [mm]

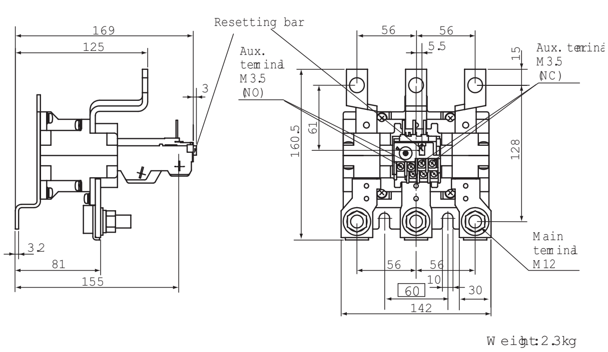
3NK4Qx



3NK4Hx

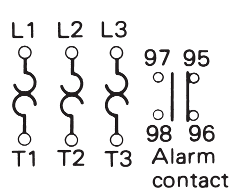


3NK5Hx

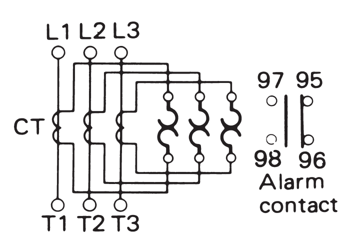


Wiring Diagrams

3NK4Qx



3NK4Hx, 3NK5Hx

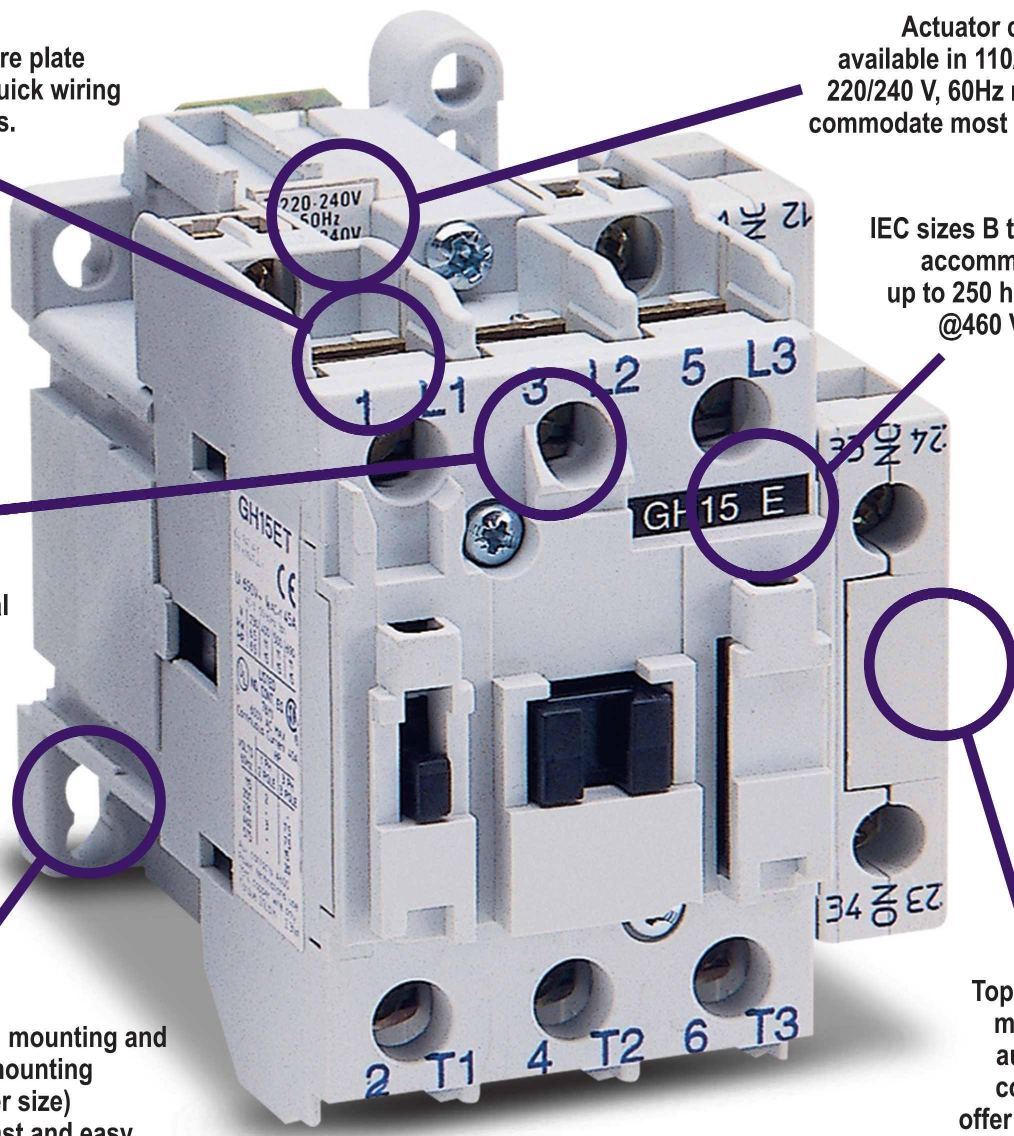


GH15 Series IEC Motor Controls

The GH15 series of IEC contactors and thermal overload relays are manufactured by Europe's leading maritime contactor company. Contactors for ocean-going vessels are built to the most rigid specifications. This same design technology carries over to this line of industrial motor controls.

We offer individual components that allow you to use the contactor alone or to assemble your motor starter using our thermal overload relays. You can also combine a manual motor starter/protector for all-in-one protection.

Use contactors wherever you need a heavy-duty switching device with up to three poles. Add up to 2 side-mounted auxiliary blocks (1 per side) plus 1 top-mounted auxiliary contact block per contactor max. This will equal up to 8 possible auxiliary contact configurations. Or use the optional mechanical interlock to create an inexpensive reversing contactor.



Self-lifting pressure plate terminals make for quick wiring terminations.

Actuator coils, available in 110/120 V and 220/240 V, 60Hz models, accommodate most applications.

IEC sizes B through TT accommodate up to 250 hp motors @460 VAC.

Terminals are IP20 rated to protect fingers from electrical shock.

35mm DIN-rail mounting and panel mounting (larger size) provides fast and easy installation. Panel mounting holes are provided.

Top and side mounted auxiliary contacts offer versatility for space requirements.

Approvals

- cULus listed #E191059
- UL 60947-4-1A

See next page for detailed specifications.

GH15 Series Contactor Configurations

Contactor Configurations							
IEC FRAME SIZE	Contactor Model*	Part Number	Price	Number of Contacts			Coil Voltage and Frequency
				Main	Auxiliary Contacts Included		
					N.0	N.C.	
45 mm	GH15BN	GH15BN-3-10A	$54.00	3	1	–	110-120 VAC 50-60 Hz
		GH15BN-3-01A	$53.00	3	–	1	110-120 VAC 50-60 Hz
		GH15BN-3-10B	$54.00	3	1	–	220-240 VAC 50-60 Hz
	GH15CN	GH15CN-3-10A	$62.00	3	1	–	110-120 VAC 50-60 Hz
		GH15CN-3-01A	$62.00	3	–	1	110-120 VAC 50-60 Hz
		GH15CN-3-10B	$62.00	3	1	–	220-240 VAC 50-60 Hz
		GH15CN-3-01B	$62.00	3	–	1	220-240 VAC 50-60 Hz
	GH15DN	GH15DN-3-10A	$67.00	3	1	–	110-120 VAC 50-60 Hz
		GH15DN-3-01A	$67.00	3	–	1	110-120 VAC 50-60 Hz
		GH15DN-3-10B	$67.00	3	1	–	220-240 VAC 50-60 Hz
		GH15DN-3-01B	$67.00	3	–	1	220-240 VAC 50-60 Hz
	GH15ET	GH15ET-3-00A	$101.00	3	–	–	110-120 VAC 50-60 Hz
		GH15ET-3-00B	$101.00	3	–	–	220-240 VAC 50-60 Hz
	GH15FT	GH15FT-3-00A	$110.00	3	–	–	110-120 VAC 50-60 Hz
		GH15FT-3-00B	$110.00	3	–	–	220-240 VAC 50-60 Hz
60 mm	GH15GT	GH15GT-3-00A	$199.00	3	–	–	120 VAC 60 Hz only
		GH15GT-3-00B	$197.00	3	–	–	240 VAC 60 Hz / 212 VAC 50 Hz
	GH15HT	GH15HT-3-00A	$222.00	3	–	–	120 VAC 60 Hz only
		GH15HT-3-00B	$222.00	3	–	–	240 VAC 60 Hz / 212 VAC 50 Hz
	GH15JT	GH15JT-3-00A	$232.00	3	–	–	120 VAC 60 Hz only
		GH15JT-3-00B	$232.00	3	–	–	240 VAC 60 Hz / 212 VAC 50 Hz
79 mm	GH15KT	GH15KT-3-00A	$286.00	3	–	–	120 VAC 60 Hz only
	GH15LT	GH15LT-3-00A	$339.00	3	–	–	120 VAC 60 Hz only
		GH15LT-3-00B	$339.00	3	–	–	240 VAC 60 Hz / 212 VAC 50 Hz
	GH15MT	GH15MT-3-00A	$376.00	3	–	–	110-120 VAC 50-60 Hz / 110 VDC
		GH15MT-3-00B	$376.00	3	–	–	220-240 VAC 50-60 Hz
110 mm	GH15NT	GH15NT-3-00A	$498.00	3	–	–	110-120 VAC 50-60 Hz / 110 VDC
	GH15PT	GH15PT-3-00A	$603.00	3	–	–	110-120 VAC 50-60 Hz / 110 VDC
		GH15PT-3-00B	$603.00	3	–	–	220-240 VAC 50-60 Hz / 220 VDC
145 mm	GH15RT	GH15RT-3-00A	$751.00	3	–	–	110-120 VAC 50-60 Hz / 110 VDC
	GH15ST	GH15ST-3-00A	$801.00	3	–	–	110-120 VAC 50-60 Hz / 110 VDC
	GH15TT	GH15TT-3-00A	$1,065.00	3	–	–	110-120 VAC 50-60 Hz / 110 VDC
		GH15TT-3-00B	$1,065.00	3	–	–	220-240 VAC 50-60 Hz / 220 VDC

*** Up to 2 auxiliary contact blocks may be added to the contactor by utilizing the side mount and top mount contact block assemblies.Though referred to as a top mount assembly, the GH15T mounts to the front of the contactor.**

Note: If using the BM0H or BM3H-AD mechanical interlock, the use of auxiliary contacts is prohibited on the side of each contactor where the interlock is mounted. This does not pertain to the auxilliary contact built into the GH15BN, GH15CN and GH15DN contactors.

GH15 Series 45mm Contactor Specifications

45mm Contactor Specifications							
Contactor Model			**GH15BN**	**GH15CN**	**GH15DN**	**GH15ET**	**GH15FT**
Insulation Voltage	**AC**	**(V)**	600 Volts AC				
Ampere Rating UL 508	**Max. UL Continuous Current**	**(A)**	11	14	19	32	32
	Max. UL General Use Current note 2	**(A)**	20	20	25	40	45
Maximum Power (hp) of Three-Phase Motors	**200V**	**(hp)**	2	3	3	7.5	7.5
	230/240V	**(hp)**	3	3	5	7.5	10
	460/480V	**(hp)**	5	7.5	10	15	20
	575V	**(hp)**	7.5	10	15	20	25
Maximum Power (hp) of Single-Phase Motors	**115V**	**(hp)**	0.5	0.5	1	2	2
	230/240V	**(hp)**	1	2	3	3	5
Insulation Voltage	**AC**	**(V)**	690 Volts AC				
Ampere Rating EN/IEC 60947	**AC-3 I_e (ambient Temp = 55°C @ 440V)**	**(A)**	9	12	16	25	32
	AC-1 I_e (ambient Temp = 40°C @ 690V)	**(A)**	30	30	30	45	50
Maximum Power (kW) of Three-Phase Motors AC3 Category note 1	**230/240V**	**(kW)**	2.2	3	4	6.5	7.5
	400V	**(kW)**	4	5.5	7.5	11	15
	440/480V	**(kW)**	4.7	6.4	9	12.5	16.5
	500V	**(kW)**	5.5	7.5	10	11	15
	690V	**(kW)**	5.5	7.5	7.5	11	15
Max Short Circuit Protection Fuses Class RK5 UL Rated Fuses	**Type 2 Coordination note 3**	**(A)**	25	30	50	60	70
SCCR Rating (kA)		**kA**	5	5	5	5	5
Auxiliary Contacts Electrical Capacity			A600 note 4				
Coil Voltage Operating Limits			AC Pick-up 85-110% rated control voltage / AC Drop-out 20-75% rated control voltage				
Average Coil Power Requirements / Coil current (A) = VA/Coil Voltage			AC Pick-Up (VA) 80-100 / AC Sealed (VA) 9-12				
Power Factor			Pick-up 0.65 / Sealed 0.35				
Coil Operating Time at Rated Coil Voltage			Pick-up (ms) 10-25 / Drop-out (ms) 6-18				
Maximum Operating Frequency (No-Load Operation)			3000 operations / hour				
Mechanical Durability			10,000,000 operations				
Operating Ambient Temperature			-25 to +70C (-13 to +158F)				
Electrical Protection Degree			IP20 (IP10 for power entry cables)				
Mounting			Screw (panel mount) or 35mm DIN rail				
Main Circuit Connections	**Wire Size**		14-10 AWG Stranded			14-8 AWG Stranded	
	Tightening Torque		1.4 N·m (12 lb·in)			2.3 N·m (20 lb·in)	
Auxiliary Circuit Connections	**Wire Size**		16-12 AWG Stranded / 14-12 AWG Solid				
	Tightening Torque		0.8 N·m (7 lb·in)				

Notes

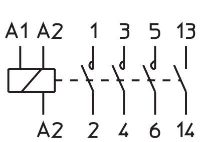
1. AC3 type loads consist of squirrel cage three phase motors.

2. AC1 non-inductive or slightly inductive loads. Typically resistive loads (i.e. furnaces, ovens, etc.)

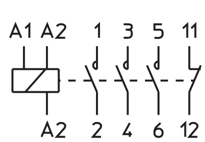
3. Type 2 coordination is a protection category for IEC 60947-4-1. Section 8.2.5.1 specifies that Type 2 coordination requires that, under short circuit conditions, the contactor or starter shall cause no danger to persons or installations, and shall be suitable for further use. The risk of minor contact welding is possible.

Contactor Diagram

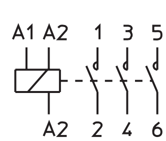
GH15BN3-10
GH15CN3-10
GH15DN3-10



GH15BN3-01
GH15CN3-01
GH15DN3-01



GH15ET3-00
GH15FT3-00



GH15 Series 60mm Contactor Specifications

60mm Contactor Specifications					
Contactor Model			***GH15GT***	***GH15HT***	***GH15JT***
Insulation Voltage	***AC***	***(V)***	600 Volts AC		
Ampere Rating UL 508	***Max. UL Continuous Current***	***(A)***	42	52	65
	Max. UL General Use Current note 2	***(A)***	60	70	80
Maximum Power (hp) of Three-Phase Motors	***200V***	***(hp)***	10	15	15
	230/240V	***(hp)***	10	15	20
	460/480V	***(hp)***	25	30	40
	575V	***(hp)***	30	40	50
Maximum Power (hp) of Single-Phase Motors	***115V***	***(hp)***	3	3	5
	230/240V	***(hp)***	5	7.5	10
Insulation Voltage	***AC***	***(V)***	690 Volts AC		
Ampere Rating EN/IEC 60947	***AC-3 I_e (ambient Temp = 55°C @440V)***	***(A)***	40	50	63
	AC-1 I_e (ambient Temp = 40°C @690V)	***(A)***	63	80	100
Maximum Power (kW) of Three-Phase Motors AC3 Category note 1	***230/240V***	***(kW)***	11	12.5	18.5
	400V	***(kW)***	18.5	22	30
	440/480V	***(kW)***	21	25	33
	500V	***(kW)***	18.5	22	30
	690V	***(kW)***	18.5	22	30
Max Short Circuit Protection Circuit Breaker UL Rated MCCB	***Type 2 Coordination note 3***	***(A)***	150	175	200
SCCR Rating (kA)		***(kA)***	5	5	5
Auxiliary Contacts Electrical Capacity			A600 note 4		
Coil Voltage Operating Limits			AC Pick-up 85-110% rated control voltage AC Drop-Out 20-75% rated control voltage		
Average Coil Power Requirements / Coil current (A) = VA/Coil Voltage			AC Pick-up (VA) 250 / AC Sealed (VA) 18		
Power Factor			Pick-up 0.54 / Sealed 0.35		
Coil Operating Time at Rated Coil Voltage			Pick-up (ms) 12-30 / Drop-out (ms) 6-15		
Maximum Operating Frequency (No-Load Operation)			3000 operations / hour		
Mechanical Durability			10,000,000 operations		
Operating Ambient Temperature			-25 to +70C (- 13 to +158F)		
Electrical Protection Degree			IP20 (IP10 for power entry cables)		
Mounting			Screw (panel mount) or 35mm DIN rail		
Main Circuit Connections	***Wire Size***		12-3 AWG stranded		
	Tightening Torque		5.0 N·m (45 lb·in)		
Auxilliary Circuit Connections	***Wire Size***		16-12 AWG (stranded recommended)		
	Tightening Torque		0.8 N·m (7 lb·in)		

Notes

1. AC3 type loads consist of squirrel cage three phase motors.

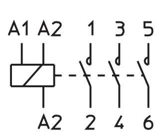
2. AC1 non-inductive or slightly inductive loads. Typically resistive loads (i.e. furnaces, ovens, etc.)

3. Type 2 coordination is a protection category for IEC 60947-4-1. Section 8.2.5.1 specifies that Type 2 coordination requires that, under short circuit conditions, the contactor or starter shall cause no danger to persons or installations, and shall be suitable for further use. The risk of minor contact welding is possible.

4. NEMA ICS 5-2000. For more information, refer to Control Circuit Contact Electrical Ratings.

Contactor Diagram

GH15GT3-00 (1)
GH15HT3-00 (1)
GH15JT3-00 (1)



GH15 Series 79mm Contactor Specifications

79mm Contactor Specifications					
Contactor Model			*GH15KT*	*GH15LT*	*GH15MT*
Insulation Voltage	***AC***	***(V)***	600 Volts AC		
Ampere Rating UL 508	***Max. UL Continuous Current***	***(A)***	90	90	120
	Max. UL General Use Current note 2	***(A)***	90	100	120
Maximum Power (hp) of Three-Phase Motors	***200V***	***(hp)***	20	25	30
	230/240V	***(hp)***	25	30	40
	460/480V	***(hp)***	50	60	75
	575V	***(hp)***	60	75	100
Maximum Power (hp) of Single-Phase Motors	***115V***	***(hp)***	5	7.5	10
	230/240V	***(hp)***	15	15	20
Insulation Voltage	***AC***	***(V)***	1000 Volts AC		
Ampere Rating EN/IEC 60947	***AC-3 I_e (ambient Temp = 55°C @440V)***	***(A)***	80	95	110
	AC-1 I_e (ambient Temp = 40°C @690V)	***(A)***	125	125	135
Maximum Power (kW) of Three-Phase Motors AC3 Category note 1	***230/240V***	***(kW)***	22	25	30
	400V	***(kW)***	37	45	55
	440/480V	***(kW)***	45	51	63
	500V	***(kW)***	45	51	55
	690V	***(kW)***	45	51	55
Max Short Circuit Protection Fuses Class RK5 UL Rated Fuses	***Type 2 Coordination note 3***	***(A)***	250	250	225
SCCR Rating (kA)		***(kA)***	10	10	10
Auxiliary Contacts Electrical Capacity			A600 note 4		
Coil Voltage Operating Limits			AC/DC Pick-up 85-110% rated control voltage AC/DC Drop-Out 20-75% rated control voltage		
Average Coil Power Requirements / Coil current (A) = VA/Coil Voltage			AC Pick-up (VA) 250 / AC Sealed (VA) 18		AC Pick-up (VA) 250 AC Sealed 24-125V (VA) 4 AC Sealed 220-600V (VA) 19
Power Factor			Pick-up 0.54 / Sealed 0.35		Pick-up 0.98 Sealed 24-125V 0.98 Sealed 220-600V 0.2
Coil Operating Time at Rated Coil Voltage			Pick-up (ms) 12-30 / Drop-out (ms) 6-15		Pick-up (ms) 15-50 Drop-out (ms) 30-80
Maximum Operating Frequency (No-Load Operation)			3000 operations / hour		
Mechanical Durability			10,000,000 operations		
Operating Ambient Temperature			-25 to +70C (- 13 to +158F)		
Electrical Protection Degree			IP20 (Front)		
Mounting			Screw (panel mount)		
Main Circuit Connections	***Wire Size***		10-2 AWG Stranded (1 or 2 wires)		
	Tightening Torque		8.0 N·m (70 lb·in)		
Auxilliary Circuit Connections	***Wire Size***		2 x 16-12 AWG Stranded / 2 x 14-12 AWG Solid		
	Tightening Torque		0.8 N·m (7 lb·in)		

Notes

1. AC3 type loads consist of squirrel cage three phase motors.

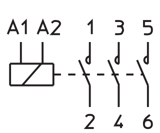
2. AC1 non-inductive or slightly inductive loads. Typically resistive loads (i.e. furnaces, ovens, etc.)

3. Type 2 coordination is a protection category for IEC 60947-4-1. Section 8.2.5.1 specifies that Type 2 coordination requires that, under short circuit conditions, the contactor or starter shall cause no danger to persons or installations, and shall be suitable for further use. The risk of minor contact welding is possible.

4. NEMA ICS 5-2000. For more information, refer to Control Circuit Contact Electrical Ratings.

Contactor Diagram

GH15KT-3-00
GH15LT-3-00



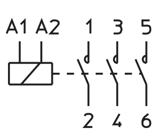
GH15 Series 110mm Contactor Specifications

110mm Contactor Specifications				
Contactor Model			***GH15NT***	***GH15PT***
Insulation Voltage	***AC***	***(V)***	600 Volts AC	
Ampere Rating UL 508	***Max. UL Continuous Current***	***(A)***	180	180
	Max. UL General Use Current note 2	***(A)***	180	220
Maximum Power (hp) of Three-Phase Motors	***200V***	***(hp)***	40	50
	230/240V	***(hp)***	50	60
	460/480V	***(hp)***	100	125
	575V	***(hp)***	125	150
Maximum Power (hp) of Single-Phase Motors	***115V***	***(hp)***	15	15
	230/240V	***(hp)***	25	30
Insulation Voltage	***AC***	***(V)***	1000 Volts AC	
Ampere Rating EN/IEC 60947	***AC-3 I_e (ambient Temp = 55°C @440V)***	***(A)***	150	175
	AC-1 I_e (ambient Temp = 40°C @690V)	***(A)***	230	250
Maximum Power (kW) of Three-Phase Motors AC3 Category note 1	***230/240V***	***(kW)***	40	50
	400V	***(kW)***	75	90
	440/480V	***(kW)***	85	100
	500V	***(kW)***	90	110
	690V	***(kW)***	110	132
Max Short Circuit Protection Fuses Class RK5 UL Rated Fuses	***Type 2 Coordination note 3***	***(A)***	300	350
SCCR Rating (kA)		***(kA)***	10	10
Auxiliary Contacts Electrical Capacity			A600 note 4	
Coil Voltage Operating Limits			AC/DC Pick-up 85-110% rated control voltage AC/DC Drop-Out 20-75%rated control voltage	
Average Coil Power Requirements / Coil current (A) = VA/Coil Voltage			AC Pick-up (VA) 350 / AC Sealed (VA) 5	
Power Factor			Pick-up 0.98 / Sealed 0.98	
Coil Operating Time at Rated Coil Voltage			Pick-up (ms) 30-60 / Drop-out (ms) 30-80	
Maximum Operating Frequency (No-Load Operation)			1200 operations / hour	
Mechanical Durability			10,000,000 operations	
Operating Ambient Temperature			-25 to +70C (- 13 to +158F)	
Electrical Protection Degree			IP00 - IP20	
Mounting			Screw (panel mount)	
Main Circuit Connections with Terminal Kit MR3-AD	***Wire Size***		2 x 4/0 AWG Stranded / 1 x 4/0 AWG Solid	
	Tightening Torque		17 N·m (150 lb·in)	
Auxilliary Circuit Connections	***Wire Size***		2 X 5-4/0 AWG Stranded	
	Tightening Torque		0.8 N·m (7 lb·in)	

Notes
1. AC3 type loads consist of squirrel cage three phase motors.
2. AC1 non-inductive or slightly inductive loads. Typically resistive loads (i.e. furnaces, ovens, etc.)
3. Type 2 coordination is a protection category for IEC 60947-4-1. Section 8.2.5.1 specifies that Type 2 coordination requires that, under short circuit conditions, the contactor or starter shall cause no danger to persons or installations, and shall be suitable for further use. The risk of minor contact welding is possible.
4. NEMA ICS 5-2000. For more information, refer to Control Circuit Contact Electrical Ratings.

Contactor Diagram

GH15NT-3-00
GH15PT-3-00



GH15 Series 145mm Contactor Specifications

145mm Contactor Specifications					
Contactor Model			***GH15RT***	***GH15ST***	***GH15TT***
Insulation Voltage	***AC***	***(V)***	600 Volts AC		
Ampere Rating UL 508	***Max. UL Continuous Current***	***(A)***	250	300	360
	Max. UL General Use Current note 2	***(A)***	250	300	360
Maximum Power (hp) of Three-Phase Motors	***200V***	***(hp)***	60	75	100
	230/240V	***(hp)***	75	100	125
	460/480V	***(hp)***	150	200	250
	575V	***(hp)***	200	250	300
Maximum Power (hp) of Single-Phase Motors	***230/240V***	***(hp)***	40	50	50
Insulation Voltage	***AC***	***(V)***	1000 Volts AC		
Ampere Rating EN/IEC 60947	***AC-3 I_e (ambient Temp = 55°C @440V)***	***(A)***	210	260	315
	AC-1 I_e (ambient Temp = 40°C @690V)	***(A)***	350	450	500
Maximum Power (kW) of Three-Phase Motors AC3 Category note 1	***230/240V***	***(kW)***	60	75	90
	400V	***(kW)***	110	132	160
	440/480V	***(kW)***	125	150	190
	500V	***(kW)***	132	160	210
	690V	***(kW)***	132	160	210
Max Short Circuit Protection Fuses Class RK5 UL Rated Fuses	***Type 2 Coordination note 3***	***(A)***	400	450	500
SCCR Rating (kA)		***(kA)***	18	18	18
Auxiliary Contacts Electrical Capacity			A600 note 4		
Coil Voltage Operating Limits			AC/DC Pick-up 85-110% rated control voltage AC/DC Drop-Out 20-75%rated control voltage		
Average Coil Power Requirements / Coil current (A) = VA/Coil Voltage			AC Pick-up (VA) 360 / AC Sealed (VA) 5		
Power Factor			Pick-up 0.98 / Sealed 0.98		
Coil Operating Time at Rated Coil Voltage			Pick-up (ms) 40-60 / Drop-out (ms) 40-60		
Maximum Operating Frequency (No-Load Operation)			1200 operations / hour		
Mechanical Durability			8,000,000 operations		
Operating Ambient Temperature			-25 to +70C (- 13 to +158F)		
Electrical Protection Degree			IP20 (Front)		
Mounting			Screw (panel mount)		
Main Circuit Connections with Terminal Kit KAL-4	***Wire size***		2 x 6-300 MCM (75° copper wire only)		
	Tightening Torque		31 N·m (275 lb·in)		
Auxillary Circuit Connections	***Wire Size***		16-12 AWG Stranded / 14-12 AWG Solid		
	Tightening Torque		0.8 N·m (7 lb·in)		

Notes

1. AC3 type loads consist of squirrel cage three phase motors.

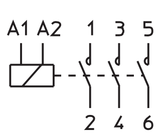
2. AC1 non-inductive or slightly inductive loads. Typically resistive loads (i.e. furnaces, ovens, etc.)

3. Type 2 coordination is a protection category for IEC 60947-4-1. Section 8.2.5.1 specifies that Type 2 coordination requires that, under short circuit conditions, the contactor or starter shall cause no danger to persons or installations, and shall be suitable for further use. The risk of minor contact welding is possible.

4. NEMA ICS 5-2000. For more information, refer to Control Circuit Contact Electrical Ratings.

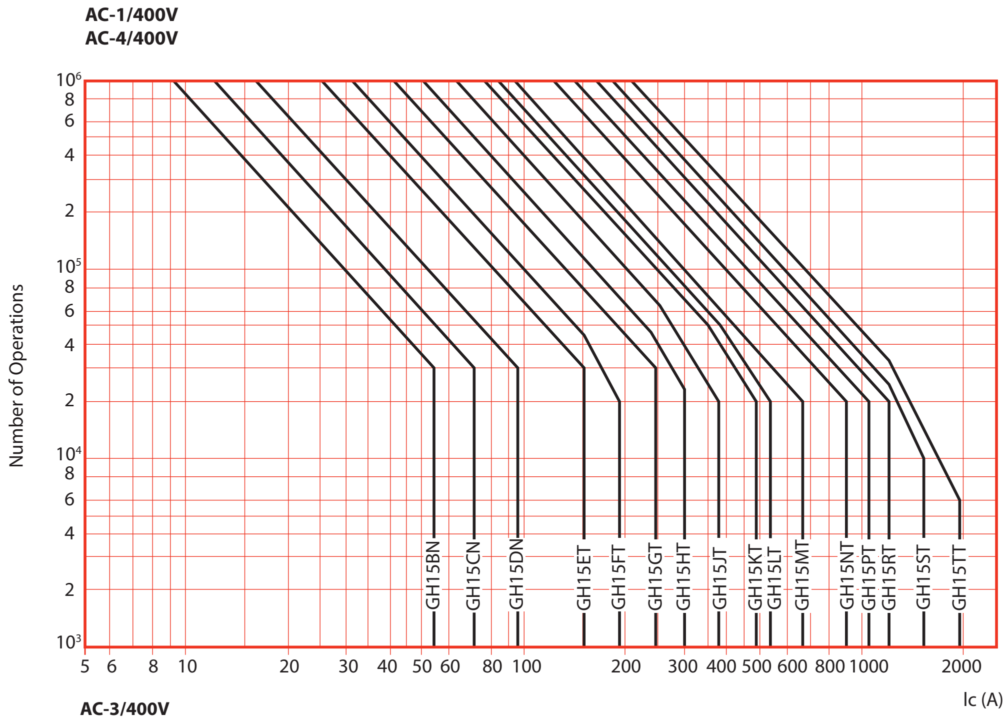
Contactor Diagram

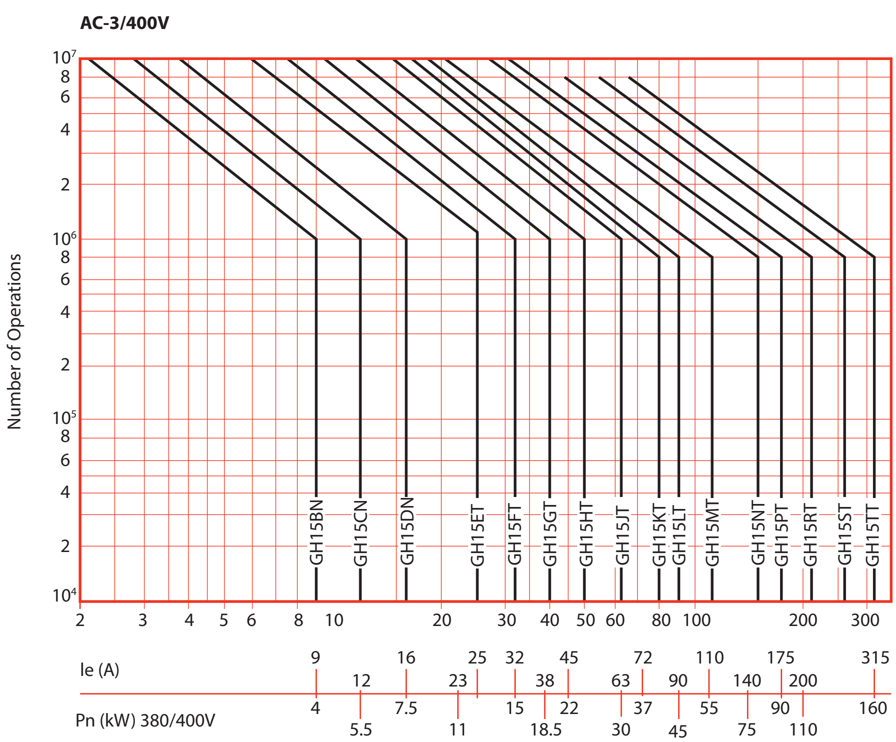
GH15RT-3-00
GH15ST-3-00
GH15TT-3-00



GH15 Series Contactor Electrical Durability of Main Contacts

Main contacts have a conductor material support, on which a silver alloy tip is welded. This tip makes, carries and breaks the load currents. The contact durability is represented by the average number of operations which the contact can carry out without maintenance and before the contact requires replacement. Every operation involves mechanical stresses when the contactor closes and thermal stress during load current conduction. However, the main stress that affects contact durability is due to the electric arc betweeen contacts during making and breaking operations. The electric arc causes the erosion of the contact active material; such erosion will increase according to the intensity of the current and the arcing time. Therefore the contact durability is strictly dependent on the type of load, i.e. on the utilization category, rated operational current and rated voltage. The following diagrams give curves of contact durability for each contactor for use in category AC-1, AC-3 and AC-4.





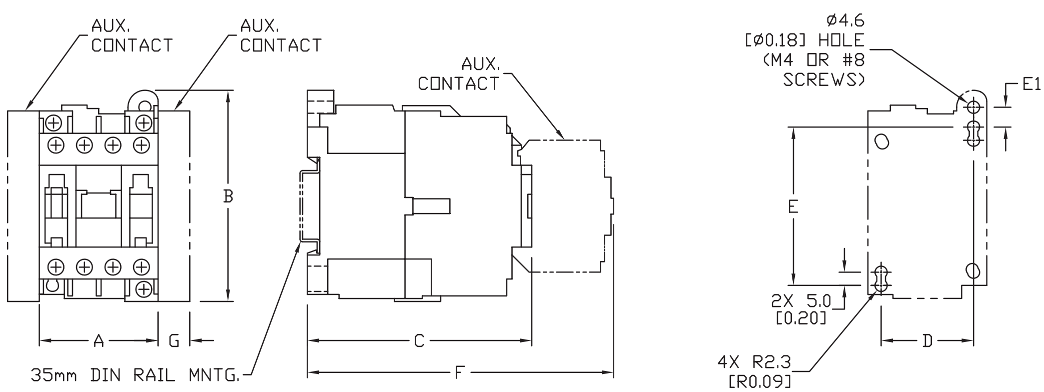
Note: Average durability curves are at 400V. For higher operational voltages, reduce the durabilty according following table.

Electrical Durability Curve Adjustment for Voltages Over 400V		
	AC-1 / AC-4	***AC-3***
400V	0%	0%
440V	10%	5%
500V	20%	10%
690V	40%	20%

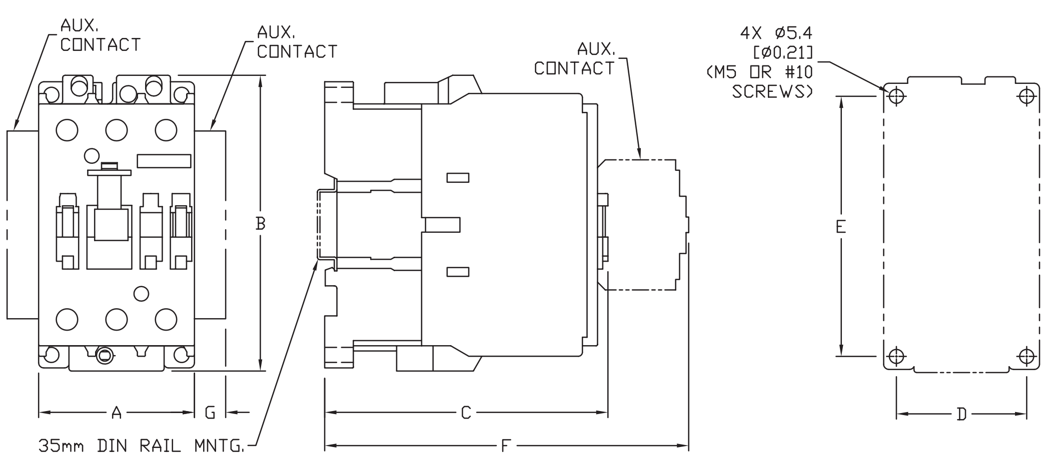
GH15 Series Contactor Dimensions

Dimensions mm [inches]									
Contactor Model	Wide	High	Deep	Mounting					Product Weight kg [lb]
	A	B	C	D	E	E1	F	G	
GH15BN GH15CN GH15DN	45.0 [1.77]	80.0 [3.15]	85.0 [3.35]	35.0 [1.38]	60.0 [2.36]	7.5 [0.30]	116.0 [4.57]	12.0 [0.47]	0.41 [0.90]
GH15ET GH15FT	45.0 [1.77]	80.0 [3.15]	91.0 [3.58]	35.0 [1.38]	60.0 [2.36]	7.5 [0.30]	122.0 [4.80]	12.0 [0.47]	0.47 [1.04]
GH15GT GH15HT GH15JT	60.0 [2.36]	114.0 [4.49]	109.0 [4.29]	50.0 [1.97]	100.0 [3.94]	—	140.0 [5.51]	12.0 [0.47]	1.12 [2.47]
GH15KT GH15LT	79.0 [3.11]	137.0 [5.39]	130.0 [5.12]	70.0 [2.76]	100.0 [3.94]	—	161.0 [6.34]	12.0 [0.47]	1.80 [3.97]
GH15MT	79.0 [3.11]	162.0 [6.38]	130.0 [5.12]	70.0 [2.76]	100.0 [3.94]	—	161.0 [6.34]	12.0 [0.47]	2.20 [4.85]
GH15NT GH15PT	110.0 [4.33]	170.0 [6.69]	162.0 [6.38]	100.0 [3.94]	130.0 [5.12]	—	193.0 [7.59]	12.0 [0.47]	4.00 [8.82]
GH15RT GH15ST GH15TT	145.0 [5.71]	200.0 [7.87]	208.0 [8.19]	120.0 [4.72]	160.0 [6.30]	—	239.0 [9.41]	12.0 [0.47]	7.50 [16.53]

GH15BN, GH15CN, GH15DN, GH15ET, GH15FT



GH15GT, GH15HT, GH15JT

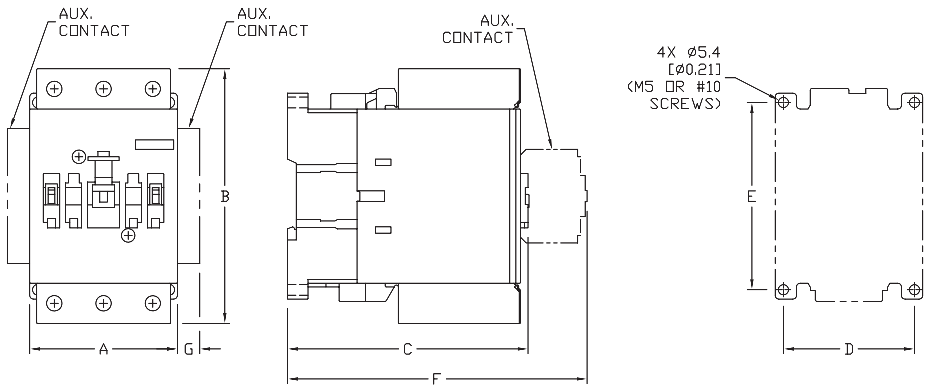


GH15 Series Contactor Dimensions

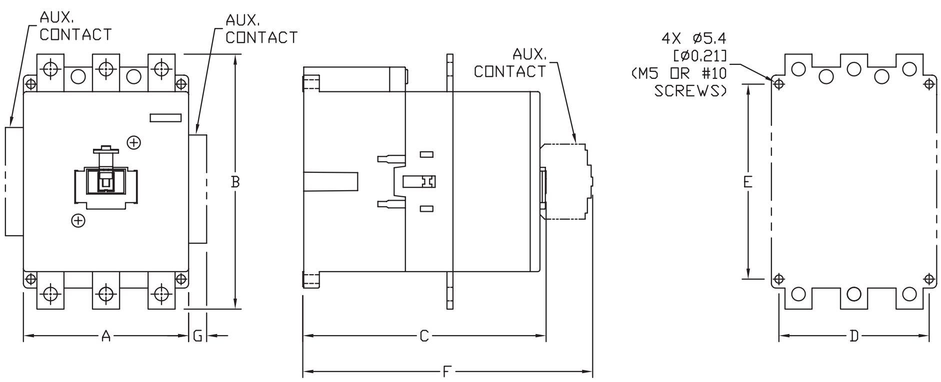
Dimensions

mm [in]

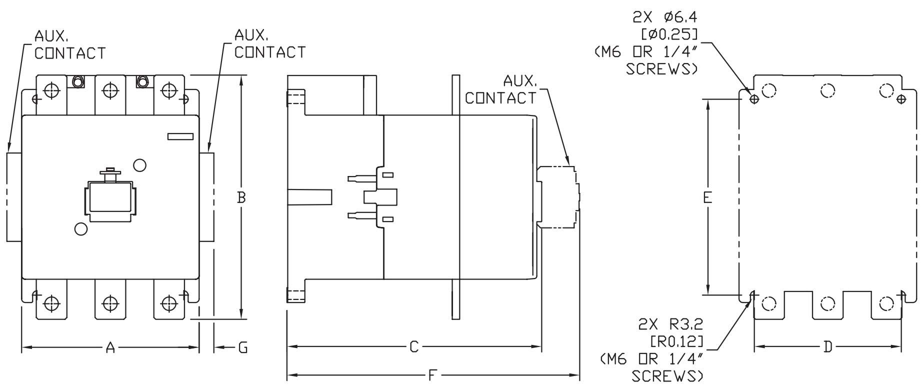
GH15KT, GH15LT, GH15MT



GH15NT and GH15PT

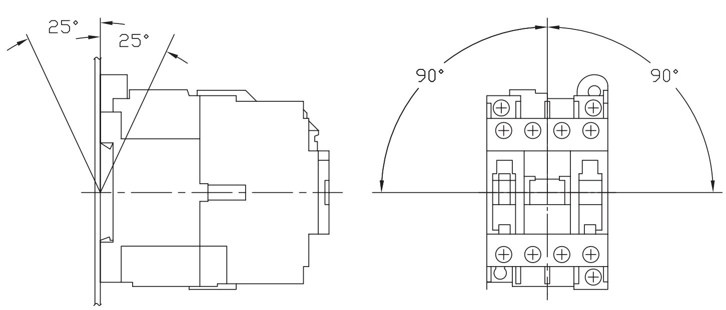


GH15RT, GH15ST, GH15TT



GH15 Series Mounting Positions

The correct mounting poistion is with the base plate in the vertical plane. The device can be mounted up to 25° from the vertical position.



GH15 Series Contactor Accessories

Auxiliary contacts

Auxiliary contacts are designed for installation on all the GH15 series contactors. The snap-on design makes them quick and easy to install. The bifurcated contact blocks feature silver nickel alloy contacts.

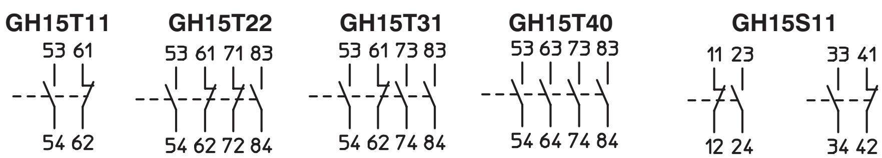
Add up to 2 side-mounted auxiliary blocks (1 per side) plus 1 top-mounted auxiliary contact block per contactor max. This will equal up to 8 possible auxiliary contact configurations.

Auxiliary Contacts			
Part Number	***Price***	***Description***	***Mounting***
GH15T11	$21.00	1 NO 1 NC	Top
GH15T22	$27.50	2 NO 2 NC	Top
GH15T31	$27.50	3 NO 1 NC	Top
GH15T40	$27.50	4 NO	Top
GH15S11	$24.00	1 NO 1 NC	Side

Contacts rated A600 per NEMA ICS 5-2000. For more info, refer to Control Circuit Contact Electrical Ratings.

Note: See contactor drawings page for dimensions

Auxiliary Contact Blocks

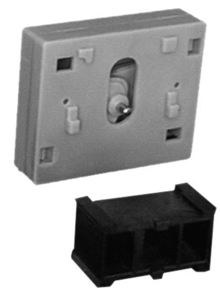


GH15 Series Contactor Accessories

Mechanical Interlock

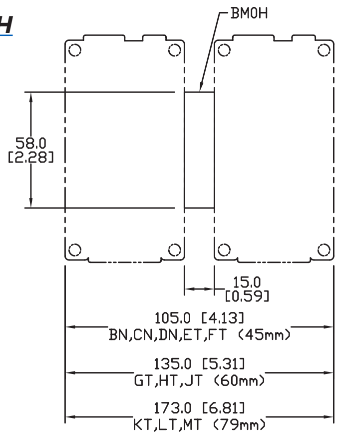
Mechanical interlocks connect two contactors horizontally. When one contactor is energized, the other contactor is mechanically prohibited from making, even though it may be energized. The mechanical interlocks work with 45, 60, 79, 110 and 145 mm contactors.

BM0H / BM3H-AD

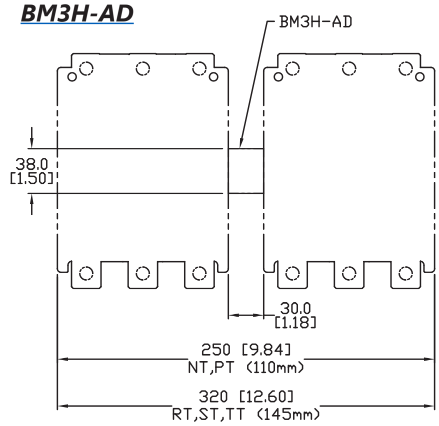


Mechanical Interlock			
Part Number	**Price**	**Description**	**Mounting**
BM0H	$13.00	Mechanical interlock, for use with GH15BN, GH15CN, GH15DN, GH15ET, GH15FT, GH15GT, GH15HT, GH15JT, GH15KT, GH15LT, or GH15MT series contactors.	Side
BM3H-AD	$33.00	Mechanical interlock, for use with GH15NT, GH15PT, GH15RT, GH15ST or GH15TT series contactors.	Side

BM0H



BM3H-AD



Terminal Screens

Terminal screens are for use with contactors and thermal overload relays to protect against accidental contact with live components.

PRT3-AD

PR37-AD

Terminal Screens*				
Part Number	**Price**	**Quantity**	**Description**	**Use With**
PR37-AD	$33.00	1 screen	Terminal screen, top or bottom, covers 3 poles. Use on line or load side. Mounting hardware included.	GH15NT GH15PT
PRT3-AD	$33.00	1 screen	Terminal screen, top or bottom, covers 3 poles. Use on line or load side. Mounting hardware included.	GH15RT GH15ST GH15TT

* *No additional protecting device is required for contactors up to IEC Size 79mm since the equipment by itself ensures IP20 frontal protection.*
Note: Not for use with MR3-AD and KAL-4. See product insert for connections.

Terminal Lug				
Part Number	**Price**	**Quantity**	**Description**	**Use With**
MR3-AD	$15.50	1	Terminal lug, 1-pole, can hold (2) wires 5 AWG - 4/0 AWG.	GH15NT GH15PT RTD180
KAL-4	$27.50	1	Terminal lug, 1-pole, can hold (1) wire 6 AWG - 300 MCM. Mounting hardware included.	GH15RT GH15ST GH15TT RTD320

MR3-AD

KAL-4

Adjustable Overloads For GH15 Series Contactors

The RTD series adjustable motor overload relays are designed for use with the GH15 Series 45 mm, 60 mm, 79 mm, 110 mm, and 145 mm contactors.

By combining the contactor with an overload relay, you have a reliable motor starter solution.

RTD32 overload relays for 45mm contactors

- 16 sizes for motor currents from 0.4 to 32 amps
- Units come with (1) N.O. and (1) N.C. auxiliary contacts
- Mount directly to 45mm contactors
- Class 10A trip class
- cULus listed, CE

RTD65 overload relays for 60mm contactors

- Four sizes for motor currents from 20 to 65 amps
- Units come with (1) N.O. and (1) N.C. auxiliary contacts
- Mount directly to 60mm contactors
- Class 10A trip class
- cULus listed, CE

RTD180 overload relays for 79mm and 110mm contactors

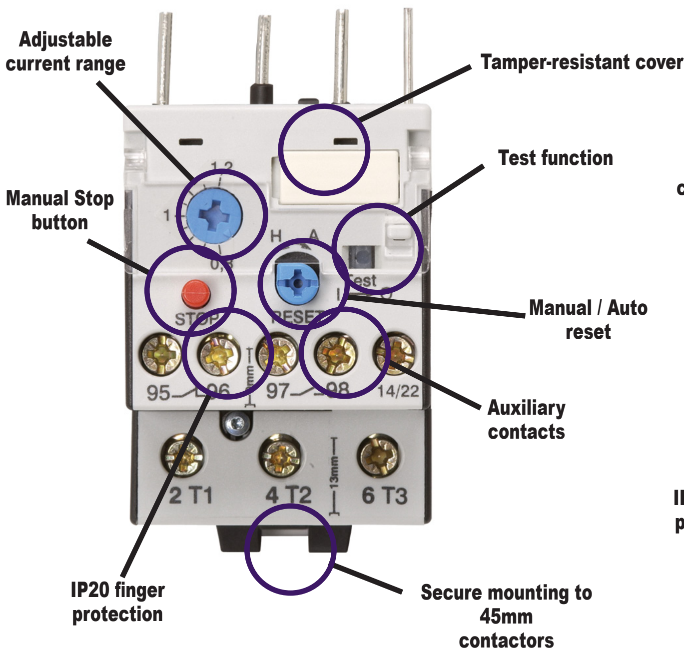
- 3 sizes for motor currents from 60 to 180 amps
- Units come with (1) N.O. and (1) N.C. auxiliary contacts
- Mount directly to 110mm contactors with connection links (included)
- Hard-wire connection to 79 mm contactors (No connection links available)
- Class 10A trip class
- cULus listed, CE

RTD320 overload relays for 145mm contactors

- 2 sizes for motor currents from 144 to 320 amps
- Units come with (1) N.O. and (1) N.C. auxiliary contacts
- Mount directly to 145mm contactors with connection links (included)
- Class 10A trip class
- cULus listed, CE

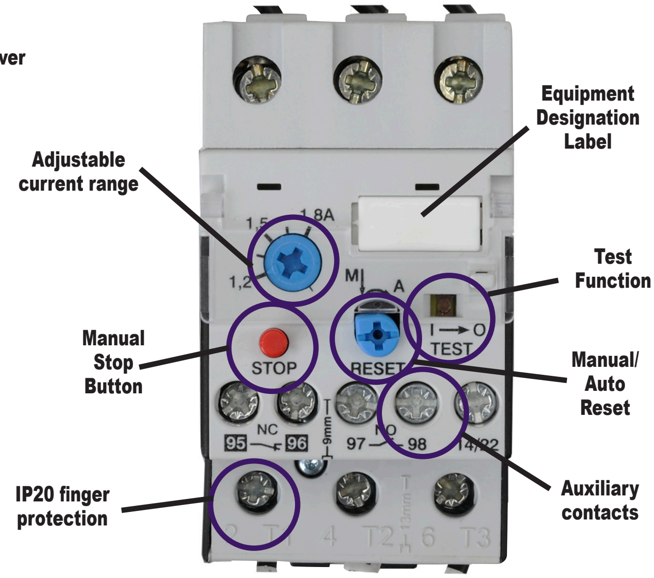
GH15 Series Adjustable Overload Relay Features

RTD32
for 45 mm Contactors



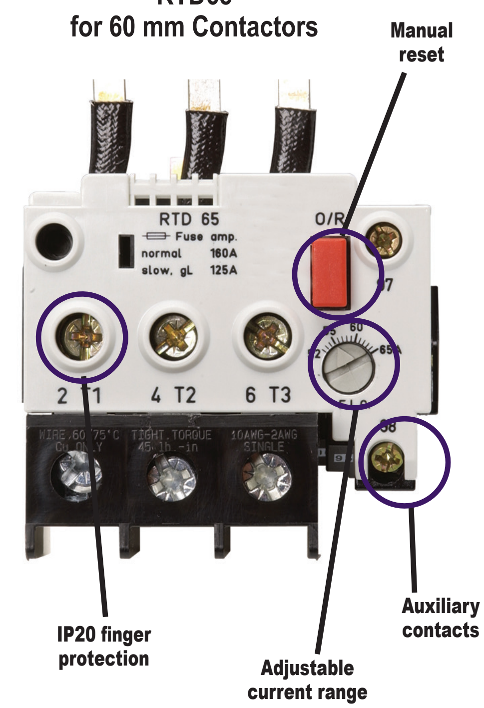
Note: Scale is 1:1 on dial.

RTD180 for 79 mm and 110 mm Contactors



Note: The secondary current for the dial adjustment of the relay is 100x the dial current. For example, for a rated load current of 120A, the relay setting should be 1.2A.

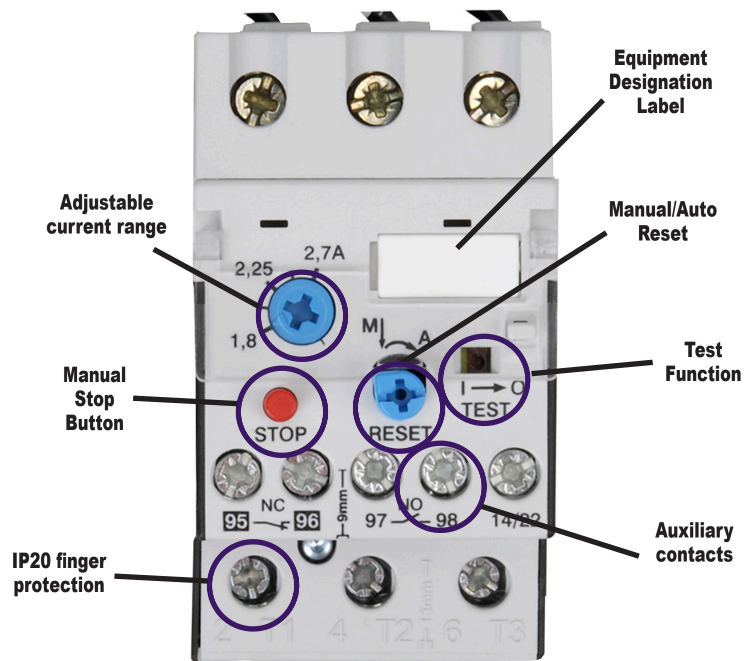
RTD65
for 60 mm Contactors



Note: Scale is 1:1 on dial.

Note: Additional Black Loadside Terminal Block is available on RTD65-5200 and RTD65-6500 only.

RTD320
for 145 mm Contactors



Note: The secondary current for the dial adjustment of the relay is 80x the dial current. For example, for a rated load current of 216A, the relay setting should be 2.7A.

GH15 Series Overload Relay Selection Guide

Step 1 Determine the motor FLA and service factor listed on the motor name plate. Next, calculate the size overload protection required based on 2005 NEC 430.32. Select your motor's FLA (Full Load Amperage) from Column A. Tripping current occurs at 125% of FLA in column A.

Step 2 Follow across to Column B to find your contactor size. Check the maximum amperage rating for that contactor. Ranges overlap and you may have to go to the next larger size.

Step 3 After selecting your contactor, follow across to Column C to find your overload relay model number.

Step 4 Order the contactor and overload relay, any desired auxiliary contacts, then assemble and install your motor starter.

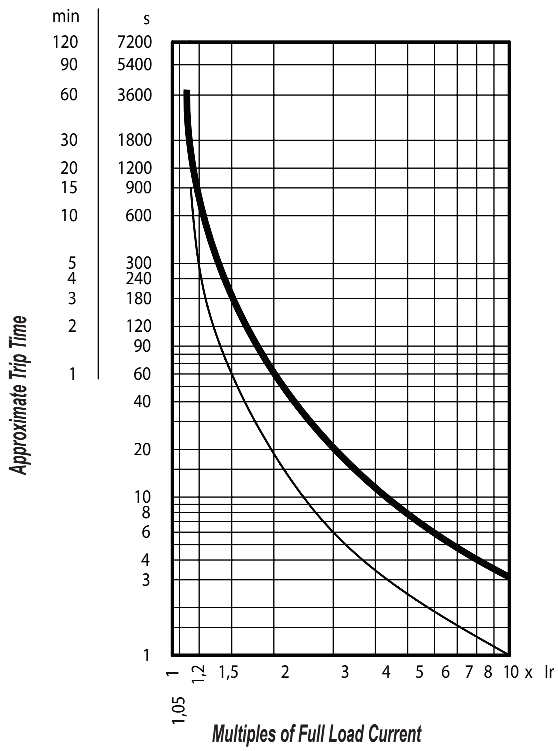
Motor Contactor and Overload Relay Selection Guide (When Motor FLA is Known)

A	B	C	Price	IEC Contactor Frame Size
Current Range Motor FLA	Contactor Model	Overload Relay		
0.4 to 0.6A	GH15BN up to maximum FLA of 9A	RTD32-60	$81.00	45mm
0.6 to 0.9A		RTD32-90	$81.00	
0.8 to 1.2A		RTD32-120	$81.00	
1.2 to 1.8A		RTD32-180	$81.00	
1.8 to 2.7A		RTD32-270	$81.00	
2.7 to 4.0A		RTD32-400	$81.00	
4.0 to 6.0A		RTD32-600	$81.00	
6.0 to 9.0A		RTD32-900	$81.00	
8.0 to 11.0A	GH15CN up to 12A FLA	RTD32-1100	$81.00	
10.0 to 14.0A		RTD32-1400	$87.00	
10.0 to 14.0A	GH15DN up to 16A FLA	RTD32-1400	$87.00	
13.0 to 18.0A		RTD32-1800	$87.00	
13.0 to 18.0A	GH15ET up to 25A FLA	RTD32-1800	$87.00	
17.0 to 24.0A		RTD32-2400	$87.00	
22.0 to 32.0A		RTD32-3200	$102.00	
22.0 to 32.0A	GH15FT up to 32A FLA	RTD32-3200	$102.00	
20.0 to 28.0A	GH15GT up to 40A FLA	RTD65-2800	$149.00	60mm
28.0 to 42.0A		RTD65-4200	$149.00	
28.0 to 42.0A	GH15HT up to 50A FLA	RTD65-4200	$149.00	
40.0 to 52.0A		RTD65-5200	$185.00	
40.0 to 52.0A	GH15JT up to 63A FLA	RTD65-5200	$185.00	
52.0 to 65.0A		RTD65-6500	$185.00	
60.0 to 90.0A	GH15KT up to 80A FLA	RTD180-9000	$261.00	79mm
60.0 to 90.0A	GH15LT up to 95A FLA	RTD180-9000	$261.00	
80.0 to 120.0A	GH15MT up to 110A FLA	RTD180-12000	$332.00	
120.0 to 180.0A	GH15NT up to 150A FLA	RTD180-18000	$356.00	110mm
120.0 to 180.0A	GH15PT up to 175A FLA	RTD180-18000	$356.00	
144.0 to 216.0A	GH15RT up to 210A FLA	RTD320-21600	$413.00	145mm
144.0 to 216.0A	GH15ST up to 260A FLA	RTD320-21600	$413.00	
216.0 to 320.0A		RTD320-32000	$413.00	
144.0 to 216.0A	GH15TT up to 315A FLA	RTD320-21600	$413.00	
216.0 to 320.0A		RTD320-32000	$413.00	

GH15 Series Contactors Overload Technical Characteristics

Typical Trip Curves

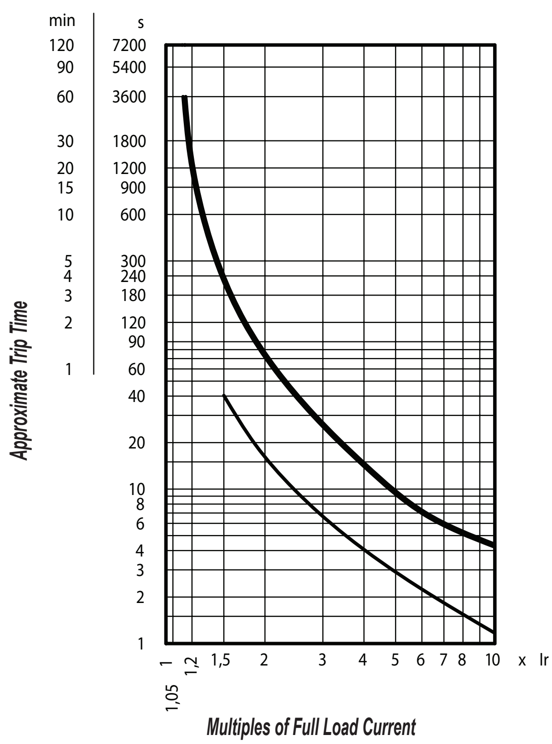
45mm and 60mm Overloads



Note: Curves show tripping time (average value) versus multiples of setting current Ir.

Tripping starting from cold
Tripping starting from hot

79mm, 110mm, and 145mm Overloads

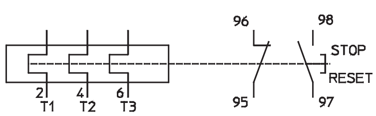


GH15 Series Contactors Overload Technical Characteristics

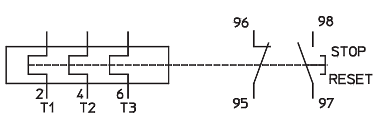
Thermal Overload Relays Specifications					
	RTD32	***RTD65***	***RTD180***	***RTD180-18000***	***RTD320***
Storage temperature	-40 to +70°C (-40°F to 158°F)				
Operating temperature	-25 to +55°C (-13°F to 131°F)				
Tripping class IEC 60947-4-1	10A				
Phase loss sensitive	Yes				
Connection to contactor	Built-in links		Pass through wire	Links for direct	Links for direct
Frequency limits	0-400 Hz		50-60 Hz		
Power dissipation per phase	2.3 Watts	3.7 Watts (52-65 A) setting range: 4.5 W	3 Watts		5 Watts
Short circuit current rating 600V	5kA rms				
Aux contacts wire range	14-10 AWG				
Aux contacts tightening torque	8.1 lb·in				

Overload Aux Contact Ratings					
Contact Rating Code Designation	***Thermal Continuous Current (Amps)***	***Maximum Current (Amps)***			
		120 Volt	***240 Volt***	***480 Volt***	***600 Volt***
		Make / Break	***Make / Break***	***Make / Break***	***Make / Break***
95-96 (NC) B600	5	30 / 3	15 / 1.5	7.5 / 0.75	6 / 0.6
97-98 (NO) C600	2.5	15 / 1.5	7.5 / 0.75	3.75 / 0.375	3 / 0.3

IEC Terminal Designations



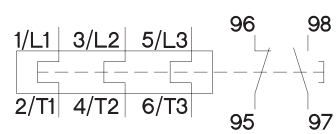
RTD32 (Manual - Auto Reset)



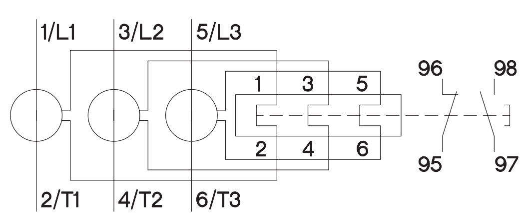
RTD65 (Manual - Auto Reset)

Wiring Diagrams

RTD32 / RTD65

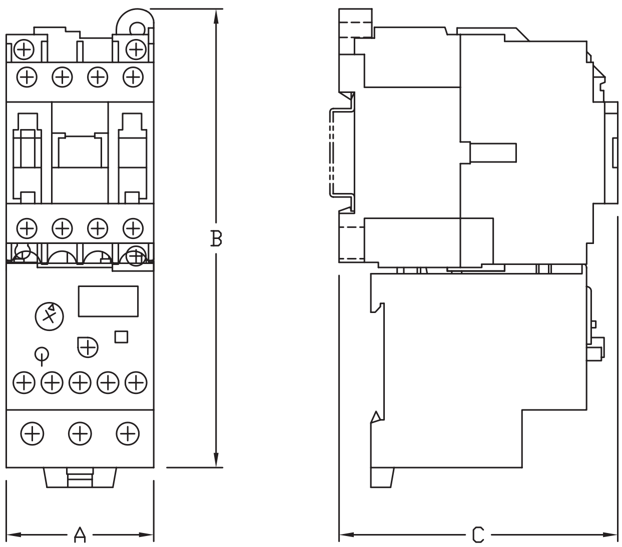


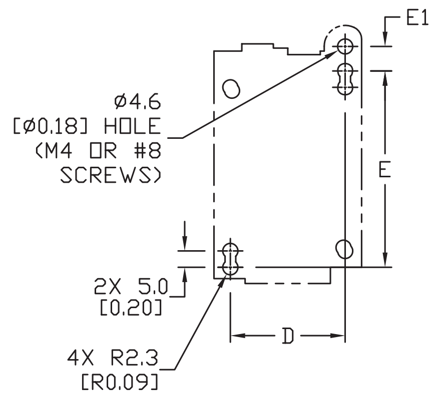
RTD180 / RTD320



GH15 Series Overload Relay Dimensions

45mm Contactor and Overload Dimensions





GH15BN, -CN, -DN, -ET, -FT + RTD32

<table>
<tr><th colspan="14">Overload Dimensions mm [in]</th></tr>
<tr><th rowspan="2">Contactor Model</th><th rowspan="2">Overload Model</th><th>Width</th><th colspan="3">Height</th><th>Depth</th><th rowspan="2">D</th><th rowspan="2">E</th><th rowspan="2">E1</th><th rowspan="2">F</th><th rowspan="2">G</th><th rowspan="2">H</th><th rowspan="2">I</th></tr>
<tr><th>A</th><th>B</th><th>B1</th><th>B2</th><th>C</th></tr>
<tr><td>GH15BN</td><td rowspan="5">RTD32</td><td rowspan="5">45.0 [1.77]</td><td rowspan="5">146.0 [5.75]</td><td rowspan="5">–</td><td rowspan="5">–</td><td rowspan="5">85.0 [3.35]</td><td rowspan="5">35.0 [1.38]</td><td rowspan="5">60.0 [2.36]</td><td rowspan="5">7.5 [0.30]</td><td rowspan="5">–</td><td rowspan="5">–</td><td rowspan="5">–</td><td rowspan="5">–</td></tr>
<tr><td>GH15CN</td></tr>
<tr><td>GH15DN</td></tr>
<tr><td>GH15ET</td></tr>
<tr><td>GH15FT</td></tr>
<tr><td>GH15GT</td><td rowspan="3">RTD65</td><td rowspan="3">68.5 [2.70]</td><td rowspan="3">169.0 [6.65]</td><td rowspan="3">–</td><td rowspan="3">–</td><td rowspan="3">109.0 [4.29]</td><td rowspan="3">50.0 [1.97]</td><td rowspan="3">100.0 [3.94]</td><td rowspan="3">–</td><td rowspan="3">–</td><td rowspan="3">–</td><td rowspan="3">–</td><td rowspan="3">–</td></tr>
<tr><td>GH15HT</td></tr>
<tr><td>GH15JT</td></tr>
<tr><td>GH15KT</td><td rowspan="3">RTD180</td><td rowspan="5">128.0 [5.04]</td><td rowspan="3">contactor and overloads do not have a link connector</td><td rowspan="2">137.0 [5.39]</td><td rowspan="2">81.0 [3.19]</td><td rowspan="3">130.0 [5.12]</td><td rowspan="3">70.0 [2.76]</td><td rowspan="3">100.0 [3.94]</td><td rowspan="3">–</td><td rowspan="3">–</td><td rowspan="3">68.0 [2.68]</td><td rowspan="3">40.0 [1.57]</td><td rowspan="3">–</td></tr>
<tr><td>GH15LT</td></tr>
<tr><td>GH15MT</td><td>162.0 [6.38]</td><td>81.0 [3.19]</td></tr>
<tr><td>GH15NT</td><td rowspan="2">RTD180-18000</td><td rowspan="2">290.0 [11.42]</td><td rowspan="2">–</td><td rowspan="2">–</td><td rowspan="2">145.0 [5.71]</td><td rowspan="2">100.0 [3.94]</td><td rowspan="2">130.0 [5.12]</td><td rowspan="2">–</td><td rowspan="2">42.5 [1.67]</td><td rowspan="2">68.0 [2.68]</td><td rowspan="2">40.0 [1.57]</td><td rowspan="2">–</td></tr>
<tr><td>GH15PT</td></tr>
<tr><td>GH15RT</td><td rowspan="3">RTD320</td><td rowspan="3">145.0 [5.71]</td><td rowspan="3">361.0 [14.21]</td><td rowspan="3">–</td><td rowspan="3"></td><td rowspan="3">208.0 [8.19]</td><td rowspan="3">120.0 [4.72]</td><td rowspan="3">160.0 [6.30]</td><td rowspan="3">–</td><td rowspan="3">80.0 [3.15]</td><td rowspan="3">68.0 [2.68]</td><td rowspan="3">40.0 [1.57]</td><td rowspan="3">96.0 [3.78]</td></tr>
<tr><td>GH15ST</td></tr>
<tr><td>GH15TT</td></tr>
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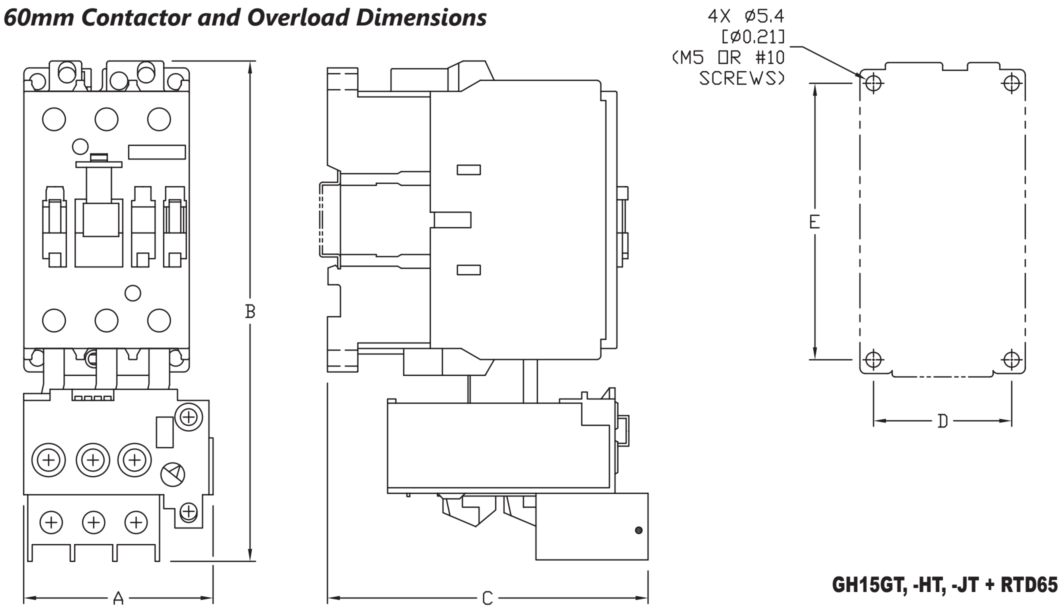
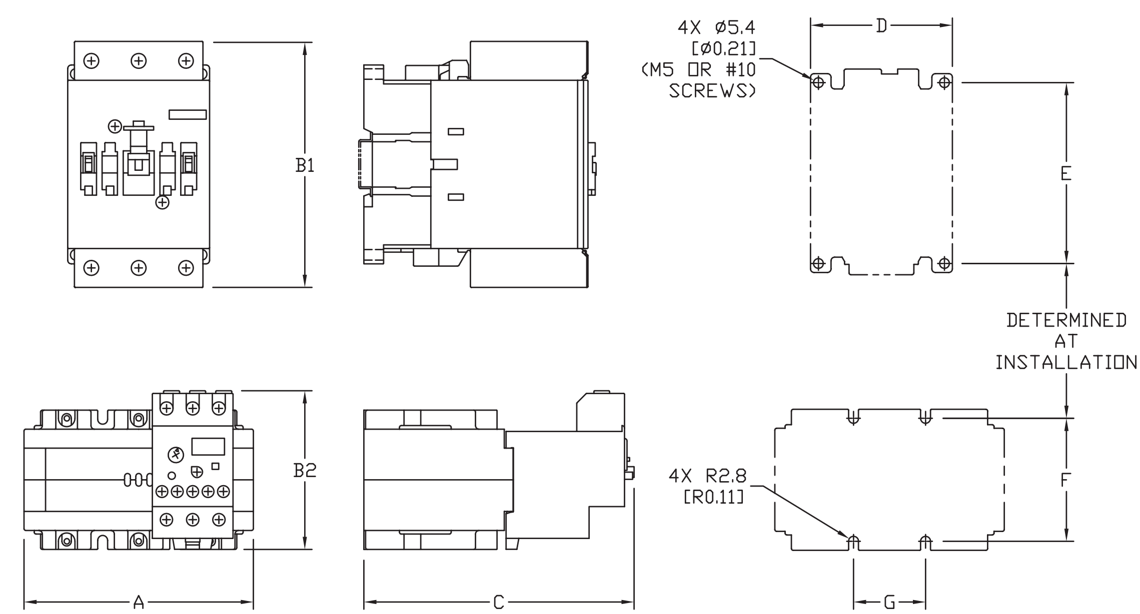
GH15 Series Overload Relay Dimensions

60mm Contactor and Overload Dimensions



GH15GT, -HT, -JT + RTD65

79mm Contactor and Overload Dimensions

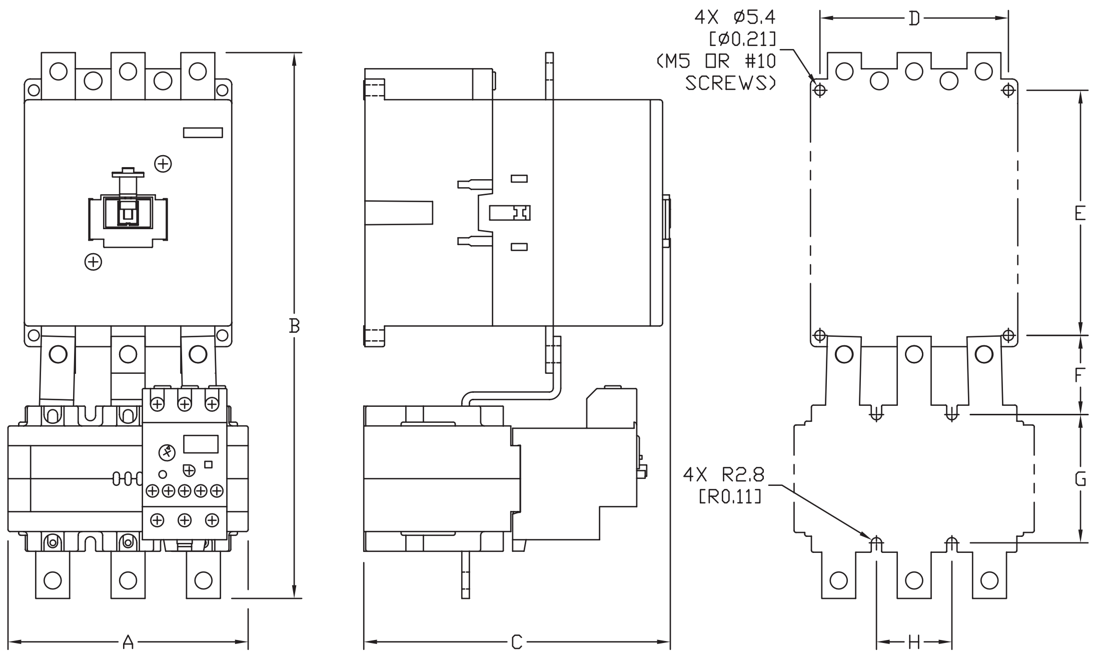


GH15KT, -LT, -MT + RTD180

Note: See our website www.automationdirect.com for complete engineering drawings

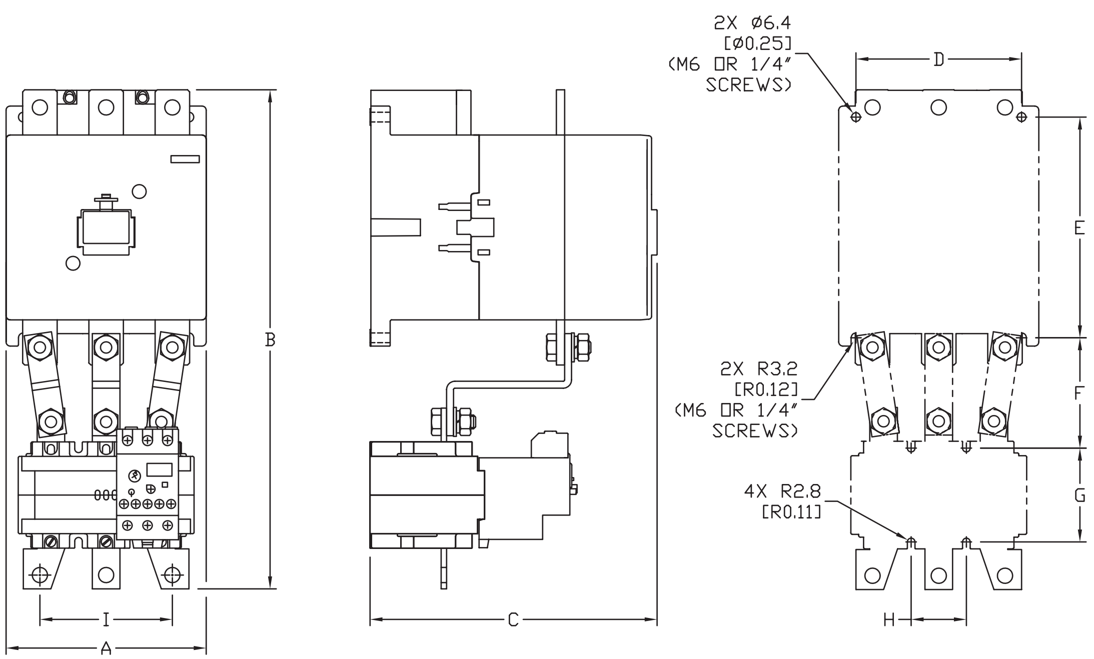
GH15 Series Overload Relay Dimensions

110mm Contactor and Overload Dimensions



GH15NT, -PT + RTD180-18000

145mm Contactor and Overload Dimensions



GH15RT, -ST, -TT + RTD320

Note: See our website www.automationdirect.com for complete engineering drawings

MS Series Motor Starter/Protector Specifications

Shunt release

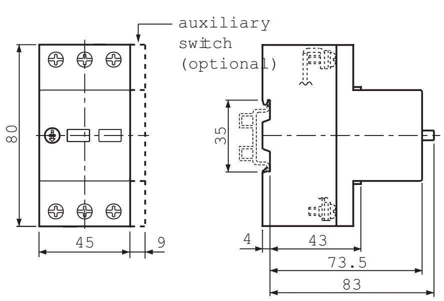
Shunt releases are used for electrically tripping the MSP. These units are easily installed inside the MSP and are offered in 120 and 220/240 volt AC versions.

Undervoltage release

Undervoltage releases are also installed inside the MSP and trip the device when the monitored voltage drops below a specified level. This is to protect the motor from damage when a low voltage situation occurs. Undervoltage releases may be wired to monitor voltage at point, but are typically wired to two of the incoming lines to the motor circuit. Undervoltage releases are not to be confused with the MSP's internal phase loss protection.

Note: A shunt release and undervoltage release cannot be installed in the same MSP.

Dimensions (mm)



Specifications		
General		
Standards		IEC 947, EN 60947, VDE 0660, EN 60204, VDE 0113
Approvals		UL
Impact Resistance at 20ms Duration		20g
Ambient Temperature		-25 to 50 °C (open) -25 to 40 °C (enclosed)
Climactic Class		IEC 68-2-3, IEC 68-2-30
Weight		0.55 lb (250g)
Protection Degree		IP 20
Mounting		Vertical or horizontal
Main Circuits		
Insulation Voltage		690V
Insulation Impulse Voltage		6kV
Thermal Current		25A
Utilization Category		AC3
Wire Size Maximum		14-10 AWG
Terminal Torque Specification		2 N·m
Auxiliary Contact		
Insulation Voltage		500V
Thermal Current		6A
Operational Current:	***230V***	3.5A
	400V	2A
	500V	1.5A
Maximum Fuse Size		6A
Wire Size Maximum		18-14 AWG

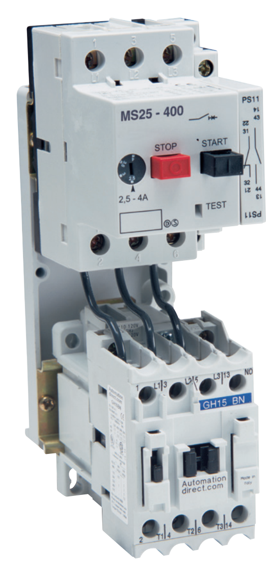
Notes: Phase loss protection only works under load.
The phase loss protection is a product of the thermal overload protection circuitry.
Maximum number of MSP units which can be mounted close together (side by side) is three.

Dimensions and installation data for these products are available on our website, listed under Tech Support/technical and application notes/motor controls/contactors and starters/ Application Data for MS25 manual starter.

Phase loss protection

Phase loss protection is integral to the MSP overload protection system. Phase loss protection works by detecting unequal current in each of the phases. A mechanical device senses the difference in the position of the bi-metallic overload strips and trips the MSP when this occurs. For proper phase loss detection, the MSP must be sized and adjusted to the motor it is protecting. The phase loss protection works only when the motor is running, and is a product of the thermal overload protection circuitry.

Note: The MSP provides magnetic short circuit protection as well as thermal overload protection under IEC 60947 requirements. NEC 430 may require a short circuit protection device upstream from the MSP. It is the responsibility of the user to comply with applicable codes and requirements.



Motor starter/protector combination consisting of a contactor, MSP with optional MS25-PS11 auxiliary contact and a UMP45 adapter plate. Components are sold separately.

MS Series MSP Selection Guide

Choose your motor starter/protector according to the FLA rating on your motor data plate. Refer to the charts on the following page.

Accessories

To complete your motor starter/ protector, there are several accessories that may be used. The Auxiliary Switch (contact) has one normally open contact and one normally closed contact. The Shunt Release trips when voltage is applied (120V or 220V). With the Undervoltage Release, your motor is protected from a low voltage situation.

Motor Starter/Protector and Accessories		
Part Number	**Price**	**Description**
MS25-16	Retired	Motor starter protector with thermal overload release, setting range from 0.1 to 0.16A
MS25-25	Retired	Motor starter protector with thermal overload release, setting range from 0.16 to 0.25A
MS25-40	Retired	Motor starter protector with thermal overload release, setting range from 0.25 to 0.4A
MS25-63	$63.00	Motor starter protector with thermal overload release, setting range from 0.4 to 0.63A
MS25-100	$63.00	Motor starter protector with thermal overload release, setting range from 0.63 to 1A
MS25-160	Retired	Motor starter protector with thermal overload release, setting range from 1 to 1.6A
MS25-250	Retired	Motor starter protector with thermal overload release, setting range from 1.6 to 2.5A
MS25-400	Retired	Motor starter protector with thermal overload release, setting range from 2.5 to 4A
MS25-630	Retired	Motor starter protector with thermal overload release, setting range from 4 to 6.3A
MS25-1000	Retired	Motor starter protector with thermal overload release, setting range from 6.3 to 10A
MS25-1600	$73.00	Motor starter protector with thermal overload release, setting range from 10 to 16A
MS25-2000	Retired	Motor starter protector with thermal overload release, setting range from 16 to 20A
MS25-2500	Retired	Motor starter protector with thermal overload release, setting range from 20 to 25A
MS25-PS11	Retired	Auxiliary switch, 1 N.O. contact, 1 N.C. contact
MS25-A120	$31.50	120V/60Hz Shunt Release
MS25-U220	Retired	220V/60Hz UnderVoltage Release
MS25-U440	Retired	440V/60Hz UnderVoltage Release
UMP45	Retired	DIN Rail Adapter Plate

MS25 Series Motor Starter/Protector Short Circuit Instantaneous Trip Current and Backup Fuse Recommendations									
Manual Starter/ Protector Part Number	**Short Circuit Trip Current 1**	**Short Circuit Breaking Capacity (kA)**				**Max Back-Up Fuses Class CC or Class J 2**			
		220/240VAC	**460/480VAC**	**500 VAC**	**690 VAC**	**230 VAC**	**400 VAC**	**500 VAC**	**690 VAC**
MS25-16	2	50	50	50	50	*	*	*	*
MS25-25	3	50	50	50	50	*	*	*	*
MS25-40	5	50	50	50	50	*	*	*	*
MS25-63	8	50	50	50	50	*	*	*	*
MS25-100	12	50	50	50	50	*	*	*	*
MS25-160	20	50	50	50	50	*	*	*	*
MS25-250	33	50	50	3	2.5	*	*	25	20
MS25-400	44	50	50	3	2.5	*	*	35	25
MS25-630	75	50	50	3	2.5	*	*	50	35
MS25-1000	120	50	6	3	2.5	*	80	50	35
MS25-1600	160	6	4	2.5	2	63	80	63	35
MS25-2000	230	6	4	2.5	2	63	80	63	50
MS25-2500	270	6	4	2.5	2	63	80	63	50

Note 1: The short-circuit trip is the current at which the device will instantly trip via the electromagnetic trip circuitry within the MSP.The short circuit breaking capacity is the total branch circuit supply current that the device can safely protect. Fields marked with an asterisk indicate that the device can safely handle any supply current with output fusing.

Note 2: The trip currents and back-up fuses are per IEC 60947. Local codes and regulations may require additional short circuit protection. Consult codes applicable to your application.

GH Series Contactor/MSP Selection Guide

Step 1: Select your motor FLA (full load amperage) from column A.

Step 2: Go to column B to find your contactor model. Check the maximum amperage rating for that contactor. Ranges overlap and you may have to go to the next larger size.

Step 3: After selecting your contactor, go to column C to find your motor starter/protector.

Step 4: Order the motor starter/protector, contactor or any other accessories.

Motor Contactor and Motor Starter/Protector (MSP) Selection Guide (when motor FLA is known)

A Current Range Motor FLA	B Contactor Model	C Motor Starter/Protector Part Number	IEC Frame Size	Special Assembly Note
0.1 to 0.16 A	GH15BN Up to 9A FLA	MS25-16	45 mm frame size	Note: A DIN rail adapter plate is needed for assembly of the contactor and motor starter/protector. This plate allows two DIN rail devices to be mounted together as an assembly to one piece of DIN rail. The part number is UMP45.
0.16 to 0.25 A		MS25-25		
0.25 to 0.4 A		MS25-40		
0.4 to 0.63 A		MS25-63		
0.63 to 1 A		MS25-100		
0.1 to 1.6 A		MS25-160		
1.6 to 2.5 A		MS25-250		
2.5 to 4 A		MS25-400		
4 to 6.3 A		MS25-630		
6.3 to 10 A		MS25-1000		
10.0 to 16 A	GH15CN Up to 12 A FLA	MS25-1600		
10.0 to 16.0 A	GH15DN Up to 16A FLA	MS25-1600		
16.0 to 20.0 A	GH15ET Up to 25A FLA	MS25-2000		
20.0 to 25.0 A		MS25-2500		

The following charts are to be used as a guideline only. Motor control devices should be sized using the motor FLA (full load amperage) rating. It is the user's responsibility to size the motor starter/protector properly.

- **Step 1:** Select your motor horsepower rating in column A based on the rating from the motor data plate or spec. sheet.
- **Step 2:** Go to column B to find your contactor model. Check the maximum amperage rating for that contactor. Ranges overlap and you may need to go to the next larger size.
- **Step 3:** After selecting your contactor, go to column C to find your motor starter/protector.

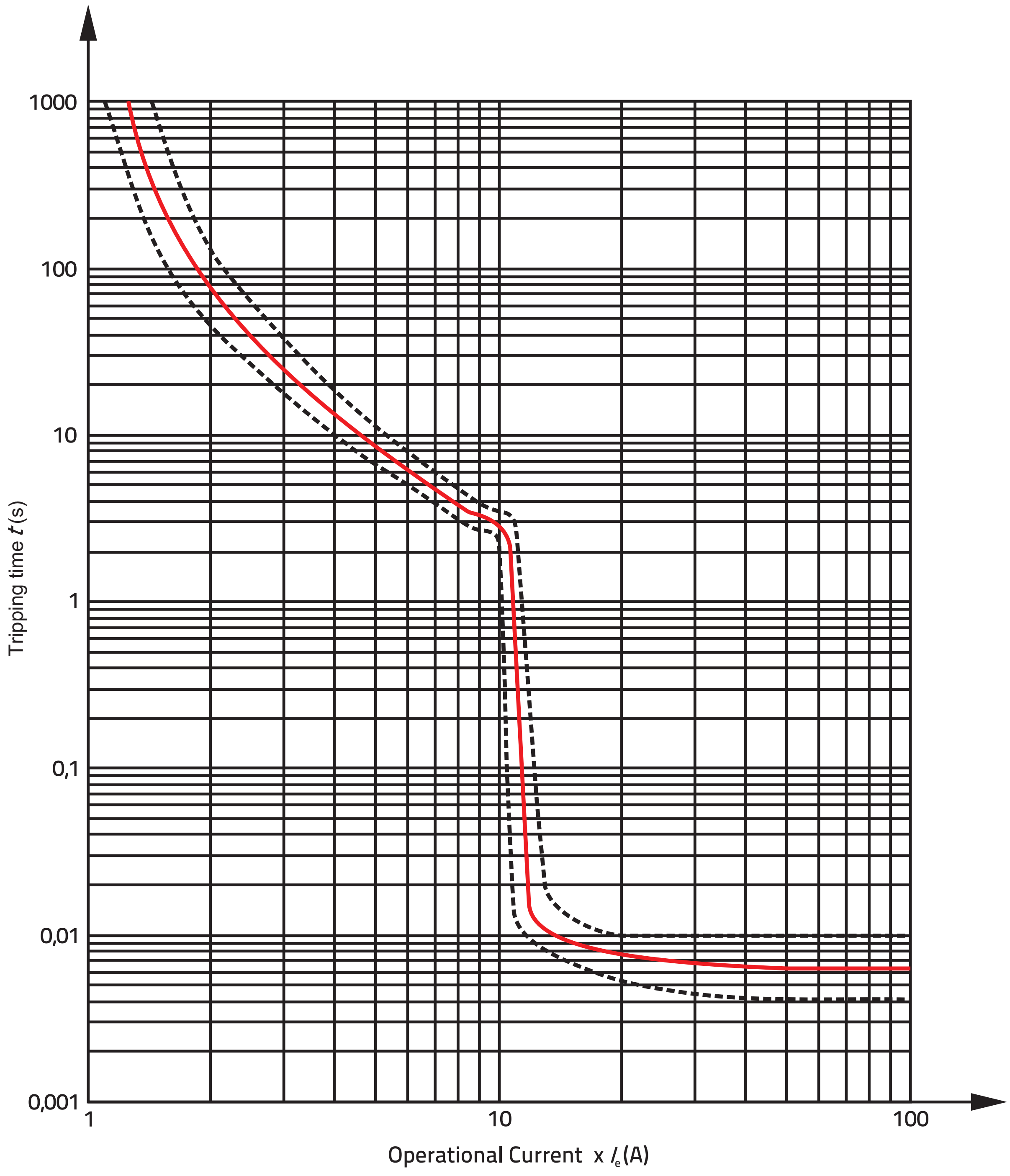
Motor Contactor and MSP Selection Guide for 440-480 Volt Three-Phase Motor Control

A Motor Horsepower	B Contactor Model	C Motor Starter/Protector Part Number	IEC Frame Size	Special Assembly Note
1/2	GH15BN Up to 9A FLA	MS25-160	45mm frame size	Note: A DIN rail adapter plate is needed for assembly of the contactor and motor starter/protector. This plate allows two DIN rail devices to be mounted together as an assembly to one piece of DIN rail. The part number is UMP45.
3/4		MS25-160		
1		MS25-250		
1 1/2		MS25-400		
2		MS25-400		
3		MS25-630		
5		MS25-1000		
7 1/2	GH15CN Up to 12A FLA	MS25-1600		
10	GH15DN Up to 16A FLA	MS25-1600		
15	GH15ET Up to 25A FLA	MS25-2500		

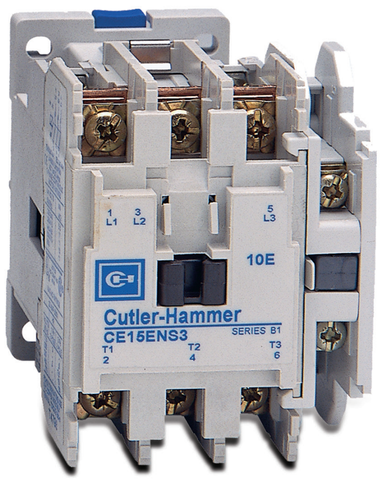
Motor Contactor and MSP Selection Guide for 230-240 Volt Three-Phase Motor Control

A Motor Horsepower	B Contactor Model	C Motor Starter/Protector art Number	IEC Frame Size	Special Assembly Note
1/2	GH15BN Up to 9A FLA	MS25-250	45 mm frame size	Note: A DIN rail adapter plate is needed for assembly of the contactor and motor starter/protector. This plate allows two DIN rail devices to be mounted together as an assembly to one piece of DIN rail. The part number is UMP45
3/4		MS25-400		
1		MS25-400		
1 1/2		MS25-630		
2		MS25-1000		
3	GH15CN Up to 12A FLA	MS25-1000		
5	GH15DN Up to 16A FLA	MS25-1600		
7 1/2	GH15ET Up to 25A FLA	MS25-2500		

MS25 Series Tripping Characteristics



EATON Starters and Contactors Overview



Cutler-Hammer's Freedom series of IEC contactors feature a compact space-saving design.

Components that meet IEC 60947 are more reliable, of higher quality, and are better matched to their intended application.

Contactor overview

The Cutler-Hammer CE15 Freedom Series IEC contactors offer big contactor ratings in a compact frame. The 45 mm frame contactors can handle up to 20 hp at 460V. They are easily DIN-rail mountable in either the vertical or horizontal upright position. Note: There is not enough space to assemble two contactors into a reversing contactor.

Starter overview

The Cutler-Hammer AE16 Series IEC starters are full voltage magnetic starters used for starting polyphase induction motors. These starters also provide protection to the motor against running or stalled overcurrents.

The 45 mm frame starters can handle up to 20 hp at 460V. They are easily DIN-rail mountable in either the vertical or horizontal upright position.

Starters are comprised of a contactor, overload relay and heater packs (sold separately). The overload relays have FLA adjustable dials.

Starter/contactor features and specifications

- EN60947-4-1 IEC 947-4-1 compliance (international standard for low voltage switchgear and control devices)
- UL-listed and CSA-certified
- 45mm frame rated maximum 20 hp at 460V; highest horsepower rating in a compact, space-saving design
- Long-life twin break, silver cadmium oxide contacts for excellent conductivity and superior resistance to welding and arc erosion
- 45mm open contactors, sizes A-F, with DIN-rail or universal base mounting
- DIN rail release mechanism: conveniently located on line side of contactor
- Designed to 2,000,000 electrical and 20,000,000 mechanical operations at maximum hp ratings through 20 hp at 460V. Adequate for most general duty control applications.
- Contactor and terminal markings conform to CENELEC EN50011.
- Holding circuit contact(s) supplied standard
- Lugs supplied standard on sizes A-F
- Tape wound coil
- Straight-through wiring

EATON Thermal Overload Relays Overview

Overload relays are provided to protect motors, motor control apparatus and motor-branch circuit conductors against excessive heating due to motor overloads and failure to start.

The C306 overload relay is designed for use with the Cutler-Hammer series non-reversing contactors.

Time-current characteristics

The time-current characteristics of an overload relay define its operating time at various multiples of its current setting. Underwriters Laboratory (UL) performs tests in accordance with NEMA Standards and the NEC as follows:

- When tested at 100 percent of its current rating, the overload relay shall trip ultimately.
- When tested at 200 percent of its current rating, the overload relay shall trip in not more that eight minutes.
- When tested at 600 percent of its current rating, the overload relay shall trip in not more that 10 or 20 seconds, depending on the class of the relay.

Definitions

Current rating: the minimum current at which the relay will trip. Per NEC, an overload must ultimately trip at 125% of FLA current (heater) setting for a 1.15 service factor motor, and 115% FLA for a 1.0 service factor motor. Current setting: the FLA (Full Load Amperage) of the motor and thus the overload heater pack setting.

Example: 600% of current rating is defined as 750% (600 X 1.25) of FLA current (heater) setting for a 1.15 service factor motor. A 10A heater setting must trip in 20 seconds or less at 75A motor current for a Class 20 relay.

Thermal overload relays feature:

- Selectable manual or automatic reset operations
- Interchangeable Class 20 heater packs ±24% to match motor FLA and calibrated for 1.0 and 1.15 service factors (orderedseparately)
- Integral load lugs which allow field wiring prior to heater pack installation
- Single-phase protection
- Bimetallic, ambient compensated operation
- Trip-free mechanism
- Electrically-isolated N.O. or N.C. contacts
- Overload trip indication
- Fingerproof terminals to reduce possibility of shock
- UL-listed, CSA-certified, NEMA-compliant

Overload relay setting

FLA dial adjustment

For motors having a 1.15 service factor, rotate the FLA adjustment dial to correspond to the motor's FLA rating. Estimate the dial position when the motor FLA falls between two letter values, as shown in the example.

For motors having a 1.0 service factor, or to meet IEC 947 requirements, rotate the FLA dial one-half of a position counterclockwise (CCW).

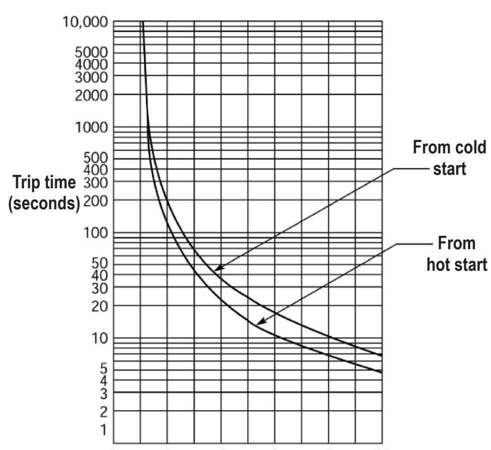
Manual/automatic reset

The overload relay is factory set at M for manual reset operation. For automatic reset operation, turn the reset adjustment dial to the A position, as shown in the illustration. Automatic reset is not intended for two-wire control devices.

Test for trip indication

To test overload relay for trip indication when in manual reset, pull out the blue RESET button. An orange flag will appear indicating that the device has tripped. Push RESET button in to reset.

Class 20 overload relay 25ºC open rating

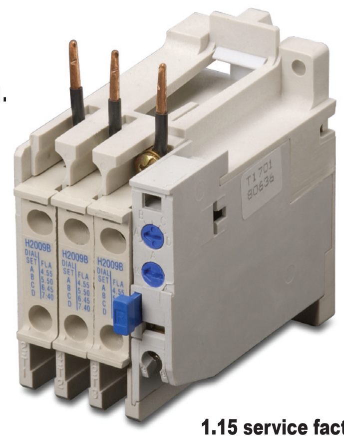


Multiples of current setting

Thermal Overload Relays			
IEC	***Max. Amps***	***No. of Poles***	***Open Type***
A-F	32	3	C306DN3B

Price: $262.00

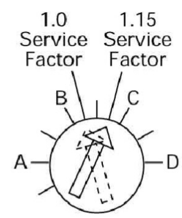
1.



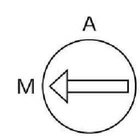
1.15 service factor

Heater packs sold separately

A 9.14
B 10.8
C 12.4
D 14.0

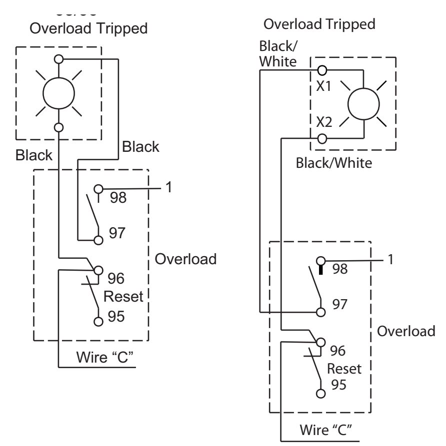


Example of 12.0 FLA setting for heater pack number H2011B showing position for 1.0 or 1.15 service factor motors.



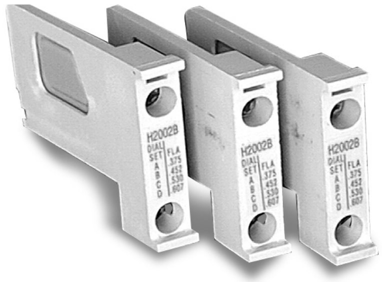
Example of setting of manual reset.

Overload terminals 95/96 and 98/97



Warning: To provide continued protection against fire or shock hazard, the complete relay must be replaced if burnout of the heater element occurs.

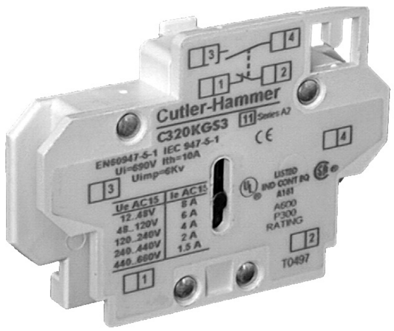
Motor Control Accessories



Heater packs

Heater packs are used with the C306DN3B overload relay. The load lugs are built into the overload base to allow load wiring prior to heater pack installation. Heater packs come in packs of three.

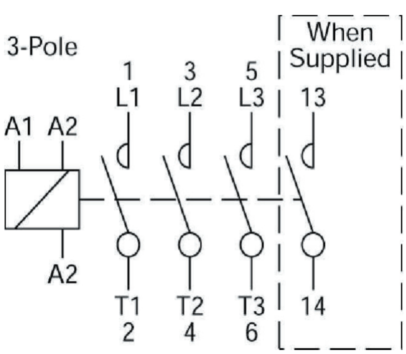
Standard Trip-Class 20 Heater Packs						
Part Number (Three heater packs)	**Price**	**Max. Amps**	**Motor Full Load Ampere Rating Dial Position**			
			A	B	C	D
H2001B-3	$140.00	32	.254	.306	.359	.411
H2002B-3	$140.00	32	.375	.452	.530	.607
H2003B-3	$140.00	32	.560	.676	.791	.907
H2004B-3	$140.00	32	.814	.983	1.15	1.32
H2005B-3	$140.00	32	1.20	1.45	1.71	1.96
H2006B-3	$140.00	32	1.79	2.16	2.53	2.90
H2007B-3	$140.00	32	2.15	2.60	3.04	3.49
H2008B-3	$140.00	32	3.23	3.90	4.56	5.23
H2009B-3	$140.00	32	4.55	5.50	6.45	7.40
H2010B-3	$140.00	32	6.75	8.17	9.58	11.0
H2011B-3	$140.00	32	9.14	10.8	12.4	14.0
H2012B-3	$140.00	32	14.0	16.9	19.9	22.8
H2013B-3	$140.00	32	18.7	22.7	26.7	30.7
H2014B-3	$140.00	32	23.5	28.5	33.5	38.5



Auxiliary contacts

Auxiliary contacts are designed for installation on the Cutler-Hammer Freedom series contactors and starters. The snap-on design makes them quick and easy to install.

The bifurcated (i.e. contact is split into two fingers for redundant contact) design of the contact blocks features silver cadmium alloy contacts.

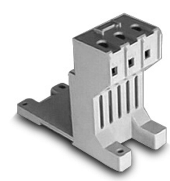


Auxiliary Contacts

Contactor terminal markings

Contactor terminals are identified by a two-digit number in accordance with international standards approved by CENELEC (European Committee for Electrotechnical Standardization). This distinctive number is marked on the top nameplate and designates the type and quantity of built-in auxiliary contacts. The first digit indicates the quantity of N.O. contacts and the second digit indicates the quantity of N.C. contacts. Example: 10E indicates a contactor with one N.O. and no N.C. auxiliary contacts (factory supplied). In addition, all terminals conform to both CENELEC and NEMA requirements. Auxiliary contact terminals use the first digit to indicate location and the second digit to indicate status (1-2 means N.C. and 3-4 means N.O.) Example: 13-14 indicates the first auxiliary contact and it is a N.O. See the diagram to the left for the contact label.

Auxiliary Contacts		
Part Number	**Price**	**Description**
C320KGS3	$100.00	1 N.O. and 1 N.C.
C320KGS1	$72.00	1 N.O.



Mounting adapters

DIN-rail and panel mounting adapters are required when overload relays need to be separately mounted due to space requirements. The terminal base adapter includes line terminals and connects with the overload relays.

Mounting Adapters		
Part Number	**Price**	**Description**
C306TB1	$44.50	Mounting Adapter for 32A Overload Relay

CE15 Contactor Specifications

45mm Cutler-Hammer CE15 Contactor Specifications								
Contactor Model			***CE15AN***	***CE15BN***	***CE15CN***	***CE15DN***	***CE15EN***	***CE15FN***
Insulation Voltage	***AC***	***(V)***	690 Volts AC					
Ampere Rating	***Max. UL Current (AC3) [1]***	***(A)***	7	10	12	18	25	32
	AC1 Thermal Current (600V) [2]	***(A)***	20	20	20	32	32	32
Maximum Power (hp) of Three-Phase Motors	***200V***	***(hp)***	1.5	2	3	5	5	7.5
	230/240V	***(hp)***	1.5	2	3	5	7.5	10
	460/480V	***(hp)***	3	5	7.5	10	15	20
	575V	***(hp)***	5	7.5	10	15	20	25
Maximum Power (hp) of Single-Phase Motors	***115V***	***(hp)***	0.25	0.5	0.5	1	2	2
	230/240V	***(hp)***	0.5	1	2	3	3	5
Maximum Power (kw) of Three-Phase Motors AC3 Category [1]	***230/240V***	***(kW)***	1.1	1.5	2.2	4	5.5	7.5
	415/440V	***(kW)***	2.2	4	5.5	7.5	11	15
	500/550V	***(kW)***	2.2	4	5.5	7.5	11	15
	500V	***(kW)***	4	5.5	7.5	11	15	18.5
	600V	***(kW)***	1.5	2.2	4	5.5	7.5	10
Auxiliary Contacts Electrical Capacity			A600 [4]					
SCCR			5kA					
Coil Voltage Operating Limits			A.C.Pick-Up 85-110% Rated Control Voltage / A.C. Drop-Out 20-75% Rated Control Voltage					
Average Coil Power Requirements / Coil current (A) = VA/Coil Voltage			A.C. Pick-Up (VA) 80-100 / A.C. Sealed (VA) 9-12					
Power Factor			Pick-Up .65 / Sealed .35					
Coil Operating Time at Rated Coil Voltage			Pick-Up (ms) 10-25 / Drop-Out (ms) 6-18					
Maximum Operating Frequency (No-Load Operation)			3000 Operations / Hour					
Mechanical Durability			10,000,000 Operations					
Electrical Durability			1,000,000 Operations					
Operating Ambient Temperature			-25° to +55°C					
Electrical Protection Degree			IP20 (IP10 for GH15ET and GH15FT)					
Mounting			Screw or 35mm DIN Rail					
Wire Sizes	***Line / Load***		#10 - #14 AWG stranded recommended			#14 - #8 stranded recommended		
	Control & Auxiliary Contacts		#12 - #14 AWG (stranded recommended)					
Line/Load Tighting Torque	***N•m (lb•in)***		7	7	7	15	15	15

1. AC3 type loads consist of squirrel cage three phase motors.
2. AC1 non-inductive or slightly inductive loads. Typically resistive loads (i.e. furnaces, ovens, etc.)
3. Type 2 coordination is a protection category for IEC 60947-4-1. Section 8.2.5.1 specifies that Type 2 coordination requires that, under short circuit conditions, the contactor or starter shall cause no danger to persons or installations and shall be suitable for further use. The risk of minor contact welding is possible.
4. NEMA ICS 5-2000. For more information, refer to Control Circuit Contact Electrical Ratings, page MRC-tMRC-130.

Cutler-Hammer CE15 Series Contactor Part Numbers									
IEC FRAME SIZE	***Cutler-Hammer Contactor Model***	***Part Number***	***Price***	***Number of Contacts***			***Coil Voltage and Frequency***	***Additional Contacts***	
				Main	***Auxiliary Contacts Included***			***Maximum Contact Block Arrangement***	***Type of Additional Contact Block***
					N.O	***N.C.***			
45 mm	CE15AN	CE15AN4AB	$310.00	4			110-120VAC 50-60Hz	Up to two auxiliary contact blocks may be added to CE15 contactors (one per side).	Side mount C320KGS3: 1 N.O. / 1 N.C. C320KGS1: 1 N.O. / 1 N.C.
		CE15AN4BB	$310.00	4			220-240VAC 50-60Hz		
	CE15BN	CE15BN4AB	$319.00	4			110-120VAC 50-60Hz		
		CE15BN4BB	$319.00	4			220-240VAC 50-60Hz		
	CE15CN	CE15CN4AB	$392.00	4			110-120VAC 50-60Hz		
		CE15CN4BB	$392.00	4			220-240VAC 50-60Hz		
	CE15DN	CE15DNS3AB	$467.00	3	1		110-120VAC 50-60Hz		
		CE15DNS3BB	$467.00	3	1		220-240VAC 50-60Hz		
	CE15EN	CE15ENS3AB	$516.00	3	1		110-120VAC 50-60Hz		
		CE15ENS3BB	$516.00	3	1		220-240VAC 50-60Hz		
	CE15FN	CE15FNS3AB	$586.00	3	1		110-120VAC 50-60Hz		
		CE15FNS3BB	$586.00	3	1		220-240VAC 50-60Hz		

Note: Holding circuit contact(s) supplied standard: a N.O. auxiliary contact block is mounted on the right-hand side. (On Sizes A-C, contact occupies fourth power pole position - no increase in width.)

AE16 Starter Specifications

45mm Cutler-Hammer AE16 Starter Specifications								
Starter Model			**AE16AN**	**AE16BN**	**AE16CN**	**AE16DN**	**AE16EN**	**AE16FN**
Insulation Voltage	**AC**	**(V)**	690 Volts AC					
Ampere Rating	**Max. UL Current (AC3)** [1]	**(A)**	7	10	12	18	25	32
	AC1 Thermal Current (600V) [2]	**(A)**	20	20	20	32	32	32
Maximum Power (hp) of Three-Phase Motors	**200V**	**(hp)**	1.5	2	3	5	5	7.5
	230/240V	**(hp)**	1.5	2	3	5	7.5	10
	460/480V	**(hp)**	3	5	7.5	10	15	20
	575V	**(hp)**	5	7.5	10	15	20	25
Maximum Power (hp) of Single-Phase Motors	**115V**	**(hp)**	0.25	0.5	0.5	1	2	2
	230/240V	**(hp)**	0.5	1	2	3	3	5
Maximum Power (kw) of Three-Phase Motors AC3 Category [1]	**230/240V**	**(kW)**	1.1	1.5	2.2	4	5.5	7.5
	415/440V	**(kW)**	2.2	4	5.5	7.5	11	15
	500/550V	**(kW)**	2.2	4	5.5	7.5	11	15
	500V	**(kW)**	4	5.5	7.5	11	15	18.5
	600V	**(kW)**	1.5	2.2	4	5.5	7.5	10
Auxiliary Contacts Electrical Capacity			A600 [4]					
SCCR			5kA					
Coil Voltage Operating Limits			AC Pick-Up 85-110% Rated Control Voltage / AC Drop-Out 45% Rated Control Voltage					
Average Coil Power Requirements / Coil current (A) = VA/Coil Voltage			AC Pick-Up (VA) 80-100 / AC Sealed (VA) 7.5-10					
Power Factor			Pick-Up .65 / Sealed .35					
Coil Operating Time at Rated Coil Voltage			Pick-Up (ms) 12 / Drop-Out (ms) 12					
Maximum Operating Frequency (No-Load Operation)			Pick-Up (ms) 12 / Drop-Out (ms) 12					
Mechanical Durability			10,000,000 Operations					
Electrical Durability in Operations (AC3) [1]			2,000,000	2,000,000	2,220,222	1,300,000	1,600,000	1,500,000
Operating Ambient Temperature			-25° to +55°C					
Electrical Protection Degree			IP20 (IP10 for AE16DN,AE16EN, AE15FN)					
Mounting			Screw or 35mm DIN Rail					
Wire Sizes	**Line / Load**		#12 - 16 AWG stranded recommended			#16 - #8 stranded recommended		
	Control & Auxiliary Contacts		#12 - #14 AWG (stranded recommended)					
Line/Load Tighting Torque	**N•m (lb•in)**		7			15		

1. AC3 type loads consist of squirrel cage three phase motors.
2. AC1 non-inductive or slightly inductive loads. Typically resistive loads (i.e. furnaces, ovens, etc.)
3. Type 2 coordination is a protection category for IEC 60947-4-1. Section 8.2.5.1 specifies that type 2 coordination requires that, under short circuit conditions, the contactor or starter shall cause no danger to persons or installations and shall be suitable for further use. The risk of minor contact welding is possible.
4. NEMA ICS 5-2000. For more information, refer to Control Circuit Contact Electrical Ratings, page MRC-tMRC-130.

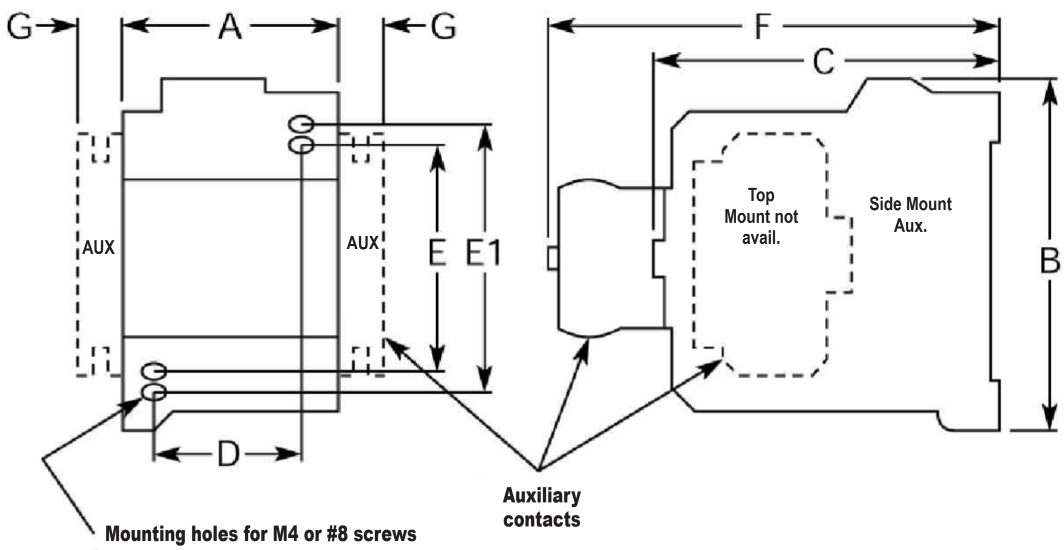
Cutler-Hammer AE16 Series Starter Part Numbers									
IEC FRAME SIZE	**Cutler-Hammer Contactor Model**	**Part Number**	**Price**	**Number of Contacts**			**Coil Voltage and Frequency**	**Additional Contacts**	
				Main	**Auxiliary Contacts Included**			**Maximum Contact Block Arrangement**	**Type of Additional Contact Block**
					N.O	**N.C.**			
45mm	AE16AN	AE16ANS0AC	$466.00	3	1		110-120VAC 50-60Hz	Up to two auxiliary contact blocks may be added to AE16 contactors (one per side).	Side mount C320KGS3 (1 NO and 1 NC) C320KGS1 (1 NO and 1 NC)
		AE16ANS0BC	$507.00	3	1		220-240VAC 50-60Hz		
	AE16BN	AE16BNS0AC	$517.00	3	1		110-120VAC 50-60Hz		
		AE16BNS0BC	$517.00	3	1		220-240VAC 50-60Hz		
	AE16CN	AE16CNS0AC	$592.00	3	1		110-120VAC 50-60Hz		
		AE16CNS0BC	$592.00	3	1		220-240VAC 50-60Hz		
	AE16DN	AE16DNS0AC	$640.00	3	1		110-120VAC 50-60Hz		
		AE16DNS0BC	$640.00	3	1		220-240VAC 50-60Hz		
	AE16EN	AE16ENS0AC	$691.00	3	1		110-120VAC 50-60Hz		
		AE16ENS0BC	$691.00	3	1		220-240VAC 50-60Hz		
	AE16FN	AE16FNS0AC	$764.00	3	1		110-120VAC 50-60Hz		
		AE16FNS0BC	$764.00	3	1		220-240VAC 50-60Hz		

Note: Holding circuit contact(s) supplied standard: a N.O. auxiliary contact block is mounted on the right-hand side. (On Sizes A-C, contact occupies fourth power pole position-no increase in width.)

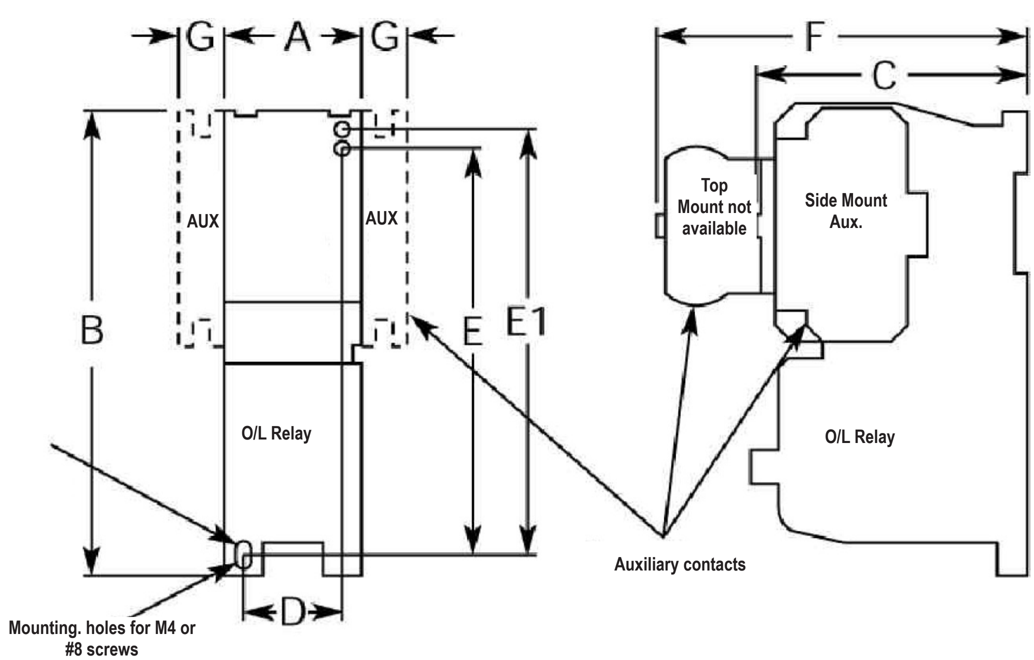
EATON Motor Control Dimensions

Size and Dimensions (Inches)										
Product	IEC Size	Contactor Type								Ship Weight in Pounds
		Wide	High	Deep	Mounting					
		A	B	C	D	E	E1	F	G	
Starters	A-F	1.80	5.86	3.28	1.36	5.19	5.39	-	54	1.75
Contactors	A-C	1.80	2.96	3.26	1.36	1.96	-	-	54	1.3
Contactors	D-F	1.80	2.96	3.26	1.36	1.96	-	-	54	1.4
Overload Relays	32 Amp	1.77	4.13	3.69	1.36	3.74	-	-	-	0.8

IEC contactor sizes A-F, CE15



IEC starter sizes A-F, AE16



Electrical Ratings Charts

Motor Current Ratings

Full Load Ampere (FLA) Rating for AC Induction Motors							
Motor HP	115 VAC		200 VAC		230 VAC		460 VAC
	1-Phase (A)	3-Phase (A)	1-Phase (A)	3-Phase (A)	1-Phase (A)	3-Phase (A)	3-Phase (A)
1/10	3.0	---	---	---	1.5	---	---
1/8	3.8	---	---	---	1.9	---	---
1/6	4.4	---	2.5	---	2.2	---	---
1/4	5.8	---	3.3	---	2.9	---	---
1/3	7.2	---	4.1	---	3.6	---	---
1/2	9.8	4.4	5.6	2.5	4.9	2.2	1.1
3/4	13.8	6.4	7.9	3.7	6.9	3.2	1.6
1	16.0	8.4	9.2	4.8	8.0	4.2	2.1
1 1/2	20.0	12.0	11.5	6.9	10	6.0	3.0
2	24.0	13.6	13.8	7.8	12	6.8	3.4
3	34.0	19.2	19.6	11.0	17	9.6	4.8
5	56.0	30.4	32.2	17.5	28	15.2	7.6
7 1/2	80.0	44.0	46.0	25.3	40	22	11
10	100.0	56.0	57.5	32.2	50	28	14
15	---	84.0	---	48.3	---	42	21
20	---	108.0	---	62.1	---	54	27
25	---	136.0	---	78.2	---	68	34
30	---	160.0	---	92	---	80	40
40	---	208.0	---	120	---	104	52
50	---	260.0	---	150	---	130	65
60	---	---	---	177	---	154	77
75	---	---	---	221	---	192	96
100	---	---	---	285	---	248	124

The motor currents are approximate and not guaranteed to be accurate. This chart is provided as a guideline only. Values were extrapolated from NEC Tables 430-148 and 430-150. Motor currents should be taken from the motor's nameplate. It is the user's responsibility to properly size their motor control devices.

Control Circuit Contact Electrical Ratings

NEMA Mechanical Switching Ratings and Test Values for DC Control Circuit Contacts					
Contact Rating Designation	Thermal Continuous Test Current (A)	Maximum Make or Break DC Current (A)			Voltamperes
		125 Volts	250 Volts	301 to 600 Volts	
P300	5.0	1.1	0.55	---	138
P600	5.0	1.1	0.55	0.20	138
Q300	2.5	0.55	0.27	---	69
Q600	2.5	0.55	0.27	0.10	69
R300	1.0	0.22	0.11	---	28

**This chart is provided as a guideline only, and the ratings and values are not guaranteed to be accurate. It is the users' responsibility to properly size their control circuit devices.
The chart values are from NEMA Standard ICS 5-2000, Table 1-4-2.**

NEMA Mechanical Switching Ratings and Test Values for AC Control Circuit Contacts											
Contact Rating Designation	Thermal Continuous Test Current (A)	Maximum AC Current, 50/60Hz (A)								Voltamperes	
		120 Volts		240 Volts		480 Volts		600 Volts			
		Make	Break	Make	Break	Make	Break	Make	Break	Make	Break
A300	10	60	6.00	30	3.00	---	---	---	---	7200	720
A600	10	60	6.00	30	3.00	15	1.50	12	1.20	7200	720
B300	5	30	3.00	15	1.50	---	---	---	---	3600	360
B600	5	30	3.00	15	1.50	7.5	0.75	6	0.60	3600	360
C600	2.5	15	1.5	7.5	0.75	3.75	0.375	3.00	0.30	1800	180

This chart is provided as a guideline only, and the ratings and values are not guaranteed to be accurate. It is the users' responsibility to properly size their control circuit devices. The chart values are from NEMA Standard ICS 5-2000, Table 1-4-1.

IEC Utilization Categories

IEC Utilization Categories for Low Voltage Switchgear and Control Gear			
Current	***Category***	***Typical Applications***	***Relevant IEC Product Standard***[3]
AC	AC-1	Non inductive or slightly inductive loads, resistance furnaces, heaters	60947-4
	AC-2	Slip-ring motors: switching off	
	AC-3	Squirrel-cage motors: starting,switching off motors during running most typical industrial application	
	AC-4	Squirrel-cage motors: starting, plugging[1], inching [2]	
	AC-5a	Switching of electric discharge lamps	
	AC-5b	Switching of incandescent lamps	
	AC-6a	Switching of transformers	
	AC-6b	Switching of capacitor banks	
	AC-7a	Slightly inductive load in household appliances: mixers, blenders	
	AC-7b	Motor-loads for household applications: fans, central vacuum	
	AC-8a	Hermetic refrigerant compressor motor control with manual resetting overloads	
	AC-8b	Hermetic refrigerant compressor motor control with automatic resetting overloads	
	AC-12	Control of resistive loads and solid state loads with opto-coupler isolation	60947-5
	AC-13	Control of solid state loads with transformer isolation	
	AC-14	Control of small electromagnetic loads	
	AC-15	Control of AC electromagnetic loads	60947-3
	AC-20	Connecting and disconnecting under no-load conditions	
	AC-21	Switching of resistive loads, including moderate loads	
	AC-22	Switching of mixed resistive and inductive loads, including moderate overloads	
	AC-23	Switching of motor loads or other highly inductive loads	
AC and DC	A	Protection of circuits, with no rated short-time withstand current	60947-2
	B	Protection of circuits, with a rated short-time withstand current	
DC	DC-1	Non-Inductive or slightly inductive loads, resistance furnaces, heaters	60947-4
	DC-3	Shunt-motors, starting, plugging[1], inching[2], dynamic breaking of motors	
	DC-5	Series-motors, starting, plugging[1], inching[2], dynamic breaking of motors	
	DC-6	Switching of incandescent lamps	
	DC-12	Control of resistive loads and solid state loads with opto-coupler isolation	
	DC-13	Control of DC electromagnetics	60947-5
	DC-14	Control of D.C. electromagnetic loads having economy resistors in the circuit	
	DC-20	Connecting and disconnecting under no-load conditions	
	DC-21	Switching of resistive loads, including moderate overloads	60947-3
	DC-22	Switching of mixed resistive and inductive loads, including moderate overloads (i.e. shunt motors)	
	DC-23	Switching of highly inductive loads (i.e. series motors)	

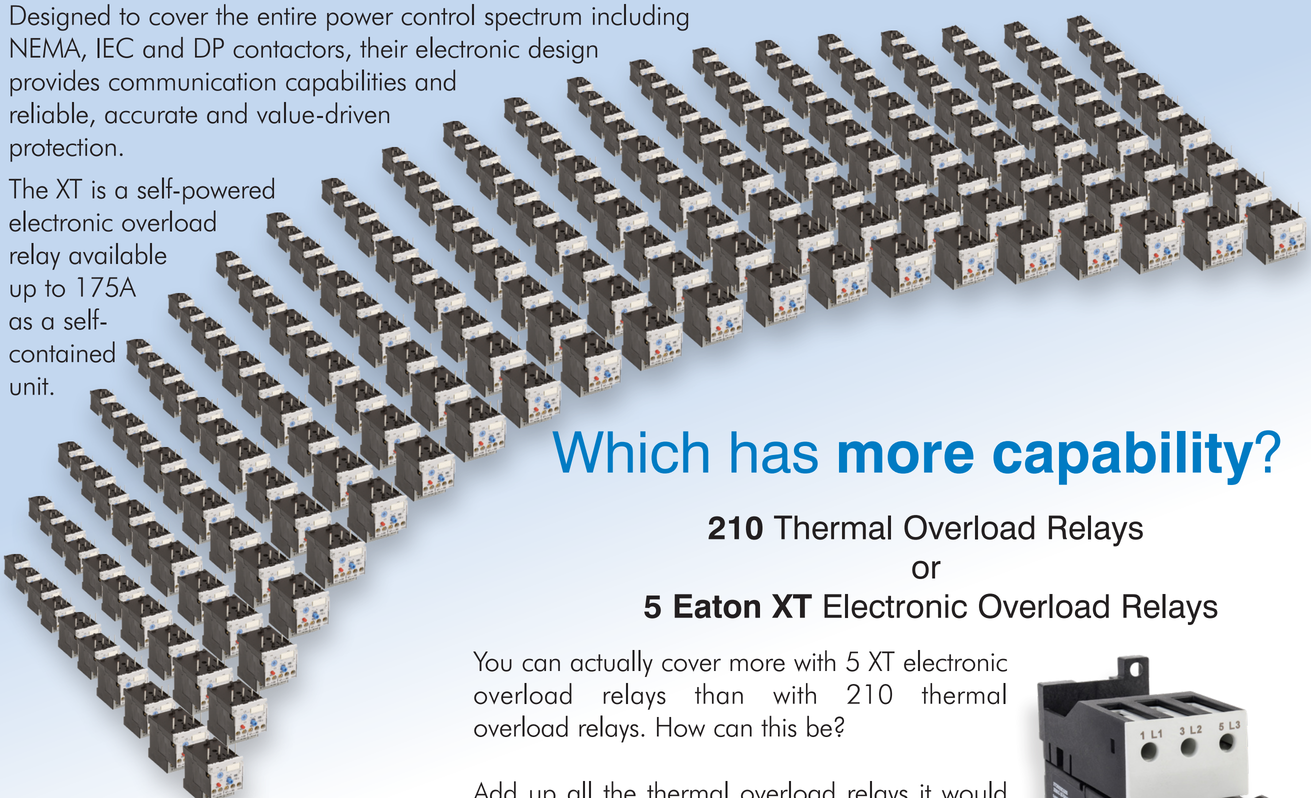
[1]***Plugging - Stopping a motor rapidly by reversing the primary power connections.***
[2]***Inching - Energizing a motor repeatedly for short periods to obtain small incremental movements.***
[3]***IEC Standards must be purchased from the International Electrotechnical Commission***

Eaton XT Electronic Overload Relays

Our new Eaton XT electronic overload relays (EOL) are the most compact, high-featured, economical products in their class.

Designed to cover the entire power control spectrum including NEMA, IEC and DP contactors, their electronic design provides communication capabilities and reliable, accurate and value-driven protection.

The XT is a self-powered electronic overload relay available up to 175A as a self-contained unit.



Which has **more capability**?

210 Thermal Overload Relays
or
5 Eaton XT Electronic Overload Relays

You can actually cover more with 5 XT electronic overload relays than with 210 thermal overload relays. How can this be?

Add up all the thermal overload relays it would take to cover 0.3 to 100 amps, class 10, class 20, class 30, and class 10A with automatic and manual reset. It would take 214 different thermal overload relays!

Eaton's XT electronic overload relays allow you to select these options right on the face of every overload relay. Imagine the amount of applications you can cover with just a handful of inventory.

Features:

- Enhanced motor protection
- Flexible design
- Predictive indication
- Separate mounting for use with any contactor
- Self-powered, no control power needed
- Integral current sensing and electronics save money and valuable panel space
- Selectable trip classes for variable or high inertia loads

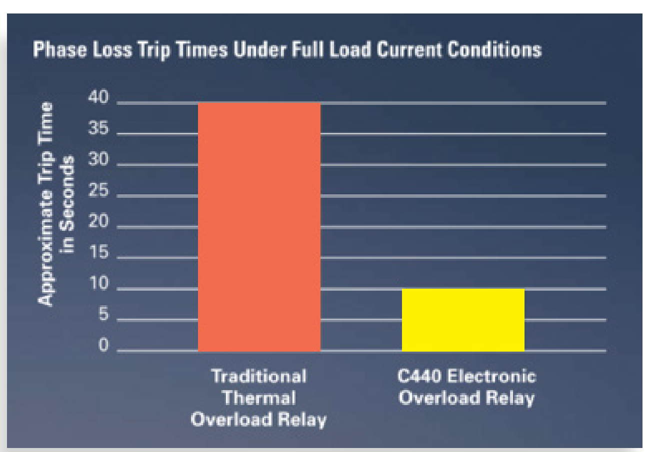
Make life simple!

Choose **Eaton XT** Electronic Overload Relays

Enhanced Protection

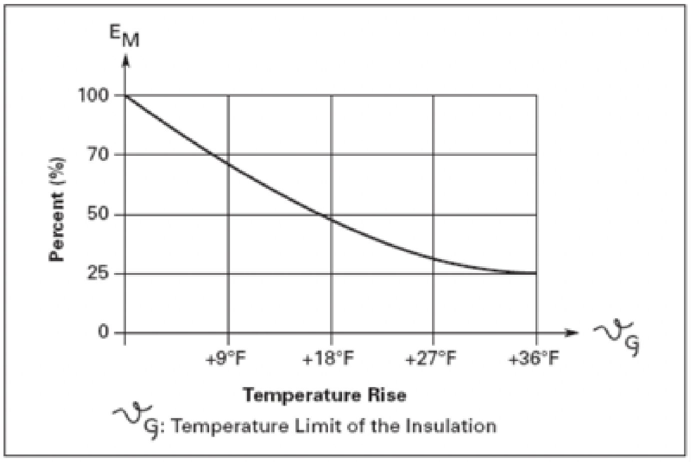
The superiority of electronic overload relays versus traditional thermal overload relays:

- Faster response time under phase loss and phase unbalance conditions
- Increased motor life due to thermal modeling design
- Common design for single-phase and three-phase applications



Eaton XT Electronic Overload Relays

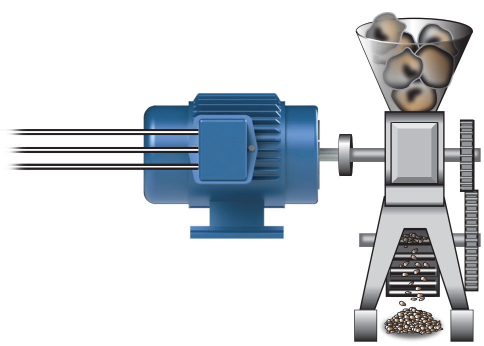
Protect your valuable assets - Increase Motor Life through better thermal protection



An increase of just 18 °F above the thermal limit will reduce motor life by 50%.

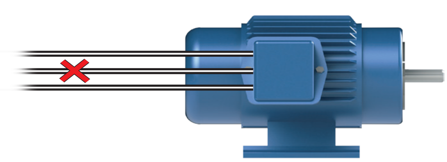
This graph shows the reduction in average life of a motor, E_M, when the winding is continuously overheated.

Applications



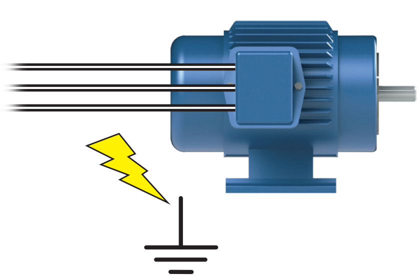
Selectable trip classes for variable or high inertia loads

- Conveyors
- Crushers / Grinders
- Mixers



Unbalance / Phase Lose Protection

- Blown fuses
- Single phasing
- Loose connections
- Stator turn to turn faults



Ground Fault Protection

- Moisture in submersible pumps, wells, freezers
- Damaged insulation in mobile / flexing applications

Integral Ground Fault Protection

- The C440 has built-in ground protection capabilities eliminating the need to purchase and install separate CTs and ground fault modules
- Integral design reduces inventory, speeds up installation time and delivers physical space savings

Eaton XT Series Electronic Overload Relays

Electronic Overload Relays up to 175A

XTOE1P6CCSS

XTOE1P6CGSS

XTOE175GCSS

Description

Eaton's new electronic overload relays (EOL) are the most compact, high-featured, economical products in their class.

Designed with a global platform in mind, the new EOL line covers the entire power control spectrum including NEMA, IEC and DP contactors. The NEMA and DP versions are offered with the IEC XT designation.

The electronic design provides reliable, accurate and value-driven protection and communications capabilities in a single compact device. It is the flexible choice for any application requiring easy-to-use, reliable protection.

The XT is a self-powered electronic overload relay available up to 175A as a self-contained unit. Accessories include remote reset capability.

Features

- Self-powered
- Reliable and accurate electronic motor protection
- Easy to select, install and maintain
- Compact size
- Flexible, intelligent design
- A global product offering available with NEMA, IEC and DP power control

Size/Range

- Broad FLA range (0.33 –175A)
- Selectable trip class (10A, 10, 20, 30)
- Separate mounting to NEMA, IEC and DP contactors
- Compact electronic overload

Motor Protection

- Thermal overload
- Phase loss
- Selectable (ON/OFF) phase imbalance
- Selectable (ON/OFF) ground fault

Standards and Certifications

- UL File E1230
- CSA File 156828 or 000353_0_000
- CE Directives, RoHS, LVD, EMC, ATEX

Eaton XT Series Electronic Overload Relays for Separate Mount

Part Number	Price	Amperage Adjustment Range (A)	Power Pole (Wire) Connections	Mounting	Ground Fault Protection	Contact Sequence	Frame Size
XTOE1P6CCSS	$102.00	0.33-1.65	Stand-alone connections	DIN rail or panel mount	No	1 3 5 97 95 / 2 4 6 98 96	45mm [1.77 in]
XTOE005CCSS	$131.00	1-5					
XTOE020CCSS	$131.00	4-20					
XTOE045CCSS	$147.00	9-45					
XTOE100GCSS	$166.00	20-100					55mm [2.17 in]
XTOE175GCSS	$218.00	35-175		Panel mount			110mm [4.33 in]
XTOE175GCSP	$226.00	35-175	Pass-through connections			1 3 5 97 95 / 2 4 6 98 96	
XTOE1P6CGSS	$129.00	0.33-1.65	Stand-alone connections	DIN rail or panel mount	Yes	1 3 5 97 95 / 2 4 6 98 96	45mm [1.77 in]
XTOE005CGSS	$137.00	1-5					
XTOE020CGSS	$137.00	4-20					
XTOE045CGSS	$153.00	9-45					
XTOE100GGSS	$180.00	20-100					55mm [2.17 in]
XTOE175GGSP	$245.00	35-175	Pass-through connections	Panel mount		1 3 5 97 95 / 2 4 6 98 96	110mm [4.33 in]

Eaton XT Series Electronic Overload Relays

Electronic Overload Relays up to 175A

Electrical Ratings			
Frame size	*45mm (1.77 in)*	*55mm (2.17 in)*	*110mm (4.33 in)*
Operating Voltage (3-phase)	690VAC		
Frequency	60/50 Hz		
FLA Range	0.33-1.65 A 1-5 A 4-20 A 9-45 A	20-100 A	28-140 A 35-175 A
Trip Class	10A, 10, 20, 30 selectable (10, 20 ground fault)		
Thermal Overload Setting	1.05xFLA: does not trip 1.15xFLA: overload trip		
Phase Loss	Fixed threshold 50%		
Phase Unbalance (Selectable: enable/disable)	Fixed threshold 50%		
Ground Fault (Selectable: enable/disable)	50% of FLA dial setting >150%=2sec >250%=1sec		
Reset	Manual/automatic		
Insulation Voltage U_i (three-phase)	690VAC		
Insulation Voltage U_i (control)	500VAC		
Rated Impulse Withstand Voltage	6000VAC		
Overvoltage Category/Pollution Degree	III/3		

Indicators			
Frame size	*45mm (1.77 in)*	*55mm (2.17 in)*	*110mm (4.33 in)*
Trip status indicator	Orange flag		
Mode LED	Flashing (0.5 Hz): Overload operating properly Flashing (1Hz): Current is above FLA dial setting–pending trip		

Options			
Frame size	*45mm (1.77 in)*	*55mm (2.17 in)*	*110mm (4.33 in)*
Remote Reset Option	Yes		
Reset Bar Option	Yes		
Communication Expansion Module Option	Yes		

Terminal Capacity and Torque			
Frame size	*45mm (1.77 in)*	*55mm (2.17 in)*	*110mm (4.33 in)*
Load Terminals Capacity	12-10 AWG (4-6 mm2) 8-6 AWG (6-16 mm2)	6-1 AWG (16-50 mm2)	8-4/0 AWG (10-95 mm2)
Load Terminals Tightening Torque	20-25 lb•in [2.3-2.8 N•m] 25-30 lb•in [28-3.4 N•m]	25-30 lb•in [28-3.4 N•m]	124 lb•in [14 N•m]
Input, Auxiliary Contact and Remote Reset Terminals Capacity (C440-XCOM and ZEB-XRR-120)	2x 18-12 AWG		
Input Terminals Tightening Torque (C440-XCOM and ZEB-XRR-120)	7-11 lb•in [0.8-1.2 N•m]		

Eaton XT Series Electronic Overload Relays

Electronic Overload Relays up to 175A

Auxiliary and Control Circuit Ratings	
Conventional Thermal Continuous Current	5A
Rated Operational Current (IEC AC-15) - Make Contact (1800VA)	
120V	15A
240V	15A
415V	0.5 A
500V	0.5A
Rated Operational Current (IEC AC-15) - Break Contact (180VA)	
120V	1.5 A
240V	1.5 A
415V	0.9 A
500V	0.8 A
Rated Operational Current (IEC DC-13) - L/R F 15ms	
0-250 V	1.0 A
Rated Operational Current (UL B600) - Make Contact (3600VA)	
120V	30A
240V	15A
480V	7.5 A
600V	6A
Rated Operational Current (UL B600) - Break Contact (360VA)	
120V	3A
240V	1.5 A
480V	0.75 A
600V	0.6 A
Rated Operational Current (UL R300) - VDC Ratings (28VA)	
0-120 V	0.22 A
250V	0.11 A

Short-Circuit Rating Without Welding	
Maximum Fuse	6A Class CC, J

Environmental Ratings	
Ambient Temperature (operating)	-13 to 149°F (-25 to 65°C)
Ambient Temperature (storage)	-40 to 185°F (-40 to 85°C)
Operating Humidity UL 991 (H3)	5% to 95% non-condensing
Altitude (No Derating) NEMA ICS1	2000m [6561.6 ft]
Shock (IEC 600068-2-27)	15g any direction
Vibration (IEC 60068-2-6)	3g any direction
Pollution Degree Per IEC 60947-4-1	3 for product (2 for PCB)
Ingress Protection	IP20
Protection Against Direct Contact When Actuated From Front (IEC 536)	Finger and back-of-hand proof
Mounting Position	Any
Climatic Proofing	Damp heat, constant to IEC 60068-2-30

Eaton XT Series Electronic Overload Relays

Electronic Overload Relays up to 175A

Electrical / EMC	
Radiated Emissions IEC 60947-4-1-Table 15 EN 55011 (CISPIR 11) Group 1, Class A, ISM	30-1000 MHz
Conducted Emissions IEC 60947-4-1-Table 14 EN 55011 (CISPIR 11) Group 1; Class ISM	0.15-30 MHz
ESD Immunity IEC 60947-4-1 (Table 13)	±8kV air, ±6kV contact
Radiated Immunity IEC 60947-4-1 IEC 61000-4-3	10 V/m 80-1000 MHz 3 V/m from 1.4-2.7 gHz 80% amplitude modulated 1 kHz sine wave
Conducted Immunity IEC 60947-4-1, IEC 61000-4-6	140 dub (10 V rms) 150 kHz – 100 MHz
Fast Transient Immunity IEC 60947-4-1 (Table 13) IEC 61000-4-4	±4kV using direct method with accessory installed in expansion bay ±2kV using direct method
Surge Immunity IEC 60947-4-1 (Table 13) IEC 61000-4-5 a Class 4	Three-phase power inputs: ±4kV line-to-line (DM); ±4kV line-to-ground (CM) With accessory installed in expansion bay: ±2kV line-to-line (DM) –>1.2/50µs; 2kV line-to-earth, 1kV line-to-line; ±4kV line-to-ground (CM)
Power Freq. Magnetic Field Immunity IEC 60947-4-1, IEC 61000-4-8	30A/m, 50Hz
Electromagnetic Field IEC 60947-4-1 Table 13, IEC 61000-4-3	10V/m
Distortion IEEE 519	5% THD max., 5th harmonic 3% max.
Electrostatic Discharge (ESD) IEC 61000-4-2, EN 61131-2	4kV contact 8kV air discharge
Electrical Fast Transient (EFT) IEC 61000-4-4, EN 61131-2	±2kV using direct method
Surge Immunity IEC 61000-4-5, EN 61131-2	±2kV line-to-ground (CM)

Agency Approvals	
UL	E1230
CSA	156828 or 000353_0_000 (Class 3211-03)
CE	2014/35/EU LVD, 2014/30/EU EMC, 2014/34/EU ATEX, 2011/65/EU RoHS

Eaton XT Series Electronic Overload Relays

Electronic Overload Relays up to 175A

Short Circuit Ratings (North America CSA, cUL)

Changes to UL 508A and NEC in recent years have brought a focus on control panel safety with regard to short-circuit current ratings (SCCR). The SCCR data in this document reflects the latest information as of April 2010.

Short-Circuit Rating Without Welding

Overload FLA Range	Maximum Operating Voltage	Standard-Fault Short Circuit Data			High-Fault Short Circuit Data			Thermal-Magnetic Circuit Breakers		
		600V (kA)	Maximum Fuse Size (A) (Class RK5)	Maximum Breaker Size (A)	480V (kA)	600V (kA)	Maximum Fuse Size (Class J, CC, RK5)	480V (kA)	600V (kA)	Maximum Breaker Size
0.33–1.65 A	600VAC	1	6	15	—	—	—	—	—	—
1–5 A		5	20	20	100	100	30	100	35	20
4–20 A		5	80	80	100	100	100	100	35	80
9–45 A		5	175	175	100	100	100	100	35	100/175 (480/600)
20–100 A		10	400	400	100	100	200	150	35	250/400 (480/600)
35–175 A		10	400	350 (690VAC) 320 (415VAC)	100	100	400	100 (415VAC)	—	350 320

Electronic Overload Education

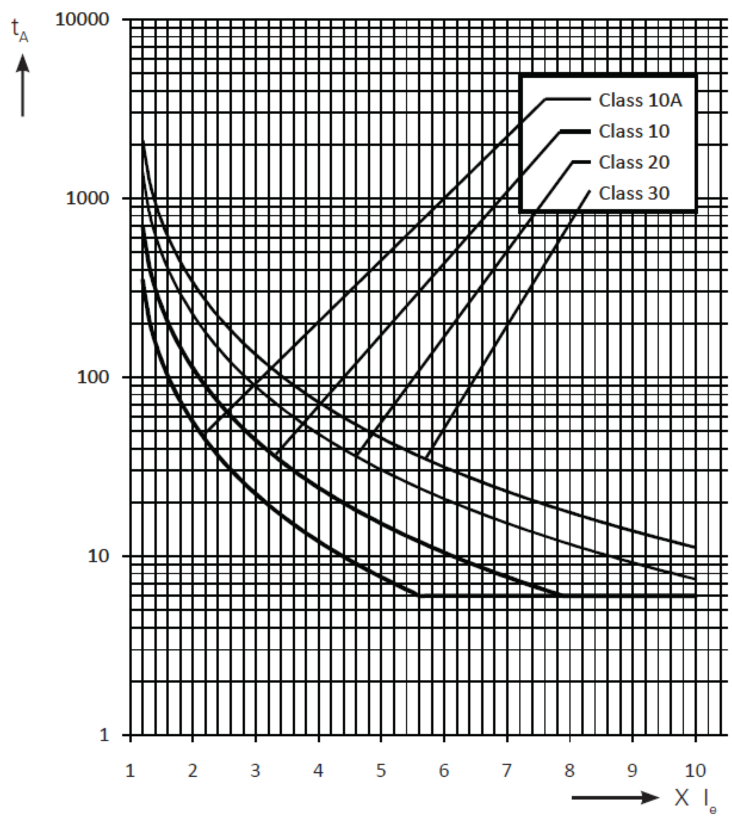
Description	Definition	Cause	Effect if not Protected	XT Protection
Motor Protection				
Thermal Overload	Overload is a condition in which current draw exceeds 115% of the full load amperage rating for an inductive motor.	• An increase in the load or torque that is being driven by the motor. • A low voltage supply to the motor causes the current to go high to maintain the power needed. • A poor power factor causing above normal current draw.	• Increase in current draw leads to heat and insulation breakdown, which can cause system failure. • Increase in current can increase power consumption.	• Thermal trip behavior is defined by UL, CSA and IEC standards. • Trip class is settable from 10A, 10, 20, 30.
Ground Fault	A line to ground fault.	A current leakage path to ground.	An undetected ground fault can burn through multiple insulation windings, ultimately leading to motor failure, not to mention risk to equipment or personnel.	Fixed protective setting that takes the starter offline if ground fault current exceeds 50% of the FLA dial setting, that is, if the FLA dial is set to 12A, the overload relay will trip if the ground current exceeds 6A.
Unbalanced Phases (Voltage and Current)	Uneven voltage or current between phases in a three-phase system.	When a three-phase load is powered with a poor quality line, the voltage per phase may be unbalanced.	Unbalanced voltage causes large unbalanced currents and as a result this can lead to motor stator windings being overloaded, causing excessive heating, reduced motor efficiency and reduced insulation life.	Fixed protective setting that takes the starter offline if a phase drops below 50% of the other two phases.
Phase Loss – Current (Single-Phasing)	One of the three-phase voltages is not present.	Multiple causes, loose wire, improper wiring, grounded phase, open fuse, etc.	Single-phasing can lead to unwanted motor vibrations in addition to the results of unbalanced phases as listed above.	Fixed protective setting that takes the starter offline if a phase is lost.

Eaton XT Series Electronic Overload Relays

Electronic Overload Relays up to 175A

Tripping characteristics, 1- and 3-phase XTOE

10A, 10, 20, 30



Class	t_A(s)							
	3	4	5	6	7.2	8	10	=x_{Ie}
30	133.5	72.5	45.7	31.4	21.7	17.5	11.2	
20	89.0	48.3	30.4	21.0	14.5	11.7	7.5	
10	44.5	24.2	15.2	10.5	7.2	6.0	6.0	
10A	22.3	12.1	7.6	6.0	6.0	6.0	6.0	

$t_{A(s)}$ = time (seconds)

x_{Ie} = multiple of FIA

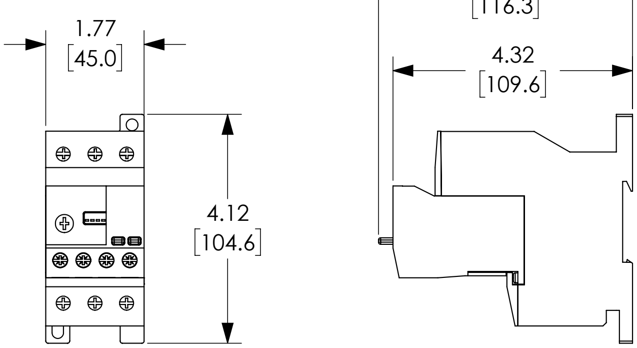
Please see our website www.AutomationDirect.com for complete engineering drawings.

Eaton XT Series Electronic Overload Relays

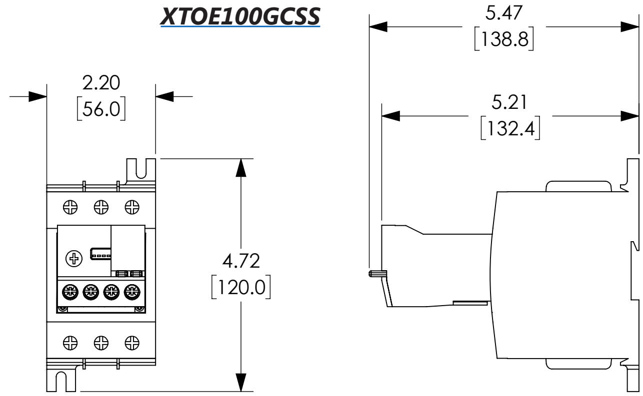
Electronic Overload Relays up to 175A

Dimensions (inches [mm])

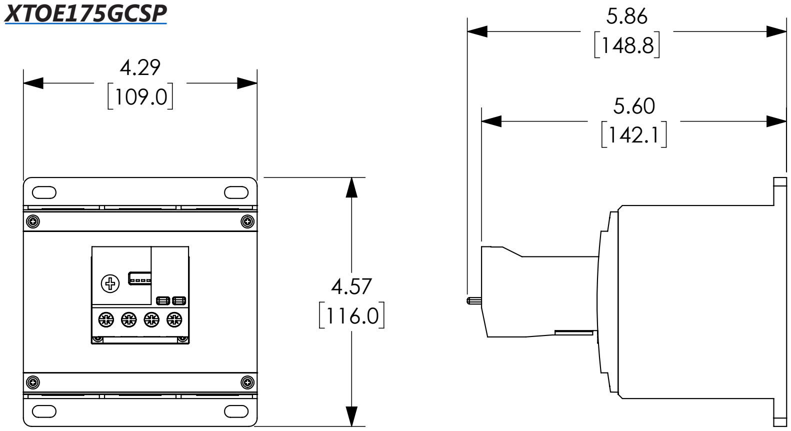
XTOE1P6CCSS



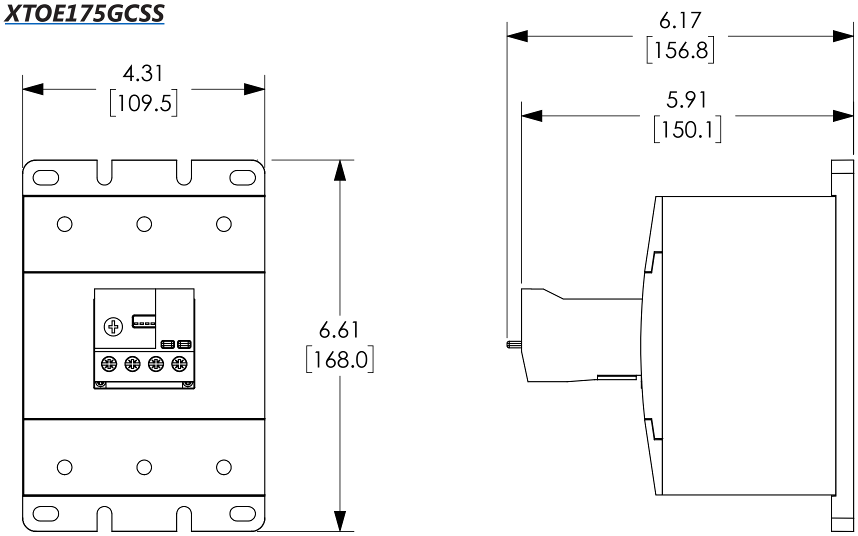
XTOE100GCSS



XTOE175GCSP



XTOE175GCSS



Please see our website www.AutomationDirect.com for complete engineering drawings.

Eaton XT Series Electronic Overload Relays

Electronic Overload Relays up to 175A

Optional Modules

C440-XCOM

ZEB-XRR-120

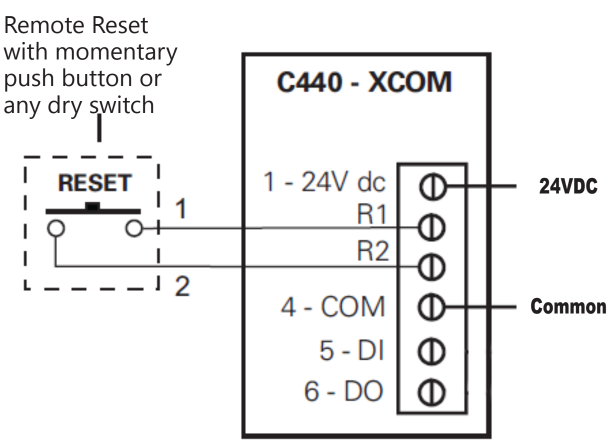
Electronic Remote Reset is accomplished with 24VDC (C440-XCOM) or 120VAC (ZEB-XRR-120) accessory options. These expansion modules plug into the expansion bay on the XT overload relays, enabling remote reset. The C440-XCOM module can also accomplish basic communication with accessories purchased from Eaton, not sold by Automationdirect.com.

Users can add a remote mounted reset button to reset the module.

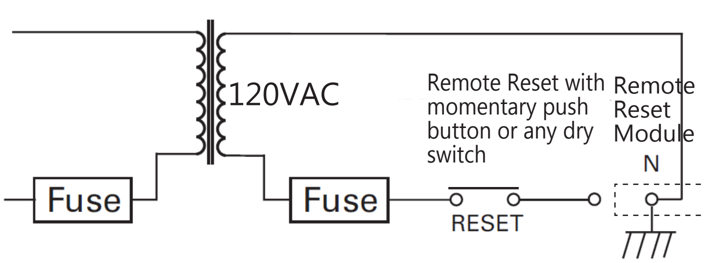
Optional Modules		
Part Number	**Price**	**Description**
C440-XCOM	$55.00	Eaton communication expansion module, adds remote reset ability for the Eaton XT series electronic overloads.
ZEB-XRR-120	$70.00	Eaton remote reset module for use with XT series electronic overloads.

Wiring Diagrams

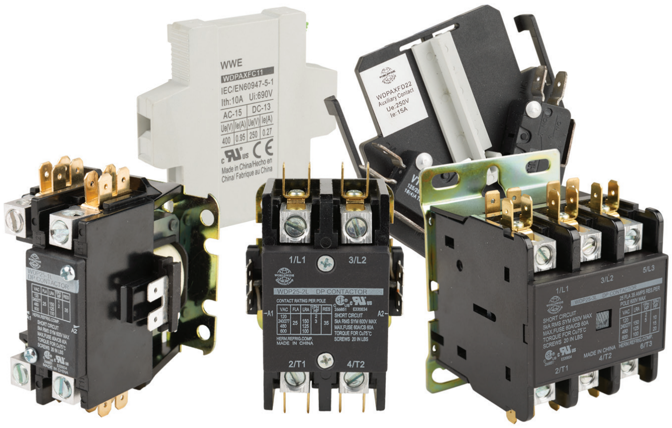
C440-XCOM



ZEB-XRR-120



WDP Series Definite Purpose Contactors



Applications

- Air conditioning
- Resistive heating
- Refrigeration equipment
- Motors
- Welding
- Pumps
- Power supplies
- Food service equipment
- Compressors

Certifications

- UL 508 Recognized, File No. E330834
- IEC/EN 60947 Compliant
- Compliance to ARI-780 HVAC standards
- CSA file No. 266851

c US

C US

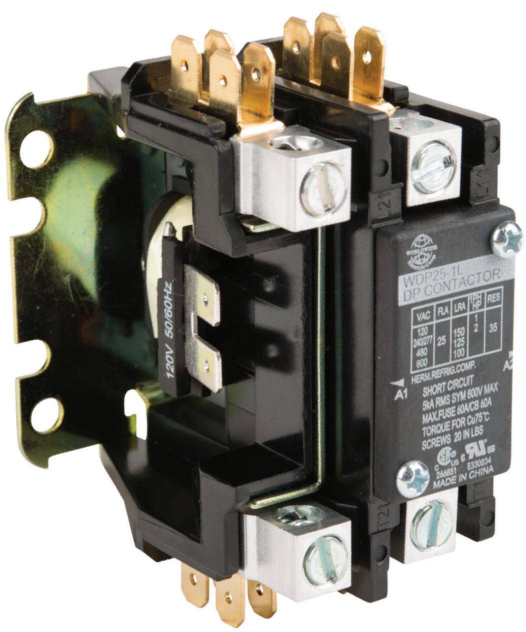
Features

- Rated current from 25-60A
- 1-, 2-, and 3-pole configurations at 25A, 30A, and 40A
- 3-pole configurations at 50A and 60A
- Enclosed coil standard for all 3-pole frame sizes
- Open coil standard for all 1- and 2-pole frame sizes
- Industry standard mounting plate provides easily accessible mounting holes
- Connection terminal box lug connections each with quick connect/disconnect terminals
- Coil is class B 266°F (130°C) insulation system with a wide range of voltages and 50/60 Hz ratings
- Double E magnet assembly provides optimal performance with reduced power consumption
- Base assembly made from high arc-resistant polyester and thermoset plastic
- Temperature range -40 to 158 °F (-40 to 70 °C)
- IP20 rating
- 5 kA SCCR with Fuse or Circuit Breaker:
  - 25A max fuse/CB 60A
  - 30A max fuse/CB 80A
  - 40A max fuse/CB 90A
  - 50A max fuse/CB 100A
  - 60A max fuse/CB 125A

Accessories

Multiple optional auxiliary contact blocks with 250 VAC/VDC or 600VAC max rating available:

- 1NO+1NC screw terminal
- 1NO+1NC quick connect
- 1NO+1NC quick connect microswitch
- 2NO+2NC quick connect microswitch



WDP 25 Series Contactor

WDP 50 Series Contactor

WDP Series Definite Purpose Contactors

Contactor Specifications

WDP Series 25-40 Amp DP Contactor Specifications

Model	Price	Qty.	Poles	FLA (A) 600VAC max[1]	Resistive Loads @600VAC (A)	Locked Rotor Amps (A)			Horsepower (hp)					Weight (lb)
						240/277V	480V	600V	1-Phase		3-Phase			
									120V	240/277V	240/277V	480V	600V	
WDP25-1L-120	$13.00	1 ea.	1NO+Shunt	25	35	150	125	100	1	2	-	-	-	0.51
WDP25-1L-230	$13.00													
WDP25-2L-120	$11.50		2NO						2	3				0.64
WDP25-2L-230	$11.50													
WDP25-3L-120	$20.00		3NO						2	5	10	15	20	0.97
WDP25-3L-230	$20.00													
WDP30-1L-120	$13.50		1NO+Shunt	32	40	200	150	120	1	2	-	-	-	0.51
WDP30-1L-230	$13.50													
WDP30-1L-24	$13.50													
WDP30-2L-120	$13.00		2NO						2	3				0.64
WDP30-2L-230	$13.00													
WDP30-2L-24	$13.00													
WDP30-3L-120	$20.00		3NO						2	5	10	15	20	0.97
WDP30-3L-230	$20.00													
WDP30-3L-24	$20.00													
WDP30-3L-480	$20.00													
WDP40-1L-120	$14.50		1NO+Shunt	40	50	240	200	160	2	3	-	-	-	0.51
WDP40-1L-230	$14.50													
WDP40-2L-120	$17.00		2NO											0.64
WDP40-2L-230	$17.00													
WDP40-3L-120	$26.50		3NO						3	7.5	10	20	25	0.97
WDP40-3L-230	$26.50													
WDP40-3L-24	$26.50													
WDP40-3L-480	$26.50													

Notes: 1-Full load amperage applies at 240/277, 480, and 600V.

WDP Series 50-60 Amp DP Contactor Specifications

Model	Price	Qty.	Poles	FLA (A) 600VAC max[1]	Resistive Loads @600VAC (A)	Locked Rotor Amps (A)			Horsepower (hp)							Weight (lb)
						240/277V	480V	600V	1-Phase			3-Phase				
									110/120V	200/208V	240/277V	200/208V	240/277V	480V	600V	
WDP50-3L-120	$40.00	1 ea.	3NO	50	65	300	250	200	3	7.5	10	15	15	25	25	1.28
WDP50-3L-230	$40.00															
WDP50-3L-24	$40.00															
WDP60-3L-120	$66.00			60	75	360	300	240	5	7.5	10	25	25	30	30	
WDP60-3L-230	$66.00															
WDP60-3L-24	$66.00															

Notes: 1-Full load amperage applies at 240/277, 480, and 600V.

WDP Series Definite Purpose Contactors

Contactor Specifications, continued

WDP Series 25-60 Amp DP Contactor Specifications	
Mechanical Life	***500,000 operations***
Electrical Life	250,000 operations
Line and Load Terminals	#10-32 Screw/Box Lug
Mounting	Vertical or Horizontal
Operating Temperature	-40 to 70 °C (-40 to 158 °F)
Insulation System	Class B 266°F (130°C)
Agency Approvals	UL file #E330834, Standard UL 60947-1, CSA file #266851

Notes: Applies to all WDP series contactors.

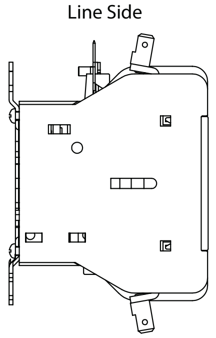
Terminal Specifications

WDP Series 25-60 Amp DP Contactor Terminal Specifications

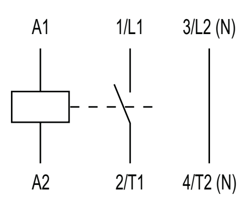
Model	Copper Cable AWG (mm^2)				Tightening Torque in-lb (N•m)			Quick Connects[1]		
	Solid Wire w/Single Core		Flexible Stranded Wire		Coil	Main Circuit		Power Terminals	Coil Terminals	0.250 Standard
	Screw	Lug	Screw	Lug		Screw	Lug			
WDP25-1L Series	14-10 (2.5-6)	14-8 (2.5-10)	14-12 (2.5-6)	14-8 (2.5-10)	See note 2	20 (1.8-2)	40 (4-6)	Dual 0.250 QC (2)	Dual 0.250 QC [2]	Quad
WDP25-2L Series										Dual or Quad[3]
WDP25-3L Series										Dual
WDP30-1L Series	12-8 (4-10)									Quad
WDP30-2L Series										Dual or Quad[3]
WDP30-3L Series	16-8 (1.5-10)									Dual
WDP40-1L Series	2-8 (4-10)									Quad
WDP40-2L Series										Dual or Quad[3]
WDP40-3L Series	16-8 (1.5-10)									Dual
WDP50 Series	-	10-6 (6-16)	-	12-8 (4-10)		-	50 (4-7)	Dual 0.250 QC (2)	0.250 QC [2]	-
WDP60 Series		10-6 (6-16)		12-8 (4-10)			50 (4-7)	Dual 0.250 QC (2)	0.250 QC [2]	

[1] Quick connects (size 6.3mm, female) may be purchased on the web store www.automationdirect.com
[2] All coil connections are 0.25 inch quick-connect terminals only.
[3] Quad is standard.

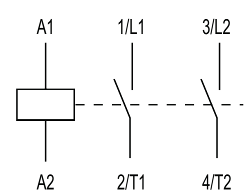
Wiring Diagrams



WDP25~40

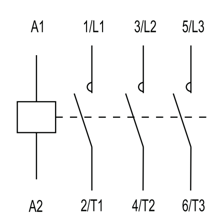


WDP... 1P 1NO+1Shunt



WDP... 2P 2NO

WDP25~60



WDP... 3P 3NO

WDP Series Definite Purpose Contactors

Coil Specifications

WDP Series 25-60 Amp DP Contactor Coil Specifications

Model	Poles	Coil Voltage (50/60Hz VAC)	Power Consumption[1] (VA) 50Hz In-Rush	Power Consumption[1] (VA) 50Hz Sealed	Power Consumption[1] (VA) 60Hz In-Rush	Power Consumption[1] (VA) 60Hz Sealed	Pick-Up Voltage	Drop-Out Voltage
WDP25-1L-120	1 NO+Shunt	120	55	13	25	6.7	85-110% Us (see note 2)	20-65% Us (see note 2)
WDP25-1L-230		230						
WDP25-2L-120	2 NO	120			40	8.8		
WDP25-2L-230		230						
WDP25-3L-120	3 NO	120	51	12	47	9.3		
WDP25-3L-230		230						
WDP30-1L-120	1 NO+Shunt	120	55	13	25	6.7		
WDP30-1L-230		230						
WDP30-1L-24		24						
WDP30-2L-120	2 NO	120			40	8.8		
WDP30-2L-230		230						
WDP30-2L-24		24						
WDP30-3L-120	3 NO	120	51	12	47	9.3		
WDP30-3L-230		230						
WDP30-3L-24		24						
WDP30-3L-480		480						
WDP40-1L-120	1 NO+Shunt	120	55	13	25	6.7		
WDP40-1L-230		230						
WDP40-2L-120	2 NO	120			40	8.8		
WDP40-2L-230		230						
WDP40-3L-120	3 NO	120	51	12	47	9.3		
WDP40-3L-230		230						
WDP40-3L-24		24						
WDP40-3L-480		480						
WDP50-3L-120	3 NO	120	84	14	83	9.3		
WDP50-3L-230		230						
WDP50-3L-24		24						
WDP60-3L-120		120						
WDP60-3L-230		230						
WDP60-3L-24		24						

1 Power consumption is the same for 24, 120, 240, 277, and 480 VAC.
2 Us = Rated control supply voltage, per UL 60947-1

WDP Series Definite Purpose Contactors Accessories

WDP Series Accessories Selection Guide

Model	*Type*	*Contact Arrangement*	*Connection Type*[1]
WDPAXFC11	Auxiliary Contact	1 NO+1 NC	Screw
WDPAXFC11Q		1 NO+1 NC	Quick Connect
WDPAXFD11	Microswitch (SPDT)	1 NO+1 NC	Quick Connect
WDPAXFD22		2 NO+2 NC	Quick Connect

WDP Series DP Contactors Accessories Specifications

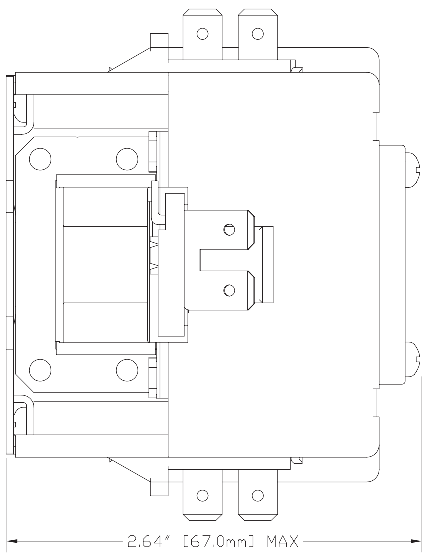
<table>
<tr><th rowspan="3">Model</th><th rowspan="3">Price</th><th rowspan="3">For Use With</th><th rowspan="3">Mounting</th><th rowspan="3">Wiring</th><th colspan="13">Current Ratings</th></tr>
<tr><th colspan="4">Break (A)</th><th colspan="4">Make (A)</th><th>Continous (A)</th><th rowspan="2">125 or 250 VAC</th><th rowspan="2">120 VAC on Lamp Load</th><th rowspan="2">125 VDC</th><th rowspan="2">250 VDC</th></tr>
<tr><th>120VAC</th><th>240VAC</th><th>480VAC</th><th>600VAC</th><th>120VAC</th><th>240VAC</th><th>480VAC</th><th>600VAC</th><th>120-600 VAC</th></tr>
<tr><td>WDPAXFC11</td><td>$17.00</td><td rowspan="2">WDP25-60 (3-Pole only)</td><td rowspan="2">Side mounted[2]</td><td>#6-32 screw terminal, wire range #14-22 AWG</td><td rowspan="4">3</td><td rowspan="4">1.50</td><td rowspan="4">0.75</td><td rowspan="4">0.60</td><td rowspan="4">30</td><td rowspan="4">15</td><td rowspan="4">7.5</td><td rowspan="4">6</td><td rowspan="4">5</td><td rowspan="2">10A, 1/3 hp</td><td rowspan="4">4A</td><td rowspan="4">1/2 A</td><td rowspan="4">1/4 A</td></tr>
<tr><td>WDPAXFC11Q</td><td>$17.00</td><td>0.250 Quick Connection</td></tr>
<tr><td>WDPAXFD11</td><td>$17.00</td><td rowspan="2">WDP25-40 (3-Pole only)</td><td>One switch per side</td><td>0.250 Quick Connection</td><td rowspan="2">15A, 1/3 hp</td></tr>
<tr><td>WDPAXFD22</td><td>$20.00</td><td>Two switches per side</td><td>0.250 Quick Connection</td></tr>
<tr><td colspan="18"></td></tr>
<tr><td>Agency Approvals</td><td colspan="17">UL file #E330834, Standard UL 60947-1</td></tr>
</table>

[1] Quick connects (size 6.3mm, female) may be purchased on the web store www.automationdirect.com
[2] Maximum of two may be mounted.

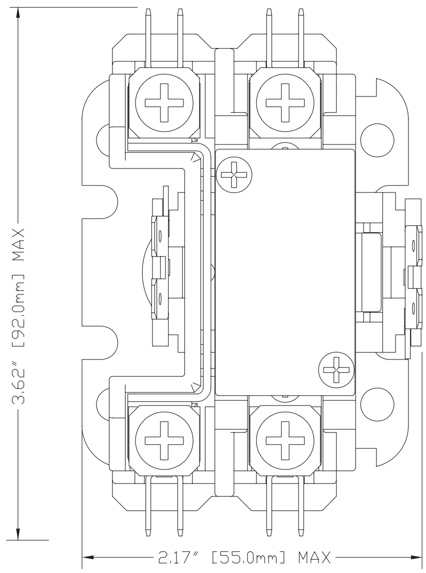
WDP Series Definite Purpose Contactors

Dimensions inches [mm]

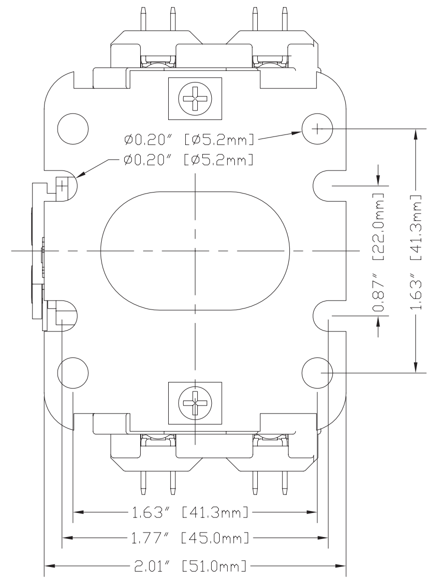
WDP Series 25-40A One Pole Contactors



Side Detail

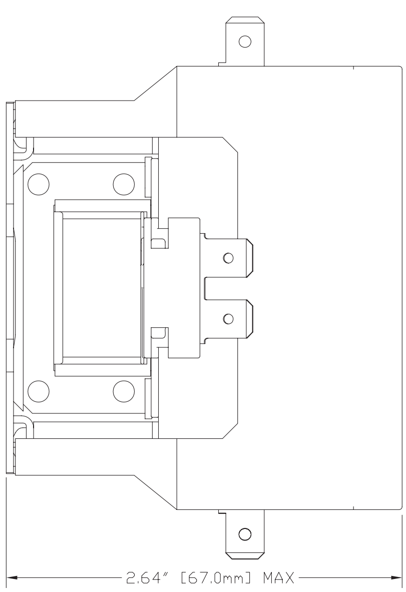


Front Detail

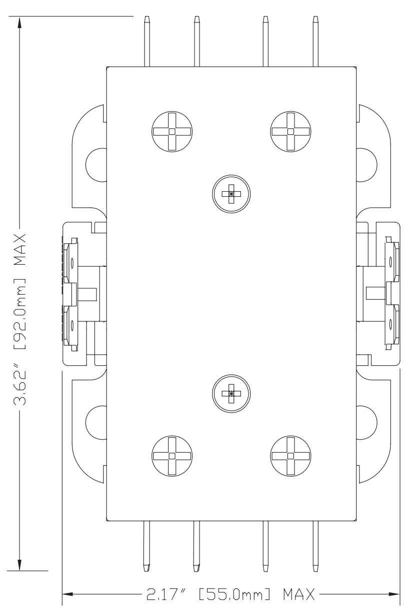


Base Detail

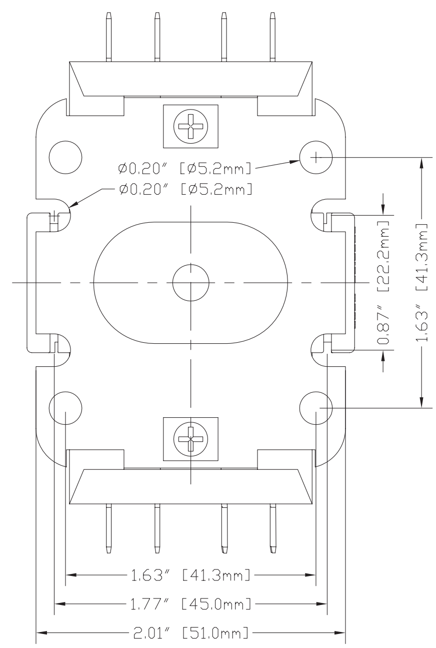
WDP Series 25-40A Two Pole Contactors



Side Detail



Front Detail

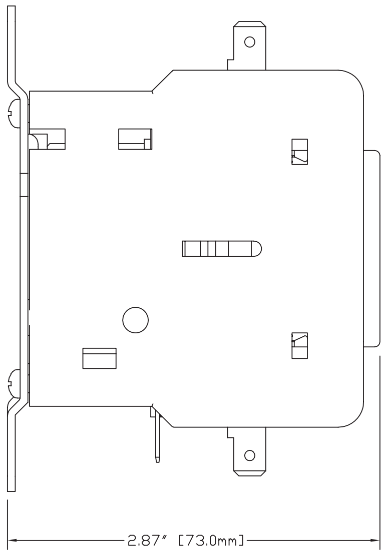


Base Detail

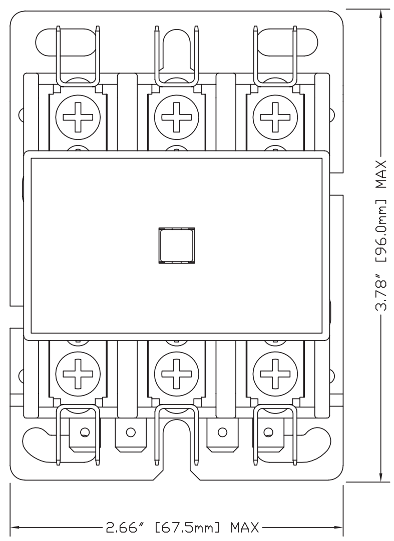
WDP Series Definite Purpose Contactors

Dimensions inches [mm]

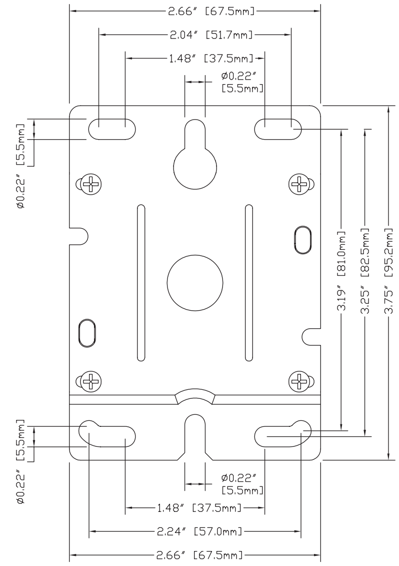
WDP Series 25-40A Three Pole Contactors



Side Detail

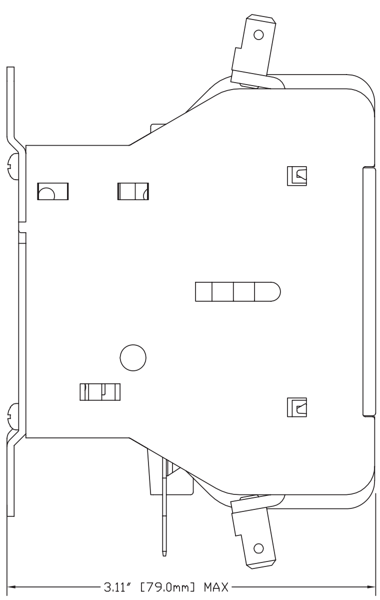


Front Detail

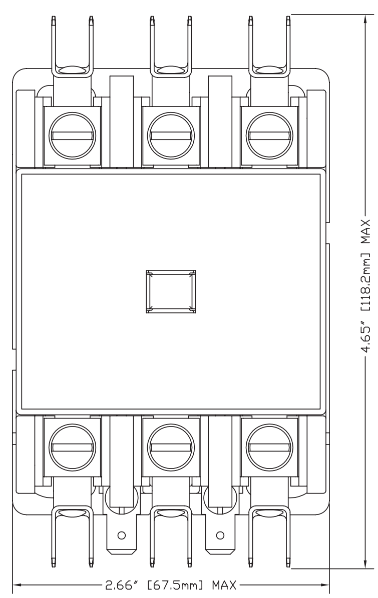


Base Detail

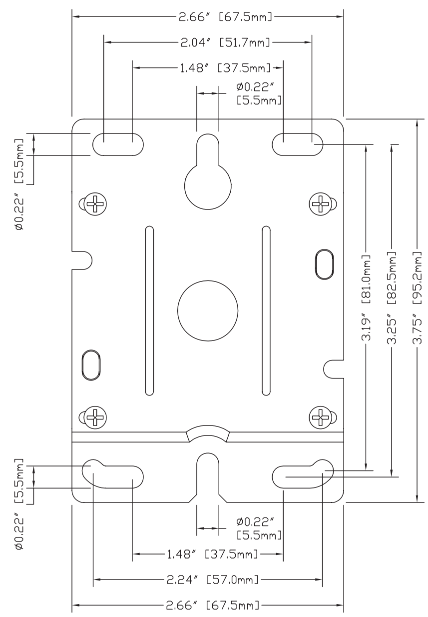
WDP Series 50-60A Three Pole Contactors



Side Detail



Front Detail

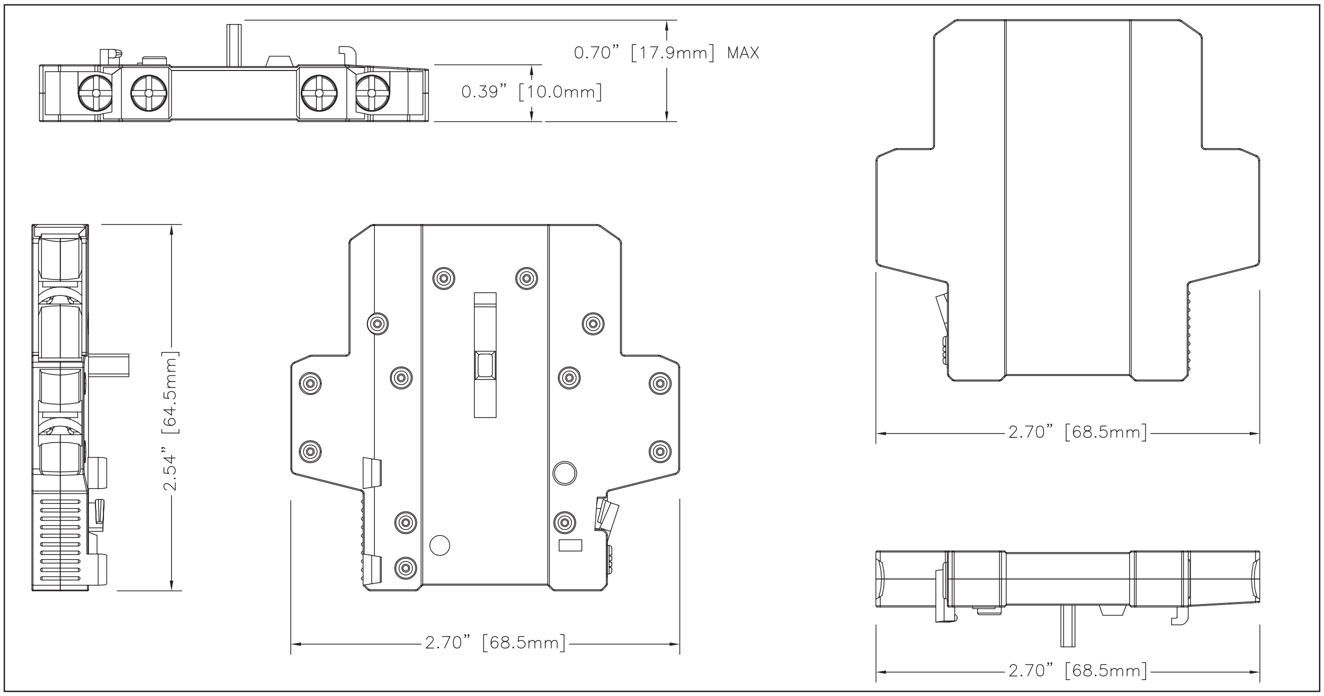


Base Detail

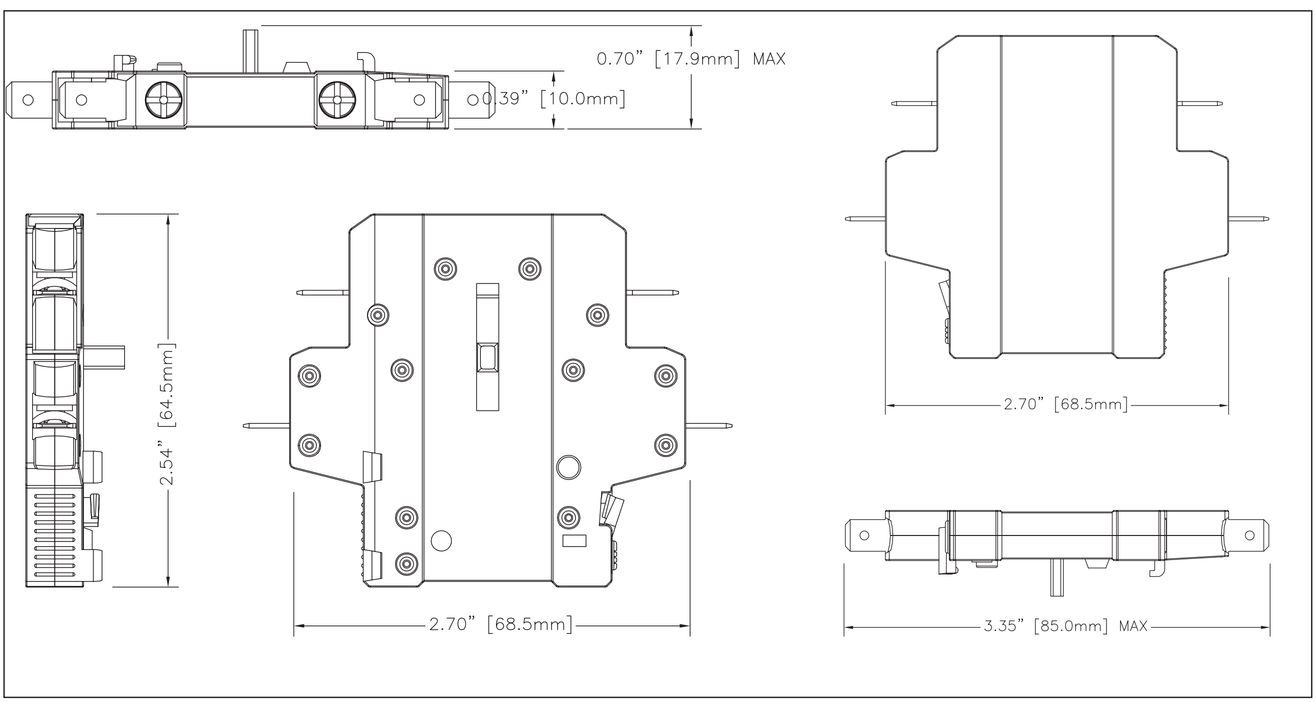
WDP Series Definite Purpose Contactors Accessories

Dimensions inches [mm]

***WDPAXFC11* Accessory**



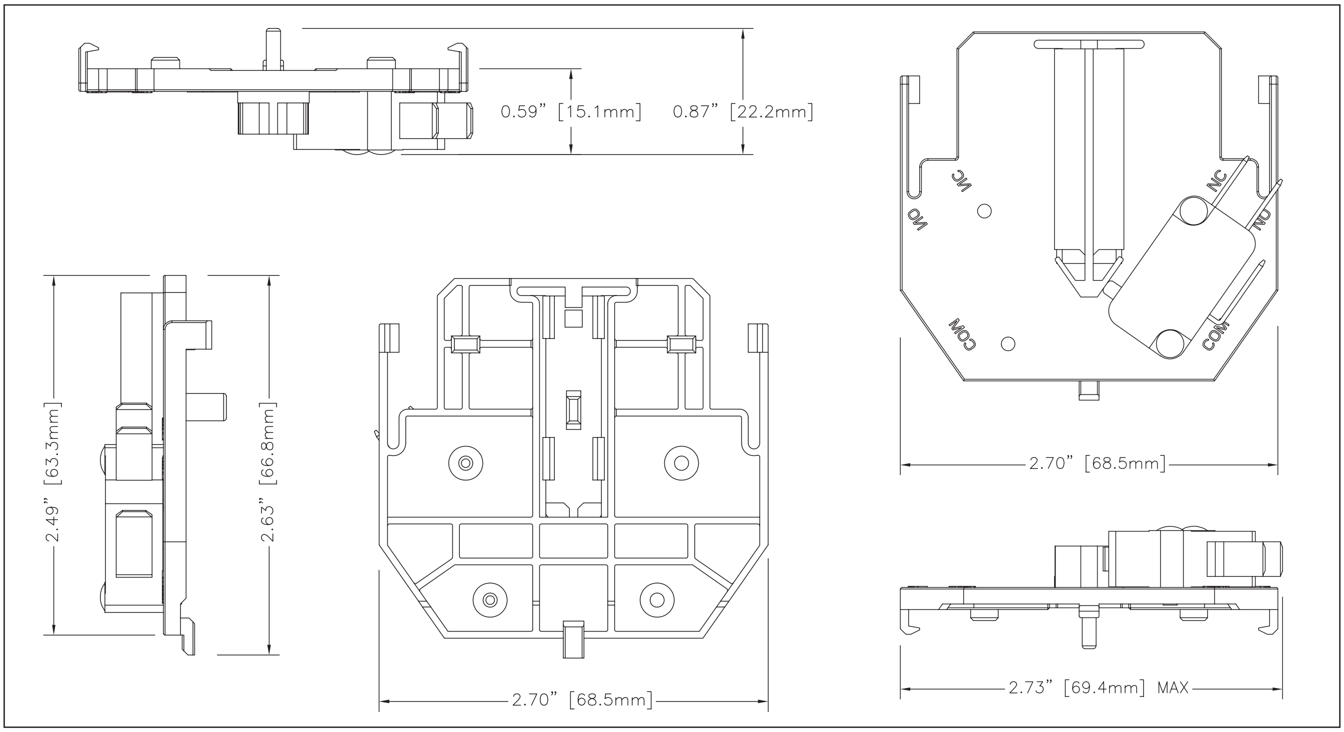
***WDPAXFC11Q* Accessory**



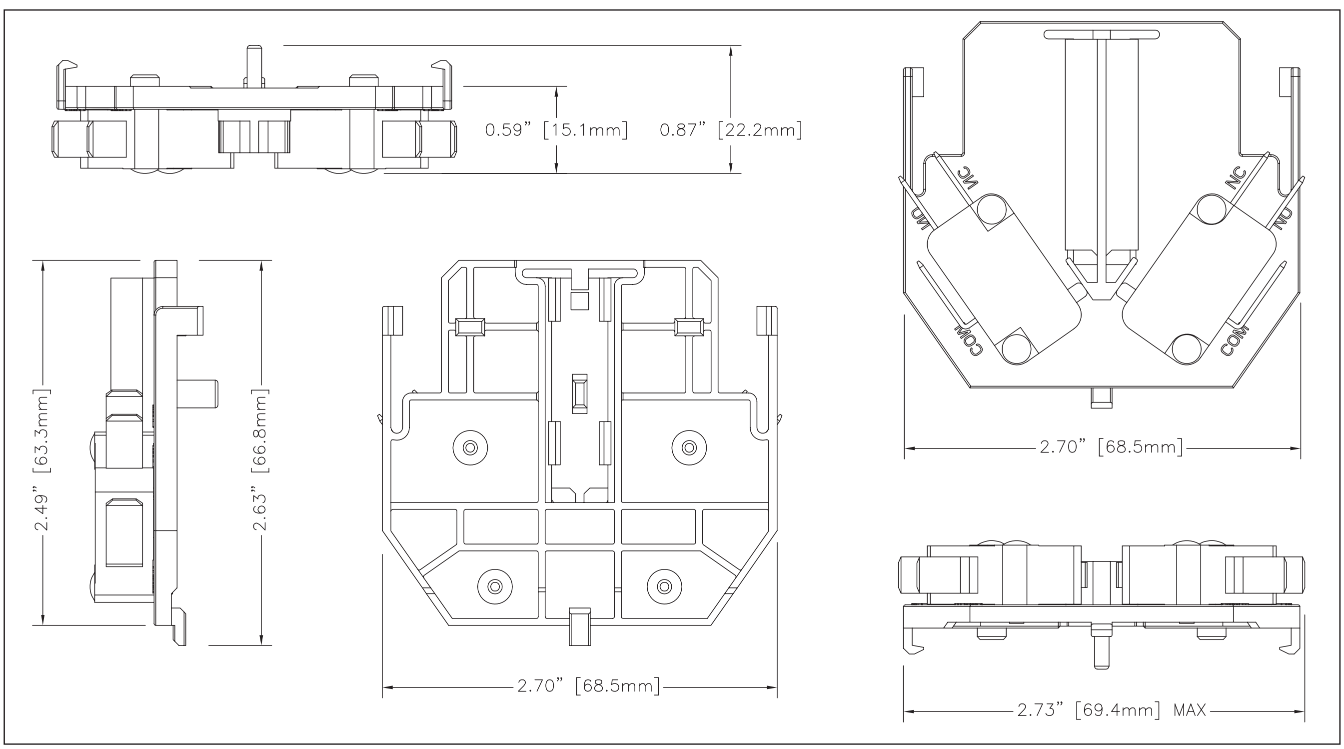
WDP Series Definite Purpose Contactors Accessories

Dimensions inches [mm]

***WDPAXFD11* Accessory**



***WDPAXFD22* Accessory**



BRYANT®

Manual Motor Controllers / Disconnects

Overview

Bryant motor controllers are "suitable as motor disconnects," which means that a motor controller marked as such can also be used as a motor disconnect. From a safety perspective, this means a motor load can now be isolated and locked-out in one convenient location. By utilizing Bryant's compact motor controllers and disconnects, you benefit through the convenience of one device fulfilling two needs. A motor controller is simply used to activate a motor load "ON" or "OFF" and perform this function thousands of times. A motor disconnect, however, is designed and tested to withstand motor overloads and high short-circuit fault currents while maintaining the ability to disconnect the motor for service or maintenance.

According to the 2008 National Electric Code (NEC®) article 430.102, all motor controllers must have a disconnecting means located within the line of sight of the controller. Because the NEC® recognizes that a controller and disconnect can be the same unit (article 430.109), Bryant has designed a compact controller that will also meet the rigorous demands of a motor disconnect. Bryant's controllers are listed as "Suitable as Motor Disconnect" under UL Standard 508 – Industrial Control Equipment – qualifying them to perform both operations in one compact package.

TECH-SPEC®

Features and Benefits

- Thermoset body provides high resistance to electrical arc tracking.
- Silver alloy contacts for excellent conductivity and extended life
- Available NEMA 1, 3/3R and 4X enclosures
- Undrilled enclosures available for custom placement of entry positions
- Lockout / Tagout capability
- Switch sizes in 30, 40 and 60 Amps up to 600 VAC
- 2-pole and 3-pole switch configurations
- Use in indoor and outdoor environments
- Quick make, slow break design
- UL Listed as "Suitable as Motor Disconnect" under UL 508
- Wiring conduit knockouts on NEMA 1 and 3R controllers / disconnects
- Compact design

Applications

- Can be used locally at the motor
- "Suitable as a motor disconnect"
- Across-the-line motor starting
- Industrial machines
- Automation
- Switch contacts AC rated only (not DC rated).

Listings

- UL Listed and Recognized Catagory NLRV, UL file #E70402
- CSA Certified File 46186
- Flammability - UL94HB/V
- Standards
  UL508
  UL60947-1
  CSA C22.2 No 14

BRYANT®

Quick Selection Guide

Manual Motor Controllers / Disconnects

TECH·SPEC®

30002D

40003D

4002

60002D

Toggle Switch AC Motor Controllers / Disconnects

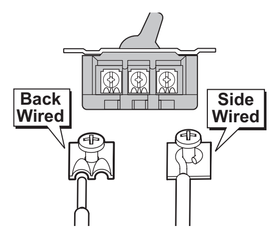
Part Number	Description	Amperage	Phase	Poles	Wired	Price
30002D	Switch only, 30A, 2-pole, 15 HP @ 600 VAC - Standard Toggle	30	1	2	Back and Side	$40.50
30003D	Switch only, 30A, 3-pole, 20 HP @ 600 VAC - Standard Toggle	30	3	3	Back and Side	$85.00
4002*	Switch only, 40A, 2-pole, 5 HP @ 600 VAC - Standard Toggle	40	1	2	Side	$45.50
40002D	Switch only, 40A, 2-pole, 15 HP @ 600 VAC - Standard Toggle	40	1	2	Side	$71.00
40003D	Switch only, 40A, 3-pole, 20 HP @ 600 VAC - Standard Toggle	40	3	3	Side	$115.00
60002D	Switch only, 60A, 2-pole, 20 HP @ 600 VAC - Standard Toggle	60	1	2	Back	$124.00
60003D	Switch only, 60A, 3-pole, 30 HP @ 600 VAC - Standard Toggle	60	3	3	Back	$152.00

*Motor controller only ("Not suitable as disconnect")

Toggle Switch AC Motor Controller Accessories

Part Number	Description	Price
30003FG	Finger guards; red; for use with 30A and 40A Switches (Set of 2)	$11.00
30100	NEMA 1 enclosure without switch, use with 30002D and 30003D	$25.50

Example
Back and Side
Wired



30102D,
30103D

30322D,
30323D

30302D,
30303D

60302D,
60303D

Enclosed Toggle Switch AC Motor Controllers / Disconnects

Part Number	Description	Included Switch	Amperage	Phase	Poles	Enclosure	Price
30102D	Enclosed, 30A, 2-pole, NEMA 1	30002D Standard Toggle	30	1	2	NEMA 1Metal	$52.00
30103D	Enclosed, 30A, 3-pole,NEMA 1	30003D Standard Toggle	30	3	3		$114.00
30302D	Enclosed, 30A, 2-pole, Aluminum	30002D Standard Toggle	30	1	2	NEMA 3RMetal	$78.00
30303D	Enclosed, 30A, 3-pole, Aluminum	30003D Standard Toggle	30	3	3		$139.00
30322D*	Enclosed, 30A, 2-pole, Plastic	30002DS Short Toggle	30	1	2	NEMA 3R Thermoplastic	$90.00
30323D*	Enclosed, 30A, 3-pole, Plastic	30003DS Short Toggle	30	3	3		$96.00
60302D*	Enclosed, 60A, 2-pole, Aluminum	60002FWD Standard Toggle	60	1	2	NEMA 3R Metal	$181.00
60303D*	Enclosed, 60A, 3-pole, Aluminum	60003FWD Standard Toggle	60	3	3		$211.00

*Switch is not available as a separate item

664X33D

664X63D

NEMA 4X Enclosed Rotary Switch AC Motor Controllers / Disconnects

Part Number	Description	Included Switch	Amperage	Phase	Poles	Enclosure	Price
664X33D*	Enclosed, 30A, 3-pole, NEMA 4X	66033D Rotary	30	3	3	NEMA 4X Thermoplastic	$189.00
664X63D*	Enclosed, 60A, 3-pole, NEMA 4X	66033D Rotary	60	3	3		$237.00

*Switch is not available as a separate item

NEMA 4X Enclosed Rotary Switch AC Motor Controller Accessories

Part Number	Description	Price
30003FG	Finger Guards; red; for use with 30A and 40A Switches (Set of 2)	$11.00
660AC*	SPDT Auxiliary contact NO / NC; includes one contact for use with push-on terminals; use with 664X33D and 664X63D	$27.00
6610MK	Rotary handle replacement kit, use with 664X33D and 664X63D. (Nema 1 rating) Must use gasket replacement kit 664XWP for NEMA 4X rating.	$22.00
664XWP	NEMA 4X enclosure gasket replacement kit; includes 4 seals, neoprene bushing and 3 o-rings; use with 664X33D and 664X63D	$14.00
664XFT	NEMA 4X enclosure mounting feet	$13.00
6603N	NEMA 4X enclosure neutral buss connector	$63.00

*660AC Terminal is a quick connect terminal #250

BRYANT®

Manual Motor Controllers / Disconnects

Toggle Switch

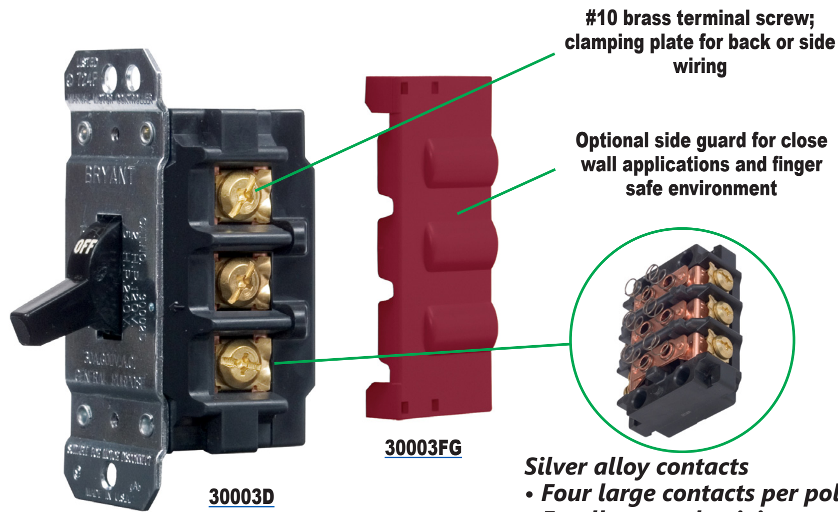
Toggle AC manual motor controllers can be integrated into your equiment design as a manual motor controller or as a motor disconnect. Quick-make and slow break operation provides reliability and long life. Each toggle switch controller has a 10,000 amp high fault short circuit withstand rating.

Toggle Switch Features

TECH·SPEC®

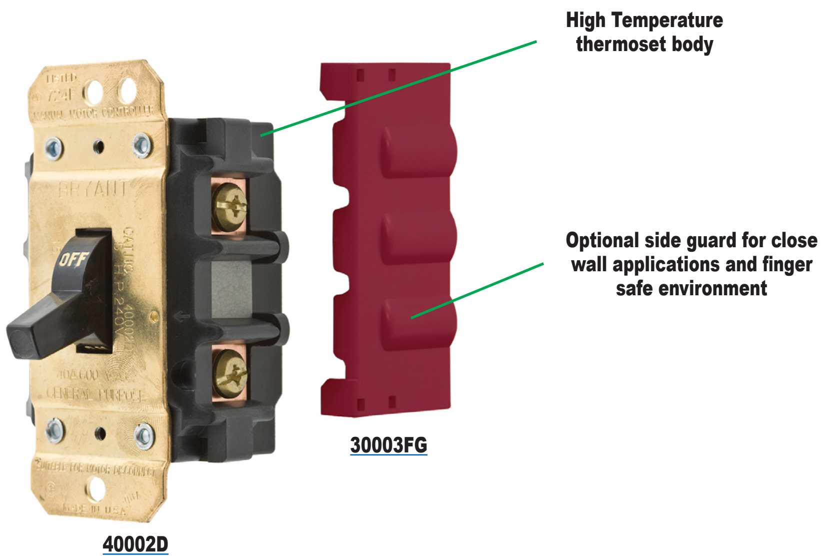
Thermoset Body

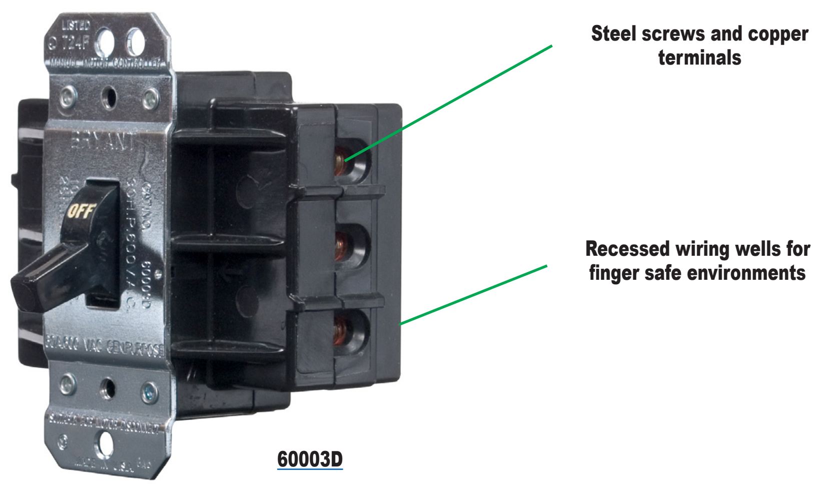
- Provides high resistance to electrical arc tracking
- Withstands high temperatures
- Excellent dimensional stability
- Superior dielectric strength



Silver alloy contacts

- ***Four large contacts per pole***
- ***Excellent conductivity***
- ***Extended life***

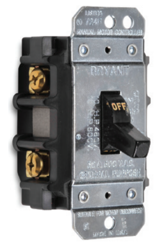




BRYANT®

Toggle Switch

Manual Motor Controllers / Disconnects



30002D

Toggle Switch AC Motor Controllers / Disconnects									
Part Number	***Amperage***	***Phase***	***Poles***	***HP Ratings***				***Wired***	***Price***
				120 VAC	***240 VAC***	***480 VAC***	***600 VAC***		
30002D	30	1	2	2	5	10	15	Back and Side	$40.50
30003D	30	3	3	3	7.5	15	20	Back and Side	$85.00
4002*	40	1	2	2	5	10	15	Side	$45.50
40002D	40	1	2	2	5	10	15	Side	$71.00
40003D	40	3	3	3	7.5	15	20	Side	$115.00
60002D	60	1	2	–	10	15	20	Back	$124.00
60003D	60	3	3	–	10	25	30	Back	$152.00

*Motor controller only ("Not suitable as disconnect")

40003D

Toggle Switch AC Motor Controller Accessories		
Part Number	***Description***	***Price***
30003FG	Finger guards; red; for use with 30A and 40A switches (Set of 2)	$11.00
30100	NEMA 1 enclosure without switch, use with 30002D and 30003D	$25.50

4002

TECH·SPEC®

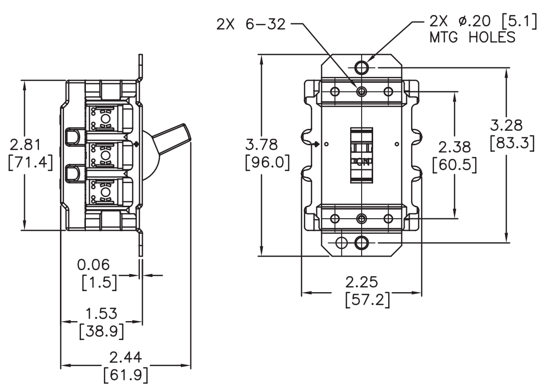
30003FG

30100

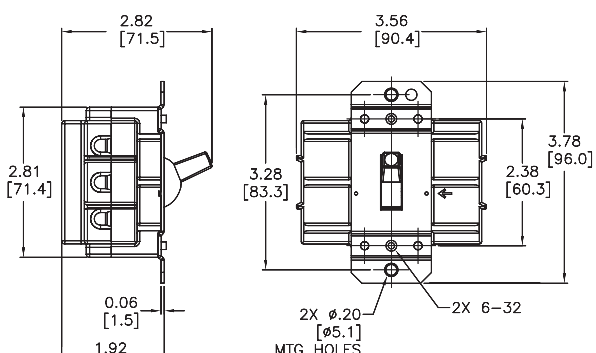
60002D

Dimensions

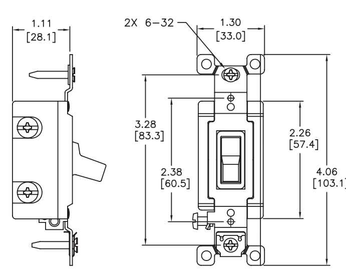
Inches [mm]



30002D, 30003D, 40002D, 40003D



60002D, 60003D



4060003D02

Dimensions are approximate
Not for construction purposes

BRYANT®

Manual Motor Controllers / Disconnects

Enclosed Toggle Switch

Enclosed toggle AC manual motor controllers feature NEMA 1 or NEMA 3R enclosures and can be used as motor controllers or disconnects. The NEMA 1 metal enclosed switches are ideal for use in indoor enviroments. The thermoplastic and metal NEMA 3R enclosed switches are raintight for use outdoors.

Enclosed Toggle Switch Features

NEMA 1 Motor Controllers / Disconnects

Wiring conduit knockouts

- 1/2 inch and 3/4 inch NPT
- Top, bottom or back wire entry points
- Surface mount control

NEMA 3 / 3R Motor Controllers / Disconnects

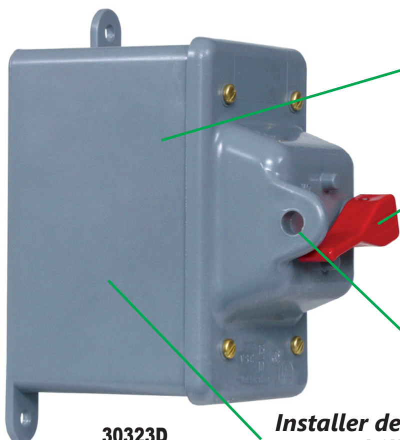
- Raintight enclosures
- Designed for surface mounting

Lockout / Tagout capability

All aluminum cover and base; base is pre-drilled for rear surface mounting

30103D

TECH·SPEC®



Valox® enclosure; chemical and impact resistant

External activation lever switch

Lockout / Tagout capability

Installer determined wire entry; no pre-drilled openings or knockouts

30323D

Rain tight drip shield top; rolled seamless sides

All aluminum cover and base; base is pre-drilled for rear surface mounting

Wiring conduit knockouts; 1/2 inch NPT KO for 30 amp; bottom or back wire entry points

Lockout / Tagout capability

30303D

All aluminum cover and base; base is pre-drilled for rear surface mounting

Wiring conduit knockouts; 3/4 inch / 1 inch NPT KO for 60 amp; bottom or back wire entry points

60303D

Valox® is a registered trademark of SABIC Innovative Plastics.

BRYANT®

Manual Motor Controllers / Disconnects

Enclosed Toggle Switch

30102D, 30103D

30302D, 30303D

30322D, 30323D

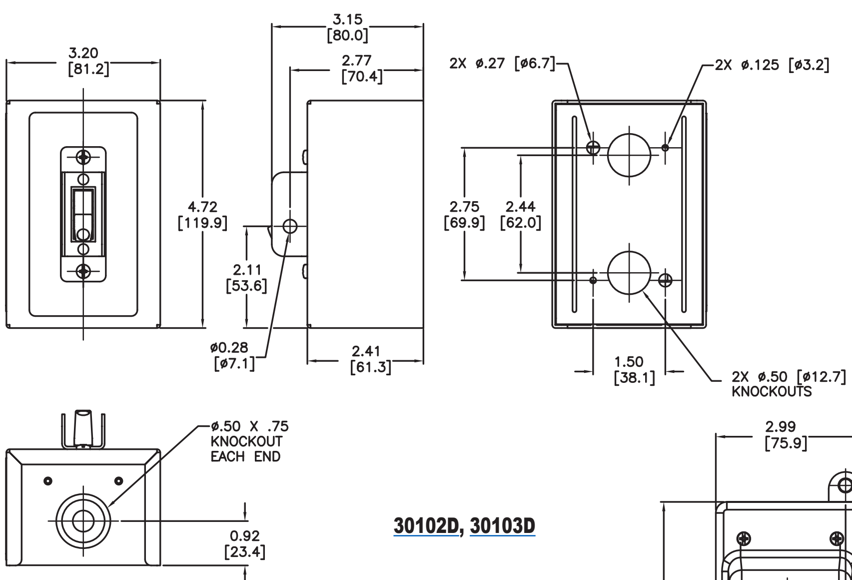
60302D, 60303D

TECH·SPEC®

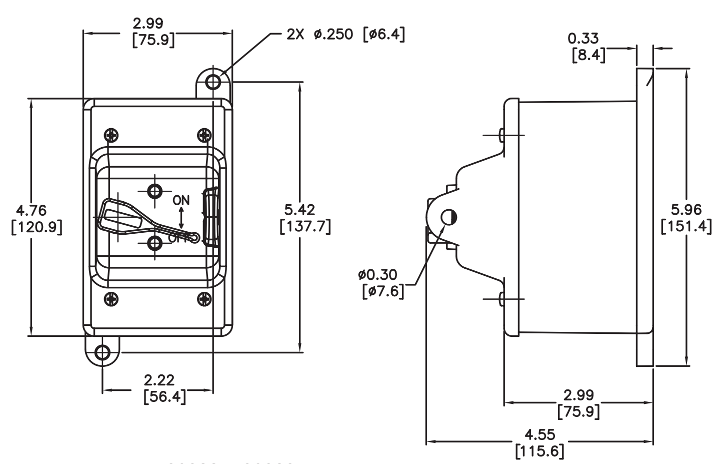
Enclosed Toggle Switch AC Motor Controllers / Disconnects									
Part Number	***Amperage***	***Phase***	***Poles***	***HP Ratings***				***Enclosure***	***Price***
				120 VAC	***240 VAC***	***480 VAC***	***600 VAC***		
30102D	30	1	2	2	5	10	15	NEMA 1 Metal	$52.00
30103D	30	3	3	3	7.5	15	20		$114.00
30302D	30	1	2	2	5	10	15	NEMA 3R Metal	$78.00
30303D	30	3	3	3	7.5	15	20		$139.00
30322D*	30	1	2	2	5	10	15	NEMA 3R Thermoplastic	$90.00
30323D*	30	3	3	–	7.5	15	20		$96.00
60302D*	60	1	2	–	10	15	20	NEMA 3R Metal	$181.00
60303D*	60	3	3	–	10	25	30		$211.00

*Switch is not available as a separate item

Dimensions [in (mm)}



30102D, 30103D



Dimensions are approximate - Not for construction purposes

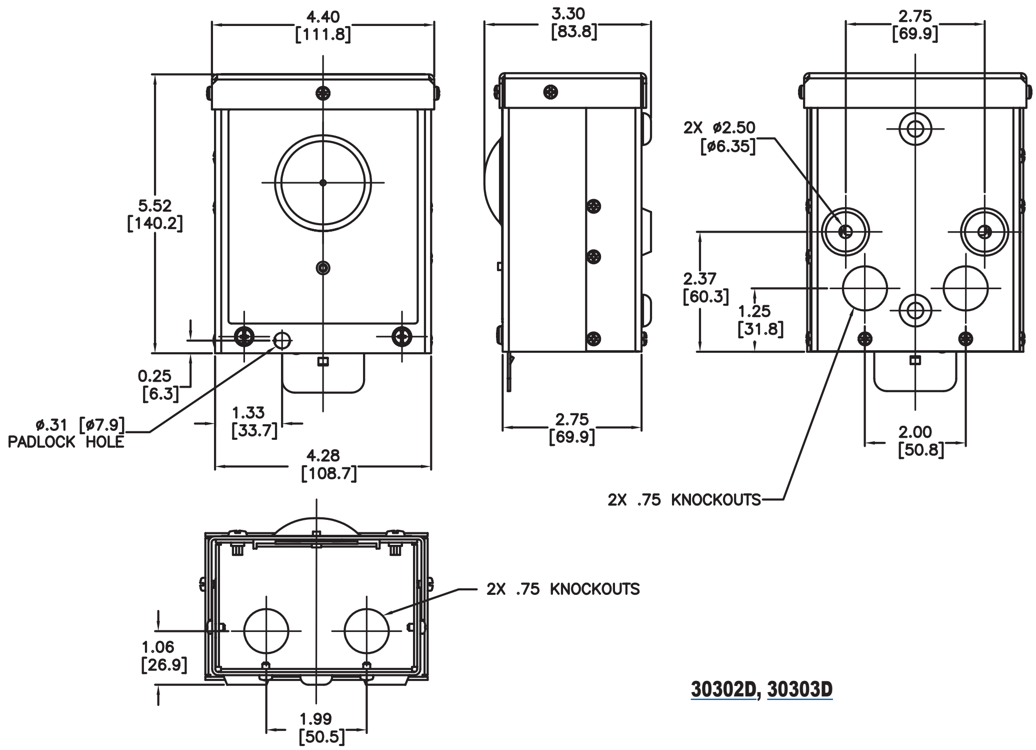
30322D, 30323D

Manual Motor Controllers / Disconnects

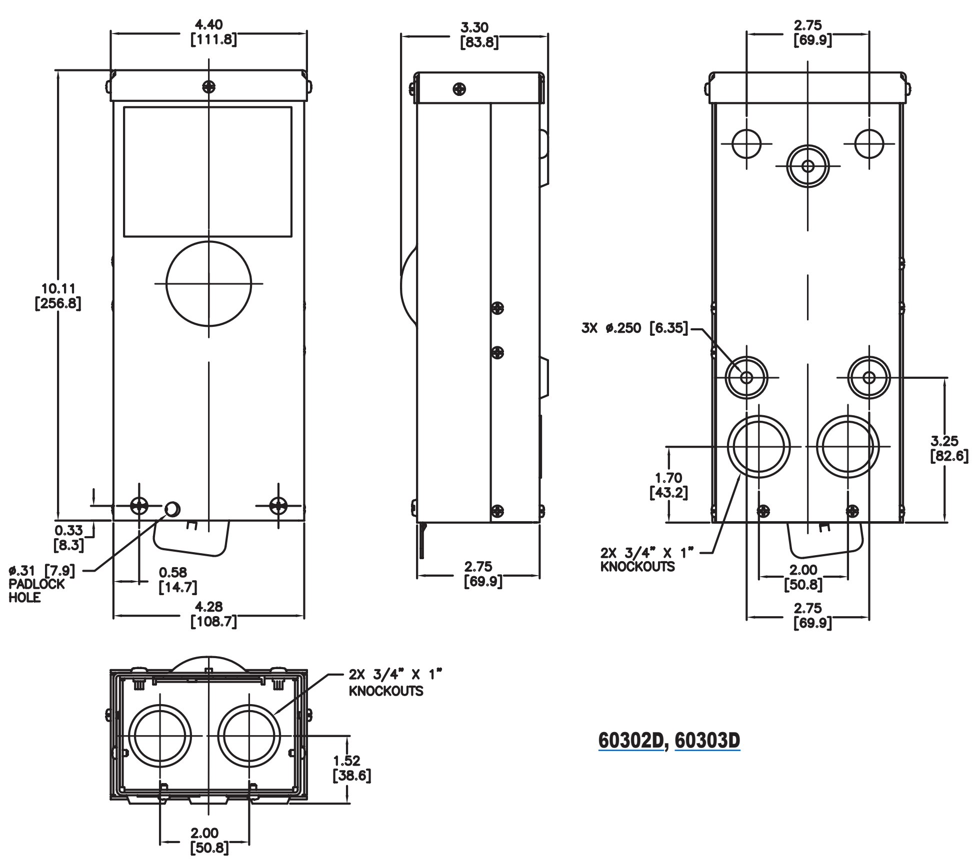
Enclosed Toggle Switch

TECH-SPEC®

Dimensions [in (mm)}



30302D, 30303D



60302D, 60303D

BRYANT®

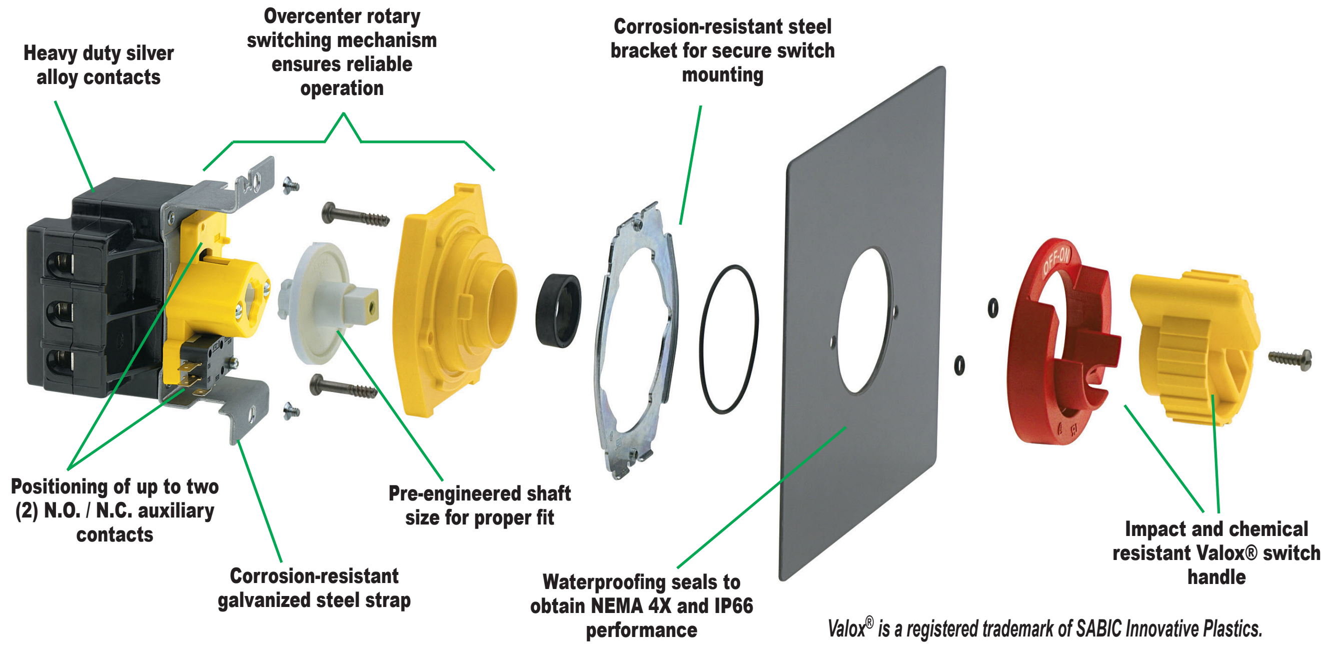
Manual Motor Controllers/Disconnects

NEMA 4X Enclosed Rotary Switch

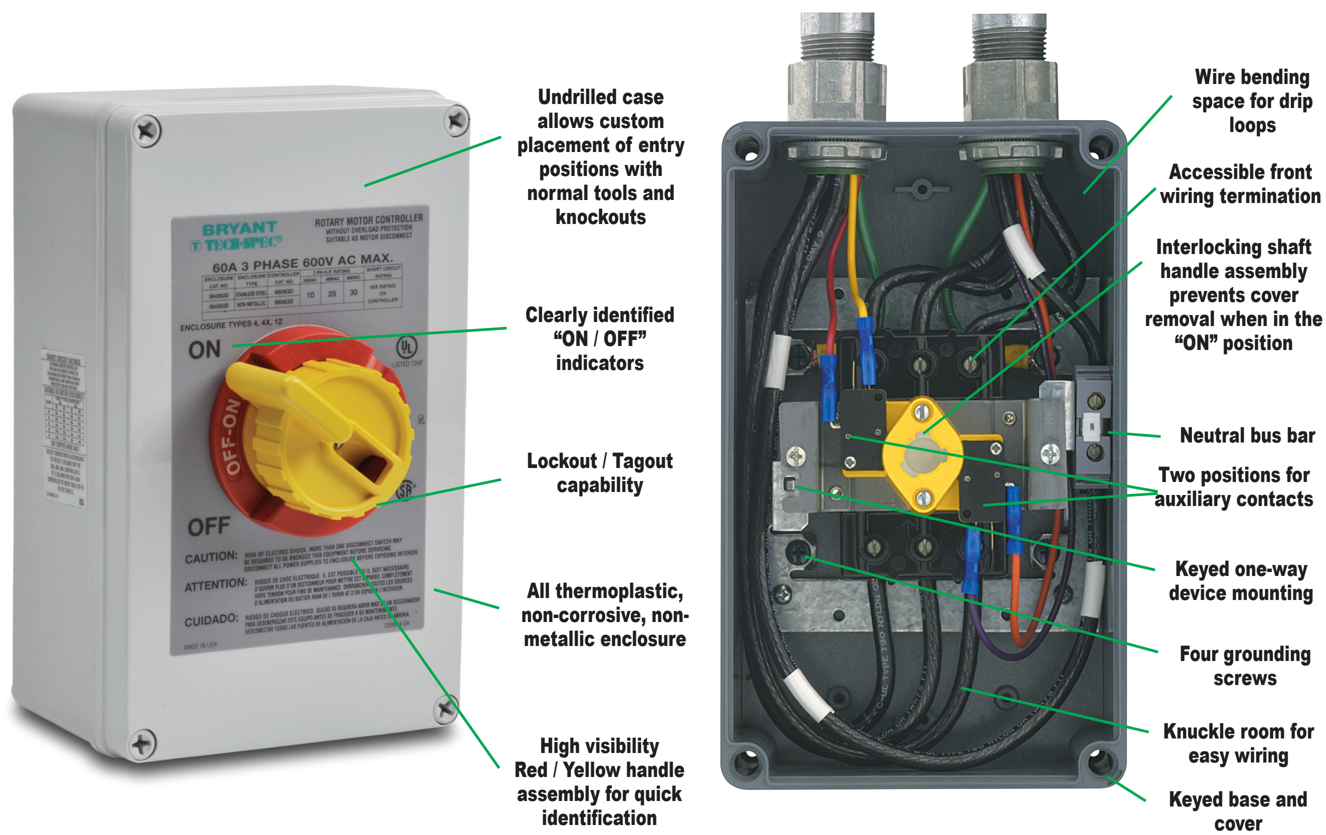
NEMA 4X enclosed toggle switch AC manual motor controllers are ideal for heavy wash down and corrosive environments. They feature thermoplastic bodies and can be used as a motor controller or disconnect.

TECH·SPEC®

NEMA 4X Enclosed Rotary Switch Features



Valox® is a registered trademark of SABIC Innovative Plastics.



BRYANT®

NEMA 4X Enclosed Rotary Switch

Manual Motor Controllers/Disconnects

NEMA 4X Enclosed Rotary Switch AC Motor Controllers

Part Number	Amperage	Phase	Poles	HP Ratings 120 VAC	240 VAC	480 VAC	600 VAC	Enclosure	Price
664X33D*	30	3	3	3	7.5	15	20	NEMA 4X Thermoplastic	$189.00
664X63D*	60	3	3	–	10	25	30		$237.00

*Sold as a complete unit only

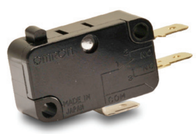
664X33D

NEMA 4X Enclosed Rotary Switch AC Motor Controller Accessories

Part Number	Description	Price
30003FG	Finger Guards; red; for use with 30A and 40A Switches (Set of 2)	$11.00
660AC*	SPDT Auxiliary contact NO / NC. includes one contact for use with push-on terminals, use with 664X33D and 664X63D	$27.00
6610MK	Rotary handle replacement kit, use with 664X33D and 664X63D (Nema 1 rating) Must use gasket replacement kit 664XWP for NEMA 4X rating.	$22.00
664XWP	NEMA 4X enclosure gasket replacement kit; includes 4 seals, neoprene bushing and 3 o-rings; use with 664X33D and 664X63D	$14.00
664XFT	NEMA 4X enclosure mounting feet	$13.00
6603N	NEMA 4X enclosure neutral bus connector	$63.00

*660AC Terminal is a quick connect terminal #250

30003FG



660AC

6610MK

664XWP

664XFT

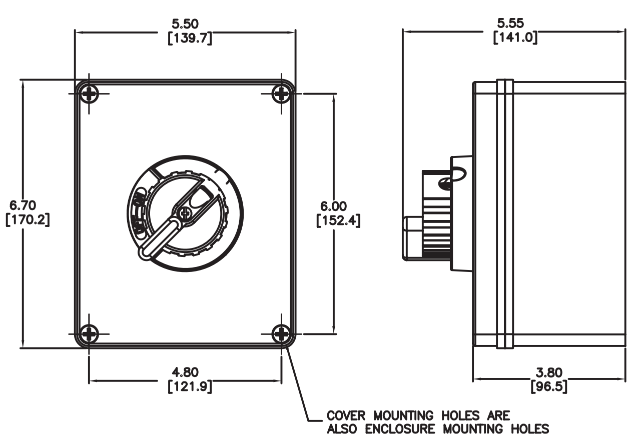
6603N

664X63D

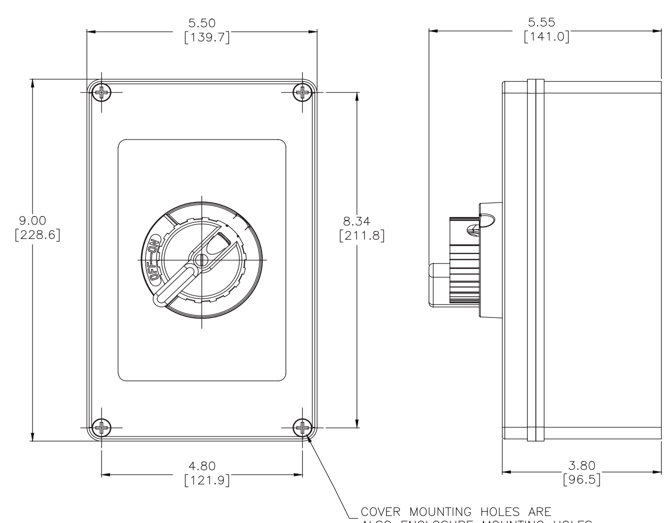
TECH·SPEC®

Dimensions [in (mm)]

Dimensions are approximate
Not for construction purposes



664X33D



664X63D

Manual Motor Controllers / Disconnects

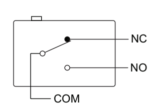
TECH-SPEC®

Specifications

General Specifications

Type	Part Number	Weight	Short Circuit Withstand Rating	Dielectric Voltage	Electrical Life	Max Working Voltage	Mechanical Life	Operating Temperature
Standard Toggle Switch	30002D	0.4 lb (181g)	10 kA 60A max J fuses or 125A max RK5 fuses	2,200V AC minimum for 1 minute	6,000 cycles at rated switch load	600 VAC RMS	10,000 minimum cycles	-40 °C (-40 °F) to 60 °C (140 °F)
	30003D	0.5 lb (227g)						
	4002	0.1 lb (45g)						
	40002D	0.4 lb (181g)						
	40003D	0.5 lb (227g)						
	60002D	0.7 lb (318g)	10 kA 80A max J fuses or 125A max RK5 fuses					
	60003D							
Enclosed Toggle Switch	30102D	1.0 lb (454g)	10 kA 60A max J fuses or 125A max RK5 fuses					
	30103D							
	30302D	1.3 lb (590g)						
	30303D							
	30322D	2.2 lb (998g)						
	30323D							
	60302D	1.9 lb (861g)	10 kA 80A max J fuses or 125A max RK5 fuses					
	60303D	2.0 lb (907g)						
Enclosed Rotary Switch	664X33D	2.5 lb (1,134g)						
	664X63D	3.0 lb (1,361g)						

NEMA 4X Enclosed Rotary Switch AC Motor Controller Accessory Specifications

Part Number		Switch Type	Load	Contact Material
660AC		SPDT	15A @ 250 VAC Resistive, 10A @ 250 VAC Inductive 10A @ 30VDC Resistive and Inductive	Silver Alloy

Wiring Specifications

Type	Part Number	Cable Size		Tightening Torque	
Toggle Switch	30002D	14 to 10 AWG	2.5 to 6 mm^2	20 lb·in	2.3 N·m
	30003D				
	4002	14 to 8 AWG	2.5 to 10 mm^2		
	40002D				
	40003D				
	60002D	14 to 6 AWG	2.5 to 16 mm2	25 lb·in	2.8 N·m
	60003D				
Enclosed Toggle Switch	30102D	14 to 10 AWG	2.5 to 6 mm^2	20 lb·in	2.3 N·m
	30103D				
	30302D				
	30303D				
	30322D				
	30323D				
	60302D	14 to 6 AWG	2.5 to 16 mm^2	25 lb·in	2.8 N·m
	60303D				
Enclose Rotary Switch	664X33D				
	664X63D				

Note: Bryant does not recommend the use of wire ferrules or crimping terminals. The wire gauges are specified above and in the installation instructions included with each manual motor controller.

CWB Series Contactors

Overview

Developed according to IEC 60947 and UL 508 international standards, the new WEG CWB line of contactors meets the requirements of a wide range of industrial applications. The CWBs are designed with the visual pattern and identity of WEG, a brand recognized worldwide for its quality.

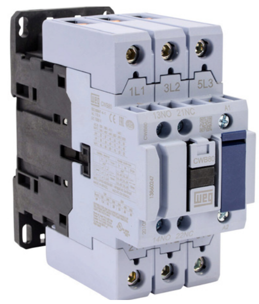
Features

- "Zero-width" mechanical interlock
- Simple and compact mounting of surge suppressor blocks
- Available with AC or DC coils
- Simple and organized control circuits
- Additional contact blocks
- Easy access power and control terminals

UL File No. E202315

CWB9-11-30D15

CWB25-11-30D15



CWB80-11-30D15

CWB9-11-30C03

CWB25-11-30C03

CWB80-11-30C03

CWB Contactor Catalog Number Sequence

CWB	12	-	11	-	30	D15

Contactor Series
CWB-IEC

Current Rating (IEC)
9: 9A
12: 12A
18: 18A
25: 25A
32: 32A
38: 38A
40: 40A
50: 50A
65: 65A
80: 80A

Auxiliary Contacts
11: 1NO+1NC

Power Poles
30: 3 NO Power Poles

Voltage Code	
AC Voltage	**DC Voltage**
D15: 120V	C03: 24V
V24: 208-240V	
D39: 480V	

Table intended as reference only and not to create part numbers.

CWB Series Contactors

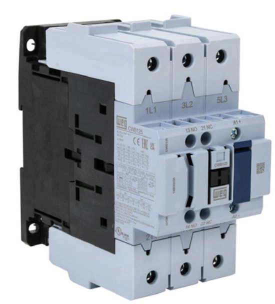
CWB Series Three-Pole Contactors – AC and AC/DC Coil – Selection Guide

Part Number	Price	Coil Voltage	Ie Max (Ue≤440V) AC-3 (A)	Maximum UL Horsepower Single-Phase 115V	Single-Phase 230V	Three-Phase 200V	Three-Phase 230V	Three-Phase 480V	Three-Phase 575V	Built-In Auxiliary Contacts Per Contactor N.O.	N.C.	Drawing
AC Coil												
CWB9-11-30D15	$29.50	120VAC										PDF
CWB9-11-30V24	$29.50	208-240 VAC	9	0.75	1.5	3	3	5	7.5	1	1	PDF
CWB9-11-30D39	$29.50	480VAC										PDF
CWB12-11-30D15	$33.00	120VAC										PDF
CWB12-11-30V24	$33.00	208-240 VAC	12	0.75	2	3	3	7.5	10	1	1	PDF
CWB12-11-30D39	$33.00	480VAC										PDF
CWB18-11-30D15	$40.50	120VAC										PDF
CWB18-11-30V24	$40.50	208-240 VAC	18	1	3	5	5	10	15	1	1	PDF
CWB18-11-30D39	$40.50	480VAC										PDF
CWB25-11-30D15	$47.00	120VAC										PDF
CWB25-11-30V24	$47.00	208-240 VAC	25	2	5	7.5	7.5	15	15	1	1	PDF
CWB25-11-30D39	$47.00	480VAC										PDF
CWB32-11-30D15	$56.00	120VAC										PDF
CWB32-11-30V24	$56.00	208-240 VAC	32	3	5	10	10	20	25	1	1	PDF
CWB32-11-30D39	$56.00	480VAC										PDF
CWB38-11-30D15	$65.00	120VAC										PDF
CWB38-11-30V24	$64.00	208-240 VAC	38	3	7.5	10	10	25	25	1	1	PDF
CWB38-11-30D39	$65.00	480VAC										PDF
CWB40-11-30D15	$66.00	120VAC										PDF
CWB40-11-30V24	$66.00	208-240 VAC	40	3	7.5	10	15	30	30	1	1	PDF
CWB40-11-30D39	$66.00	480VAC										PDF
CWB50-11-30D15	$88.00	120VAC										PDF
CWB50-11-30V24	$88.00	208-240 VAC	50	3	10	15	15	40	40	1	1	PDF
CWB50-11-30D39	$88.00	480VAC										PDF
CWB65-11-30D15	$101.00	120VAC										PDF
CWB65-11-30V24	$101.00	208-240 VAC	65	5	10	20	20	50	50	1	1	PDF
CWB65-11-30D39	$101.00	480VAC										PDF
CWB80-11-30D15	$107.00	120VAC										PDF
CWB80-11-30V24	$107.00	208-240 VAC	80	7.5	15	20	25	50	60	1	1	PDF
CWB80-11-30D39	$107.00	480VAC										PDF
CWB95-11-30D02	$143.00	24VAC										PDF
CWB95-11-30D15	$143.00	120VAC										PDF
CWB95-11-30D24	$143.00	230VAC	95	7.5	20	30	30	75	75	1	1	PDF
CWB95-11-30D39	$143.00	480VAC										PDF
CWB95-11-30D77	$143.00	208VAC										PDF
CWB110-11-30D02	$164.00	24VAC										PDF
CWB110-11-30D15	$164.00	120VAC										PDF
CWB110-11-30D24	$164.00	230VAC	110	10	25	30	40	75	100	1	1	PDF
CWB110-11-30D39	$164.00	480VAC										PDF
CWB110-11-30D77	$164.00	208VAC										PDF

AC/DC Coil With Electronic Module												
CWB95-11-30E04	$176.00	24-60 VAC/DC	95	7.5	20	30	30	75	75	1	1	PDF
CWB95-11-30E65	$176.00	110-255 VAC/DC										PDF
CWB110-11-30E04	$215.00	24-60 VAC/DC	125	10	25	40	40	100	125	1	1	PDF
CWB110-11-30E65	$215.00	110-255 VAC/DC										PDF
CWB125-11-30E04	$293.00	24-60 VAC/DC										PDF
CWB125-11-30E65	$293.00	110-255 VAC/DC										PDF

CWB9-11-30D15

CWB80-11-30D39



CWB125-11-30E65

CWB Series Contactors

CWB Series Three-Pole Contactors – DC Coil – Selection Guide												
Part Number	Price	Coil Voltage (VDC)	Ie Max (Ue ≤ 440V) AC-3 (A)	Maximum UL Horsepower Single-Phase 115V	Maximum UL Horsepower Single-Phase 230V	Maximum UL Horsepower Three-Phase 200V	Maximum UL Horsepower Three-Phase 230V	Maximum UL Horsepower Three-Phase 480V	Maximum UL Horsepower Three-Phase 575V	Built-In Auxiliary Contacts Per Contactor N.O.	Built-In Auxiliary Contacts Per Contactor N.C.	Drawing
CWB9-11-30C03	$35.00	24	9	0.75	1.5	3	3	5	7.5	1	1	PDF
CWB12-11-30C03	$41.00		12	0.75	2	3	3	7.5	10	1	1	PDF
CWB18-11-30C03	$49.00		18	1	3	5	5	10	15	1	1	PDF
CWB25-11-30C03	$50.00		25	2	5	7.5	7.5	15	15	1	1	PDF
CWB32-11-30C03	$71.00		32	3	5	10	10	20	25	1	1	PDF
CWB38-11-30C03	$79.00		38	3	7.5	10	10	25	25	1	1	PDF
CWB40-11-30C03	$85.00		40	3	7.5	10	15	30	30	1	1	PDF
CWB50-11-30C03	$121.00		50	3	10	15	15	40	40	1	1	PDF
CWB65-11-30C03	$139.00		65	5	10	20	20	50	50	1	1	PDF
CWB80-11-30C03	$165.00		80	7.5	15	20	25	50	60	1	1	PDF

CWB9-11-30C03

CWB80-11-30C03

CWB Series Contactors Accessories

BFB-11

BLB-11

BFB-20

BFB-22

BFB-40

BFB-04

WEG CWB Series Contactors Accessories – Front Mounted Auxiliary Contact Blocks Selection Guide

Part Number	Price	For Use With	Max. number of additional contacts/contactor	Auxiliary contacts		Weight g [oz]	Dimensional Drawing
				NO	NC		
BFB-11	$8.00	CWB9 through CWB80	4	1	1	63 [2.22]	PDF
BFB-20	$8.25			2	0	63 [2.22]	PDF
BFB-22	$12.50			2	2	63 [2.22]	PDF
BFB-40	$12.50			4	0	63 [2.22]	PDF
BFB-04	$12.50			0	4	63 [2.22]	PDF

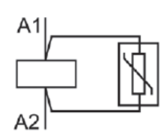
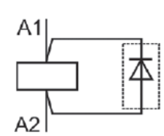
NOTES: The maximum number of auxiliary contacts assembled on the contactor is 4.

WEG CWB Series Contactors Accessories – Side Mounted Auxiliary Contact Blocks Selection Guide

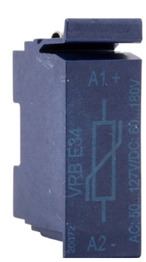
Part Number	Price	For Use With	Max. Number of Additional Contacts/Contactor	Auxiliary Contacts		Weight g [oz]	Dimensional Drawing
				NO	NC		
BLB-11	$8.75	CWB9 through CWB80	4	1	1	34 [1.20]	PDF

NOTE: The maximum number of auxiliary contacts assembled on the contactor is 4.

WEG CWB Series Contactors Accessories – Plug-In Surge Suppressors Selection Guide

Part Number	Price	For Use With	Voltage	Diagram	Weight g [oz]	Dimensional Drawing
VRB-E34	$12.50	CWB9 through CWB80	50-127 VAC 50/60 Hz 60-180 VDC		8 [0.28]	PDF
VRB-E50	$12.50		130-250 VAC 50/60 Hz 180-300 VDC		8 [0.28]	PDF
VRB-D73	$12.50		400-510 VAC 50/60 Hz		8 [0.28]	PDF
DIB-C33	$12.50		12-600 VDC		8 [0.28]	PDF

DIB-C33



VRB-E34

CWB Series Contactors Accessories and Spare Parts

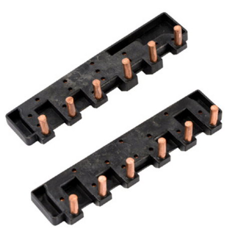
IM1

WEG CWB Series Contactors Accessories – Mechanical Interlock Selection Guide				
Part Number	***Price***	***For Use With***	***Description***	***Dimensional Drawing***
IM1	$5.25	CWB9 through CWB 38	Mounting set for interlocking two contactors with the same frame type. Fitting through snaps without tools.	PDF
IM2	$6.50	CWB40 through CWB80		PDF

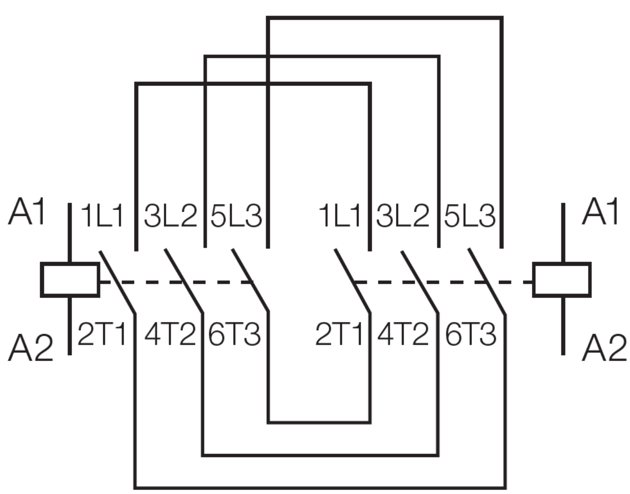
IM2

WEG CWB Series Contactors Accessories Easy-Connection Reversing Bar Connection Kit for Reversing Starters – Selection Guide						
Part Number	***Price***	***For Use With***	***Hp Values Declared on Direct and Reversing Starters Per UL 60947-4-1, Test Cycles. Three-Phase Voltage (V)***		***Weight g [oz]***	***Dimensional Drawing***
		K1=K2	***220-240 V (hp)***	***440-480 V (hp)***		
EC-R1	$24.00	CWB9	3	5	2.83 [0.10]	PDF
		CWB12	3	7.5		PDF
		CWB18	5	10		PDF
		CWB25	7.5	15		PDF
		CWB32	10	20		PDF
		CWB38	10	25		PDF
EC-R2	$29.50	CWB40	15	30	7.09 [0.25]	PDF
		CWB50	15	40		PDF
		CWB65	20	50		PDF
		CWB80	25	50		PDF

EC-R1

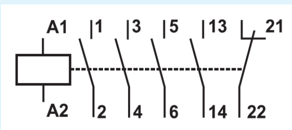
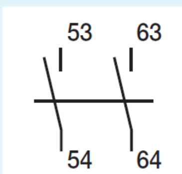
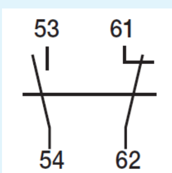
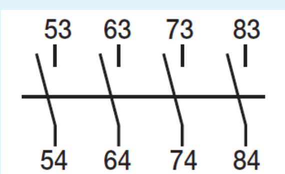
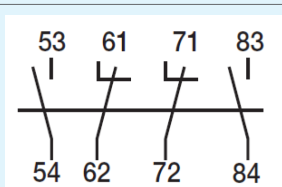
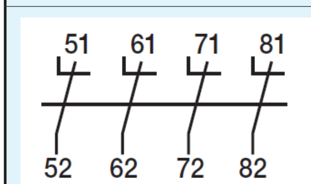
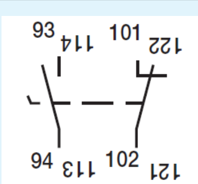


EC-R2



Electric Diagram

CWB Series Contactors

Terminal Markings According to IEC/EN 60947				
Diagram	*Configuration*	*Auxiliary Contacts*		*Reference Code*
		NO	*NC*	
3-Pole Contactors With Built-In Auxiliary Contacts				
	11	1	1	CWB9-11-30 CWB12-11-30 CWB18-11-30 CWB25-11-30 CWB32-11-30 CWB38-11-30 CWB40-11-30 CWB50-11-30 CWB65-11-30 CWB80-11-30
Front Mounted Auxiliary Contact Blocks				
	20	2	0	BFB-20
	11	1	1	BFB-11
	40	4	0	BFB-40
	22	2	2	BFB-22
	04	0	4	BFB-04
Side Mounted Auxiliary Contact Block				
	11	1	1	BLB-11

CWB Series Contactors

WEG CWB Series Contactors Specifications – General Specifications

		CWB9	CWB12	CWB18	CWB25	CWB32	CWB38	CWB40	CWB50	CWB65	CWB80
Compliance		IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 508									
Rated Insulation Voltage U (Pollution Degree 3)	**IEC/EN 60947-4-1**	690V						1000V			
	UL, CSA	600V									
Rated Impulse-Withstand Voltage U_{imp}	**IEC/EN 60947-1**	6kV									
Frequency Limits		25-400 Hz									
Mechanical Lifespan	**AC Coil (million cycles)**	10						6			
	DC Coil (million cycles)	10						6			
Electrical Lifespan	**I_e AC-3 (million cycles)**	2.0	2.0	1.8	1.6	1.6	1.2	1.6	1.6	1.6	1.2
Degree of protection (IEC/EN 60529)	**Main Terminals**	IP10 (front)									
	Coil and Auxiliary Contacts	IP20 (front)									
Mounting		With screws or DIN 35mm rail (EN 50022)									
Coil Connection Points	**Contactors With AC Coil**	2									
	Contactors With DC Coil	2									
Vibration resistance (IEC/EN 60068-2-6)	**Open Contactor**	4g									
	Closed Contactor	4g									
Resistance to mechanical shocks (½ sine wave=11ms - IEC/EN 60068-2-27)	**Open Contactor**	10g									
	Closed Contactor	15g									
Ambient Temperature	**Operating**	-25ºC to +55ºC [-13ºF to +131ºF]									
	Storage	-55ºC to +80ºC [-67ºF to +176ºF]									
Maximum Operation Altitude Without Modification of Rated Values[1]		3000m [9843ft]									

[1] For altitudes of 3000-4000 m [9843-13123 ft] (0.90 x Ie and 0.80 x Ui) and 4000-5000 m [13123-16404 ft] (0.80 x Ie and 0.75 x Ui).

WEG CWB Series Contactors Specifications – Control Circuit (AC)

		CWB9	CWB12	CWB18	CWB25	CWB32	CWB38	CWB40	CWB50	CWB65	CWB80
Compliance		IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 508									
Rated Insulation Voltage U (Pollution Degree 3)	**IEC/EN 60947-4-1**	690V						1000V			
	UL, CSA	600V						600V			
Standard Voltages at 50/60 Hz		12 to 600 V						24 to 600 V			
Coil Operating Limits		0.8 to 1.1 xUs						0.8 to 1.1 xUs			
Coil 50/60 Hz	**Pick Up**	0.5 to 0.8 xUs						0.5 to 0.8 xUs			
	Drop Out	0.2 to 0.6 xUs						0.2 to 0.6 xUs			
Average Consumption (50Hz/60Hz)	**Magnetic Circuit Closed**	9 / 7.5 VA						27 / 17.2 VA			
	Power Factor Switching On (cos φ)	0.8 / 0.7						0.56 / 0.55			
	Power Factor Switched On (cos φ)	0.24 / 0.27						0.25 / 0.28			
	Thermal Power Dissipation	5-7 / 5-7 W						3.7-6.3 / 3.7-6.3 W			
	Closing the Magnetic Circuit	90 / 75 VA						202 / 185 VA			
Operation Average Time of NO Contacts (Closing/Opening)		15 to 25 ms / 8 to 12 ms						10 to 15 ms / 8 to 12 ms			

WEG CWB Series Contactors Specifications – Control Circuit (DC)

		CWB9	CWB12	CWB18	CWB25	CWB32	CWB38	CWB40	CWB50	CWB65	CWB80
Compliance		IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 508									
Rated Insulation Voltage U (Pollution Degree 3)	**IEC/EN 60947-4-1**	690V						1000V			
	UL, CSA	600V						600V			
Standard Voltages		12 to 500 V						12 to 500 V			
Coil Operating Limits		0.8 to 1.1 xUs						0.8 to 1.1 xUs			
	Pick Up	0.5 to 0.8 xUs						0.5 to 0.8 xUs			
	Drop Out	0.1 to 0.4 xUs						0.1 to 0.4 xUs			
Average Consumption (50Hz/60Hz)		1.0x use the coil cold						1.0x use the coil cold			
	Magnetic Circuit Closed	5.8 W						10.6 W			
	Closing the Magnetic Circuit	5.8 W						53.5 W			
Operation Average Time of NO Contacts (Closing/Opening)		35 to 45 ms / 8 to 12 ms						20 to 30 ms / 4 to 8 ms			
Thermal Power Dissipation		5 to 7 W						12 to 16 W			

CWB Series Contactors

WEG CWB Series Contactors Specifications – Main Contacts

			CWB9	CWB12	CWB18	CWB25	CWB32	CWB38	CWB40	CWB50	CWB65	CWB80
Rated operational current I_e	***AC-3 (U_e ≤440 V)***	A	9	12	18	25	32	38	40	50	65	80
	AC-4 (U_e ≤440 V)	A	4.4	5.8	8.5	10.4	13.7	13.7	18.5	18.5	26	32
	AC-1 θ≤55 °C, U_e ≤690 V)	A	25	25	32	40	50	50	60	90	110	110
Rated operational voltage U_e	***IEC/EN 60947-4-1***	V	690V							1000V		
	UL, CSA	V	600V									
Conventional thermal current I_{th} (θ≤55 °C)		A	25	25	32	40	50	50	60	90	110	110
Making capacity – IEC/EN 60947		A	250	250	300	450	550	550	550	1000	1000	1000
Breaking capacity – IEC/EN 60947	***U_e ≤400 V)***	A	250	250	300	450	550	550	550	1000	1000	1000
	U_e = 500 V)	A	220	220	250	350	450	450	480	880	880	880
	U_e = 690 V)	A	150	150	180	250	350	350	350	640	640	640
Acceptable short-time current (no current flowing during recovery time of 15min and θ≤40ºC)	***1s***	A	210	210	240	380	400	430	720	820	900	900
	10s	A	105	105	145	240	260	310	320	400	520	640
	1min	A	60	60	80	120	130	150	165	230	340	360
	10min	A	30	30	40	50	60	60	85	110	130	130
Short circuit protection of the main contacts Fuse (RK5)	***@600 V - UL/CSA***	kA	5									
	Coordination type 1	A	25	40	50	63	63	63	80	100	125	160
	Coordination type 2	A	20	20	25	35	50	50	63	80	100	125
Impedance per pole		mΩ	2.5	2.5	2.5	2	2	2	1.6	1.6	1.6	1.6
Average power dissipation per pole	***AC-1***	W	1.5	1.5	2.5	3.2	5	5	6	13	19	19
	AC-3	W	0.2	0.4	0.8	1.2	2	3	3	4	7	10
Utilization category AC-3												
Rated operational current I_e (θ≤55 ºC)	***U_e ≤440 V***	A	9	12	18	25	32	38	40	50	65	80
	U_e ≤500 V	A	9	12	15.8	23	28.5	28.5	35	45	55	75
	U_e ≤690 V	A	7	9	12.8	16.5	21	21	32	35	40	50
Orientative rated operational power Three-phase induction motors (50/60 Hz) IV poles - 1,800 rpm	***220/240 V***	kW	2.2	3	4.5	6.5	7.5	9.2	11	15	18.5	22
		hp	3	4	6	8.7	10	12.5	15	20	25	29
	380/400 V	kW	4	5.5	7.5	12.5	15	18.5	18.5	22	30	37
		hp	5.5	7.5	10	16.8	20	25	25	29	40	50
	415/440 V	kW	4.5	6.5	9.2	12.5	15	18.5	22	30	37	45
		hp	6	8.7	12.5	16.8	20	25	29	40	50	60
	500V	kW	5.5	7.5	10	15	18.5	18.5	22	30	37	55
		hp	7.5	10	13.4	20	25	25	29	40	50	74
	660/690 V	kW	5.5	7.5	11	15	18.5	18.5	30	33	37	45
		hp	7.5	10	15	20	25	25	40	44	50	60
Maximum percentage	***600 ops/h***	%	100	100	100	100	100	100	100	100	100	100
Utilization category AC-4												
Rated operational current I_e	***(U_e ≤440 V)***	A	4.4	5.8	8.5	10.4	13.7	13.7	18.5	18.5	26	32
	(U_e ≤500 V)	A	3.9	5.1	7.5	12	13.9	13.9	17.5	23.5	28.5	33
	(U_e ≤690 V)	A	2.8	3.7	5.4	12	12.8	12.8	14	18	22	26
Orientative rated operational power Three-phase induction motors (50/60 Hz) IV poles - 1,800 rpm (200,000 operations)	***220/240 V***	kW	1.5	1.5	2.2	3	4	4	4.5	5.5	7.5	11
		hp	2.0	2.0	2.9	4.0	5.4	5.4	6.0	7.4	10.1	14.7
	380/400 V	kW	2.2	3.7	4	5.5	7.5	7.5	9.2	11	15	18.5
		hp	2.9	5.0	5.4	7.4	10.1	10.1	12.3	14.7	20.1	24.8
	415/440 V	kW	2.2	3	3.7	5.5	7.5	7.5	11	11	15	22
		hp	2.9	4.0	5.0	7.4	10.1	10.1	14.7	14.7	20.1	29.5
	500V	kW	2.2	3	5	7.5	9	9	11	15	18.5	22
		hp	2.9	4.0	6.7	10.1	12.1	12.1	14.7	20.1	24.8	29.5
	660/690 V	kW	2.2	3	5	10	11	11	12.5	15	20	25
		hp	2.9	4.0	6.7	13.4	14.7	14.7	16.8	20.1	26.8	33.5

CWB Series Contactors

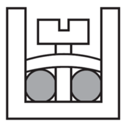
WEG CWB Series Contactors Specifications – Main Contacts			CWB9	CWB12	CWB18	CWB25	CWB32	CWB38	CWB40	CWB50	CWB65	CWB80
Utilization category AC-1 (3P NO)												
Conventional thermal current I_{th} (θ≤55 °C)		A	25	25	32	40	50	50	60	90	110	110
Maximum orientative operational current according to ambient temperature	θ≤60ºC U_e≤690V)	A	25	25	32	40	50	50	60	90	110	110
Max Operational Power θ≤55ºC (Three-Phase Resistors)	220/230 V	kW	9.5	9.5	12	15	19	19	22.5	34	42	42
	380/400 V	kW	16.5	16.5	21	26	33	33	39.5	59	72.5	72.5
	415/440 V	kW	19	19	24.5	30.5	38	38	45.5	68.5	84	84
	500V	kW	21.5	21.5	27.5	34.5	43	43	52	77	95	95
	660/690 V	kW	28.5	28.5	36.5	45.5	57	57	66	100	125	125
Current Values for Connection	2 poles in parallel		I_e x 1.7									
	3 poles in parallel		I_e x 2 .4									
	4 poles in parallel		–									
Percentage of maximum operational current	600 ops/h	%	100	100	100	100	100	100	100	100	100	100

WEG CWB Series Contactors Specifications – Auxiliary Contacts			CWB9 / CWB12 / CWB18 / CWB25 / CWB32 / CWB38 / CWB40 / CWB50 / CWB65 / CWB80
Utilization category AC-1 (3P NO)			
Compliance		60947-5-1	IEC/EN
Rated Insulation Voltage U_i (Pollution Degree 3)	IEC/EN 60947-4-1, VDE 0660	V	690
	UL, CSA	V	600
Rated Operational Voltage U_e	IEC/EN 60947-4-1, VDE 0660	V	690
	UL, CSA	V	600
Conventional Thermal Current I_{th} (θ≤55ºC)		A	10
Rated Operational Current I_e			
AC-15 (IEC/EN 60947-5-1)	220/230 V	A	10
	380/400 V	A	4
	500V	A	2.5
	660/690 V	A	1.5
DC-13 (IEC/EN 60947-5-1)	24V	A	4
	48V	A	2
	110V	A	0.7
	220V	A	0.3
	440V	A	0.15
Making Capacity	U_e≤690V 50/60 Hz – AC-15	A	10 x Ie
Breaking Capacity	U_e≤400V 50/60 Hz – AC-15	A	1 x Ie
Short Circuit Protection With Fuse (RK5)		A	10
Control Circuit Reliability		V/mA	17 / 5
Electrical Lifespan	Million cycles		1
Mechanical Lifespan	Million cycles		10
Non-Overlapping Time Between NO and NC Contacts		ms	1.5
Impedance of Contacts		mΩ	2.5

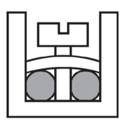
CWB Series Contactors

WEG CWB Series Contactors Specifications – Terminal Capacity and Tightening Torque

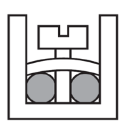
Power Circuit

			CWB9 / CWB12 / CWB18	CWB25 / CWB32 / CWB38	CWB40 / CWB50 / CWB65 / CWB80	CWB95 / CWB110 / CWB125
Mounting System Screw Type			Phillips Number 2	Phillips Number 2	Allen (4mm)	Allen (4mm)
Flexible Conductor Without Terminal	***AWG***		1 x 16-10 2 x 16-10	1 x 16-10 2 x 16-10	1 x 14-3 2 x 14-3	1 x 2.5-70 2 x 2.5-70
Flexible Conductor With Terminal	***AWG***		1 x 16-10 2 x 16-12	1 x 16-8 2 x 16-10	1 x 14-3 2 x 14-3	1 x 2.5-70 2 x 2.5-70
Solid Wire	***AWG***		1 x 16-10 2 x 16-10	1 x 14-18 2 x 14-18	1 x 14-3 2 x 14-3	1 x 2.5-70 2 x 2.5-70
Tightening Torque	***N•m [lb•ft]***		1.7 [1.25]	2.5 [1.84]	5.0 [3.69]	6.0 [4.43]

Control and Auxiliary Circuit – Terminal Capacity and Tightening Torque

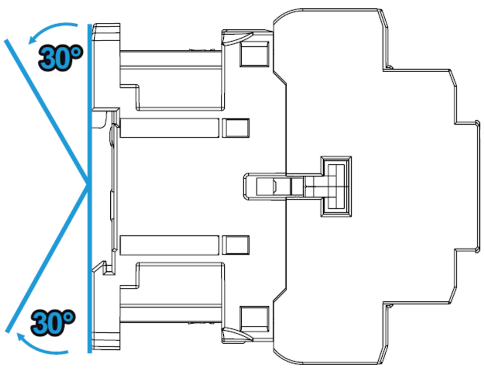
			CWB9 / CWB12 / CWB18 / CWB25 / CWB32 / CWB38	CWB40 / CWB50 / CWB65 / CWB80	CWB95 / CWB110 / CWB125
Mounting System Screw Type			Phillips Number 2	Phillips Number 2	Philips Number 2
Flexible Conductor Without Terminal	***AWG***		1 x 16-12 2 x 16-12	1 x 16-12 2 x 16-12	1 x 1-4 2 x 1-4
Flexible Conductor With Terminal	***AWG***		1 x 16-12 2 x 16-14	1 x 16-12 2 x 16-14	1 x 1-4 2 x 1-2.5
Solid Wire	***AWG***		1 x 16-12 2 x 16-12	1 x 16-12 2 x 16-12	1 x 1-4 2 x 1-4
Tightening Torque	***N•m [lb•ft]***		1.0 [0.74]	1.0 [0.74]	1.0 [0.74]

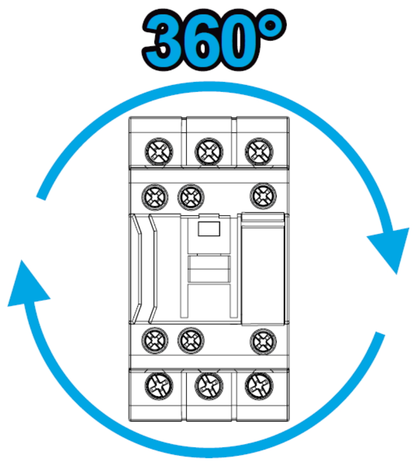
Auxiliary Contact Blocks – Terminal Capacity and Tightening Torque

			BFB (Front)	BLB (Side)
Mounting System Screw Type			Phillips Number 2	
Flexible Conductor Without Terminal	***AWG***		1 x 16-14 2 x 16-14	
Flexible Conductor With Terminal	***AWG***		1 x 16-14 2 x 16-14	
Solid Wire	***AWG***		1 x 16-14 2 x 16-14	
Tightening Torque	***N•m [lb•ft]***		1.0 [0.74]	

CWB Series Contactors

Mounting Position (CWB9 through CWB80)





CWB Series Contactors

CWB Technical Specifications			
	CWB95	***CWB110***	***CWB125***
Compliance With Standards	IEC/EN 60947-1 IEC/EN 60947-4-1 IEC/EN 60947-5-1 UL 60947		
Rated Insulation Voltage U_i (Pollution Degree 3)	IEC/EN 60947-4-1: 1000V UL, CSA: 600V		
Rated Impuse-Withstand Voltage U_{imp} ***IEC/EN 60947-1***	6kV		
Frequency Limits	25-400 Hz		
Mechanical Lifespan	AC coil: 6 million cycles DC coil: 6 million cycles		
Electrical Lifespan, I_e AC-3	1.1 million cycles	1.0 million cycles	1.0 million cycles
Degree of Protectopm (IEC/EN 60529)	Main terminals: IP10 (front) Coil and auxiliary contacts: IP20 (front)		
Mounting	By screws or DIN 35mm rail (EN 50022)		
Coil Connection Points	Contactors with AC coil: 2 Contactors with DC coil: 2		
Vibration Resistance (IEC/EN 60068-2-6)	Open contactor: 4g Closed contactor: 4g		
Resistance to Mechanical Shocks ***(½ senoide = 11ms - IEC/EN 60068-2-27)***	Open contactor: 10g Closed contactor: 15g		
Ambient Temperature	Operating: -25°C to 55°C [-13°F to 131°F] Storage: -55°C to 80° [-67°F to 176°F]		
Maximum operation altitude without modification in the rated values[1]	3000m [9842.5 ft]		

Note 1: For altitudes of 3,000 - 4,000 m (0.90xIe and 0.80xUi) and of 4,000 - 5,000 m (0.80xIe and 0.75xUi).

Control Circuit – Alternating Current (AC) Technical Specifications		
		CWB95/110
Rated Insulation Voltage U_i (Pollution Degree 3)		IEC/EN 60947-4-1: 1000V UL, CSA: 600V
Standard Voltages at 50/60 Hz		24-500 V
Coil Operating Limits		At 50Hz: 0.8 - 1.1 xUs At 60Hz: 0.8 - 1.1 xUs
Average Consumption Coil 50/60 Hz (60Hz Operation)	Magnetic circuit closed	25VA
	Power factor switched on	0.40 (cos Φ)
	Thermal power dissipation	9 - 11 W
	Closing of the magnetic circuit	410VA
	Power factor switching on	0.48 (cos Φ)
Average Consumption Coil 50/60 Hz (60Hz Operation)	Magnetic circuit closed	27VA
	Power factor switched on	0.4 (cos Φ)
	Thermal power dissipation	11 - 13.4 W
	Closing of the magnetic circuit	426VA
	Power factor switching on	0.5 (cos Φ)
Average Operating Time	Closing of the NO contacts	8 - 12.5 ms
	Opening of the NO contacts	4 - 8 ms

CWB Series Contactors

Control Circuit – Electronic Coils (AC/DC) Technical Specifications		
		CWB95/110/125
Rated Insulation Voltage U_i (Pollution Degree 3)		IEC 60947-4-1, VDE 0660: 1000V UL, CSA: 600V
Standard Voltages		24-500 V
Coil Operating Limits		At V DC: 0.8 - 1.1 xUs At 50Hz: 0.8 - 1.1 xUs At 60Hz: 0.8 - 1.1 xUs
Average Consumption		1.0 x Us and cold coil
AC Power Supply (60Hz)	Magnetic circuit closed	10.8 VA
	Power factor	0.47 (cos Φ)
	Thermal power dissipation	5.1 W
	Closing of the magnetic circuit	217VA
	Power factor	0.88 (cos Φ)
DC Power Supply	Magnetic circuit closed	2 - 5 W
	Closing of the magnetic circuit	180 - 220 W
Average Operating Time	Closing of the NO contacts	32 - 48 ms
	Opening of the NO contacts	30 - 55 ms

CWB Series Contactors

Main Contacts Technical Specifications

			CWB95	CWB110	CWB125
Rated operational current I_e	AC-3 (Ue ≤440 V)	(A)	95	110	125
	AC-4 (Ue ≤440 V)	(A)	52	58	65
	AC-1 (θ ≤55 ºC, Ue ≤690 V)	(A)	140	150	175
Rated operational voltage U_e	IEC/EN 60947-4-1	V	1000		
	UL, CSA	V	600		
Conventional thermal current I_{th} (θ ≤55 ºC)		(A)	140	150	175
Making capacity - IEC/EN 60947		(A)	1100	1200	1375
Breaking capacity IEC/EN 60947	(Ue ≤400 V)	(A)	1100	1200	1375
	(Ue =500 V)	(A)	970	1000	1200
	(Ue =690 V)	(A)	700	765	870
Acceptable short-time current (no current flowing during recovery time of 15min and θ ≤40 ºC)	1s	(A)	1200	1350	1430
	10s	(A)	720	780	860
	1min	(A)	410	470	515
	10min	(A)	140	150	175
Short circuit protection of the main contacts Fuse (gL/gG)	@600 V - UL/CSA	kA	5	5	10
	Coordination type 1	(A)	–	–	–
	Coordination type 2	(A)	–	–	–
Impedance Per Pole		(mΩ)	0.7	0.7	0.7
Average power dissipation per pole	AC-1	(W)	15	17	21
	AC-3	(W)	7	9	11
Minimum switching capacity[1]		(V/mA)	50/100		
Utilization Category AC-3					
Rated Operational Current I_e (θ ≤55 ºC)	(Ue ≤440 V)	(A)	95	110	125
	(Ue =500 V)	(A)	84	97	110
	(Ue =690 V)	(A)	61	70	80
Orientative rated operational power Three-phase induction motors (50/60 Hz) IV poles - 1800 rpm	220/240 V	(kW)	22	30	37
		(cv)	30	40	50
	380/400 V	(kW)	45	55	55
		(cv)	60	75	75
	415/440 V	(kW)	55	55	75
		(cv)	75	75	100
	500 V	(kW)	55	55	75
		(cv)	75	75	100
	660/690 V	(kW)	55	55	75
		(cv)	75	75	100
Maximum percentage	600 ops/hr	(%)	100	100	100
Utilization Category AC-4					
Rated operational current I_e	(Ue ≤440 V)	(A)	52	58	65
	(Ue =500 V)	(A)	46	51	57
	(Ue =690 V)	(A)	33	37	41
Orientative rated operational power Three-phase induction motors (50/60 Hz) IV poles - 1,800 rpm (200,000 operations)	220/240 V	(kW)	15	16.5	18.5
		(cv)	20	22	25
	380/400 V	(kW)	22	28	30
		(cv)	30	38	40
	415/440 V	(kW)	30	33	37
		(cv)	40	44	50
	500 V	(kW)	30	30	37
		(cv)	40	40	50
	660/690 V	(kW)	30	30	45
		(cv)	40	40	60

Note 1: In order to achieve acceptable reliability for application and/or continuity test on the power contacts, a minimum voltage and current of 50V and 100mA, respectively, must be used. For lower values, the auxiliary contacts must be used.

CWB Series Contactors

Auxiliary Contacts Technical Specifications Utilization Category AC-1 3P and 4P (NO)				
		CWB9 - 125, (built-in)	BFB (front mounted)	BLB (side mounted
Compliance With Standards		IEC/EN 60947-5-1		
Rated Insulation Voltage U_i (pollution degree 3)	IEC/EN 60947-4-1, VDE 0660 (V)	690		
	UL, CSA (V)	600		
Rated Operational Voltage U_e	IEC/EN 60947-4-1, VDE 0660 (V)	690		
	UL, CSA (V)	600		
Conventional Thermal Current I_{th} ($\theta \leq 55$ ºC)	(A)	10		
Rated Operational Current I_e				
AC-15 (IEC/EN 60947-5-1)	220/230 V (A)	10		
	380/440 V (A)	4		
	500V (A)	2.5		
	660/690 V (A)	1.5		
DC-13 (IEC/EN 60947-5-1)	24V (A)	4		
	48V (A)	2		
	110V (A)	0.7		
	220V (A)	0.3		
	440V (A)	0.15		
	600V (A)	0.1		
Making Capacity	Ue ≤690 V 50/60 Hz - AC-15 (A)	10 x I_e		
Breaking Capacity	Ue ≤400 V 50/60 Hz - AC-15 (A)	1 x I_e		
Short Circuit Protection With Fuse (gL/gG)	(A)	10		
Control Circuit Reliability	(V/ma)	17 / 5		
Electrical Lifespan	Million cycles	1		
Mechanical Lifespan	Million cycles	10		
Non-Overlapping Time Between NO and NC Contacts	(ms)	1.5		
Contact Impedance	(mΩ)	2.5		

CWB Series Contactors Accessories

BFB-11

BLB-11

BFB-20

BFB-22

BFB-40

BFB-04

WEG CWB Series Contactors Accessories – Front Mounted Auxiliary Contact Blocks Selection Guide

Part Number	Price	For Use With	Max. number of additional contacts/contactor	Auxiliary contacts		Weight g [oz]	Drawing
				NO	NC		
BFB-11	$8.00			1	1	63 [2.22]	PDF
BFB-20	$8.25			2	0	63 [2.22]	PDF
BFB-22	$12.50	CWB9 through CWB80	4	2	2	63 [2.22]	PDF
BFB-40	$12.50			4	0	63 [2.22]	PDF
BFB-04	$12.50			0	4	63 [2.22]	PDF

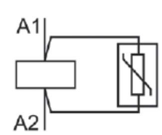
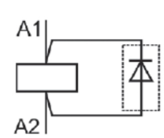
NOTES: The maximum number of auxiliary contacts assembled on the contactor is 4.

WEG CWB Series Contactors Accessories – Side Mounted Auxiliary Contact Blocks Selection Guide

Part Number	Price	For Use With	Max. Number of Additional Contacts/Contactor	Auxiliary Contacts		Weight g [oz]	Drawing
				NO	NC		
BLB-11	$8.75	CWB9 through CWB80	4	1	1	34 [1.20]	PDF

NOTE: The maximum number of auxiliary contacts assembled on the contactor is 4.

WEG CWB Series Contactors Accessories – Plug-In Surge Suppressors Selection Guide

Part Number	Price	For Use With	Voltage	Diagram	Weight g [oz]	Drawing
VRB-E34	$12.50		50-127 VAC 50/60 Hz 60-180 VDC		8 [0.28]	PDF
VRB-E50	$12.50		130-250 VAC 50/60 Hz 180-300 VDC		8 [0.28]	PDF
VRB-D73	$12.50	CWB9 through CWB80 CWBS9 through CWBS80	400-510 VAC 50/60 Hz		8 [0.28]	PDF
DIB-C33*	$12.50		12-600 VDC		8 [0.28]	PDF

** Contactors CWB9…110 with DC coils assembled with surge suppressor DIB will increase the opening time by 6 times. The surge suppressor cannot be used with BLB or BFB auxiliary contact blocks that contain N.C. contacts.*

DIB-C33

VRB-E34

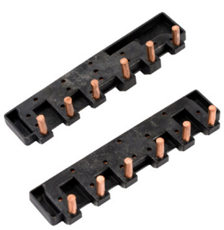
CWB Series Contactors Accessories and Spare Parts

IM1

IM2

WEG CWB Series Contactors Accessories – Mechanical Interlock Selection Guide				
Part Number	***Price***	***For Use With***	***Description***	***Drawing***
IM1	$5.25	CWB9 through CWB38 CWBS9 through CWBS38	Mounting set for interlocking two contactors with the same frame type. Fitting through snaps without tools.	PDF
IM2	$6.50	CWB40 through CWB125 CWBS40 through CWBS80		PDF

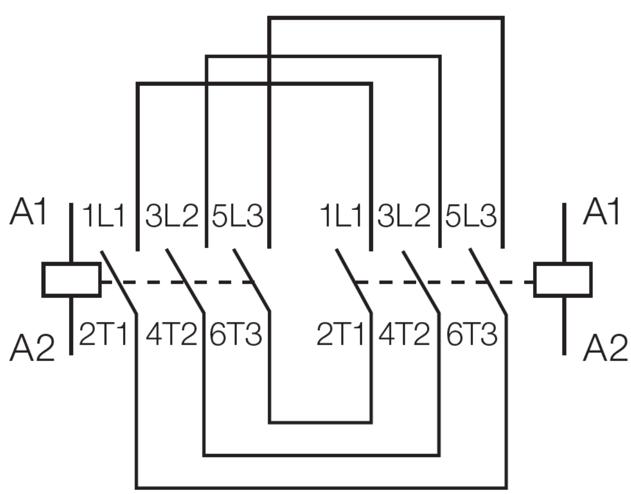
EC-R1



EC-R2

EC-R3

WEG CWB Series Contactors Accessories Easy-Connection Reversing Bar Connection Kit for Reversing Starters – Selection Guide						
Part Number	***Price***	***For Use With***	***Hp Values Declared on Direct and Reversing Starters Per UL 60947-4-1, Test Cycles. Three-Phase Voltage (V)***		***Weight g [oz]***	***Drawing***
		K1=K2	***220-240 V (hp)***	***440-480 V (hp)***		
EC-R1	$24.00	CWB9	3	5	2.83 [0.10]	PDF
		CWB12	3	7.5		PDF
		CWB18	5	10		PDF
		CWB25	7.5	15		PDF
		CWB32	10	20		PDF
		CWB38	10	25		PDF
EC-R2	$29.50	CWB40	15	30	7.09 [0.25]	PDF
		CWB50	15	40		PDF
		CWB65	20	50		PDF
		CWB80	25	50		PDF
EC-R3	$39.50	Reversing connection kit, for use with CWB95 to CWB125 series contactors. Line and loadside connection bars included.				PDF



Reversing Bar Connection Kit Electrical Wiring Diagram

CWBS Series Contactors For Safety Applications

Safety Assurance for Operators and Equipment

WEG's new CWBS line of contactors for safety applications (from 9A to 80A in AC-3) was developed in compliance with IEC and UL standards.

These contactors feature mechanically-linked contacts (IEC/EN 60947-5-1) and mirror contacts (IEC/EN 60947-4-1), which provide proper operation of safety circuits of machines and equipment that must operate in compliance with international safety standards, including the Brazilian machine safety standard (NR12).

Characteristics

CWBS Power Contactors

- TÜV certification for mechanically linked contacts (IEC 60947-5-1 - Annex L) and mirror contacts (IEC 60947-4-1 - Annex F)
- 45mm wide up to 38A and 54mm wide in models from 40 to 80A, with six built-in auxiliary contacts (3 NO + 3 NC)
- Choice of up to six auxiliary contacts
- Compact starters can be assembled with MPW40 and MPW80 manual motor protectors and with RW27-2D and RW67-5D thermal relays.

CWBS Series Contactors For Safety Applications

CWBS40-33-30C03

Features

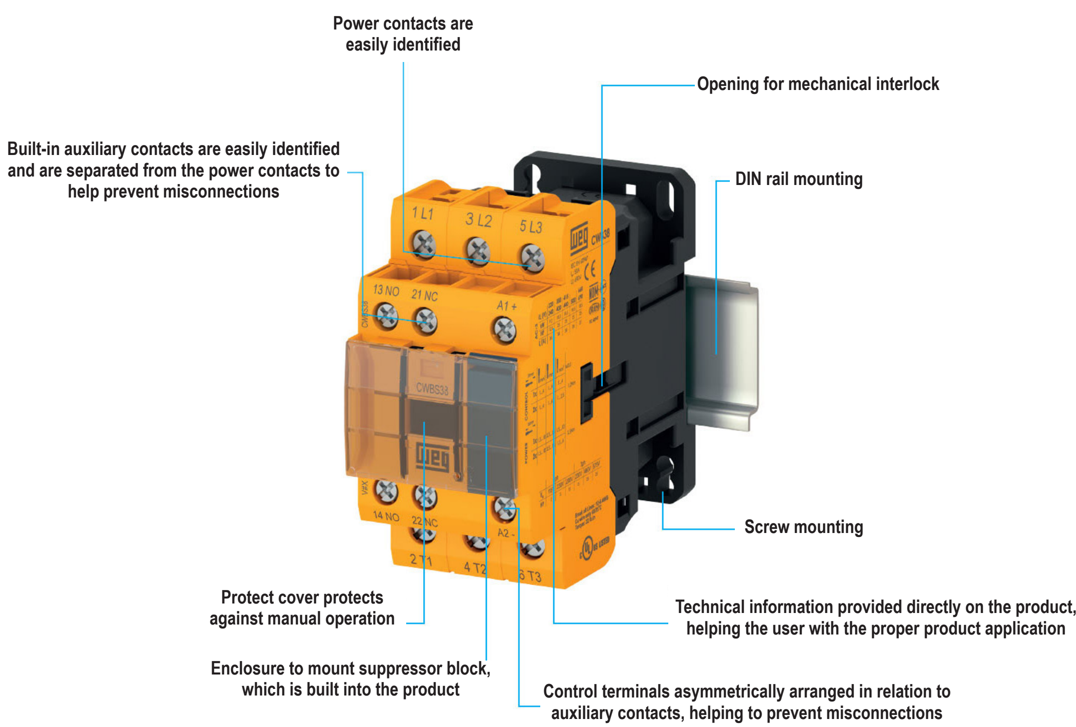
- Mechanically linked contacts (IEC 60947-5-1 - Annex L) and mirror contacts (IEC 60947-4-1 - Annex F)
- Available in versions up to 80A (AC-3)
- Includes 3NO/3NC mechanically linked/mirror contacts
- Compact starters can be assembled with MPW40 and MPW80 manual motor protectors and RW27-2D, RW67-5D overload relays

Benefits

- Protection against inadvertent operation
- Protection for operators and equipment
- Machine safety applications
- Certificate for worldwide use
- Fast mounting on DIN rail 35 mm or with screws
- Auxiliary contact block assembled and tested at the factory
- Specific color that enables easy identification on panels and equipment

Certifications

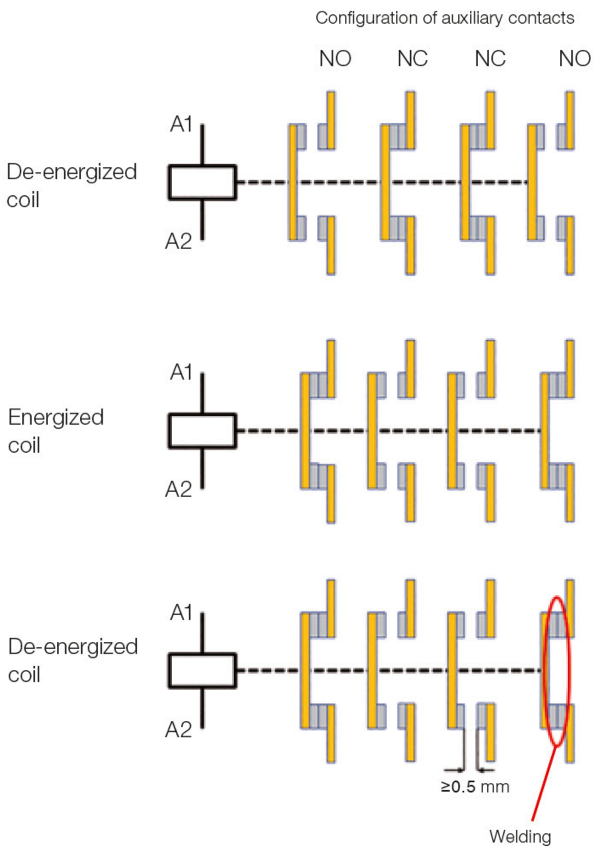
CE UKCA cULus *UL file # E202315*



CWBS Series Contactors For Safety Applications

Mechanically Linked Contacts (IEC/EN 60947-5-1 – Annex L)

Applicable to the auxiliary contacts used in auxiliary control circuits those contacts can be built into the contactor or blocks of external auxiliary contacts mounted on the contactors. According to IEC/EN 60947-5-1 - Annex L, open contacts and closed contacts cannot be simultaneously closed. In case welding occurs on the NO contacts, the NC contacts must remain open, and in case welding occurs on the NC contacts, the NO auxiliary contacts must remain open. The example given here shows that characteristic.



Mechanically linked contact elements have previously been referred to in technical documents as forced contacts, positively activated contacts, linked contacts and positively guided contacts. Contactors with that characteristic are often used in self-monitoring circuits combined with safety interfaces (e.g., safety relays) used in the automation and safety of machinery and equipment. Contactors which do not meet that requirement may damage the equipment or harm the operator.

Side view showing the symbols which identify mechanically linked contacts.

Mirror Contact (IEC/EN 60947-4-1 – Annex F)

Applicable to auxiliary contacts mechanically linked to the power contacts. When the contactor coil is energized, the power contacts will be closed and at the same time the NC auxiliary contacts will be open. Those auxiliary contacts are called mirror contacts.

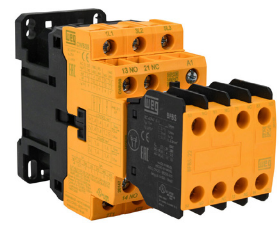
NOTE 1: A typical application of mirror contacts is to have, in the machine control circuit, a highly reliable monitoring of the status of the contactor. However, mirror contacts should not be relied upon exclusively as a means to ensure safety.

NOTE 2: Mirror contacts have previously been referred to as positively safety contacts, forced contacts, linked contacts, or positively driven contacts.

CWBS Series Contactors For Safety Applications

WEG CWBS Series Three-Pole Contactors for Safety Applications Selection Guide

Part Number	Price	Coil Voltage	Ie Max (Ue≤440V)	Maximum UL Horsepower						Built-In Auxiliary Contacts Per Contactor		Drawing
			AC-3 (A)	Single-Phase		Three-Phase				N.O.	N.C.	
				115V	230V	200V	230V	480V	575V			
AC Coil												
CWBS9-33-30D02	$80.00	24VAC	9	0.75	1.5	3	3	5	7.5	3	3	PDF
CWBS9-33-30D15	$80.00	120VAC										PDF
CWBS12-33-30D02	$89.00	24VAC	12	0.75	2	3	3	7.5	10	3	3	PDF
CWBS12-33-30D15	$89.00	120VAC										PDF
CWBS18-33-30D02	$102.00	24VAC	18	1	3	5	5	10	15	3	3	PDF
CWBS18-33-30D15	$102.00	120VAC										PDF
CWBS25-33-30D02	$114.00	24VAC	25	2	5	7.5	7.5	15	15	3	3	PDF
CWBS25-33-30D15	$114.00	120VAC										PDF
CWBS32-33-30D02	$132.00	24VAC	32	3	5	10	10	20	25	3	3	PDF
CWBS32-33-30D15	$132.00	120VAC										PDF
CWBS38-33-30D02	$148.00	24VAC	38	3	7.5	10	10	25	25	3	3	PDF
CWBS38-33-30D15	$148.00	120VAC										PDF
CWBS40-33-30D02	$166.00	24VAC	40	3	7.5	10	15	30	30	3	3	PDF
CWBS40-33-30D15	$166.00	120VAC										PDF
CWBS50-33-30D02	$187.00	24VAC	50	3	10	15	15	40	40	3	3	PDF
CWBS50-33-30D15	$187.00	120VAC										PDF
CWBS65-33-30D02	$226.00	24VAC	65	5	10	20	20	50	50	3	3	PDF
CWBS65-33-30D15	$226.00	120VAC										PDF
CWBS80-33-30D02	$255.00	24VAC	80	7.5	15	20	25	50	60	3	3	PDF
CWBS80-33-30D15	$255.00	120VAC										PDF
DC Coil												
CWBS9-33-30C03	$91.00	24VDC	9	0.75	1.5	3	3	5	7.5	3	3	PDF
CWBS12-33-30C03	$102.00		12	0.75	2	3	3	7.5	10	3	3	PDF
CWBS18-33-30C03	$116.00		18	1	3	5	5	10	15	3	3	PDF
CWBS25-33-30C03	$129.00		25	2	5	7.5	7.5	15	15	3	3	PDF
CWBS32-33-30C03	$151.00		32	3	5	10	10	20	25	3	3	PDF
CWBS38-33-30C03	$170.00		38	3	7.5	10	10	25	25	3	3	PDF
CWBS40-33-30C03	$198.00		40	3	7.5	10	15	30	30	3	3	PDF
CWBS50-33-30C03	$215.00		50	3	10	15	15	40	40	3	3	PDF
CWBS65-33-30C03	$250.00		65	5	10	20	20	50	50	3	3	PDF
CWBS80-33-30C03	$279.00		80	7.5	15	20	25	50	60	3	3	PDF

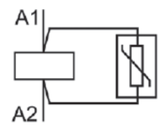
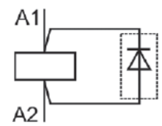


CWBS9-33-30D02

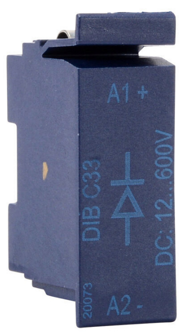
CWBS80-33-30D15

CWBS Series Contactors Accessories and Spare Parts

WEG CWBS Series Contactors Accessories – Plug-In Surge Suppressors Selection Guide

Part Number	Price	For Use With	Voltage	Diagram	Weight g [oz]	Drawing
VRB-E34	$12.50	CWBS9 through CWBS80	50-127 VAC 50/60 Hz 60-180 VDC		8 [0.28]	PDF
DIB-C33*	$12.50		12-600 VDC		8 [0.28]	PDF

***** Contactors CWB9…110 with DC coils assembled with surge suppressor DIB will increase the opening time by 6 times. The surge suppressor cannot be used with BLB or BFB auxiliary contact blocks that contain N.C. contacts.***



DIB-C33

VRB-E34

WEG CWBS Series Contactors Accessories – Mechanical Interlock Selection Guide

Part Number	Price	For Use With	Description	Drawing
IM1	$5.25	CWBS9 through CWBS38	Mounting set for interlocking two contactors with the same frame type. Fitting through snaps without tools.	PDF
IM2	$6.50	CWBS40 through CWBS80		PDF

IM1

IM2

CWBS Series Contactors Specifications

Technical Specifications											
		CWBS9	CWBS12	CWBS18	CWBS25	CWBS32	CWBS38	CWBS40	CWBS50	CWBS65	CWBS80
Compliance With Standards		IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 508									
Rated Insulation Voltage U_i (Pollution Degree 3)	IEC/EN 60947-4-1 (V)	690V						1000V			
	UL, CSA (V)	600V									
Rated Impulse Withstand Voltage U_{imp}	IEC/EN 60947-4-1 (kV)	6kV									
Frequency Limits	(Hz)	25 - 400									
Mechanical Life	AC coil (millions of operations)	10						6			
	DC coil (millions of operations)	10						6			
Electrical Life	I_e AC-3 (millions of operations)	2.0	2.0	1.8	1.6	1.6	1.2	1.6	1.6	1.6	1.2
Degree of Protection (IEC 60529)ΦΦ	Main terminals	IP10 (front)									
	Coil and auxiliary contacts	IP20 (front)									
Mounting		Screws or DIN rail 35 mm (EN 50022)									
Coil Connection Points	Contactors with AC coil	2									
	Contactors with DC coil	2									
Resistance to Vibrations (IEC 60068-2-6)	Open contactor (g)	4									
	Closed contactor (g)	4									
Resistance to mechanical shocks (½ sine wave = 11ms - IEC 60068-2-27)	Open contactor (g)	10									
	Closed contactor (g)	15									
Ambient Temperature	Operation	-25°C to 55°C [-13°F to 131°F]									
	Storage	-55°C to 80° [-67°F to 176°F]									
Maximum operation altitude without modification in the rated values[1]		3000m [9842.5 ft]									

Note 1: For altitudes of 3,000 - 4,000 m (0.90xIe and 0.80xUi) and of 4,000 - 5,000 m (0.80xIe and 0.75xUi).

Control Circuit – Alternating Current (AC) Technical Specifications			
		CWBS9 - 38	CWBS40 - 80
Rated Insulation Voltage U_i (Pollution Degree 3)	IEC/EN 60947-4-1 (V)	690	1000
	UL, CSA (V)	600	600
Standard Voltages at 50/60 Hz	(V)	12 - 600	24 - 600
Coil Operation Limits	(xUs)	0.8 - 1.1	0.8 - 1.1
Coil 50/60 Hz	Pick up (xUs)	0.5 - 0.8	0.5 - 0.8
	Drop out (xUs)	0.2 - 0.6	0.2 - 0.6
Average coil consumption 50/60 Hz	Closed magnetic circuit (VA)	7.5	17.5
	Power factor switched on (cos Φ)	0.27	0.28
	Thermal power dissipation (W)	1.5 - 2.5	4 - 5.5
	Closing of the magnetic circuit (VA)	75	185
	Power factor (cos Φ)	0.7	0.55
Average Commute Time	Closing of the NO contacts (ms)	15 - 25	10 - 15
	Opening of the NO contacts (ms)	8 - 12	8 - 12

CWBS Series Contactors Specifications

Control Circuit – Direct Current (DC) Technical Specifications			
		CWBS9 - 38	CWBS40 - 80
Rated Insulation Voltage U_i (Pollution Degree 3)	IEC/EN 60947-4-1 (V)	690	1000
	UL, CSA (V)	600	600
Standard Voltages	(V)	12 - 600	12 - 500
Coil Operation Limits	(xUs)	0.8 - 1.1	0.8 - 1.1
	Pick up (xUs)	0.5 - 0.8	0.5 - 0.8
	Drop out (xUs)	0.1 - 0.4	0.1 - 0.4
Average DC Coil Consumption	Closed magnetic circuit (W)	5.8	10.6
	Closing of the magnetic circuit (W)	5.8	105.5
Average Commute Time	Closing of the NO contacts (ms)	35 - 45	20 - 30
	Opening of the NO contacts (ms)	8 - 12	4 - 8

CWBS Series Contactors Specifications

Main Contacts Technical Specifications												
			CWBS9	CWBS12	CWBS18	CWBS25	CWBS32	CWBS38	CWBS40	CWBS50	CWBS65	CWBS80
Rated operational current I_e	AC-3 (Ue ≤440 V)	(A)	100	12	18	25	32	38	40	50	65	80
	AC-4 (Ue ≤440 V)	(A)	4.4	5.8	8.5	10.4	13.7	13.1	18.5	18.5	26	32
	AC-1 (θ ≤55 °C, Ue ≤690 V)	(A)	25	25	32	40	50	50	60	90	110	110
Rated operational voltage U_e	IEC/EN 60947-4-1	V	690						1000			
	UL, CSA	V	600									
Conventional thermal current I_{th} (θ ≤55 °C)		(A)	25	25	32	40	50	50	60	90	110	110
Making capacity - IEC/EN 60947		(A)	250	250	300	450	550	550	550	1000	1000	1000
Breaking capacity IEC/EN 60947	(Ue ≤400 V)	(A)	250	250	300	450	550	550	550	1000	1000	1000
	(Ue =500 V)	(A)	220	220	250	350	450	450	480	880	880	880
	(Ue =690 V)	(A)	150	150	180	250	350	350	350	640	640	640
Acceptable short-time current (no current flowing during recovery time of 15min and θ ≤40 °C)	1s	(A)	210	210	240	380	400	430	720	820	900	900
	10s	(A)	105	105	145	240	260	310	320	400	520	640
	1min	(A)	61	61	84	120	138	150	165	230	340	360
	10min	(A)	30	30	40	50	60	60	85	110	130	130
Short circuit protection of the main contacts Fuse (gL/gG)	@600 V - UL/CSA	kA	5									
	Coordination type 1	(A)	25	40	50	63	63	63	80	100	125	160
	Coordination type 2	(A)	20	25	35	40	63	63	63	80	100	125
Average Impedance Per Pole		(mΩ)	2.5	2.5	2.5	2	2	2	1.6	1.6	1.6	1.6
Average Power Dissipation Per Pole	AC-1	(W)	1.5	1.5	2.5	3.2	5	5	6	13	19	19
	AC-3	(W)	0.2	0.4	0.8	1.2	2	3	3	4	7	10
Reliability[1]		(V/mA)	50/100									
Utilization Category AC-3												
Rated Operational Current I_e (θ ≤55 °C)	(Ue ≤440 V)	(A)	100	12	18	25	32	38	40	50	65	80
	(Ue =500 V)	(A)	9	12	45.8	23	28.5	28.5	35	45	55	75
	(Ue =690 V)	(A)	7	9	12.8	16.5	21	21	32	35	40	50
Orientative Rated Operational Power Three-phase induction motors (50/60 Hz) IV poles - 1800 rpm	220/240 V	(kW)	2.2	3	4.5	6.5	7.5	9.2	11	15	18.5	22
		(cv)	3	4	6	8.7	10	12.5	15	20	25	29
	380/400 V	(kW)	4	5.5	7.5	12.5	15	18.5	18.5	22	30	37
		(cv)	5.5	7.5	10	16.8	20	25	25	29	40	50
	415/440 V	(kW)	4.5	6.5	9.2	12.5	15	18.5	22	30	37	45
		(cv)	6	8.7	12.5	16.8	20	25	29	40	50	60
	500 V	(kW)	5.5	7.5	10	15	18.5	18.5	22	30	37	55
		(cv)	7.5	10	13.4	20	25	25	29	40	50	74
	660/690 V	(kW)	5.5	7.5	11	15	18.5	18.5	30	33	37	45
		(cv)	7.5	10	15	20	25	25	40	44	50	60
Maximum percentage	600 ops/hr	(%)	100	100	100	100	100	100	100	100	100	100
Utilization Category AC-4												
Rated Operational Current I_e	(Ue ≤440 V)	(A)	4.4	5.8	8.5	10.4	13.7	13.7	18.5	18.5	26	32
	(Ue =500 V)	(A)	3.9	5.1	7.5	12	13.9	13.9	17.5	23.5	28.5	33
	(Ue =690 V)	(A)	2.8	3.7	5.4	12	12.8	12.8	14	18	22	28
Orientative Rated Operational Power Three-phase induction motors (50/60 Hz) IV poles - 1,800 rpm (200,000 operations)	220/240 V	(kW)	1.5	1.5	2.2	3	4	4	4.5	5.5	7.5	11
		(cv)	2.0	2.0	2.9	4.0	5.4	5.4	6.0	7.4	10.1	14.7
	380/400 V	(kW)	2.2	3.7	4	5.5	7.5	7.5	9.2	11	15	18.5
		(cv)	2.9	5.0	5.4	7.4	10.1	10.1	12.3	14.7	20.1	24.8
	415/440 V	(kW)	2.2	3	3.7	5.5	7.5	7.5	11	11	15	22
		(cv)	2.9	4.0	5.0	7.4	10.1	10.1	14.7	14.7	20.1	29.5
	500 V	(kW)	2.2	3	5	7.5	9	9	11	15	18.5	22
		(cv)	2.9	4.0	6.7	10.1	12.1	12.1	14.7	20.1	24.8	29.5
	660/690 V	(kW)	2.2	3	5	10	11	11	12.5	15	20	25
		(cv)	2.9	4.0	6.7	13.4	14.7	14.7	16.8	20.1	26.8	33.5

Note 1: In order to achieve acceptable reliability for application and/or continuity test on the power contacts, a minimum voltage and current of 50V and 100mA, respectively, must be used. For lower values, the auxiliary contacts must be used.

CWBS Series Contactors Specifications

Main Contacts Technical Specifications Utilization Category AC-1 3P (NO)

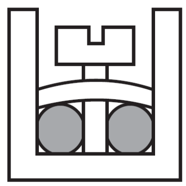
		CWBS9	CWBS12	CWBS18	CWBS25	CWBS32	CWBS38	CWBS40	CWBS50	CWBS65	CWBS80
Conventional thermal current I_{th} (θ ≤55 °C)	(A)	25	25	32	40	50	50	60	90	110	110
Maximum orientative operational current according to the ambient temperature	θ ≤60 °C (Ue ≤690 V) (A)	25	25	32	40	50	50	60	90	110	110
Maximum operational power θ ≤55 °C (three-phase resistors)	220/230 V (kW)	9.5	9.5	12	15	19	19	22.5	34	42	42
	380/400 V (kW)	16.5	16.5	21	26	33	33	39.5	59	72.5	72.5
	415/440 V (kW)	19	19	24.5	30.5	38	38	45.5	68.5	84	84
	500 V (kW)	21.5	21.5	27.5	34.5	43	43	52	77	95	95
	660/690 V (kW)	28.5	28.5	36.5	45.5	57	57	66	100	125	125
Actual values for connections	2 poles in parallel	Ie x 1.7									
	3 poles in parallel	Ie x 2.4									
Percentage of maximum operational current	600 ops/h (%)	100	100	100	100	100	100	100	100	100	100

Auxiliary Contacts Technical Specifications

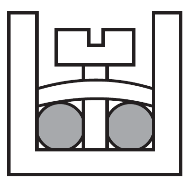
		CWBS9 - 80 (built in)	BFBS (front mounted blocks)
Compliance with the standards		IEC 60947-5-1	IEC 60947-5-1
Rated insulation voltage Ui (pollution degree 3)	(V)	690	690
	(V)	600	600
Rated operational voltage U_e	(V)	690	690
	(V)	600	600
Conventional thermal current I_{th} (θ ≤55 °C)	(A)	10	10
Rated operational current I_e			
AC-15 (IEC/EN 60947-5-1)	220/230 V (A)	10	10
	380/440 V (A)	4	4
	500V (A)	2.5	2.5
	660/690 V (A)	1.5	1.5
DC-13 (IEC/EN 60947-5-1)	24 V (A)	4	4
	48 V (A)	2	2
	110 V (A)	0.7	0.7
	220 V (A)	0.3	0.3
	440 V (A)	0.15	0.15
Making capacity	U_e ≤690 V 50/60 Hz - AC-15 (A)	10 x I_e	10 x I_e
Breaking capacity	U_e ≤400 V 50/60 Hz - AC-15 (A)	1 x I_e	1 x I_e
Short circuit protection with fuse (gL/gG)	(A)	10	10
Control circuit reliability	(V/ma)	17 / 5	17 / 5
Electrical life	(millions of operations)	1	1
Mechanical life	(millions of operations)	10	10
Non-overlapping time between NO and NC contacts	(ms)	1.5	1.5
Impedance of the contacts	(mΩ)	2.5	2.5

CWBS Series Contactors Specifications

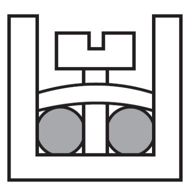
WEG CWBx Series Contactors Specifications – Terminal Capacity and Tightening Torque

			Power Circuit									
			CWBx9	CWBx12	CWBx18	CWBx25	CWBx32	CWBx38	CWBx40	CWBx50	CWBx65	CWBx80
Mounting System Screw Type			Phillips Number 2			Phillips Number 2			Allen (4mm)			
Flexible Conductor Without Terminal/Ferrules	AWG		1 x 16-10 2 x 16-10			1 x 16-10 2 x 16-10			1 x 14-3 2 x 14-3			
Flexible Conductor With Terminal/Ferrules	AWG		1 x 16-10 2 x 16-12			1 x 16-8 2 x 16-10			1 x 14-3 2 x 14-3			
Solid Wire	AWG		1 x 16-10 2 x 16-10			1 x 14-18 2 x 14-18			1 x 14-3 2 x 14-3			
Tightening Torque	N•m [lb•ft]		1.7 [1.25]			2.5 [1.84]			5.0 [3.69]			

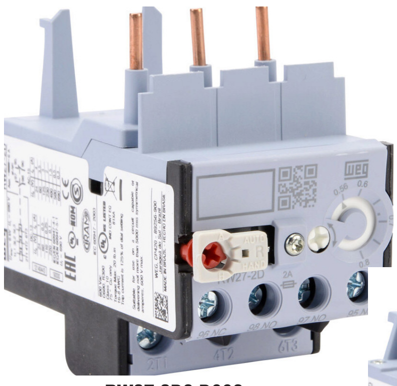
Control and Auxiliary Circuit – Terminal Capacity and Tightening Torque

			CWBx9	CWBx12	CWBx18	CWBx25	CWBx32	CWBx38	CWBx40	CWBx50	CWBx65	CWBx80
Mounting System Screw Type			Phillips Number 2						Phillips Number 2			
Flexible Conductor Without Terminal/Ferrules	AWG		1 x 16-12 2 x 16-12						1 x 16-12 2 x 16-12			
Flexible Conductor With Terminal/Ferrules	AWG		1 x 16-12 2 x 16-14						1 x 16-12 2 x 16-14			
Solid Wire	AWG		1 x 16-12 2 x 16-12						1 x 16-12 2 x 16-12			
Tightening Torque	N•m [lb•ft]		1.0 [0.74]						1.0 [0.74]			

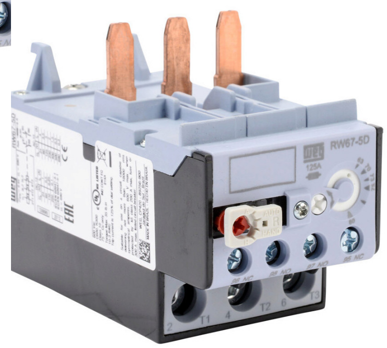
Auxiliary Contact Blocks – Terminal Capacity and Tightening Torque

			BFB (Front)	BLB (Side)
Mounting System Screw Type			Phillips Number 2	
Flexible Conductor Without Terminal/Ferrules	AWG		1 x 16-14 2 x 16-14	
Flexible Conductor With Terminal/Ferrules	AWG		1 x 16-14 2 x 16-14	
Solid Wire	AWG		1 x 16-14 2 x 16-14	
Tightening Torque	N•m [lb•ft]		1.0 [0.74]	

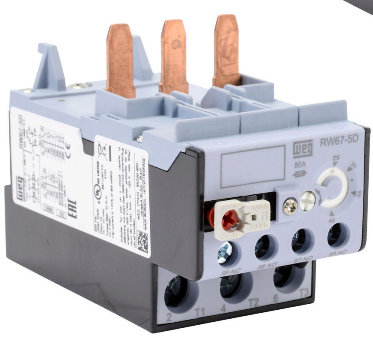
Thermal Overload Relays RW Series – Bi-Metallic



RW27-2D3-D008



RW67-5D3-U080



RW67-5D3-U040

Overview

An extended operational service life is one of the main features you'll find in RW overload relays. WEG's RW Thermal Overload Relays are designed for use with, and as perfect complement to, WEG contactors. RW overload relays can be mounted directly under WEG contactors, assuring electrical and mechanical operation as an open across-the-line starter. Accessories are also available for separate mounting.

Features

- 3-pole version available
- Direct mounting to WEG contactors with no accessory required (accessories also available for separate mounting)
- Phase-loss and current unbalance sensitivity protection
- Class 10 trip characteristics
- Selectable RESET button (auto or manual)
- Isolated 1NO and 1NC auxiliary contacts

UL File No. E189202

RW Series Contactor Catalog Number Sequence

RW	27-2D	3	-	U004

Overload Relay Series
RW: Thermal Overload Relay

Frame Size and Terminal Type
27-2D: To use with CWB9 through CWB38 67-5D: To use with CWB40 through CWB80

Power Poles
3: 3 NO Power Poles

Overload Setting Current	
RW27	D004: 0.28-0.40 A
RW67	U040: 25-40 A U080:63-80 A

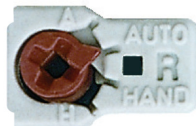
Table intended as reference only and not to create part numbers.
For complete list of overload setting ranges, refer to selection guide tables.

Thermal Overload Relays RW Series – Bi-Metallic

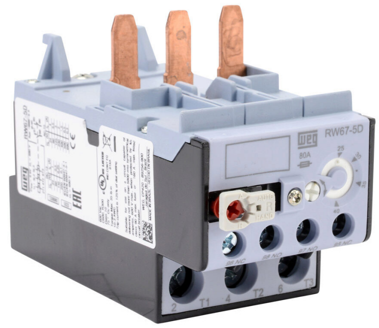
Multifunction Reset/Test Button

The thermal overload relay has a multifunction RESET/TEST button that can be set in four different positions:

A - Automatic RESET only
AUTO - Automatic RESET / TEST
HAND - Manual RESET / TEST
H - Manual RESET only



In HAND and AUTO positions, when the RESET button is pressed, both NO (97-98) and NC (95-96) contacts change states.



RW67-5D3-U040

Operation

In the H (manual RESET only) or A (automatic RESET only) position, the test function is blocked. However, in the HAND (manual RESET/TEST) or AUTO (automatic RESET/TEST) positions it is possible to simulate the test and the trip functions by pressing the RESET button.

When set in the H or HAND position, the RESET button must be pressed manually to reset the overload relay after a tripping event. On the other hand, when set in A or AUTO position, the overload relay will reset automatically after a tripping event.

The H, HAND, AUTO or A function settings are selected by rotating without pressing the red button and placing it in the desired position.

When changing from HAND to AUTO, the RESET button must be slightly pressed while the red button is rotated.

Function	H	HAND	AUTO	A
Relay Reset	Manual1	Manual1	Automatic	Automatic
Auxiliary Contact Trip Test 95-96 (NC)	Function is disabled	Test is allowed	Test is allowed	Function is disabled
Auxiliary Contact Trip Test 97-98 (NO)	Function is disabled	Test is allowed	Test is allowed	Function is disabled

Note: A recovery time of a few minutes is necessary before resetting the thermal overload relay.

Recovery Time

The RW thermal overload relays have thermal memory. After tripping due to an overload, the relay requires a certain period of time (the "recovery time") for the bimetal strips to cool down. The relay can only be reset once it has cooled down. The recovery time depends on the characteristic tripping curves and the level of the tripping current. After tripping due to overload, the recovery time allows the load to cool down.

Dial FLA Setting

The trip current is set via a continuously adjustable dial designed with the motor's full load current (FLA) in mind.

Temperature compensation

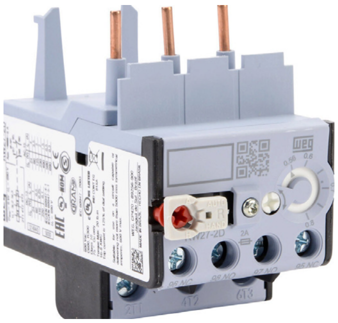
Because RW thermal overload relays include a forth bimetallic strip in addition to the three that are directly heated by the motor current, ambient temperature variations in the range of -4°F to +140°F [-20°C to +60°C] are no obstacle for accurate protection of your motors even in the toughest conditions.

Phase Failure Sensitivity

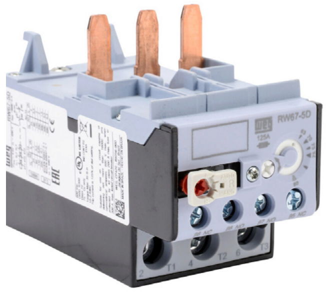
WEG overload relays include phase failure sensitivity protection as a standard. This feature ensures fast tripping in case of phase-loss, protecting your motor and avoiding expensive repairs/corrective maintenance.

Thermal Overload Relays RW Series – Bi-Metallic

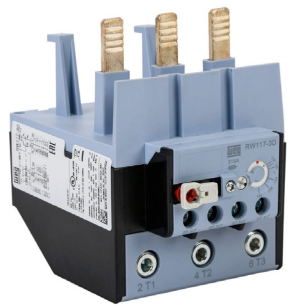
Three-Pole Thermal Overload Relay Class 10 For Use With CWB Contactors



RW27-2D3-D008



RW67-5D3-U080



RW117-3D3-U140

Features

- Adjustable trip current
- Phase-loss sensitivity
- Trip Class 10
- Built-in auxiliary contacts: 1 NO and 1 NC
- Ambient temperature compensation (-4°F to +140°F [-20°C to +60°C])
- Multi-function button: Hand/Auto/Reset

RW Series Bi-Metallic Thermal Overload Relays Selection Guide

Part Number	Price	Matching Contactor	Setting Range (A)		Max. Fuse (A)	Drawing
			Minimum	Maximum		
RW27-2D3-D008	$28.50	CWB9 CWB12 CWB18 CWB25 CWB32 CWB38	0.56	0.80	15	PDF
RW27-2D3-D012	$28.50		0.8	1.20	15	PDF
RW27-2D3-D018	$28.50		1.2	1.80	15	PDF
RW27-2D3-D028	$28.50		1.8	2.80	15	PDF
RW27-2D3-U004	$28.50		2.8	4	15	PDF
RW27-2D3-D063	$28.50		4	6.30	25	PDF
RW27-2D3-U008	$28.50		5.6	8	30	PDF
RW27-2D3-U010	$28.50		7	10	40	PDF
RW27-2D3-D125	$28.50		8	12.5	50	PDF
RW27-2D3-U017	$28.50		11	17	60	PDF
RW27-2D3-U023	$28.50		15	23	90	PDF
RW27-2D3-U032	$28.50		22	32	90	PDF
RW27-2D3-U040	$31.50		32	40	90	PDF
RW67-5D3-U040	$54.00	CWB40 CWB50 CWB65 CWB80	25	40	90	PDF
RW67-5D3-U050	$54.00		32	50	125	PDF
RW67-5D3-U057	$54.00		40	57	150	PDF
RW67-5D3-U063	$54.00		50	63	150	PDF
RW67-5D3-U070	$63.00		57	70	175	PDF
RW67-5D3-U080	$63.00		63	80	200	PDF
RW117-3D3-U080	$110.00	CWB95-CWB125	63	80	200	PDF
RW117-3D3-U097	$124.00		75	97	225	PDF
RW117-3D3-U112	$130.00		90	112	250	PDF
RW117-3D3-U140	$148.00		110	140	315	PDF

Thermal Overload Relays RW Series – Bi-Metallic

Separate Mounting Bracket

BF27-2D

RW Series Bi-Metallic Thermal Overload Relays Mounting Bracket Selection Guide				
Part Number	***Price***	***Description***	***Mounting on Overload Relays (2- or 3-Pole)***	***Drawing***
BF27-2D	$8.50	Enables overload relay to be directly mounted to a back panel via screws or DIN rail	RW27-2D	PDF
BF67-5D	$15.00	Enables overload relay to be directly mounted to a back panel via screws or DIN rail	RW67-5D	PDF
BF117-3D	$17.50	35mm DIN rail/panel mount adapter, for use with RW117-3D series thermal overload relays.	RW117-3D	PDF

Thermal Overload Relays RW Series – Bi-Metallic

RW Series Bi-Metallic Thermal Overload Relays Specifications – General Data and Main Contacts

			RW27	RW67
Standards			IEC 60947 / UL 508	
Setting Current		A	0.28-40	25-80
Tripping Class			10	
Temperature Compensation			Continuous	
Rated Insulation Voltage U_i (Pollution Degree 3)	IEC 60947	V	690	
	UL/CSA	V	600	
Rated Impulse Withstand Voltage U_{imp}		kV	6	
Rated Operational Frequency		Hz	0-400	
Degree of protection Protection against direct contact from the front when actuated by a perpendicular test finger (IEC 536)			IP20 Finger and back-of-hand proof	
Ambient Temperature	Operating temperature		-25°C to +60°C [-13°F to +140°F]	
	Storage temperature		-40°C to +70°C [-40°F to +158°F]	
Environmental Testing (IEC 60 068-2-3, IEC 60 068-2-30)			Damp heat. Constant	
Current Heat Loss				
Lower Value of Setting Range		W	0.9	1.5
Higher Value of Setting Range		W	1.7	4.7

RW Series Bi-Metallic Thermal Overload Relays Specifications – Auxiliary Contacts

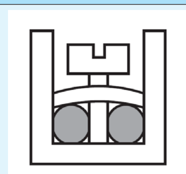
			RW27	RW67
Standards			IEC 60947-4-1, UL 508	
Rated Insulation Voltage U_i (Pollution Degree 3)	IEC	V	690	
	UL/CSA	V	600	
Rated Operational Voltage U_e	IEC	V	690	
	UL/CSA	V	600	
Rated Thermal Current I_{th} ($\theta \leq 55°C$)		A	6	
Rated Operational Current I_e				
AC-14 / AC-15 (IEC 60947-5-1)	24V	A	4	
	60V	A	3.5	
	125V	A	3	
	230V	A	2	
	400V	A	1.5	
	500V	A	0.5	
	690V	A	0.3	
UL, CSA			C600	
DC-13 / DC-14 (IEC 60947-5-1)	24V	A	1	
	60V	A	0.5	
	110V	A	0.25	
	220V	A	0.1	
UL, CSA			R300	
Short-Circuit Protection With Fuse (RK5)		A	6	
Minimum Voltage / Admissible Current (IEC 60947-5-4)			17V / 5ma	

Thermal Overload Relays RW Series – Bi-Metallic

RW Series Bi-Metallic Thermal Overload Relays Specifications
Terminal Capacity and Tightening Torque – Main Contacts

			RW27	RW67
Current Setting		***A***	0.28-40	25-80
Cable Size (75ºC [167ºF]) / Cu Cable)				
Flexible Cable	***1 cable***	***mm²***	1.5-10	6.0-35
	2 cables	***mm²***	1.5-10	–
Cable With Terminal or Rigid Cable	***1 cable***	***mm²***	1.5-6	6.0-35
	2 cables	***mm²***	1.5-6	–
Busbar		***mm²***	–	–
Tightening Torque		***N•m [lb•ft]***	2.3 [1.69]	4.0 [2.95]
UL Cable Size (75ºC [167ºF]) / Cu Cable)		***AWG***	16 to 8	10 to 3
Tightening Torque (UL)		***N•m [lb•in]***	2.26 [20]	3.95 [35]

RW Series Bi-Metallic Thermal Overload Relays Specifications
Terminal Capacity and Tightening Torque – Auxiliary Contacts

			RW27	RW67
Type of Screws			M3.5x10 Philips	M3.5x10 Philips
Cable Size (75ºC [167ºF]) / Cu Cable)				
Cable With or Without Terminal	***mm²***		2 x 1-2.5	2 x 1-2.5
Wire	***AWG***		16-12	16-12
Tightening Torque	***N•m [lb•in]***		1.5 [13]	1.5 [13]

Thermal Overload Relays RW Series – Bi-Metallic

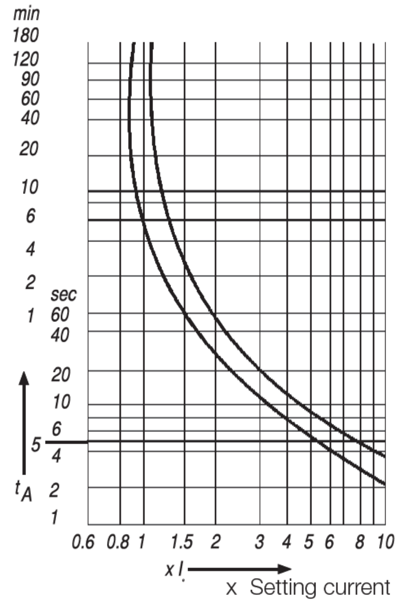
RW Series Bi-Metallic Thermal Overload Relays Specifications – General Technical Data			
			RW27
Standards			IEC 60947-1, UL 508
Rated insulation voltage U_i (Pollution Degree 3)	**IEC/EN 60947-4-1**	**V**	690
	UL, CSA	**V**	600
Rated impulse withstand voltage Uimp (IEC 60947-1)		**kV**	6
Rated operational frequency		**Hz**	25-400
Use with direct current?			Yes
Maximum operation per hour		**ops/h**	15
Protection degree (IEC 60529)	**Main contacts**		IP10
	Auxiliary contacts		IP20
	Frontal		IP20
Mounting			Direct on the contactor
Resistance to Impact (IEC 60068-2-27 - 1/2 sinusoid)		**g/ms**	10/11
Ambient Temperature	**Transport and storage**		-50°C to +80°C [-58°F to +176°F]
	Operating		-20°C to +70°C [-4°F to +158°F]
	Temperature compensation		-20°C to +60°C [-4°F to +140°F]
Altitude		**m [ft]**	2000 [6562]

RW Series Bi-Metallic Thermal Overload Relays Specifications – Main Contacts			
			RW27
Rated Operational Voltage U_e	**IEC 60947-4-1**	**V**	690
	UL, CSA	**V**	600
Setting Current / Max Fuse (Class RK5)		**A**	0.28-0.4 / 2
			0.43-0.63 /2
			0.56-0.8 / 2
			0.8-1.2 / 4
			1.2-1.8 / 6
			1.8-2.8 / 6
			2.8-4 / 10
			4-6.3 / 16
			5.6- 8 / 20
			7-10 / 25
			8-12.5 / 25
			10-15 / 35
			11-17 / 40
			15-23 / 50
			22-32 / 63
			32-40 / 90
Average Power Dissipation Per Pole		**W**	≤3

Thermal Overload Relays RW Series – Bi-Metallic

RW Tripping Characteristics

These tripping characteristics show the tripping of RW in relation to the current. They show the mean values of the tolerance ranges at on ambient temperature of 68°F (20°C), starting from cold stats. The tripping time of the overload releases at operational temperature is reduced to approximately 25% of the values shown. Under normal operational conditions, all Three-Phases of the RWs should be loaded.



Altitude and Temperature Derating

Derating of an RW overload relay is based on two possible factors.

Ambient temperature:
Temperature compensation considers a factor according to which the rated current must be reduced when ambient temperature is higher than 60°C [140°F].

Altitude:
Altitude compensation involves both rated current and voltage.

- Current compensation considers a factor according to the rated current must be reduced.
- For voltage, altitude limits the higher operating voltage the overload relay can be used.

Derating Calculation

The derating of the permissible operating current for installation altitudes above 2000m (6667 ft) and ambient temperatures over 60°C (140°F) is calculated according to the following formula:

Total derating = Derating altitude x Derating ambient temperature

Temperature Compensation (F [C])	Current Correction Factor
149 [65]	0.94
158 [70]	0.87
167 [75]	0.81
176 [80]	0.73

Derating Example

Here is an example of how derating is calculated.

- Altitude: 3000m (10,000 ft)
- K1 = 0.96
- Ambient temperature: 70°C (158°F)
- K2 = 0.87

Total current derating = 0.96 x 0.87 = 0.84 x Ie

In this case, the maximum rated voltage that can be connected to the RW overload relay is 550V.

In order to select the proper overload relay, choose a device with a current range that accommodates the following:

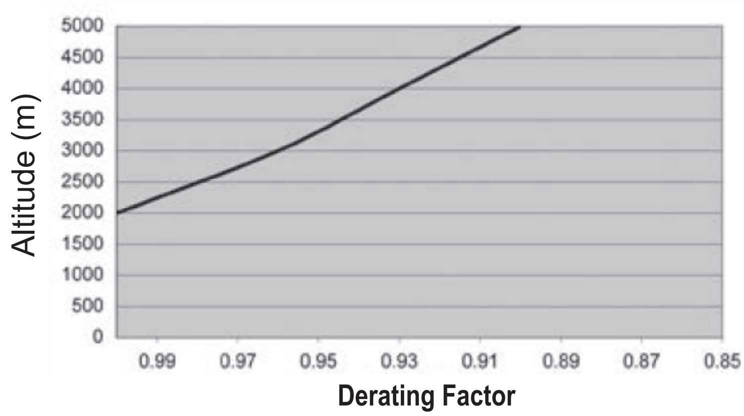
Overload Setting Point = FLA motor / (K1 x K2)

As in the example above, K1 x K2 = 0.84

For a motor with FLA = 20A:

Overload Setting Point = 20 / 0.84 = 23.8A

Altitude	Voltage Correction (U_e)
Up to 2000m (6667ft)	690
Up to 3000m (10,000 ft)	550
Up to 4000m (13,333 ft)	480
Up to 5000m (16,667ft)	420



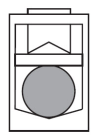
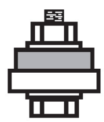
Thermal Overload Relays RW Series – Bi-Metallic

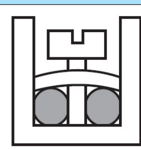
RW117 Technical Specifications		
Compliance With Standards		IEC 60947-1 and UL 508
Frequency Limits		25 - 400 Hz
Use in Direct Current		Yes
Maximum Frequency of Operation Cycles		15 operations per hour
Protection Rating (IEC 60529)	*Main terminals*	IP10
	Auxiliary contacts	IP10
	Other regions	IP20
Mounting		Directly to contactors or with screws and DIN rail 35mm (EN 50022) using an accessory
Resistance to Mechanical Shocks (IEC 60068-2-27, 1/2 sine wave)		10 / 11 g/ms
Ambient Temperature	*Transport and storage*	-50°C to 80°C [-58°F to 176°F]
	Operation	-20°C to 70°C [-4°F to 158°F]
Maximum operation altitude without modification in the rated values	*Temperature compensation*	-20°C to 60°C [-4°F to 140°F]
Maximum Operation Altitude Without Modification of the Rated Values		2000m

RW117 Main Contacts Specifications		
Rated Insulation Voltage U_i Pollution Degree 3	*IEC 60947-4-1*	690V
	UL, CSA	600V
Rated Impulse Withstand Voltage U_{imp}		6kV
Current Settings / Maximum Fuse (gL/gG)		63-80 / 200 A
		75 - 97 / 225 A
		90 - 112 / 250 A
		110 - 140 / 315 A
Average Power Dissipation Per Pole		≤5.5 W

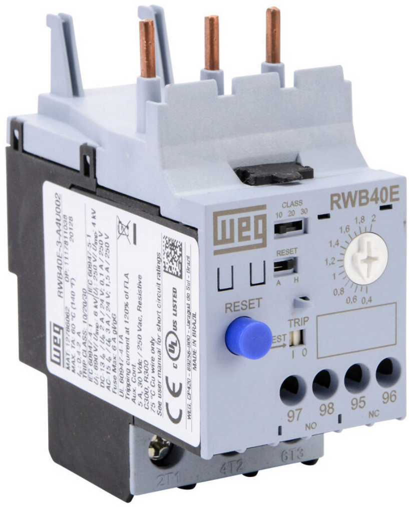
RW117 Auxiliary Circuit Technical Specifications		
Compliance With Standards		IEC 60947-1 and UL 508
Rated Insulation Voltage U_i Pollution Degree 3	*IEC*	690V
	UL, CSA	600V
Rated Operational Voltage U_i	*IEC*	690V
	UL, CSA	600V
Conventional Thermal Current I_{th} ($\theta \leq 55°C$)		6A
	Rated Operational Current	
AC-14/AC-15 (IEC 60947-5-1)	*24V*	4A
	60V	3.5 A
	125V	3A
	230V	2A
	400V	1.5 A
	500V	0.5A
	690V	0.3A
UL, CSA		C600
DC-13/DC-14 (IEC 60947-5-1)	*24V*	1A
	60V	0.5A
	110V	0.25A
	220V	0.1A
UL, CSA		R300
Short Circuit Protection With Fuse (gl/gG)		6A
Minimum Voltage/Permissible Current (IEC 60947-5-4)		17V / 5mA

Thermal Overload Relays RW Series – Bi-Metallic

RW117 Terminal Capacity and Tightening Torque (Power Circuit) Specifications		
Mounting System Screw Type		M10 Allen
Conductor Connection at the Bottom		
Flexible Conductor		25 - 36 mm^2
Conductor With Terminal/Ferrules		25 - 36 mm^2
Flexible Conductor		25 - 36 mm^2
Wire / Cable AWG		8 - 1/0 AWG
Torque		6 N•m
Mounting System Screw Type		
Screw Type		M12 Hexagonal
Cable With Terminal/Ferrules		–
Busbars (mm) - Maximum Size		2 x (60x10 mm^2)
Torque		26 N•m

RW117 Terminal Capacity and Tightening Torque (Auxiliary Contacts) Specifications		
Mounting System Screw Type		M3.5x10 Philips
Conductor Cross-Section		
Wire / Conductor With or Without Terminal/Ferrules		2 x (1-2.5 mm^2)
Torque		1.5 N•m

RW-E Series Solid State Overload Relays



RWB40E-3-A4U002

Overview

RW-E Series Solid State Overload relays are developed with cutting-edge technology to meet the most demanding standards worldwide. With their wide current/AMP setting range, RW-E Series OL Relays can be used for protection of electric motors of different power ratings. The benefit is versatility and flexibility for manufacturers due to the possibility of standardization of control panels. This Solid State Overload Relay can be directly mounted on WEG Contactors (CWB line) providing very reliable and flexible motor starter units. The RW-E Series counts on two independent and highly reliable built in auxiliary contacts that assure the motor is switched off when a failure occurs.

Features

- 3-pole solid state overload relays with adjustable trip class: 10, 20 and 30
- Self-powered
- Wide 5:1 adjustment range
- Thermal memory
- Phase-loss protection (less than 5s)
- Phase unbalance protection (>40% between phases)
- Temperature compensated (-20°C [-4°F] up to +60°C [+140°F])
- Manual or automatic reset modes
- Direct mounting on CWB9-38 contactor
- Separate mounting is possible with accessories
- 1NO + 1NC built in auxiliary contacts

UL File No. E189202

RW-E Solid-State Overload Relay Catalog Number Sequence

RWB	40	E	-	3	-	A4U040
Contactor Series RWB Solid State OL for CWB	**Contactor Frame** 40: 40A	**OL Relay Type** E: Electronic OL		**Power Poles** 3: 3-Phase Relay		**A4U002: 0.4 - 2.0A** **A4U008: 1.6 - 8.0A** **A4U025: 5 - 25A** **A4U040: 8 - 40A**

Table intended as reference only and not to create part numbers.

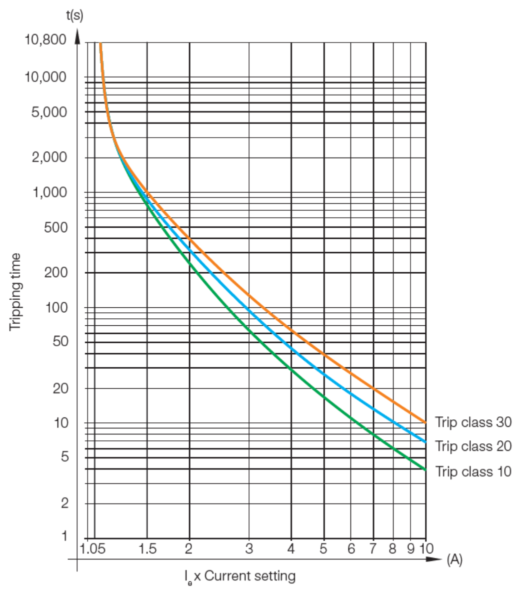
RW-E Series Solid State Overload Relays

Suitable for a Wide Range of Applications

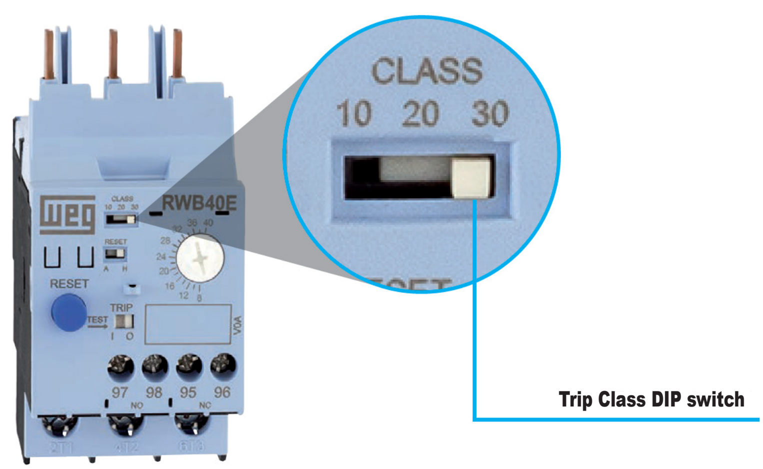
RW-E Series solid-state overload relays are suitable for protecting motors in a wide range of industrial applications including those where long starting time is required. Motors used in low, medium or heavy duty applications can be properly protected just by selecting the proper trip class (10, 20 or 30 according to IEC 60947-4-1) on the DIP-switches.

Additionally, the microprocessor electronic circuits of RW Series solid-state overload relays are temperature compensated according to IEC 60947-4-1, which means that throughout the temperature range of -20°C [-4°F] up to +60°C [140°F], the tripping point is not affected and performs consistently without undesirable tripping.

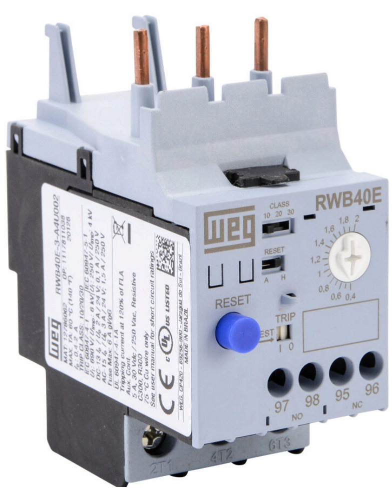
The RW-E Series also features thermal memory which assures that the heating and cooling effects of motors are modeled and that proper protection is guaranteed even after downtime periods.



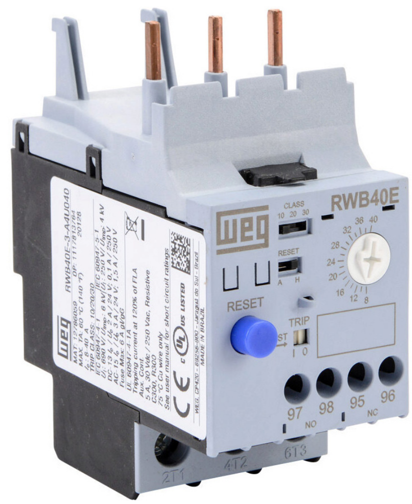
Trip Class	Multiples of Current Setting			
	1.05 x I_r	1.2 x I_r	1.5 x I_r	7.2 x I_r
10	–	T_p<2h	T_p<4min	4<T_p≤10s
20	–	T_p<2h	T_p<8min	6<T_p≤20s
30	–	T_p<2h	T_p<12min	9<T_p≤30s



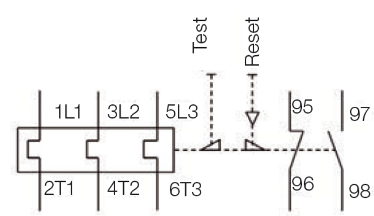
RW-E Series Solid State Overload Relays



RWB40E-3-A4U002



RWB40E-3-A4U040

RW-E Series Solid-State Overload Relays Selection Guide							
Part Number	***Price***	***For Direct Mounting on Contactors***	***Current Range A***	***Max. Fuse (gL/gG) A***	***Diagram***	***Weight (kg [lb])***	***Dimensional Drawing***
RWB40E-3-A4U002	$53.00	CWB9 through CWB38	0.4-2	16		0.25 [0.55]	PDF
RWB40E-3-A4U008	$53.00		1.6-8	32			PDF
RWB40E-3-A4U025	$53.00		5-25	63			PDF
RWB40E-3-A4U040	$83.00		8-40	125			PDF

Note: Not to be used in single-phase applications.

RWB-E Series Solid State Overload Relays

Mounting Kit

BF27-2D

RW-E Series Solid-State Overload Relays Mounting Kit Selection Guide					
Part Number	Price	Description	For Use With	Weight (kg [lb])	Dimensional Drawing
BF27-2D	$8.50	Enables the overload relay to be mounted directly to a panel via screws or 35mm DIN rail	RWB40E	0.05 [0.11]	PDF

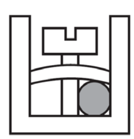
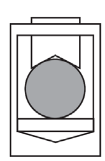
RW-E Series Solid State Overload Relays

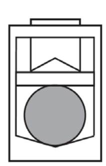
RW-E Series Series Solid State Overload Relays Specifications – General Data			
			RWB40E
Standards			IEC 60947-4-1, IEC 60947-5-1, IEC 60947-1, UL 60947-1, UL 60947-4-1A and UL 508
Rated Insulation Voltage U_i (Pollution Degree 3)	***IEC 60947-4-1***	***V***	690
	UL/CSA	***V***	600
Rated impulse withstand voltage U_{imp}		***kV***	6
Rated Operational Frequency (Sinusoidal Networks)		***Hz***	50/60
Suitable for use	***Three-phase loads***		Yes
	Single-phase/two-phase loads		No
	DC current loads		No
Trip class (IEC 60947-4-1)			10, 20 or 30, selectable
Additional featured protections	***Phase-loss***		Yes, <5s
	Phase unbalance		Yes, >40%
Reset	***Manual/minimum downtime for reset***		Yes / instantaneous
	Automatic/minimum downtime for reset		Yes / ≥90s
Maximum Operations Per Hour			30
Protection degree (IEC 60529)	***Main contacts***		IP10
	Auxiliary contacts		IP20
Mounting			Direct mounting on contactor or directly on the panel via screws or 35mm DIN rail when using the mounting kit accessory (BF27-2D)
Mechanical shock resistance 1/2 sinusoid			15g / 11ms
Vibration resistance (IEC 60068-2-6)			6g / 30-300 Hz
Ambient Temperature	***Transport and storage***		-50°C to +80°C [-58°F to +176°F]
	Operating		-20°C to +60°C [-4°F to +140°F]
	Temperature compensation		-20°C to +60°C [-4°F to +140°F]
Altitude			2000m [6562ft]

RW Series Series Solid State Overload Relays Specifications – Main Contacts			
			RWB40E
Rated Operational Voltage U_e (Pollution Degree 3)	***IEC 60947-4-1***	***V***	690
	UL/CSA	***V***	600
Current Setting / Max Fuse (RK5)		***A***	0.4-2 / 16 1.6-8 / 32 5-25 / 63 8-40 / 125
Setting Current / Average Power Dissipation Per Pole		***W***	0.4-2 / 0.07 1.6-8 / 0.06 5-25 / 0.38 8-40 / 1.5

RW-E Series
Solid State Overload Relays

RW-E Series Series Solid State Overload Relays Specifications – Auxiliary Contacts			
			RWB40E
Rated Insulation Voltage U_i (Pollution Degree 3)	IEC 60947-4-1	V	250
	UL/CSA	V	600
Rated Impulse Withstand Voltage U_{imp} (IEC 60947-1)		kV	4
Rated Operational Voltage U_e	IEC 60947-4-1	V	250
	UL/CSA	V	600
Rated Thermal Current Ith ≤60°C		A	5
Rated Operational Current I_e			
AC-14/AC-15 (IEC 60947-5-1)	24V	A	3
	120V	A	3
	250V	A	1.5
DC-13 (IEC 60947-5-1)	24V	A	2
	60V	A	0.4
	110V	A	0.22
	125V	A	0.22
	250V	A	0.1
NEMA Control Circuit Ratings	UL, CSA		C300 / R300
Short-Circuit Protection With Fuse		A	6
Minimum Voltage / Admissible Current (IEC 60947-5-4)			12V / 10mA

RW-E Series Series Solid State Overload Relays Specifications Terminal Capacity and Tightening Torque – Main Contacts			
			RWB40E
Type of Screw			M3.5
			Flat / Phillips #2
Cable Size			
Flexible Cable	mm^2		–
Cable With Terminal / Rigid Cable	mm^2		–
AWG Wire			–
Tightening Torque	N•m [lb•ft]		–
Flexible Cable	mm^2		1-10
Cable With Terminal / Rigid Cable	mm^2		1-10
Wire	AWG		16-8
Tightening Torque	N•m [lb•ft]		1.7

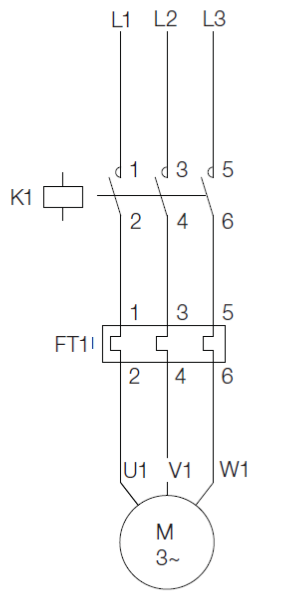
RW-E Series Series Solid State Overload Relays Specifications Terminal Capacity and Tightening Torque – Auxiliary Contacts			
			RWB40E
Type of Screw			Flat / Phillips #1
Cable Size			
Cable With or Without Terminal	mm^2		1 x 1-2.5
Wire	AWG		16-12
Tightening Torque	N•m [lb•ft]		0.8 [0.59]

RW-E Series Solid State Overload Relays

Technical Data

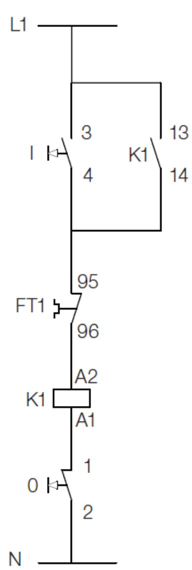
Motor Protection – Alternating Current

3-pole

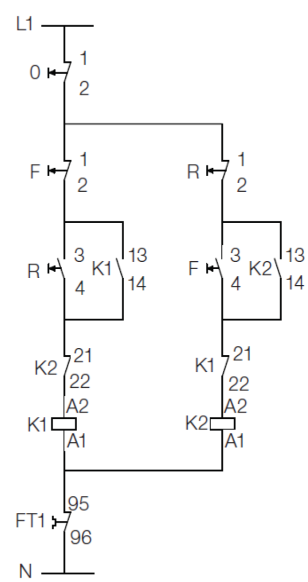


Typical Connection – Contactor + Overload Relay

Direct On Line Starter (1 Direction of Rotation)

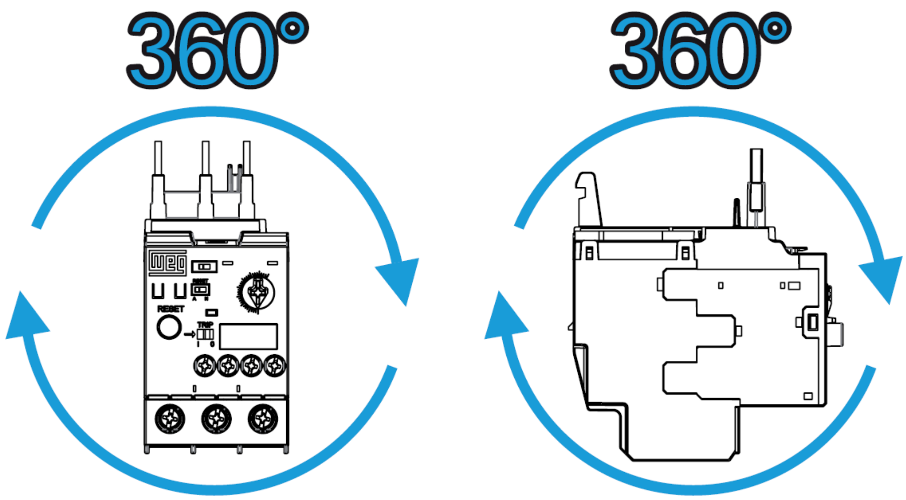


Direct On Line Starter (2 Directions of Rotation)



RW-E Series
Solid State Overload Relays

RWB40E Mounting Position



Mounting Position

MPW Series Manual Motor Protectors

MPW40-3-U001

Overview

The WEG MPW Series Manual Motor Protectors provide a very compact solution for operation and protection in motor control applications. The NEC requires four functions to be considered a combination motor starter: Motor Disconnect, Branch Circuit

Protection, Motor Controller and Motor Overload Protection. The WEG MPW meets all of these requirements, as well as the requirements of UL for Self-Protected Motor Controllers to be used in Type-E & F applications. With worldwide approvals, the WEG MPW can be used in a variety of applications all over the globe.

Features

- High short-circuit interrupting ratings (up to 65kA @480V)
- Phase-loss sensitivity protection
- UL Type-E self-protected combination starter
- Suitable for motor disconnect applications
- Group motor installations (per NEC Article 430)
- Wide variety of accessories
- Rated for DC applications

UL File No. E172121

MPW Manual Motor Protectors Catalog Number Sequence

MPW	40	-	3	-	U004

Manual Motor Protector Series
MPW: Manual Motor Protectors

Frame Size
40: To use with CWC07-CWC025 CWB09-CWB38

Number of Poles
3: 3

Overload Setting Current
MPW40
U001: 0.63-1.0 A
U032: 25-32 A

For more details refer to selection table for each frame size

Table intended as reference only and not to create part numbers.

MPW Series Manual Motor Protectors

MPW40-3-U001

MPW40

- Suitable for manual motor controller, group installation, tap conductor and combination starters* Type E & Type F
- Built-in protection: disconnect means, short-circuit protection, motor control and overload protection
- Short-circuit interrupting capacity up to 50kA@480VAC (25kA@600VAC)
- Fixed short-circuit release 13 x I_u
- Phase-loss sensitivity
- Ambient temperature compensation -4 to +140°F (-20 to +60°C)

* When associated with line side terminal LST25 and trip indicator TSB

MPW Series Manual Motor Protectors Selection Guide											
Part Number	Price	Maximum UL Horsepower						Thermal Setting (A)	Short-Circuit Ratings for Group Installation		Dimensional Drawing
		Single-Phase		Three-Phase							
		115V	230V	200V	230V	460V	575V		480V	600V	
MPW40-3-U001	$54.00	–	–	–	–	1/2	1/2	0.63 - 1.0	50kA	25kA	PDF
MPW40-3-D016	$54.00	–	1/10	1/4	1/3	3/4	1	1.0 - 1.6	50kA	25kA	PDF
MPW40-3-D025	$54.00	–	1/6	1/2	1/2	1-1/2	1-1/2	1.6 - 2.5	50kA	25kA	PDF
MPW40-3-U004	$54.00	1/8	1/3	3/4	1	2	3	2.5 - 4.0	50kA	25kA	PDF
MPW40-3-D063	$54.00	–	3/4	1-1/2	1-1/2	5	5	4.0 - 6.3	50kA	25kA	PDF
MPW40-3-U010	$54.00	1/2	1-1/2	3	3	7-1/2	10	6.3 - 10	50kA	25kA	PDF
MPW40-3-U016	$59.00	1	3	5	5	10	15	10 - 16	50kA	25kA	PDF
MPW40-3-U020	$65.00	1-1/2	3	5	7-1/2	15	20	16 - 20	50kA	25kA	PDF
MPW40-3-U025	$77.00	2	3	7-1/2	7-1/2	15	20	20 - 25	50kA	25kA	PDF
MPW40-3-U032	$82.00	–	5	10	10	20	25	25 - 32	42kA	25kA	PDF

Note: Horsepower ratings shown in the table are for reference only. Please refer to “Full Load Amps of the Motor” for final selection.

MPW Series Manual Motor Protectors

CLT32MPW40

MPW40-3-U001

MPW40 With Current Limiter

- Suitable for manual motor controller, group installation, tap conductor and combination starters* Type E & Type F
- Built-in protection: disconnect means, short-circuit protection, motor control and overload protection
- Short-circuit interrupting capacity up to 100kA@480VAC (50kA@600VAC)
- Fixed short-circuit release 13 x I_u
- Phase-loss sensitivity
- Ambient temperature compensation -4 to +140°F (-20 to +60°C)
- MPW motor protectors and CLT32MPW40 current limiter are ordered separately

** When associated with line side terminal LST25 and trip indicator TSB*

MPW Series CLT32MPW40 Current Limiter Selection Guide												
Current Limiter Part Number	*Price*	*Dimensional Drawing*	*Use With MPW Motor Protector Part Number*	*Maximum UL Horsepower*						*Thermal Setting (A)*	*Short-Circuit Ratings for Group Installation*	
				Single-Phase		*Three-Phase*						
				115V	*230V*	*200V*	*230V*	*460V*	*575V*		*480V*	*600V*
CLT32MPW40	$45.00	PDF	***MPW40-3-U001***	–	–	–	–	1/2	1/2	0.63 - 1.0	100kA	50kA
			MPW40-3-D016	–	1/10	1/4	1/3	3/4	1	1.0 - 1.6	100kA	50kA
			MPW40-3-D025	–	1/6	1/2	1/2	1-1/2	1-1/2	1.6 - 2.5	100kA	50kA
			MPW40-3-U004	1/8	1/3	3/4	1	2	3	2.5 - 4.0	100kA	50kA
			MPW40-3-D063	1/4	3/4	1-1/2	1-1/2	5	5	4.0 - 6.3	100kA	50kA
			MPW40-3-U010	1/2	1-1/2	3	3	7-1/2	10	6.3 - 10	100kA	50kA
			MPW40-3-U016	1	3	5	5	10	15	10 - 16	100kA	50kA
			MPW40-3-U020	1-1/2	3	5	7-1/2	15	20	16 - 20	100kA	50kA
			MPW40-3-U025	2	3	7-1/2	7-1/2	15	20	20 - 25	100kA	50kA
			MPW40-3-U032	–	5	10	10	20	25	25 - 32	100kA	50kA

Note: Horsepower ratings shown in the table are for reference only. Please refer to "Full Load Amps of the Motor" for final selection.

MPW Series
Manual Motor Protectors

Accessories

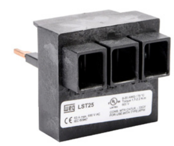
Part Number	Price	Description	Dimensional Drawing
		Auxiliary Contact Blocks	
ACBF-11	$8.25	Field installable auxiliary contact, front mount, (1) N.O./(1) N.C. contact(s), 2.5A @300 VAC/1A @ 300 VDC, screw terminal. For use with MPW40 series manual motor protectors.	PDF
ACBS-11	$9.00	Field installable auxiliary contact, left side mount, (1) N.O./(1) N.C. contact(s), 10A @ 600 VAC/2.5A @ 600 VDC, screw terminal. For use with MPW40 series manual motor protectors.	PDF
ACBS-20	$9.00	Field installable auxiliary contact, left side mount, (2) N.O. contact(s), 10A @ 600 VAC/2.5A @ 600 VDC, screw terminal. For use with MPW40 series manual motor protectors.	PDF
ACBS-02	$9.00	Field installable auxiliary contact, left side mount, (2) N.C. contact(s), 10A @ 600 VAC/2.5A @ 600 VDC, screw terminal. For use with MPW40 series manual motor protectors.	PDF
		Accessories for Combination Type-E Construction	
LST25	$17.00	Incoming power terminal block, 3-pole, maximum current 63A, 20-8 AWG. For use with MPW40 series manual motor protectors. Required when using a MPW40 in a UL Type E application 32A and less.	PDF
TSB	$15.00	Field installable short circuit alarm contact, left side mount, (2) N.O./(2) N.C. contact(s), 2.5A @300 VAC/1A @ 300 VDC, screw terminal. For use with MPW40 series manual motor protectors.	PDF
		Current Limiter	
CLT32MPW40	$45.00	Current limiter, 35mm DIN rail mount. For use with MPW40 series manual motor protectors.	PDF
		Link Modules	
ECCMP-C0	$8.50	Link module, for use with MPW40 protectors and CWC07 through CWC016 series miniature contactors with AC or DC coils. Not for use with 4-Pole CWC series miniature contactors.	PDF
ECCMP-C025	$8.50	Link module, for use with MPW40 protectors and CWC025 series miniature contactors with AC coils. Not for use with 4-Pole CWC series miniature contactors.	PDF
ECCMP-40B38	$10.00	Link module, for use with MPW40 protectors and CWB9 through CWB38 series contactors with AC coils.	PDF
ECCMP-40B38DC	$10.00	Link module, for use with MPW40 protectors and CWB9 through CWB38 series contactors with DC coils.	PDF


ACBF-11


ACBS-11

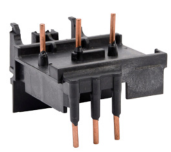

ACBS-20


ACBS-02

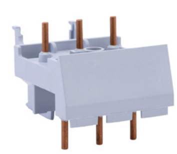

LST25

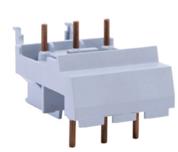

TSB


CLT32MPW40


ECCMP-C0


ECCMP-C025


ECCMP-40B38


ECCMP-40B38DC

MPW Series Manual Motor Protectors

Accessories, continued

Accessories for MPW Series Manual Motor Protectors – Selection Guide			
Part Number	**Price**	**Description**	**Dimensional Drawing**
Through-the-Door Rotary Mechanisms			
RMMP-130	$28.50	Handle, rotary, 130mm length, black/gray, external front mount, 2-position, lockable in OFF only, NEMA 1/3R, IP55. For use with MPW40 series manual motor protectors.	PDF
RMMP-130E	$28.50	Handle, rotary, 130mm length, red/yellow, external front mount, 2-position, lockable in OFF only, NEMA 1/3R, IP55. For use with MPW40 series manual motor protectors.	PDF
RMMP-330	$34.50	Handle, rotary, 330mm length, black/gray, external front mount, 2-position, lockable in OFF only, NEMA 1/3R, IP55. For use with MPW40 series manual motor protectors.	PDF
RMMP-330E	$34.50	Handle, rotary, 330mm length, red/yellow, external front mount, 2-position, lockable in OFF only, NEMA 1/3R, IP55. For use with MPW40 series manual motor protectors.	PDF
MRX-130	$42.50	Handle, rotary, 130mm length, black/gray, external front mount, 2-position, lockable in OFF only, defeatable, NEMA 4/4X, IP65. For use with MPW40 series manual motor protectors.	PDF
MRX-130E	$42.50	Handle, rotary, 130mm length, red/yellow, external front mount, 2-position, lockable in OFF only, defeatable, NEMA 4/4X, IP65. For use with MPW40 series manual motor protectors.	PDF
MRX-330	$46.50	Handle, rotary, 330mm length, black/gray, external front mount, 2-position, lockable in OFF only, defeatable, NEMA 4/4X, IP65. For use with MPW40 series manual motor protectors.	PDF
MRX-330E	$46.50	Handle, rotary, 330mm length, red/yellow, external front mount, 2-position, lockable in OFF only, defeatable, NEMA 4/4X, IP65. For use with MPW40 series manual motor protectors.	PDF
Under Voltage and Shunt Trip Releases			
SRMPD51	$22.50	Field installable shunt trip, right side mount, 20-24 VAC (50/60Hz) coil voltage, screw terminal. For use with MPW40 series manual motor protectors.	PDF
SRMPD59	$22.50	Field installable shunt trip, right side mount, 100-127 VAC (50/60Hz) coil voltage, screw terminal. For use with MPW40 series manual motor protectors.	PDF
SRMPD65	$22.50	Field installable shunt trip, right side mount, 200-240 VAC (50/60Hz) coil voltage, screw terminal. For use with MPW40 series manual motor protectors.	PDF
URMPV18	$22.50	Field installable undervoltage trip device, right side mount, 110 VAC (50Hz)/120 VAC (60Hz) sensing range, screw terminals. For use with MPW40 series manual motor protectors.	PDF
URMPV23	$22.50	Field installable undervoltage trip device, right side mount, 180 VAC (50Hz)/208 VAC (60Hz) sensing range, screw terminals. For use with MPW40 series manual motor protectors.	PDF
URMPV30	$22.50	Field installable undervoltage trip device, right side mount, 208 VAC (50Hz)/240 VAC (60Hz) sensing range, screw terminals. For use with MPW40 series manual motor protectors.	PDF
URMPV37	$22.50	Field installable undervoltage trip device, right side mount, 230-240 VAC (50Hz)/240-277 VAC (60Hz) sensing range, screw terminals. For use with MPW40 series manual motor protectors.	PDF
URMPV47	$22.50	Field installable undervoltage trip device, right side mount, 400-415 VAC (50Hz)/480 VAC (60Hz) sensing range, screw terminals. For use with MPW40 series manual motor protectors.	PDF
URMPD02	$22.50	Field installable undervoltage trip device, right side mount, 24 VAC (50/60Hz) sensing range, screw terminals. For use with MPW40 series manual motor protectors.	PDF

RMMP-130

MRX-130

MRX-130E

SRMPD51

URMPV18

URMPD02

Self Protected Combination Type-E Motor Controller

Combination starters are the most common type of packaged motor controllers. They are called combination because of their construction and combined functions required by the US National Electric Code (NEC): Motor Disconnect, Motor Branch Circuit Protection, Motor Controller and Motor Overload Protection. UL currently recognizes six different types of combination starters that meet the requirements of a motor branch circuit.

Constructions Types A through D are traditional starters that use either a listed disconnect switch and fuses or a listed circuit breakers as the disconnect means and for short circuit protection. Each type uses a separate UL 508 listed motor controller and overload relay. Recently revisions on UL508 introduced the Type E and Type F starters.

<table>
<tr><th rowspan="2">UL Combination Starter Type</th><th colspan="4">Device Used for Component Function</th></tr>
<tr><th>Disconnected</th><th>Branch Circuit Protection</th><th>Motor Controller</th><th>Motor OL Relay</th></tr>
<tr><td>A</td><td rowspan="2">UL 98 Manual Disconnect</td><td>UL 248 Fuses</td><td rowspan="4">UL 508 Magnetic or Solid State Controller</td><td rowspan="4">UL 508 Motor Overload Relay</td></tr>
<tr><td>B</td><td>UL 508 Motor Short Circuit Protector</td></tr>
<tr><td>C</td><td colspan="2">UL 489 Inverse Time Circuit Breaker</td></tr>
<tr><td>D</td><td colspan="2">UL 489 Instantaneous Trip Circuit Breaker</td></tr>
<tr><td>E</td><td colspan="4">UL 508 Self-Protected Combination Controller</td></tr>
<tr><td>F</td><td colspan="2">UL 508 Manual Self-Protected Combination Controller</td><td>UL 508 Magnetic or Solid State Controller</td><td>UL 508 Manual Self-Protected Combination Controller</td></tr>
</table>

Type E starter is a self-protected combination motor controller that combines in a single device all the required functions of a combination starter and eliminates any additional requirements for upstream fuses or circuit breakers. These starters clear faults within their rating without sustaining damage to themselves or the rest of the system, being able to get back into operation. There are two arrangements for a Type E starter: manual (as stand-alone) and associated with a contactor. Both are submitted to the same tests sequences.

Type F starter consists of a listed manual Type E combined with a UL508 listed contactor. The difference between the two types is related to the absence of self-protected characteristic; hence, Type F has softened tests sequences allowing damages on the contactor after a fault.

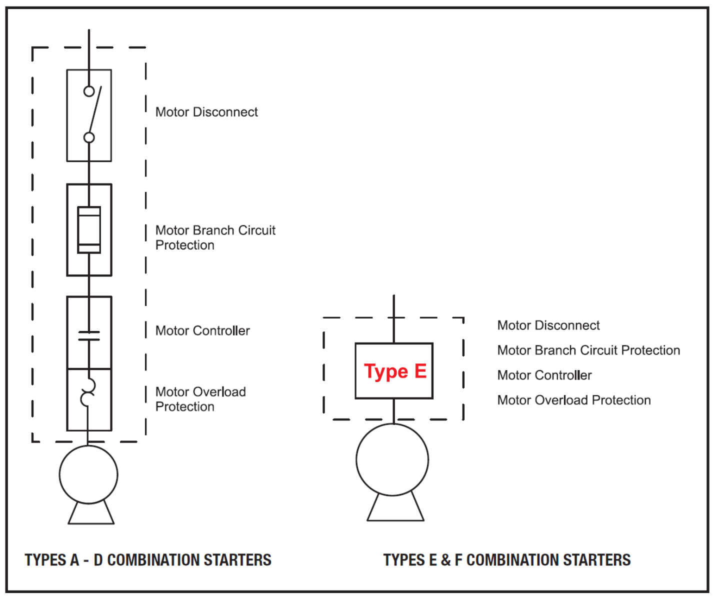
Tests performed in order to fulfill the Type E requirements are considered the hardest in UL508, including short-circuit and endurance tests on the same sample. As a comparison, UL Type E exceeds the requirements for Type F and IEC60947-4-1 Coordination type 2.

WEG's self-protected combination Type E combines all of these functions within a single product for a manual operation or within a set of two products (with a listed contactor) for a remote operation. Both options must be associated with the accessories Line Side Terminal (LST25) and Tripping Signaling Block (TSB) to accomplish UL508/UL489 requirements for spacing (clearance and creepage) and short-circuit indication.

They are recommended for a wide range of applications where full voltage combination starters are required. Some examples are: Pumps, Industrial Washing Machines, Compressors, Blowers, Cutting Machines, Conveyors, Lumber Processing and many others.

The Manual Type E Starter is a stand-alone product – MPW series – that ranges from fractional up to 20Hp@460V motors (0.16 to 32A) with up to 100KA@480V and 50KA@600V interrupting short-circuit capability. Together with some accessories that complete this product line, the MPW series are a compact and reliable solution for starting and protecting motors.

WEG also offers an option for a remote Type E & F Starter, combining the MPW series (as a manual type E) together with a contactor from the CWB Series. As this version undergoes the same tests, it has the same horse power ratings and short-circuit capabilities as the manual Type E. However, it provides remote operation and controlling of the application through the contactor's coil.



Manual Self Protected Combination Type-E Motor Controllers

MPW40-3-U001

Manual Self-Protected Combination Type-E Motor Controllers

- No need for upstream protective devices such as UL489 MCCB or UL248 fuses
- Built-in protection: disconnect means, short-circuit protection, motor control and overload protection
- Short-circuit interrupting capacity up to 100kA@480VAC (50kA@600VAC)
- Compact combination starter
- Phase-loss sensitivity
- Ambient temperature compensation -4 to +140°F (-20 to +60°C)

Manual Self Protected Combination Type-E Motor Controllers (High Interruption Capacity) Selection Guide

Part Number			Maximum UL Horsepower						Thermal Setting (A)	Short-Circuit Interruption Capacity
Manual Motor Protector	Line Side Terminal	Tripping Indicator	Single-Phase		Three-Phase					
			115V	230V	200V	230V	460V	575V		480V
MPW40-3-U001	LST25	TSB	–	–	–	–	1/2	1/2	0.63 - 1.0	65kA
MPW40-3-D016			–	1/10	1/4	1/3	3/4	1	1.0 - 1.6	65kA
MPW40-3-D025			–	1/6	1/2	1/2	1-1/2	1-1/2	1.6 - 2.5	65kA
MPW40-3-U004			1/8	1/3	3/4	1	2	3	2.5 - 4.0	65kA
MPW40-3-D063			1/4	3/4	1-1/2	1-1/2	5	5	4.0 - 6.3	65kA
MPW40-3-U010			1/2	1-1/2	3	3	7-1/2	10	6.3 - 10	65kA
MPW40-3-U016			1	3	5	5	10	15	10 - 16	65kA
MPW40-3-U020			1-1/2	3	5	7-1/2	15	20	16 - 20	50kA
MPW40-3-U025			2	3	7-1/2	7-1/2	15	20	20 - 25	50kA
MPW40-3-U032			–	5	10	10	20	25	25 - 32	42kA

Note: Horsepower ratings shown in the table are for reference only. Please refer to "Full Load Amps of the Motor" for final selection.
Note: Individual component catalog numbers are ordered separately.

Manual Self Protected Combination Type-E Motor Controllers (Extra High Interruption Capacity) Selection Guide

Part Number				Maximum UL Horsepower						Thermal Setting (A)	Short-Circuit Interruption Capacity
Manual Motor Protector	Current Limiter	Line Side Terminal	Tripping Indicator	Single-Phase		Three-Phase					
				115V	230V	200V	230V	460V	575V		480V
MPW40-3-U001	CLT32MPW40	LST25	TSB	–	–	–	–	1/2	1/2	0.63 - 1.0	100kA
MPW40-3-D016				–	1/10	1/4	1/3	3/4	1	1.0 - 1.6	100kA
MPW40-3-D025				–	1/6	1/2	1/2	1-1/2	1-1/2	1.6 - 2.5	100kA
MPW40-3-U004				1/8	1/3	3/4	1	2	3	2.5 - 4.0	100kA
MPW40-3-D063				1/4	3/4	1-1/2	1-1/2	5	5	4.0 - 6.3	100kA
MPW40-3-U010				1/2	1-1/2	3	3	7-1/2	10	6.3 - 10	100kA
MPW40-3-U016				1	3	5	5	10	15	10 - 16	100kA
MPW40-3-U020				1-1/2	3	5	7-1/2	15	20	16 - 20	100kA
MPW40-3-U025				2	3	7-1/2	7-1/2	15	20	20 - 25	100kA
MPW40-3-U032				–	5	10	10	20	25	25 - 32	100kA

Note: Horsepower ratings shown in the table are for reference only. Please refer to "Full Load Amps of the Motor" for final selection.
Note: Individual component catalog numbers are ordered separately.

Combination Type-F Motor Controllers

MPW40-3-U001

Combination Type-F Motor Controllers

- No need for upstream protective devices such as UL489 MCCB or UL248 fuses
- Built-in protection: disconnect means, short-circuit protection, motor control and overload protection
- Short-circuit interrupting capacity up to 100kA@480VAC (50kA@600VAC)
- Compact combination starter
- Phase-loss sensitivity
- Ambient temperature compensation -4 to +140°F (-20 to +60°C)
- Remote operation

Combination Type-F Motor Controllers (High Interruption Capacity) Selection Guide

Part Number					Maximum UL Horsepower						Thermal Setting (A)	Short-Circuit Interruption Capacity
Manual Motor Protector	Line Side Terminal	Tripping Indicator	Link Module	Contactor	Single-Phase		Three-Phase					
					115V	230V	200V	230V	460V	575V		480V
MPW40-3-U001				CWB9	–	–	–	–	1/2	1/2	0.63 - 1.0	65kA
MPW40-3-D016				CWB9	–	1/10	1/4	1/3	3/4	1	1.0 - 1.6	65kA
MPW40-3-D025				CWB9	–	1/6	1/2	1/2	1-1/2	1-1/2	1.6 - 2.5	65kA
MPW40-3-U004				CWB9	1/8	1/3	3/4	1	2	3	2.5 - 4.0	65kA
MPW40-3-D063	LST25	TSB	ECCMP-40B38	CWB9	1/4	3/4	1-1/2	1-1/2	5	5	4.0 - 6.3	65kA
MPW40-3-U010				CWB9	1/2	1-1/2	3	3	7-1/2	10	6.3 - 10	65kA
MPW40-3-U016				CWB18	1	3	5	5	10	15	10 - 16	65kA
MPW40-3-U020				CWB25	1-1/2	3	5	7-1/2	15	20	16 - 20	50kA
MPW40-3-U025				CWB32	2	3	7-1/2	7-1/2	15	20	20 - 25	42kA

Notes: 1) Horsepower ratings shown in the table are for reference only. Please refer to "Full Load Amps of the Motor" for final selection.
2) Individual component catalog numbers are ordered separately.

Combination Type-F Motor Controllers (Extra-High Interruption Capacity) Selection Guide

Part Number						Maximum UL Horsepower						Thermal Setting (A)	Short-Circuit Interruption Capacity
Manual Motor Protector	Line Side Terminal	Tripping Indicator	Link Module	Current Limiter	Contactor	Single-Phase		Three-Phase					
						115V	230V	200V	230V	460V	575V		480V
MPW40-3-U001					CWB9	–	–	–	–	1/2	1/2	0.63 - 1.0	100kA
MPW40-3-D016					CWB9	–	1/10	1/4	1/3	3/4	1	1.0 - 1.6	100kA
MPW40-3-D025					CWB9	–	1/6	1/2	1/2	1-1/2	1-1/2	1.6 - 2.5	100kA
MPW40-3-U004					CWB9	1/8	1/3	3/4	1	2	3	2.5 - 4.0	100kA
MPW40-3-D063	LST25	TSB	ECCMP-40B38	CLT32MPW40	CWB9	1/4	3/4	1-1/2	1-1/2	5	5	4.0 - 6.3	100kA
MPW40-3-U010					CWB9	1/2	1-1/2	3	3	7-1/2	10	6.3 - 10	100kA
MPW40-3-U016					CWB18	1	3	5	5	10	15	10 - 16	100kA
MPW40-3-U020					CWB18	1-1/2	3	5	7-1/2	15	20	16 - 20	100kA
MPW40-3-U025					CWB25	2	3	7-1/2	7-1/2	15	20	20 - 25	100kA
MPW40-3-U032					CWB32	–	5	10	10	20	25	25 - 32	100kA

Notes: 1) Horsepower ratings shown in the table are for reference only. Please refer to "Full Load Amps of the Motor" for final selection.
2) Individual component catalog numbers are ordered separately.

Combination Type-F Motor Controllers

Accessories for MPW Series Manual Motor Protectors

Auxiliary Contact Block Accessories Selection Guide

Part Number	Price	Description	Auxiliary Contacts N.O.	Auxiliary Contacts N.C.	Dimensional Drawing
Front Mounting Auxiliary Contact Block – CBF					
ACBF-11	$8.25	For use with MPW40[1]	1	1	PDF
Left Side Auxiliary Contact Block – ACBS					
ACBS-11	$9.00	For use with MPW40[1]	1	1	PDF
ACBS-20	$9.00		2	–	PDF
ACBS-02	$9.00		–	2	PDF

Trip Signalling Block (TSB) Accessory Selection Guide

Part Number	Price	For Use With	Description	Dimensional Drawing
TSB	$15.00	MPW40[1]	• Equipped with 2 auxiliary contacts (1 N.O. + 1 N.C.) for overload trip signalling and 2 other auxiliary contacts (1 N.O. + 1 N.C.) for short-circuit trip signalling. • To reset the MPW after a short-circuit, the blue flag must be manually reset after the cause of the failure has been solved. • Left side auxiliary contacts can be assembled together with the trip signalling block. • Left side assembly only.	PDF

Undervoltage Release (URMP) Accessory Selection Guide

Part Number	Price	For Use With	Voltage	Dimensional Drawing
URMPV23	$22.50	MPW40[1]	208VAC 60Hz	PDF
URMPD02	$22.50		24VAC 50/60Hz	PDF
URMPV47	$22.50		400-415 VAC 50Hz / 480VAC 60Hz	PDF
URMPV18	$22.50		110VAC50Hz / 120VAC 60Hz	PDF
URMPV30	$22.50		240VAC 60Hz	PDF
URMPV37	$22.50		230-240 VAC 50Hz / 277VAC 60Hz	PDF

Shunt Trip Releases Selection Guide

Part Number	Price	For Use With	Voltage	Dimensional Drawing
SRMPD51	$22.50	MPW40[1]	20-24 VAC 50/60 Hz	PDF
SRMPD59	$22.50		100-127 VAC 50/60 Hz	PDF
SRMPD65	$22.50		200-240 VAC 50/60 Hz	PDF

Link Modules for Manual Motor Protector Assembly + Contactors (ECCMP) Selection Guide

Part Number	Price	For Use With	Description	Contactors	Dimensional Drawing
ECCMP-C0	$8.50	MPW40[1]	For direct connection (electrical and mechanical) of motor protector to contactors.	CWC07 through CWC016, AC coils	PDF
ECCMP-C025	$8.50			CWC025, AC coils	PDF

[1]The following accessories can be assembled at the same time: 1 ACBF + 1 URMP/SRMP + 1 TSB or 1 ACBS + 1 URMP/SRMP + 1 TSB

ACBF-11

ACBS-11

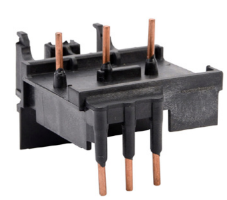
ACBS-20

ACBS-02

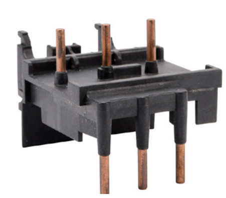
TSB

URMPV18

URMPD02



ECCMP-C0



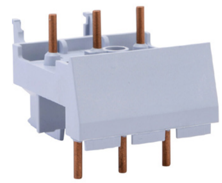
ECCMP-C025

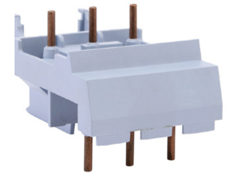
Combination Type-F Motor Controllers

Accessories (continued)

Connector Links for MPW40 and CWB Contactors Selection Guide

Part Number	Price	For Use With	Description	Contactors	Dimensional Drawing
ECCMP-40B38	$10.00	MPW40	For direct connection (electrical and mechanical) of motor protector to contactors.	CWB9 through CWB38, AC coils	PDF
ECCMP-40B38DC	$10.00			CWB9 through CWB38, DC coils	PDF





ECCMP-40B38 ECCMP-40B38DC

Through-the-Door Rotary Handle – RMMP and MRX Selection Guide

Part Number	Price	For Use With	Description	Handle Color	Dimensional Drawing
RMMP-130	$28.50	MPW40	• Degree of protection: IP55/NEMA1. • Shows MPW position “1” (ON) or “0” (OFF). • Panel door can only be opened in OFF position. • Adjustable shaft length: 130-155 mm [5.12- 6.10 in] (Model 130) and 330-355 mm [12.99-13.98 in] (Model 330). • To assemble the handle on the MPW, the shaft must have a length of at least 80mm [3.15 in] • Up to three padlocks can be used in OFF position to block MPW operation and panel door opening • Handle can be mounted on panels with thickness of 1-5 mm [0.04-0.20 in]. • Handle can be assembled even with MPW turned in the 90° position.	Gray/black	PDF
RMMP-330	$34.50				PDF
RMMP-130E	$28.50			Red/ yellow	PDF
RMMP-330E	$34.50				PDF
MRX-130	$42.50		• Panel door can be opened in ON position (thermometry) by defeating mechanism, • Degree of protection: IP65/NEMA 4X. • Shows MPW position “1” (ON) or “0” (OFF). • Panel door can only be opened in OFF position. • Adjustable shaft length: 130-155 mm [5.12- 6.10 in] (Model 130) and 330-355 mm [12.99-13.98 in] (Model 330). • To assemble the handle on the MPW, the shaft must have a length of at least 80mm [3.15 in] • Up to three padlocks can be used in OFF position to block MPW operation and panel door opening • Handle can be mounted on panels with thickness of 1-5 mm [0.04-0.20 in].	Gray/black	PDF
MRX-330	$46.50				PDF
MRX-130E	$42.50			Red/ yellow	PDF
MRX-330E	$46.50				PDF

RMMP-130

MRX-130

Three-Phase Feeder Terminal – Selection Guide

Part Number	Price	For Use With	Description	Dimensional Drawing
LST25	$17.00	MPW40	• Block module for “Type E” Combination Motor Controller” in accordance with UL (LST25+MPW+TSB) • Rated insulation voltage: 690VAC. • I_e: 63A • Terminals: 8-20AWG	PDF

LST25

MPW40 Technical Data

MPW40 – Specifications					
Type	MPW40-3-U001	MPW40-3-D016	MPW40-3-D025	MPW40-3-U004	MPW40-3-D063
Standards	Devices according to International Standards IEC 60947-1 / 60947-4-1; European Standards EN 60947-1 / 60947-4-1; Underwriters Laboratories - UL 508; CSA C.22.2/14; VDE 0660/102				
Current Setting Range	0.63-1.0 A	1.0 - 1.6 A	1.6 - 2.5 A	2.5-4.0 A	4.0-6.3 A
Rated Thermal Current I_{th}	1.0 A	1.6 A	2.5 A	4.0 A	6.3 A
Rated Insulation Voltage U_i					
Acc. IEC; VDE 0660	690V				
Acc. UL; CSA	600V				
Rated Operating Voltage U_e					
Acc. IEC; VDE 0660	690V				
Acc. UL; CSA	600V				
Rated Impulse Voltage U_{imp}					
Acc. IEC60947-1	6kV				
Rated Operating Frequency	50/60 Hz				
Overvoltage Category	III				
Pollution Degree	3				
Utilization Category					
IEC 60947-2 (Motor Protector)	A				
IEC 60947-4-1 (Motor Starter)	AC-3				
Lifespan					
Mechanical	100,000 operations				
Electrical (I_e max.)	100,000 operations				
Switching Rate (motor starts) AC-3	15 operations/hour				
Ambient Temperature					
Storage	-50°C to +80°C (-58°F to +176°F)				
Operating	-20°C to +60°C (-4°F to +140°F)				
Ambient Temperature Compensation	-20°C to +60°C (-4°F to +140°F)				
Climatic Proofing	IEC 60068-2-3 / IEC 60068-2-30				
Altitude					
Up to 2,000m (6,600ft)	Nominal values (for higher altitudes refer to Altitude Correction Factors table)				
Degree of protection	IP20				
Resistance to Shock					
Acc. IEC 60068-2-27	15g				
Resistance to Vibration	IEC 68-2				
Protection Against Direct Contact					
Acc. IEC 536; DIN VDE 0106 Part 100	Finger and back of hand proof				
Phase Failure Sensitivity Protection	Yes				
Overload Protection Characteristics (x I_u)	0.6 - 1 A				
Magnetic Release (x I_u)	13A				
Overload Trip Class	10				
Total Power Loss P_v					
At rated load operating temperature	6W	6W	6W	6W	6W
Weight	0.32 kg [0.71 lb]				
Type of Terminal	Flat type				
Screw Driver	Philips #2				
Terminal Capacity					
Solid-Stranded	1 or 2 x (0.5 to 2.5)				
Tightening Torque	1.2-1.7 N•m [11-16 lb•in]				
Mounting Position	Any position				

MPW40 Technical Data

MPW40 – Specifications (continued)					
Type	*MPW40-3-U010*	*MPW40-3-U016*	*MPW40-3-U020*	*MPW40-3-U025*	*MPW40-3-U032*
Standards	Devices according to International Standards IEC 60947-1 / 60947-4-1; European Standards EN 60947-1 / 60947-4-1; Underwriters Laboratories - UL 508; CSA C.22.2/14; VDE 0660/102				
Current Setting Range	6.3 - 10 A	10 - 16 A	16 - 20 A	20 - 25 A	25 - 32 A
Rated Thermal Current I_{th}	10A	16A	20A	25A	32A
Rated Insulation Voltage U_i					
Acc. IEC; VDE 0660	690V				
Acc. UL; CSA	600V				
Rated Operating Voltage U_e					
Acc. IEC; VDE 0660	690V				
Acc. UL; CSA	600V				
Rated Impulse Voltage U_{imp}					
Acc. IEC60947-1	6kV				
Rated Operating Frequency	50/60 Hz				
Overvoltage Category	III				
Pollution Degree	3				
Utilization Category					
IEC 60947-2 (Motor Protector)	A				
IEC 60947-4-1 (Motor Starter)	AC-3				
Lifespan					
Mechanical	100,000 operations				
Electrical (I_e max.)	100,000 operations				
Switching Rate (motor starts) AC-3	15 operations/hour				
Ambient Temperature					
Storage	-50°C to +80°C (-58°F to +176°F)				
Operating	-20°C to +60°C (-4°F to +140°F)				
Ambient Temperature Compensation	-20°C to +60°C (-4°F to +140°F)				
Climatic Proofing	IEC 60068-2-3 / IEC 60068-2-30				
Altitude					
Up to 2,000m (6,600ft)	Nominal values (for higher altitudes refer to Altitude Correction Factor tables)				
Degree of protection	IP20				
Resistance to Shock					
Acc. IEC 60068-2-27	15g				
Resistance to Vibration	IEC 68-2				
Protection Against Direct Contact					
Acc. IEC 536; DIN VDE 0106 Part 100	Finger and back of hand proof				
Phase Failure Sensitivity Protection	Yes				
Overload Protection Characteristics (x I_u)	0.6 - 1 A				
Magnetic Release (x I_u)	13A				
Overload Trip Class	10A				
Total Power Loss P_v					
At rated load operating temperature	6W	6W	8W	8W	8W
Weight	0.32 kg [0.71 lb]				
Type of Terminal	Flat type				
Screw Driver	Philips #2				
Terminal Capacity					
Solid-Stranded	1 or 2 x (0.5 to 2.5)				
Tightening Torque	1.2-1.7 N•m [11-16 lb•in]				
Mounting Position	Any position				

MPW40 Technical Data

MPW40 – Specifications – Power Contact Ratings					
Type	***MPW40-3-U001***	***MPW40-3-D016***	***MPW40-3-D025***	***MPW40-3-U004***	***MPW40-3-D063***
UL/CSA Data					
Rated Operational Current I_e	1.0 A	1.6 A	2.5 A	4.0 A	6.3 A
Magnetic Release Current	13A	21A	33A	52A	82A
Max. Short Circuit Current					
Without CLT32 (480V)	65kA	65kA	65kA	65kA	65kA
Without CLT32 (600V)	25kA	25kA	25kA	25kA	25kA
With CLT32 (480V)	100kA	100kA	100kA	100kA	100kA
With CLT32 (600V)	50kA	50kA	50kA	50kA	50kA
Motor Load, 1-phase (115V)	–	–	–	1/8 hp	1/4 hp
Motor Load, 1-phase (230V)	–	1/10 hp	1/6 hp	1/3 hp	3/4 hp
Motor Load, 3-phase (200V)	–	1/4 hp	1/2 hp	3/4 hp	1 1/2 hp
Motor Load, 3-phase (230V)	–	1/3 hp	1/2 hp	1 hp	1 1/2 hp
Motor Load, 3-phase (460V)	1/2	3/4 hp	1 1/2 hp	2 hp	5 hp
Motor Load, 3-phase (575V)	1/2	1 hp	1 1/2 hp	3 hp	5 hp
Max. Rated Current of Protection Device for Group Installation					
Fuse or MCCB	125A	125A	125A	125A	125A

MPW40 – Specifications – Power Contact Ratings					
Type	***MPW40-3-U010***	***MPW40-3-U016***	***MPW40-3-U020***	***MPW40-3-U025***	***MPW40-3-U032***
UL/CSA Data					
Rated Operational Current I_e	10A	16A	20A	25A	32A
Magnetic Release Current	130A	208A	260A	325A	416A
Max. Short Circuit Current					
Without CLT32 (480V)	65kA	50kA	50kA	50kA	50kA
Without CLT32 (600V)	25kA	25kA	25kA	25kA	25kA
With CLT32 (480V)	100kA	100kA	100kA	100kA	100kA
With CLT32 (600V)	50kA	50kA	50kA	50kA	50kA
Motor Load, 1-phase (115V)	1/2 hp	1 hp	1 1/2 hp	2 hp	–
Motor Load, 1-phase (230V)	1 1/2 hp	3 hp	3 hp	3 hp	5 hp
Motor Load, 3-phase (200V)	3 hp	5 hp	5 hp	7 1/2 hp	10 hp
Motor Load, 3-phase (230V)	3 hp	5 hp	7 1/2 hp	7 1/2 hp	10 hp
Motor Load, 3-phase (460V)	7 1/2 hp	10 hp	15 hp	15 hp	20 hp
Motor Load, 3-phase (575V)	10 hp	15 hp	20 hp	20 hp	25 hp
Max. Rated Current of Protection Device for Group Installation					
Fuse or MCCB	125A	160A	250A	250A	300A

MPW Technical Data

Auxiliary Contact Ratings					
Type		***ACBF-11***	***ACBS-11***	***ACBS-20***	***ACBS-02***
Rated Insulation Voltage U_i					
Acc. IEC; VDE 0660		300V	690V	690V	690V
Acc. UL; CSA		240V	600V	600V	600V
Rated Operating Voltage U_e					
Acc. IEC; VDE 0660		250V	690V	690V	690V
Acc. UL; CSA		240V	600V	600V	600V
Rated Impulse Voltage U_{imp}					
Acc. IEC60947-1		4kv	6kv	6kv	6kv
Overvoltage Category		III	III	III	III
Pollution Degree		3			
Life Span					
Mechanical		100,000 operations			
Electrical (I_e max.)		100,000 operations			
Rated Thermal Current I_{th}		2.5 A	10A	10A	10A
Rated Operating Current I_e					
Acc. IEC 60947-5-1 / AC-15	24V	2A	6A	6A	6A
	110-127V	0.5 A	6A	6A	6A
	220-240V	0.5 A	6A	6A	6A
	380-400V	–	3A	3A	3A
	415-450V	–	1A	1A	1A
	500V	–	1A	1A	1A
	660-690V	–	1A	1A	1A
Acc. UL; CSA		C300	A600	A600	A600
Rated Operating Current I_e					
Acc. IEC 60947-5-1 / DC-13	24V	1A	2A	2A	2A
	48V	0.3 A	0.8 A	0.8 A	0.8A
	60V	0.15 A	0.5 A	0.5 A	0.5 A
	110V	–	0.5 A	0.5 A	0.5 A
	220V	–	0.25 A	0.25 A	0.25 A
	440V	–	0.1 A	0.1 A	0.1 A
Acc. UL; CSA		R300	Q600	Q600	Q600
Short Circuit Rating Without Welding					
RK5		10A			
MCB		6A			
Type of Terminal		Screwdriver; Philips #2			
Terminal Capacity					
Solid or Stranded		1 or 2 x (0.5 to 2.5 mm^2)			
Solid or Stranded		1 or 2 x (18 to 14 AWG)			
Tightening Torque		1.0-1.25 N•m [8.85-11.06 lb•in]			

MPW Technical Data

Trip Signalling Block Ratings		
Type		*TSB*
Rated Insulation Voltage U_i		
Acc. IEC; VDE 0660		690V
Acc. UL; CSA		600V
Rated Operating Voltage U_e		
Acc. IEC; VDE 0660		690V
Acc. UL; CSA		600V
Rated Impulse Voltage U_{imp}		
Acc. IEC60947-1		6kv
Overvoltage Category		III
Pollution Degree		3
Life Span		
Mechanical		100,000 operations
Electrical (I_e max.)		100,000 operations
Rated Thermal Current I_{th}		10A
Rated Operating Current I_e		
Acc. IEC 60947-5-1 / AC-15	***24V***	6A
	110-127V	6A
	220-240V	6A
	380-400V	3A
	415-450V	3A
	500V	2A
	660-690V	1A
Acc. UL; CSA		A600
Rated Operating Current I_e		
Acc. IEC 60947-5-1 / DC-13	***24V***	2A
	48V	0.5 A
	60V	0.5 A
	110V	0.5 A
	220V	0.25 A
	440V	0.1 A
Acc. UL; CSA		Q600
Short Circuit Rating Without Welding		
Fuse RK5		6A
MCB		6A
Type of Terminal		Screwdriver; Philips #2
Terminal Capacity		
Solid or Stranded		1 or 2 x (0.5 to 2.5 mm2)
Solid or Stranded		1 or 2 x (18 to 14 AWG)
Tightening Torque		1.0-1.25 N•m [8.85-11.06 lb•in]

MPW Technical Data

Shunt Trip Ratings

Type	SRMP
Rated Insulation Voltage U_i	
Acc. IEC; VDE 0660	690V
Acc. UL; CSA	600V
Rated Operating Voltage U_e	
Acc. IEC; VDE 0660	690V
Acc. UL; CSA	600V
Rated Impulse Voltage U_{imp}	
Acc. IEC60947-1	6kv
Overvoltage Category	III
Pollution Degree	3
Life Span	
Mechanical	100,000 operations
Electrical (I_e max.)	100,000 operations
Actuating Voltage (x U_s)	0.7-1.1 V
Power Consumption	
Pull-In	20.2 VA [13W]
Hold	7.2 VA [2.4 W]
Maximum Opening Time	20ms
Short Circuit Rating Without Welding	
Fuse RK5	10A
MCB	6A
Type of Terminal	Screwdriver; Philips #2
Terminal Capacity	
Solid or Stranded	1 or 2 x (0.5 to 2.5 mm^2)
Solid or Stranded	1 or 2 x (18 to 14 AWG)
Tightening Torque	1.0-1.25 N•m [8.85-11.06 lb•in]

Undervoltage Trip Ratings

Type	URMP
Rated Insulation Voltage U_i	
Acc. IEC; VDE 0660	690V
Acc. UL; CSA	600V
Rated Operating Voltage U_e	
Acc. IEC; VDE 0660	690V
Acc. UL; CSA	600V
Rated Impulse Voltage U_{imp}	
Acc. IEC60947-1	6kv
Overvoltage Category	III
Pollution Degree	3
Life Span	
Mechanical	100,000 operations
Electrical (I_e max.)	100,000 operations
Pick-Up Voltage (x U_s)	0.85-1.1 V
Drop-Out Voltage (x U_s)	0.7-0.35 V
Power Consumption	
Pull-In	20.2 VA [13W]
Hold	7.2 VA [2.4 W]
Maximum Opening Time	20ms
Short Circuit Rating Without Welding	
Fuse gL/gG	10A
MCB	6A
Type of Terminal	Screwdriver; Philips #2
Terminal Capacity	
Solid or Stranded	1 or 2 x (0.5 to 2.5 mm^2)
Solid or Stranded	1 or 2 x (18 to 14 AWG)
Tightening Torque	1.0-1.25 N•m [8.85-11.06 lb•in]

Main Terminal Capacity

Part Number	Type	Number of Conductors	Cross-Section
MPW40-x-xxxx	Rigid or flexible cable	1 or 2	1 to 2.5 mm^2 2.5 to 6 mm^2 14 to 8 AWG

MPW Technical Data

Altitude – Correction Factor

The MPW manual motor protectors do not undergo any change in their specified performance when used at an altitude of up to 2000 meters above sea level. However, as the altitude increases, the reduced atmospheric pressure results in decreasing dielectric properties. Therefore, current and voltage correction factors must be applied for altitudes exceeding 2000 meters, as shown in the table at right.

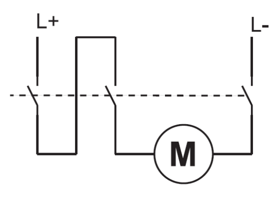
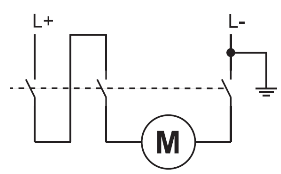
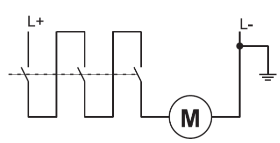
Altitude h (above sea level)	*Rated operational voltage U_e*	*Current correction factor I_u*
h ≤ 2000 m	690V	1 x I_u
2000 < h ≤ 3000 m	550V	0.96 x I_u
3000 < h ≤ 4000 m	480V	0.93 x I_u
4000 < h ≤ 5000 m	420V	0.90 x I_u

DC Operation

The MPW40 motor protective circuit breaker can also be used for operating DC loads. For such operation it is necessary to connect 2 or 3 poles in series. See recommended circuits and their voltage limits in the table at right.

Time constant t = 5ms

Short-circuit breaking capacity Icu = 10 kA for all configurations

Circuits	*Max. VDC*	*Notes*
	150V	System not grounded 2 poles series connected
	300V	System grounded 2 poles series connected
	450V	System grounded 3 poles series connected

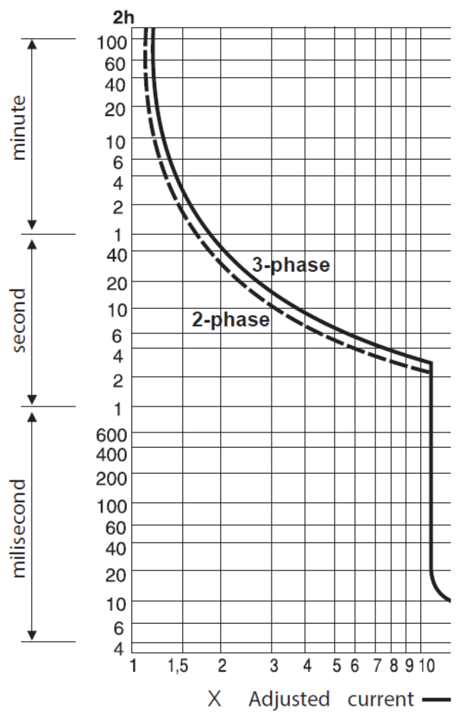
MPW Technical Data

Time Current Characteristic MPW40 Class 10

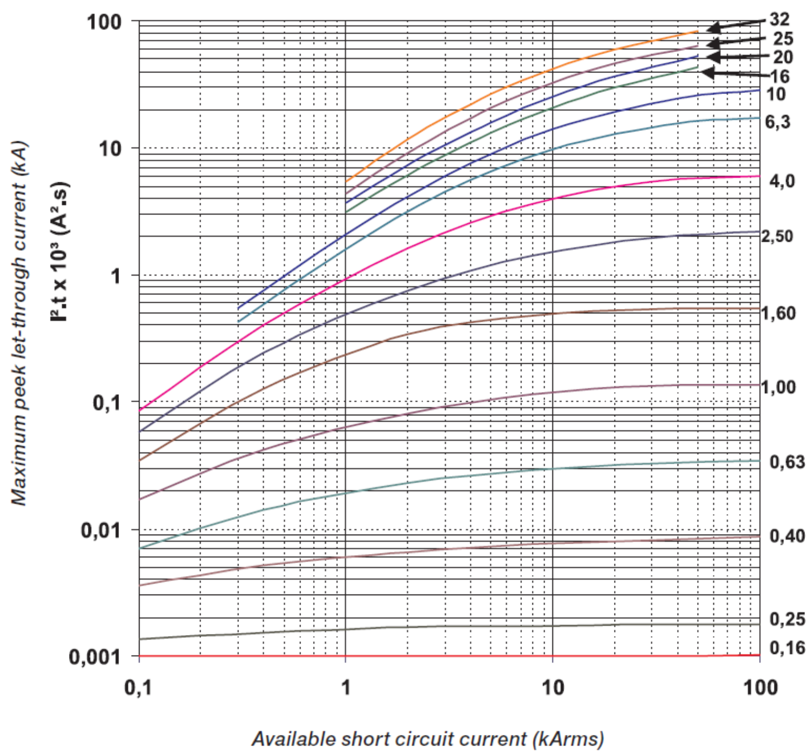
The tripping characteristic indicates the manual motor protector trip time in relation to the rated current.

The curves show average tolerance range values for an ambient temperature of 20°C [68°F], starting in a cold state. Thermal trip time when working in operating temperature is reduced to around 25% of the listed values. Under normal operating conditions, all three manual motor protector phases must be conducting.

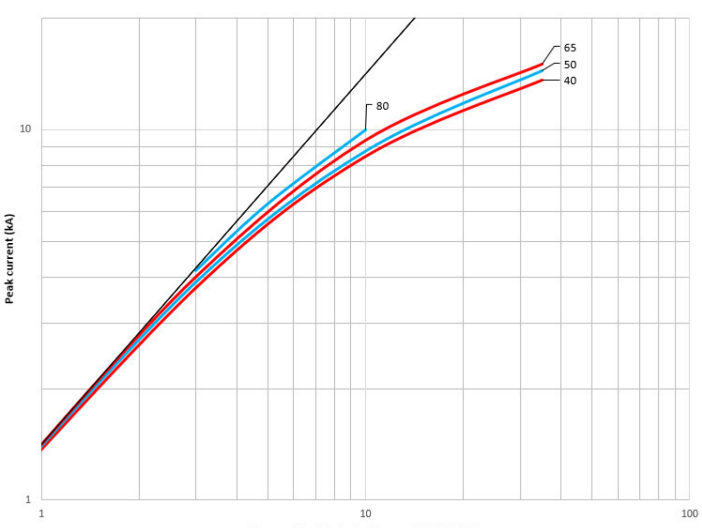
MPW40/80



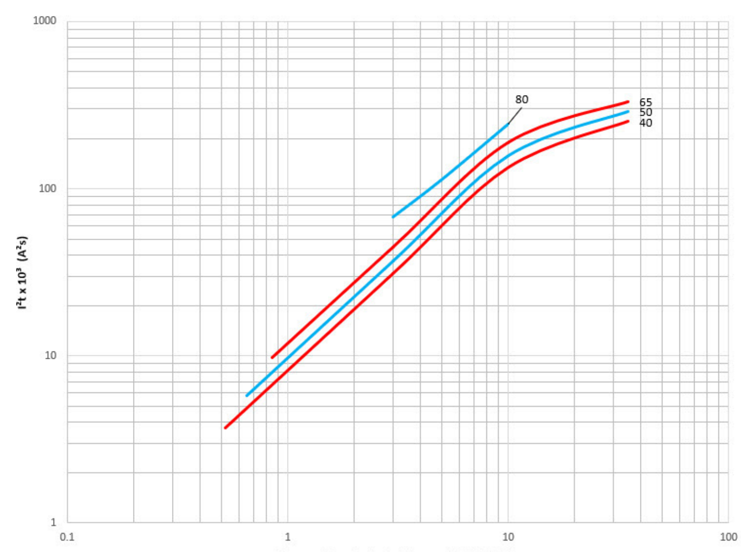
Characteristic I²t at 460V – MPW40



Short-Circuit Current Limitation Curve at 500V – MPW80



Characteristic I²t at 500V – MPW80



MPW Technical Data

Short Circuit Interruption Capacity UL/CSA for MPW40												
	Manual Motor Controller High Capacity				*Combination Motor Controller (Type E/F) High Capacity*				*Combination Motor Controller (Type E/F) Extra High Capacity*			
Setting Overload Release (A)	***240VAC***	***480Y 277VAC***	***600Y 347VAC***	***Max. Fuse or MCCB***	***240VAC***	***480VAC Y/277VAC***	***600VAC Y/347VAC***	***Max. Fuse or MCCB***	***240VAC***	***480VAC Y/277VAC***	***600VAC Y/347VAC***	***Max. Fuse or MCCB***
	kA	***kA***	***kA***	***A***	***kA***	***kA***	***kA***	***A***	***kA***	***kA***	***kA***	***A***
0.63 - 1.0	50	65	25	125	50	50	25	–	100	100	50	–
1.0 - 1.6	50	65	25	125	50	50	25	–	100	100	50	–
1.6 - 2.5	50	65	25	125	50	50	25	–	100	100	50	–
2.5 - 4.0	50	65	25	125	50	50	25	–	100	100	50	–
4.0 - 6.3	50	65	25	125	50	50	25	–	100	100	50	–
6.3 - 10	50	65	25	125	50	50	25	–	100	100	50	–
10 - 16	50	50	25	160	50	50	25	–	100	100	50	–
16 - 20	50	50	25	250	50	50	25	–	100	100	50	–
20 - 25	50	50	25	250	50	50	25	–	100	100	50	–
25 - 32	42	50	25	500	42	42	25	–	100	100	50	–
32 - 40	20	20	5	520	–	–	–	–	–	–	–	–

Note: Fuse or MCCB not required.

Short-Circuit Interruption Capacity (IEC 60947-2) for MPW40															
Setting Overload Release (A)	*220-230 VAC*			*380-415 VAC*			*440VAC*			*460-500 VAC*			*630-690 VAC*		
	I_{cu} (kA)	***I_{cs} (kA)***	***Max. Fuse (RK5) (A)***	***I_{cu} (kA)***	***I_{cs} (kA)***	***Max. Fuse (RK5) (A)***	***I_{cu} (kA)***	***I_{cs} (kA)***	***Max. Fuse (RK5) (A)***	***I_{cu} (kA)***	***I_{cs} (kA)***	***Max. Fuse (RK5) (A)***	***I_{cu} (kA)***	***I_{cs} (kA)***	***Max. Fuse (RK5) (A)***
0.63 - 1.0	100	100	–	100	100	–	100	100	–	100	100	–	100	100	–
1.0 - 1.6	100	100	–	100	100	–	100	100	–	100	100	–	100	100	–
1.6 - 2.5	100	100	–	100	100	–	100	100	–	100	100	–	8	8	25
2.5 - 4.0	100	100	–	100	100	–	100	100	–	100	100	–	8	8	32
4.0 - 6.3	100	100	–	100	100	–	100	100	–	100	100	–	8	8	50
6.3 - 10	100	100	–	100	100	–	50	25	80	42	21	63	8	8	50
10 - 16	100	100	–	50	25	100	50	15	80	10	8	80	5	5	63
16 - 20	100	100	–	50	25	125	50	15	80	10	8	80	5	5	63
20 - 25	100	100	–	50	25	125	50	15	100	10	8	80	5	5	63
25 - 32	100	100	–	50	25	125	25	15	100	10	8	80	5	5	63
32 - 40	100	100	–	50	25	125	25	15	100	10	8	80	5	2	63

Self-protected against short-circuits up to 100kA.

– Back-up fuse not required

1) Fuse required for greater short-circuit currents.

MPW Technical Data

Short-Circuit Interruption Capacity (IEC 60947-2) With Current Limiter (MPW40 + CLT32MPW40)												
Setting Overload Release (A)	380-415 VAC			440VAC			460-500 VAC			630-690 VAC		
	I_{cu} (kA)	I_{cs} (kA)	Max. Fuse (RK5) (A)	I_{cu} (kA)	I_{cs} (kA)	Max. Fuse (RK5) (A)	I_{cu} (kA)	I_{cs} (kA)	Max. Fuse (RK5) (A)	I_{cu} (kA)	I_{cs} (kA)	Max. Fuse (RK5) (A)
0.63 - 1.0	•	•	–	•	•	–	•	•	–	•	•	–
1.0 - 1.6	•	•	–	•	•	–	•	•	–	•	•	–
1.6 - 2.5	•	•	–	•	•	–	•	•	–	50	50	–
2.5 - 4.0	•	•	–	•	•	–	•	•	–	50	50	–
4.0 - 6.3	•	•	–	•	•	–	•	•	–	50	50	–
6.3 - 10	•	•	–	100	100	–	100	100	–	50	50	–
10 - 16	100	100	–	100	100	–	100	100	–	50	50	–
16 - 20	100	100	–	100	100	–	100	100	–	50	50	–
20 - 25	100	100	–	100	100	–	100	100	–	10	10	–
25 - 32	100	100	–	100	100	–	100	100	–	10	10	–

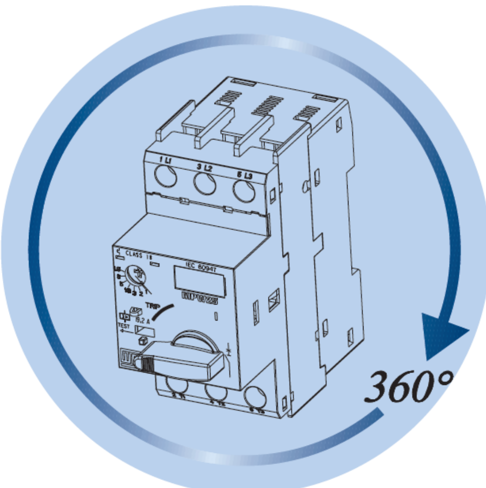
Note: Self protected against short-circuits up to 100kA

– Back-up fuse not required

● Not applicable due to MPW40 already having 100 kA of I_{cu} / I_{cs} in referred ranges.

MPW Technical Data

Mounting Position



MPW Series Manual Motor Protectors

MPW40-3-U001

Features (MPW40 Series)

- Suitable for manual motor controller, group installation, tap conductor and combination starters* Type E & Type F
- Built-in protection: disconnect means, short-circuit protection, motor control and overload protection
- Short-circuit interrupting capacity up to 50kA@480VAC (25kA@600VAC)
- Fixed short-circuit release 13 times the maximum circuit breaker rated current
- Phase-loss sensitivity
- Ambient temperature compensation -4 to +140°F (-20 to +60°C)

** When associated with line side terminal LST25 and trip indicator TSB*

MPW40 Series Manual Motor Protectors Selection Guide

Part Number	Price	Maximum UL Horsepower						Thermal Setting (A)	Short-Circuit Ratings for Group Installation		Drawing
		Single-Phase		Three-Phase							
		115V	230V	200V	230V	460V	575V		480V	600V	
MPW40-3-U001	$54.00	–	–	–	–	1/2	1/2	0.63 - 1.0	50kA	25kA	PDF
MPW40-3-D016	$54.00	–	1/10	1/4	1/3	3/4	1	1.0 - 1.6	50kA	25kA	PDF
MPW40-3-D025	$54.00	–	1/6	1/2	1/2	1-1/2	1-1/2	1.6 - 2.5	50kA	25kA	PDF
MPW40-3-U004	$54.00	1/8	1/3	3/4	1	2	3	2.5 - 4.0	50kA	25kA	PDF
MPW40-3-D063	$54.00	–	3/4	1-1/2	1-1/2	5	5	4.0 - 6.3	50kA	25kA	PDF
MPW40-3-U010	$54.00	1/2	1-1/2	3	3	7-1/2	10	6.3 - 10	50kA	25kA	PDF
MPW40-3-U016	$59.00	1	3	5	5	10	15	10 - 16	50kA	25kA	PDF
MPW40-3-U020	$65.00	1-1/2	3	5	7-1/2	15	20	16 - 20	50kA	25kA	PDF
MPW40-3-U025	$77.00	2	3	7-1/2	7-1/2	15	20	20 - 25	50kA	25kA	PDF
MPW40-3-U032	$82.00	–	5	10	10	20	25	25 - 32	42kA	25kA	PDF
MPW40-3-U040	$98.00	–	5	10	15	25	–	32 - 40	20kA	5kA	PDF

Note: Horsepower ratings shown in the table are for reference only. Please refer to "Full Load Amps of the Motor" for final selection.

MPW80-3-U065

Features (MPW80 Series)

- Designed to provide operation, overload and short circuit protection of electric motors
- Suitable for manual motor controller, group installation, tap conductor and combination starters* Type E & Type F
- Fixed short-circuit release 13 times the maximum circuit breaker rated current
- Phase-failure sensitivity according to IEC 60947-4-1
- Can be used as main switch (IEC 60947-2)
- Short-circuit breaking capacity from 65kA up to 80A at 380 VAC according to IEC 60947-2
- Thermomagnetic Motor Protective Circuit Breaker with overload protection (class 10)
- Ambient temperature compensation -4 to +140°F (-20 to +60°C)

** When associated with line side terminal LST65 and trip indicator TSB*

MPW80 Series Manual Motor Protectors Selection Guide

Part Number	Price	Maximum UL Horsepower						Thermal Setting (A)	Short-Circuit Ratings for Group Installation		Drawing
		Single-Phase		Three-Phase							
		115V	230V	200V	230V	460V	575V		480V	600V	
MPW80-3-U040	$149.00	3	7.5	–	15	25	30	32-40	35kA	10kA	PDF
MPW80-3-U050	$149.00	–	10	15	15	30	40	40-50	35kA	10kA	PDF
MPW80-3-U065	$149.00	5	10	20	20	50	60	50-65	35kA	10kA	PDF

Note: Horsepower ratings shown in the table are for reference only. Please refer to "Full Load Amps of the Motor" for final selection.

MPW Series Manual Motor Protectors

MPW40-3-U001

Features (MPW40 Series)

- Suitable for manual motor controller, group installation, tap conductor and combination starters* Type E & Type F
- Built-in protection: disconnect means, short-circuit protection, motor control and overload protection
- Short-circuit interrupting capacity up to 50kA@480VAC (25kA@600VAC)
- Fixed short-circuit release 13 times the maximum circuit breaker rated current
- Phase-loss sensitivity
- Ambient temperature compensation -4 to +140°F (-20 to +60°C)

** When associated with line side terminal LST25 and trip indicator TSB*

MPW40 Series Manual Motor Protectors Selection Guide

Part Number	Price	Maximum UL Horsepower						Thermal Setting (A)	Short-Circuit Ratings for Group Installation		Drawing
		Single-Phase		Three-Phase							
		115V	230V	200V	230V	460V	575V		480V	600V	
MPW40-3-U001	$54.00	–	–	–	–	1/2	1/2	0.63 - 1.0	50kA	25kA	PDF
MPW40-3-D016	$54.00	–	1/10	1/4	1/3	3/4	1	1.0 - 1.6	50kA	25kA	PDF
MPW40-3-D025	$54.00	–	1/6	1/2	1/2	1-1/2	1-1/2	1.6 - 2.5	50kA	25kA	PDF
MPW40-3-U004	$54.00	1/8	1/3	3/4	1	2	3	2.5 - 4.0	50kA	25kA	PDF
MPW40-3-D063	$54.00	–	3/4	1-1/2	1-1/2	5	5	4.0 - 6.3	50kA	25kA	PDF
MPW40-3-U010	$54.00	1/2	1-1/2	3	3	7-1/2	10	6.3 - 10	50kA	25kA	PDF
MPW40-3-U016	$59.00	1	3	5	5	10	15	10 - 16	50kA	25kA	PDF
MPW40-3-U020	$65.00	1-1/2	3	5	7-1/2	15	20	16 - 20	50kA	25kA	PDF
MPW40-3-U025	$77.00	2	3	7-1/2	7-1/2	15	20	20 - 25	50kA	25kA	PDF
MPW40-3-U032	$82.00	–	5	10	10	20	25	25 - 32	42kA	25kA	PDF
MPW40-3-U040	$98.00	–	5	10	15	25	–	32 - 40	20kA	5kA	PDF

Note: Horsepower ratings shown in the table are for reference only. Please refer to "Full Load Amps of the Motor" for final selection.

MPW80-3-U065

Features (MPW80 Series)

- Designed to provide operation, overload and short circuit protection of electric motors
- Suitable for manual motor controller, group installation, tap conductor and combination starters* Type E & Type F
- Fixed short-circuit release 13 times the maximum circuit breaker rated current
- Phase-failure sensitivity according to IEC 60947-4-1
- Can be used as main switch (IEC 60947-2)
- Short-circuit breaking capacity from 65kA up to 80A at 380 VAC according to IEC 60947-2
- Thermomagnetic Motor Protective Circuit Breaker with overload protection (class 10)
- Ambient temperature compensation -4 to +140°F (-20 to +60°C)

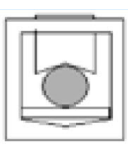
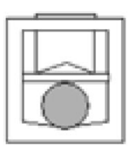
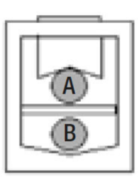
** When associated with line side terminal LST65 and trip indicator TSB*

MPW80 Series Manual Motor Protectors Selection Guide

Part Number	Price	Maximum UL Horsepower						Thermal Setting (A)	Short-Circuit Ratings for Group Installation		Drawing
		Single-Phase		Three-Phase							
		115V	230V	200V	230V	460V	575V		480V	600V	
MPW80-3-U040	$149.00	3	7.5	–	15	25	30	32-40	35kA	10kA	PDF
MPW80-3-U050	$149.00	–	10	15	15	30	40	40-50	35kA	10kA	PDF
MPW80-3-U065	$149.00	5	10	20	20	50	60	50-65	35kA	10kA	PDF

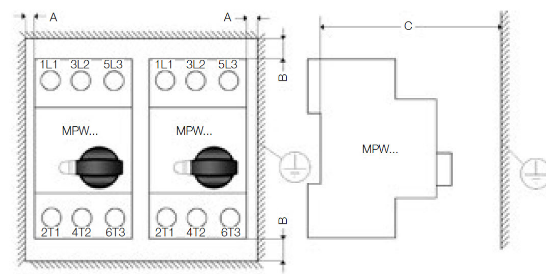
Note: Horsepower ratings shown in the table are for reference only. Please refer to "Full Load Amps of the Motor" for final selection.

MPW Series Manual Motor Protectors

MPW80 Series Main Terminal Capacity Specifications		
Connection	**Type**	**Cross-Section**
1 conductor connection on top only 	Rigid Cable	1 - 35 mm^2
	Cable Without Terminal/Ferrules	1.5 - 35 mm^2
	Cable With Terminal/Ferrules	1 - 35 mm^2
	Flexible Cable	1.5 - 35 mm^2 12 - 2 AWG
1 conductor connection on bottom only 	Rigid Cable	2.5 - 35 mm^2
	Cable Without Terminal/Ferrules	6 - 35 mm^2
	Cable With Terminal/Ferrules	2.5 - 35 mm^2
	Flexible Cable	6 - 35 mm^2 12 - 2 AWG
Connection of 2 conductors 	Rigid Cable	(A) 1 - 35 mm^2
		(B) 2.5 - 35 mm^2
	Cable Without Terminal/Ferrules	(A) 1.5 - 35 mm^2
		(B) 6 - 35 mm^2
	Cable With Terminal/Ferrules	(A) 1 - 35 mm^2
		(B) 2.5 - 35 mm^2
	Flexible Cable	(A) 1.5 - 35 mm^2 12 - 2 AWG
		(B) 6 - 35 mm^2 12 - 2 AWG

Mounting Configurations

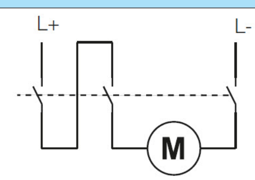
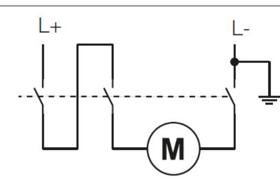
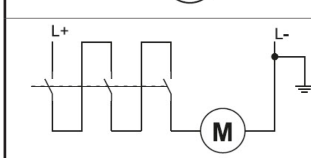
MPW Series Mounting Configurations				
Live or Grounded Parts – Distance to the Circuit Breaker				
Model	***U_e***	***Minimum distance between the circuit breaker and live or grounded parts (mm [in])***		
		A	***B***	***C***
MPW40	Up to 500 V	9 [0.35]	30 [1.18]	95 [3.74]
	Up to 690 V	30 [1.18]	50 [1.97]	95 [3.74]
MPW80	Up to 690 V	10 [0.39]	50 [1.97]	150 [5.91]



The motor protective circuit breaker can be mounted in any position, but according to IEC 60447 standard, the "On - I" indicator must be to the right or up.

DC Operation

The MPW40-MPW80 can also be used for operating continuous current loads. For such operation it is necessary to connect 2 or 3 poles in series. See recommended circuits and their voltage limits in the table below. Short-circuit breaking capacity I_{cu} = 10kA for all configurations.

MPW Series DC Operation		
Circuit	***Maximum VDC***	***Notes***
	150VDC	System not grounded; 2 poles in series.
	300VDC	System grounded; 2 poles in series.
	450VDC	System grounded; 3 poles in series.

MPW Series
Manual Motor Protectors Accessories

Accessories for MPW Series Manual Motor Protectors – Selection Guide			
Part Number	***Price***	***Description***	***Drawing***
		Auxiliary Contact Blocks	
ACBF-11	$8.25	Field installable auxiliary contact, front mount, (1) N.O./(1) N.C. contact(s), 2.5A @300 VAC/1A @ 300 VDC, screw terminal. For use with MPW40 series manual motor protectors.	PDF
ACBS-11	$9.00	Field installable auxiliary contact, left side mount, (1) N.O./(1) N.C. contact(s), 10A @ 600 VAC/2.5A @ 600 VDC, screw terminal. For use with MPW40 series manual motor protectors.	PDF
ACBS-20	$9.00	Field installable auxiliary contact, left side mount, (2) N.O. contact(s), 10A @ 600 VAC/2.5A @ 600 VDC, screw terminal. For use with MPW40 series manual motor protectors.	PDF
ACBS-02	$9.00	Field installable auxiliary contact, left side mount, (2) N.C. contact(s), 10A @ 600 VAC/2.5A @ 600 VDC, screw terminal. For use with MPW40 series manual motor protectors.	PDF
		Accessories for Combination Type-E Construction	
LST25	$17.00	Incoming power terminal block, 3-pole, maximum current 63A, 20-8 AWG. For use with MPW40 series manual motor protectors. Required when using a MPW40 in a UL Type E application 32A and less.	PDF
LST65	$33.50	Incoming power terminal block, 3-pole, maximum current 120A, 8-4 AWG. For use with MPW80 series manual motor protectors.	
TSB	$15.00	Field installable short circuit alarm contact, left side mount, (2) N.O./(2) N.C. contact(s), 2.5A @300 VAC/1A @ 300 VDC, screw terminal. For use with MPW40 series manual motor protectors.	PDF
		Current Limiter	
CLT32MPW40	$45.00	Current limiter, 35mm DIN rail mount. For use with MPW40 series manual motor protectors.	PDF
		Link Modules	
ECCMP-C0	$8.50	Link module, for use with MPW40 protectors and CWC07 through CWC016 series miniature contactors with AC or DC coils. Not for use with 4-Pole CWC series miniature contactors.	PDF
ECCMP-C025	$8.50	Link module, for use with MPW40 protectors and CWC025 series miniature contactors with AC coils. Not for use with 4-Pole CWC series miniature contactors.	PDF
ECCMP-40B38	$10.00	Link module, for use with MPW40 protectors and CWB9 through CWB38 series contactors with AC coils.	PDF
ECCMP-40B38DC	$10.00	Link module, for use with MPW40 protectors and CWB9 through CWB38 series contactors with DC coils.	PDF
ECCMP-80B80	$37.50	Link module, for use with MPW80 protectors and CWB40 through CWB80 series contactors with AC and DC coils.	PDF
EC-R3	$39.50	Reversing connection kit, for use with CWB95 to CWB125 series contactors. Line and loadside connection bars included.	PDF


ACBF-11


ACBS-11

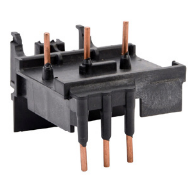

ACBS-20


ACBS-02

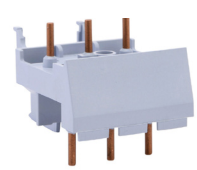

LST25

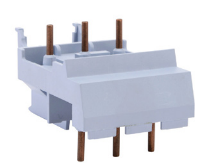

TSB


CLT32MPW40


ECCMP-C0


ECCMP-C025


ECCMP-40B38


ECCMP-40B38DC

MPW Series Manual Motor Protectors

Accessories, continued

RMMP-130

Accessories for MPW Series Manual Motor Protectors – Selection Guide			
Part Number	**Price**	**Description**	**Drawing**
Through-the-Door Rotary Mechanisms			
RMMP-130	$28.50	Handle, rotary, 130mm length, black/gray, external front mount, 2-position, lockable in OFF only, NEMA 1/3R, IP55. For use with MPW40 series manual motor protectors.	PDF
RMMP-130E	$28.50	Handle, rotary, 130mm length, red/yellow, external front mount, 2-position, lockable in OFF only, NEMA 1/3R, IP55. For use with MPW40 series manual motor protectors.	PDF
RMMP-330	$34.50	Handle, rotary, 330mm length, black/gray, external front mount, 2-position, lockable in OFF only, NEMA 1/3R, IP55. For use with MPW40 series manual motor protectors.	PDF
RMMP-330E	$34.50	Handle, rotary, 330mm length, red/yellow, external front mount, 2-position, lockable in OFF only, NEMA 1/3R, IP55. For use with MPW40 series manual motor protectors.	PDF
MRX-130	$42.50	Handle, rotary, 130mm length, black/gray, external front mount, 2-position, lockable in OFF only, defeatable, NEMA 4/4X, IP65. For use with MPW40 series manual motor protectors.	PDF
MRX-130E	$42.50	Handle, rotary, 130mm length, red/yellow, external front mount, 2-position, lockable in OFF only, defeatable, NEMA 4/4X, IP65. For use with MPW40 series manual motor protectors.	PDF
MRX-330	$46.50	Handle, rotary, 330mm length, black/gray, external front mount, 2-position, lockable in OFF only, defeatable, NEMA 4/4X, IP65. For use with MPW40 series manual motor protectors.	PDF
MRX-330E	$46.50	Handle, rotary, 330mm length, red/yellow, external front mount, 2-position, lockable in OFF only, defeatable, NEMA 4/4X, IP65. For use with MPW40 series manual motor protectors.	PDF
MRX65-130	$47.50	Rotary handle, selector, black/gray, external front mount, 2-position, lockable in OFF only, defeatable, NEMA 4/4X, IP65. For use with MPW80 series manual motor protectors. 130mm shaft included.	PDF
MRX65-130E	$47.50	Rotary handle, selector, red/yellow, external front mount, 2-position, lockable in OFF only, defeatable, NEMA 4/4X, IP65. For use with MPW80 series manual motor protectors. 130mm shaft included.	PDF
MRX65-330	$51.00	Rotary handle, selector, black/gray, external front mount, 2-position, lockable in OFF only, defeatable, NEMA 4/4X, IP65. For use with MPW80 series manual motor protectors. 330mm shaft included.	PDF
MRX65-330E	$51.00	Rotary handle, selector, red/yellow, external front mount, 2-position, lockable in OFF only, defeatable, NEMA 4/4X, IP65. For use with MPW80 series manual motor protectors. 330mm shaft included.	PDF
Under Voltage and Shunt Trip Releases			
SRMPD51	$22.50	Field installable shunt trip, right side mount, 20-24 VAC (50/60Hz) coil voltage, screw terminal. For use with MPW40 and MPW80 series manual motor protectors.	PDF
SRMPD59	$22.50	Field installable shunt trip, right side mount, 100-127 VAC (50/60Hz) coil voltage, screw terminal. For use with MPW40 and MPW80 series manual motor protectors.	PDF
SRMPD65	$22.50	Field installable shunt trip, right side mount, 200-240 VAC (50/60Hz) coil voltage, screw terminal. For use with MPW40 and MPW80 series manual motor protectors.	PDF
URMPV18	$22.50	Field installable undervoltage trip device, right side mount, 110 VAC (50Hz)/120 VAC (60Hz) sensing range, screw terminals. For use with MPW40 and MPW80 series manual motor protectors.	PDF
URMPV23	$22.50	Field installable undervoltage trip device, right side mount, 180 VAC (50Hz)/208 VAC (60Hz) sensing range, screw terminals. For use with MPW40 and MPW80 series manual motor protectors.	PDF
URMPV30	$22.50	Field installable undervoltage trip device, right side mount, 208 VAC (50Hz)/240 VAC (60Hz) sensing range, screw terminals. For use with MPW40 and MPW80 series manual motor protectors.	PDF
URMPV37	$22.50	Field installable undervoltage trip device, right side mount, 230-240 VAC (50Hz)/240-277 VAC (60Hz) sensing range, screw terminals. For use with MPW40 and MPW80 series manual motor protectors.	PDF
URMPV47	$22.50	Field installable undervoltage trip device, right side mount, 400-415 VAC (50Hz)/480 VAC (60Hz) sensing range, screw terminals. For use with MPW40 and MPW80 series manual motor protectors.	PDF
URMPD02	$22.50	Field installable undervoltage trip device, right side mount, 24 VAC (50/60Hz) sensing range, screw terminals. For use with MPW40 and MPW80 series manual motor protectors.	PDF

MRX-130

MRX-130E

MRX65-130

SRMPD51

URMPV18

URMPD02

ESW/PESW Non-Combination Enclosed Starters

ESW-B9D15A-R23

PESW-B9D15AX-R57

Overview

WEG offers non-reversing and non-combination magnetic starters up to 75HP at 460VAC (105A). Featuring components that meet IEC design standards and UL horsepower ratings, incorporating WEG contactors and overload relays, the magnetic starters are ideal for protecting and operating motors, ensuring smooth operation year after year.

Metallic and non-metallic series are available:

- Metallic Type 1 – ESW Series
- Non-Metallic Type 4X – PESW Series

WEG ESW and PESW starters are pre-wired from the factory and recommended for all single- and three-phase applications where magnetic starters can be applied.

Features

- High horsepower ratings in four compact sizes
- Fast acceleration and high initial torque
- Bimetallic overload relays – class 10
- Adjustable trip current
- Ambient temperature compensated
- Phase-loss sensitivity protection
- Selectable manual or automatic RESET
- Electrically isolated N.O.-N.C. auxiliary contacts
- Easy to install and setup

UL File No. E202315

ESW/ESWS Non-Combination Enclosed Starters

ESW/ESWS Part Number Breakdown

ESW	*	–	B	18	D15	A	–	R32

ESW Enclosed Starter Non-Combination NEMA1

ESW Enclosed Starter Non-Combination NEMA1
Blank: 3 Phase
S: 1 Phase

Contactor Style
B: CWB

Contactor Amps
9: 9A
12: 12A
18: 18A
25: 25A
32: 32A
38: 38A
40: 40A
50: 50A
65: 65A
80: 80A

Coil Voltage
D15: 120VAC
V24: 208-240VAC
D39: 480VAC

Control Devices
Start Stop+Reset

Overload Amps		
1-Phase	*3-Phase*	*Range*
RM26	R26	2.8-4
RM27	R27	4-6.3
RM28	R28	5.6-8
RM29	R29	7-10
RM30	R30	8-12.5
RM32	R32	11-17
RM33	R33	15-23
–	R34	22-32
–	R35	32-40
–	R70	25-40
–	R71	32-50
–	R72	40-57
–	R73	50-63
–	R74	57-70
–	R75	63-80

PESW/PESWS Non-Combination Enclosed Starters

PESW/PESWS Part Number Breakdown

PESW	S	–	B	18	D15	AX	–	R70

PESW Enclosed Starter Non-Combination NEMA4X

Series

Contactor Style

S: 1-Phase
Blank: 3-Phase

Contactor Style

B: CWB

Contactor Amps

9: 9A
12: 12A
18: 18A
25: 25A
32: 32A
38: 38A
40: 40A
50: 50A
65: 65A
80: 80A

Coil Voltage

D15: 120VAC
V24: 208-240VAC
D39: 480VAC

Control Devices

AX:
Start Stop+Reset

Overload Amps

1-Phase	*3-Phase*	*Range*
RM60	–	2.8-4
RM61	–	4-6.3
RM62	–	5.6-8
RM63	–	7-10
RM64	–	8-12.5
RM65	–	10-15
RM66	–	11-17
RM67	–	15-23
–	R57	0.8-1.2
–	R58	1.2-1.8
–	R59	1.8-2.8
–	R60	2.8-4
–	R61	4-6.3
–	R62	5.6-8
–	R63	7-10
–	R64	8-12.5
–	R65	10-15
–	R66	11-17
–	R67	15-23
–	R68	22-32
–	R69	25-40
–	R70	25-40
–	R71	32-50
–	R72	40-57
–	R73	50-63
–	R74	57-70
–	R75	63-80

ESW/ESWS Non-Combination Enclosed Starters

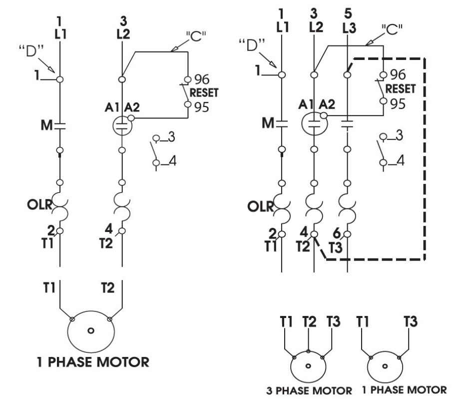
ESW Series Non-Combination Across The Line Starter – 3-Phase Enclosure Type-1 Selection Guide

START/STOP + RESET Part Number	Price	Coil Voltage	Max. UL Horsepower 200V	230V	460V	575V	Box	Setting Range	Drawing
ESW-B9D15A-R23	$115.00	120	–	–	1/2	1/2	M04	0.8 - 1.2	PDF
ESW-B9V24A-R23	$115.00	208-240							PDF
ESW-B9D39A-R23	$115.00	480							PDF
ESW-B9D15A-R24	$115.00	120	–	–	3/4	1	M04	1.2 - 1.8	PDF
ESW-B9V24A-R24	$115.00	208-240							PDF
ESW-B9D39A-R24	$115.00	480							PDF
ESW-B9D15A-R25	$115.00	120	1/2	1/2	1	2	M04	1.8 - 2.8	PDF
ESW-B9V24A-R25	$115.00	208-240							PDF
ESW-B9D39A-R25	$115.00	480							PDF
ESW-B9D15A-R26	$115.00	120	3/4	3/4	2	3	M04	2.8 - 4.0	PDF
ESW-B9V24A-R26	$115.00	208-240							PDF
ESW-B9D39A-R26	$115.00	480							PDF
ESW-B9D15A-R27	$115.00	120	1	1 1/2	3	5	M04	4.0 -6.3	PDF
ESW-B9V24A-R27	$115.00	208-240							PDF
ESW-B9D39A-R27	$115.00	480							PDF
ESW-B9D15A-R28	$115.00	120	2	2	5	5	M04	5.6 - 8.0	PDF
ESW-B9V24A-R28	$115.00	208-240							PDF
ESW-B9D39A-R28	$115.00	480							PDF
ESW-B9D15A-R29	$115.00	120	2	3	5	7 1/2	M04	7.0 - 10	PDF
ESW-B9V24A-R29	$115.00	208-240							PDF
ESW-B9D39A-R29	$115.00	480							PDF
ESW-B12D15A-R30	$123.00	120	3	3	7 1/2	10	M04	8.0 - 12.5	PDF
ESW-B12V24A-R30	$123.00	208-240							PDF
ESW-B12D39A-R30	$123.00	480							PDF
ESW-B18D15A-R32	$133.00	120	3	5	10	15	M04	11 - 17	PDF
ESW-B18V24A-R32	$133.00	208-240							PDF
ESW-B18D39A-R32	$133.00	480							PDF
ESW-B25D15A-R33	$150.00	120	5	7 1/2	15	15	M04	15 -23	PDF
ESW-B25V24A-R33	$150.00	208-240							PDF
ESW-B25D39A-R33	$150.00	480							PDF
ESW-B32D15A-R34	$161.00	120	10	10	20	25	M04	22 -32	PDF
ESW-B32V24A-R34	$161.00	208-240							PDF
ESW-B32D39A-R34	$161.00	480							PDF
ESW-B38D15A-R35	$190.00	120	10	–	25	–	M04	32-40	PDF
ESW-B38V24A-R35	$190.00	208-240							PDF
ESW-B38D39A-R35	$190.00	480							PDF
ESW-B40D15A-R70	$208.00	120	10	10	20	25	M06	25 - 40	PDF
ESW-B40V24A-R70	$208.00	208-240							PDF
ESW-B40D39A-R70	$208.00	480							PDF
ESW-B50D15A-R71	$218.00	120	10	15	30	40	M06	32 - 50	PDF
ESW-B50V24A-R71	$218.00	208-240							PDF
ESW-B50D39A-R71	$218.00	480							PDF
ESW-B65D15A-R72	$232.00	120	15	20	40	50	M06	40 - 57	PDF
ESW-B65V24A-R72	$232.00	208-240							PDF
ESW-B65D39A-R72	$232.00	480							PDF
ESW-B65D15A-R73	$244.00	120	15	20	40	50	M06	50 - 63	PDF
ESW-B65V24A-R73	$244.00	208-240							PDF
ESW-B65D39A-R73	$244.00	480							PDF
ESW-B80D15A-R74	$256.00	120	20	25	50	–	M06	57 - 70	PDF
ESW-B80V24A-R74	$256.00	208-240							PDF
ESW-B80D39A-R74	$256.00	480							PDF
ESW-B80D15A-R75	$269.00	120	–	25	50	–	M06	63 - 80	PDF
ESW-B80V24A-R75	$269.00	208-240							PDF
ESW-B80D39A-R75	$269.00	480							PDF

Note: 3-phase starters can be wired for single-phase applications (see single-phase conversion diagrams).

ESW-B9D15A-R23

Single-phase Starter   Three-phase Starter



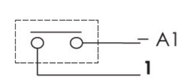
Conversion to single-phase:
To convert to single-phase, add a jumper wire from L3 to T2 (follow the dotted line connection as shown above).

Separate Control

FOR SEPARATE CONTROL, REMOVE WIRES "C" AND "D" IF SUPPLIED AND CONNECT SEPARATE CONTROL LINES TO TERMINAL N° 96 ON THE OVERLOAD RELAY AND TO TERMINAL N° _3 ON THE AUX. CONTACT BLOCK (FOR 3 WIRE CONTROL) OR TO THE CONTACTOR COIL N° A1 (FOR 2 WIRE CONTROL).

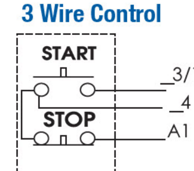
Pilot Devices

2 Wire Control

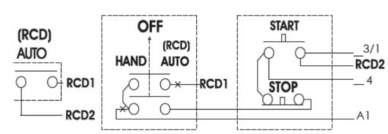


NOT FOR USE WITH AUTO RESET OL RELAYS.

3 Wire Control



Hand-Off Auto Wire Control (For ESW Series Only)



ESWS/PESWS Non-Combination Enclosed Starters

ESWS Series Non-Combination Across The Line Starter – 1-Phase Enclosure Type-1 Selection Guide

START/STOP + RESET Part Number	Price	Coil Voltage	Max. UL Horsepower 115V	Max. UL Horsepower 230V	Box	Setting Range	Drawing
ESWS-B9D15A-RM26	$102.00	120VAC	1/8	1/3	M04	2.8 - 4.0	PDF
ESWS-B9V24A-RM26	$102.00	208-240 VAC					PDF
ESWS-B9D15A-RM27	$102.00	120VAC	1/4	1/2	M04	4.0 - 6.3	PDF
ESWS-B9V24A-RM27	$102.00	208-240 VAC					PDF
ESWS-B9D15A-RM28	$102.00	120VAC	1/3	1	M04	5.6 - 8.0	PDF
ESWS-B9V24A-RM28	$102.00	208-240 VAC					PDF
ESWS-B9D15A-RM29	$102.00	120VAC	1/2	1.5	M04	7.0 - 10.0	PDF
ESWS-B9V24A-RM29	$102.00	208-240 VAC					PDF
ESWS-B12D15A-RM30	$116.00	120VAC	1/2	2	M04	8.0 - 12.5	PDF
ESWS-B12V24A-RM30	$116.00	208-240 VAC					PDF
ESWS-B18D15A-RM31	$121.00	120VAC	3/4	2	M04	10 - 15	PDF
ESWS-B18V24A-RM31	$128.00	208-240 VAC					PDF
ESWS-B18D15A-RM32	$121.00	120VAC	1	3	M04	11 - 17	PDF
ESWS-B18V24A-RM32	$121.00	208-240 VAC					PDF
ESWS-B25D15A-RM33	$126.00	120VAC	1.5	3	M04	15 - 23	PDF
ESWS-B25V24A-RM33	$126.00	208-240 VAC					PDF

ESWS-B9D15A-RM26

PESWS Series Non-Combination Across The Line Starter – 1-Phase – Enclosure Type-4X Selection Guide

START/STOP + RESET Part Number	Price	Coil Voltage	Max. UL Horsepower 115V	Max. UL Horsepower 230V	Box	Setting Range	Drawing
PESWS-B9D15AX-RM60	$69.00	120VAC	1/8	1/3	05	2.8 - 4.0	PDF
PESWS-B9V24AX-RM60	$76.00	208-240 VAC					PDF
PESWS-B9D15AX-RM61	$69.00	120VAC	1/4	1/2	05	4.0 - 6.3	PDF
PESWS-B9V24AX-RM61	$76.00	208-240 VAC					PDF
PESWS-B9D15AX-RM62	$76.00	120VAC	1/3	1	05	5.6 - 8.0	PDF
PESWS-B9V24AX-RM62	$76.00	208-240 VAC					PDF
PESWS-B9D15AX-RM63	$76.00	120VAC	1/2	1.5	05	7.0 - 10.0	PDF
PESWS-B9V24AX-RM63	$76.00	208-240 VAC					PDF
PESWS-B12D15AX-RM64	$84.00	120VAC	1/2	2	05	8.0 - 12.5	PDF
PESWS-B12V24AX-RM64	$84.00	208-240 VAC					PDF
PESWS-B18D15AX-RM65	$90.00	120VAC	3/4	2	05	10 - 15	PDF
PESWS-B18V24AX-RM65	$90.00	208-240 VAC					PDF
PESWS-B18D15AX-RM66	$90.00	120VAC	1	3	05	11 - 17	PDF
PESWS-B18V24AX-RM66	$90.00	208-240 VAC					PDF
PESWS-B25D15AX-RM67	$96.00	120VAC	1.5	3	05	15 - 23	PDF
PESWS-B25V24AX-RM67	$96.00	208-240 VAC					PDF

PESWS-B9D15AX-RM60

PESW Non-Combination Across the Line Enclosed Starters

PESW Series - Non-Combination Across the Line Starter – Three-Phase Enclosure Type - 4X

START/STOP + RESET		Coil Voltage	Max. UL Horsepower				Size	Setting Range	Drawing
Part Number	Price		200V	230V	460V	575V			
PESW-B9D15AX-R57	$103.00	120	–	–	1/2	1/2	05	0.8 - 1.2	PDF
PESW-B9V24AX-R57	$103.00	208-240							PDF
PESW-B9D39AX-R57	$103.00	480							PDF
PESW-B9D15AX-R58	$103.00	120	–	–	3/4	1	05	1.2 - 1.8	PDF
PESW-B9V24AX-R58	$103.00	208-240							PDF
PESW-B9D39AX-R58	$103.00	480							PDF
PESW-B9D15AX-R59	$103.00	120	1/2	1/2	1	2	05	1.8 - 2.8	PDF
PESW-B9V24AX-R59	$103.00	208-240							PDF
PESW-B9D39AX-R59	$103.00	480							PDF
PESW-B9D15AX-R60	$103.00	120	3/4	3/4	2	3	05	2.8 - 4.0	PDF
PESW-B9V24AX-R60	$103.00	208-240							PDF
PESW-B9D39AX-R60	$103.00	480							PDF
PESW-B9D15AX-R61	$103.00	120	1	1 1/2	3	5	05	4.0 -6.3	PDF
PESW-B9V24AX-R61	$103.00	208-240							PDF
PESW-B9D39AX-R61	$103.00	480							PDF
PESW-B9D15AX-R62	$103.00	120	2	2	5	5	05	5.6 - 8.0	PDF
PESW-B9V24AX-R62	$103.00	208-240							PDF
PESW-B9D39AX-R62	$103.00	480							PDF
PESW-B9D15AX-R63	$103.00	120	2	3	5	7 1/2	05	7.0 - 10	PDF
PESW-B9V24AX-R63	$103.00	208-240							PDF
PESW-B9D39AX-R63	$103.00	480							PDF
PESW-B12D15AX-R64	$112.00	120	3	3	7 1/2	10	05	8.0 - 12.5	PDF
PESW-B12V24AX-R64	$112.00	208-240							PDF
PESW-B12D39AX-R64	$112.00	480							PDF
PESW-B18D15AX-R66	$119.00	120	3	5	10	15	05	11 - 17	PDF
PESW-B18V24AX-R66	$119.00	208-240							PDF
PESW-B18D39AX-R66	$119.00	480							PDF
PESW-B25D15AX-R67	$136.00	120	5	7 1/2	15	15	05	15 - 23	PDF
PESW-B25V24AX-R67	$136.00	208-240							PDF
PESW-B25D39AX-R67	$136.00	480							PDF
PESW-B32D15AX-R68	$147.00	120	10	10	20	25	05	22 - 32	PDF
PESW-B32V24AX-R68	$147.00	208-240							PDF
PESW-B32D39AX-R68	$147.00	480							PDF
PESW-B38D15AX-R69	$170.00	120	10	–	25	–	05	32 - 40	PDF
PESW-B38V24AX-R69	$170.00	208-240							PDF
PESW-B38D39AX-R69	$170.00	480							PDF
PESW-B40D15AX-R70	$270.00	120	10	10	20	25	08	25 - 40	PDF
PESW-B40V24AX-R70	$270.00	208-240							PDF
PESW-B40D39AX-R70	$270.00	480							PDF
PESW-B50D15AX-R71	$284.00	120	10	15	30	40	08	32 - 50	PDF
PESW-B50V24AX-R71	$284.00	208-240							PDF
PESW-B50D39AX-R71	$284.00	480							PDF
PESW-B65D15AX-R72	$296.00	120	15	20	40	50	08	40 - 57	PDF
PESW-B65V24AX-R72	$296.00	208-240							PDF
PESW-B65D39AX-R72	$296.00	480							PDF
PESW-B65D15AX-R73	$308.00	120	15	20	40	50	08	50 - 63	PDF
PESW-B65V24AX-R73	$308.00	208-240							PDF
PESW-B65D39AX-R73	$308.00	480							PDF
PESW-B80D15AX-R74	$319.00	120	20	25	50	–	08	57 - 70	PDF
PESW-B80V24AX-R74	$319.00	208-240							PDF
PESW-B80D39AX-R74	$319.00	480							PDF
PESW-B80D15AX-R75	$334.00	120	–	25	50	–	08	63 - 80	PDF
PESW-B80V24AX-R75	$334.00	208-240							PDF
PESW-B80D39AX-R75	$334.00	480							PDF

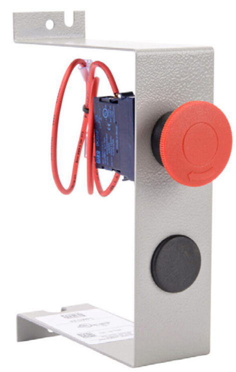
PESW-B9D15AX-R57

ESW/PESW Non-Combination Enclosed Starters

Field Modification Kits for ESW/ESWS Series					
Part Number	***Price***	***Description***	***Structure***		***Dimensional Drawing***
			Top	***Bottom***	
KESWPP	$14.50	No Pilot Device Metal Brackets - 2 x 22mm holes w/ plugs	PLUG	PLUG	PDF
KESWHP	$44.00	Hand-Off-Auto Selector Switch	HAND - OFF - AUTO	PLUG	PDF
KESWFP	$44.00	Off-On Selector Switch	OFF - ON	PLUG	PDF
KESWPE	$44.00	E-stop	PLUG	E-STOP	PDF

KESWHP

KESWFP



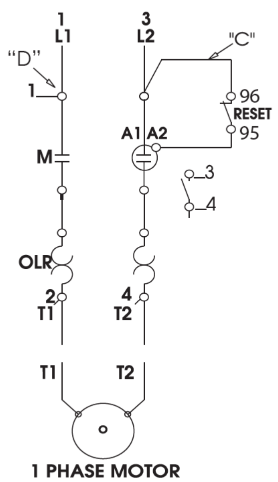
KESWFP

KESWPP

ESW Non-Combination Enclosed Starters

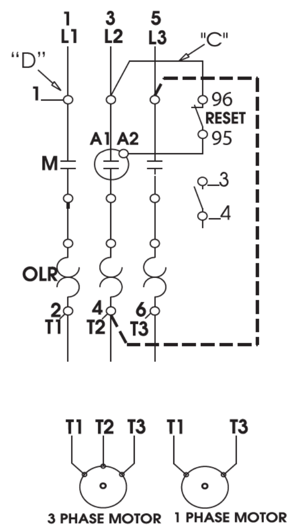
Wiring Diagram

Single-phase Starter



Note: See CWB contactor specs for single phase ratings

Three-phase Starter



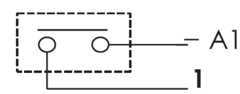
Conversion to single-phase: Add jumper wire from L3 to T2 (follow dotted line connection above).

Separate Control

For separate control, remove wires C and D if supplied and connect separate control lines to terminal 96 on the overload relay and to terminal 3 on the Aux contact block (for 3-wire control) or to the contactor coil A1 (for 2-wire control).

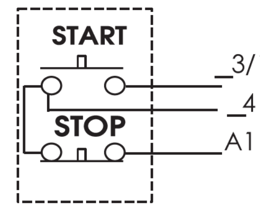
Pilot Devices

Two-Wire Control

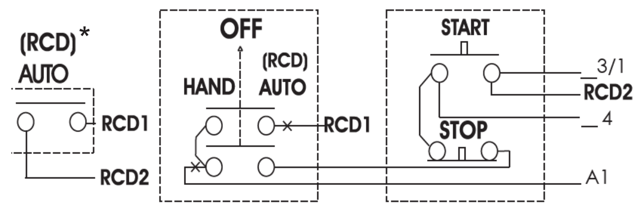


NOT FOR USE WITH AUTO RESET OL RELAYS.

Three-Wire Control



Hand-Off Auto Wire Control (for ESW Series Only)



*** RCD is a customer-supplied remote control device**

Dimensions

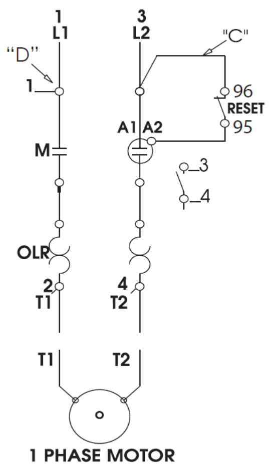
Provision for cable gland fitting	*Standard*			
	Top	*Bottom*	*Side*	*Back*
Box M04	2x (½" or ¾")	2x (½" or ¾")	4x (½" or ¾")	2x (½" or ¾")
	1x (¾" or 1")	1x (¾" or 1")	–	–

Dimensions (approximate in [mm])				
Enclosed Starters	*Enclosure Size*			
	Box	*H*	*W*	*D*
ESW(S) 9, 12, 18, 25, 32, 38	M04	9.5 [241.3]	5.5 [139.7]	5 [127]

PESW Non-Combination Enclosed Starters

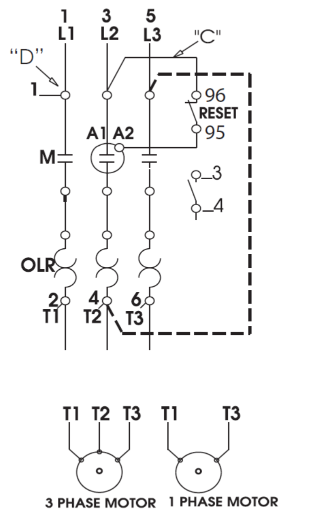
Wiring Diagram

Single-phase Starter



Note: See CWB contactor specs for single phase ratings

Three-phase Starter



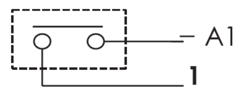
Conversion to single-phase: Add jumper wire from L3 to T2 (follow dotted line connection above).

Separate Control

For separate control, remove wires C and D if supplied and connect separate control lines to terminal 96 on the overload relay and to terminal 3 on the Aux contact block (for 3-wire control) or to the contactor coil A1 (for 2-wire control).

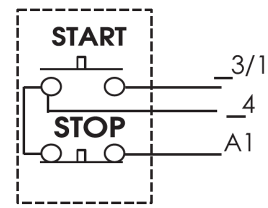
Pilot Devices

Two-Wire Control



NOT FOR USE WITH AUTO RESET OL RELAYS.

Three-Wire Control

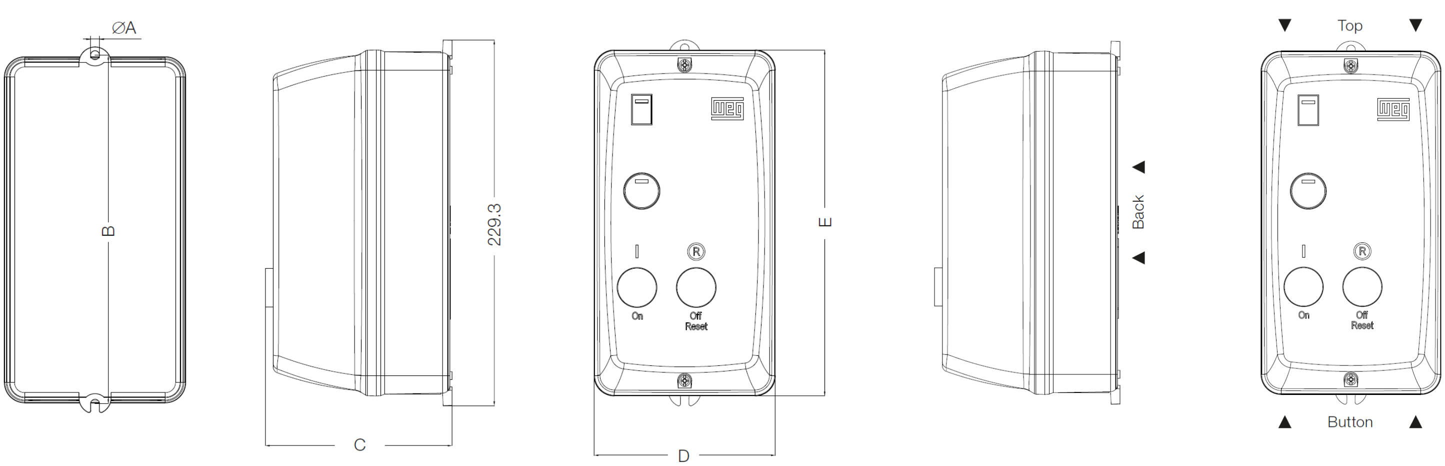


Dimensions

Size 05 (mm [in])
øA = 5.5 [0.2165]
B = 219.0 [8.622]
C = 112 [4.4331]
D = 114.0 [4.4882]
E = 217 [8.5433]

Cable Knock-Outs	Standard	
	Top and Bottom	*Back*
Size 05	2x øPG13.5 or 2x ø20/25 mm	2 x øPG9 or 2x ø16 mm

Technical Data	
Standard	IEC/IEN 60947
Operating Temperature	-20°C to +55°C [-4°F to +131°F]
Storage Temperature	-50°C to +80°C [-58°F to +176°F]
Degree of Protection	IP65/66
Mechanical Lifespan	1x10^6 operations
Electrical Lifespan	1x10^6 operations
Maximum Number of Operations Per Hour	15 (limited by the thermal overload relay)
Certifications	CE, ANCE, EAC, ICONTEC, IRAM
Thermoplastic Enclosed Material (Cover and Base)	VO (fire retardant)
UV Protection	Yes (indoor or outdoor use)



IronHorse HMC Series Contactors

IRONHORSE®

Overview

The IronHorse HMC Series contactors feature advanced technology combined with straightforward design. They are ideal for situations where peripheral devices are used. These units offer an economical solution where compact size and easy connection are important.

Their sealed structure means that no arc flash is exposed.

These environmentally friendly products comply with international RoHS environmental standards.

The series includes multiple models in a number of different frames, as described in the table below. AF refers to the amp frame size. For example, 22AF indicates a 22 amp frame size.

See FAQ at AutomationDirect.com for the IEC utilization categories tables

Features

- Compact design
- DIN rail or screw mountable (up to 150AF)
- Overload relays can be directly mounted to contactors
- Finger-proof design
- Easy to combine with manual motor starters
- Wide range of accessories
- Conforms to IEC and UL standards

UL File No. E191059

IronHorse HMC Series Contactors Selection Guide

	22AF	*40AF*	*65AF*	*100AF*	*150AF*	*225AF*	*400AF*
							
	HMC-9 HMC-22	HMC-32 HMC-40	HMC-50 HMC-65	HMC-75 HMC-100	HMC-130 HMC-150	HMC-185 HMC-225	HMC-265 HMC-330 HMC-400
Rated Current (Amps)	9 12 18 22	32 40	50 65	75 85 100	130 150	185 225	265 330 400
Insulation Rating (Volts)	690	1000	1000	1000	1000	1000	1000

IronHorse HTOR Series Overload Relays Selection Guide

	22AF	*40AF*	*65AF*	*100AF*	*150AF*	*225AF*	*400AF*
							
	HTOR32	HTOR2	HTOR63	HTOR95	HTOR150	HTOR225	HTOR400
Current Range (Amps)	0.1 - 40	0.1 - 40	34 - 65	54 - 100	80 - 150	100 - 240	160 - 400
Trip Class	10A	10A	10A	10A	10A	10A	10A

IronHorse
HMC Series Contactors

IRONHORSE®

HMC Series Contactor Catalog Number Sequence

HMC	-	32A	30	-	11	-	A	S

Contactor Series
HMC

Frame Size

9: 9A	85: 85A
12: 12A	100: 100A
18: 18A	130: 130A
22: 22A	150: 150A
32: 32A	185: 185A
40: 40A	225: 225A
50: 50A	265: 265A
65: 65A	330: 330A
75: 75A	400: 400A

Power Poles
30: 3 NO Power Poles

Auxiliary Contacts
11: 1NO+1NC
22: 2NO+2NC

Coil Code

A:	110VAC 50/60 Hz
B:	24VAC 50/60 Hz
C:	240VAC 50/60 Hz
D:	24VDC
E:	480VAC 60Hz
F:	100/200 VAC/VDC
G:	24/48 VAC/VDC
H:	24 VAC/VDC

Terminals
S=Screw
L=Lug
B=Bolt-On Connector

Table intended as reference only and not to create part numbers.

HTOR Series Thermal Overload Relay Catalog Number Sequence

HTOR	32	-	32	-	S

Contactor Series
HTOR

Current Setting
0.1 - 400

Frame Size
32: 32A
63: 63A
95: 95A
150: 150A
225: 225A
400: 400A
150: 150A
225: 225A
400: 400A

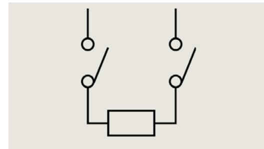
Terminals
S=Screw
L=Lug
B=Bolt-On Connector

IronHorse HMC Series Contactors (22AF)

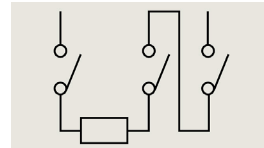
HMC-22B30-11-BS

Description

- 3-pole (NO) main contact
- Finger-proof design
- DIN rail or screw mountable
- AC or DC load ratings in different physical sizes
- Front/side mountable accessories available
- Direct-mountable overload relay
- 1NO/1NC auxiliary contact built-in
- Degree of protection: IP20



DC loads (2-pole)



DC loads (3-pole)

Certifications
CE(IEC), UL508, CCC

IronHorse HMC Series Three-Pole Contactors (22AF) Selection Guide

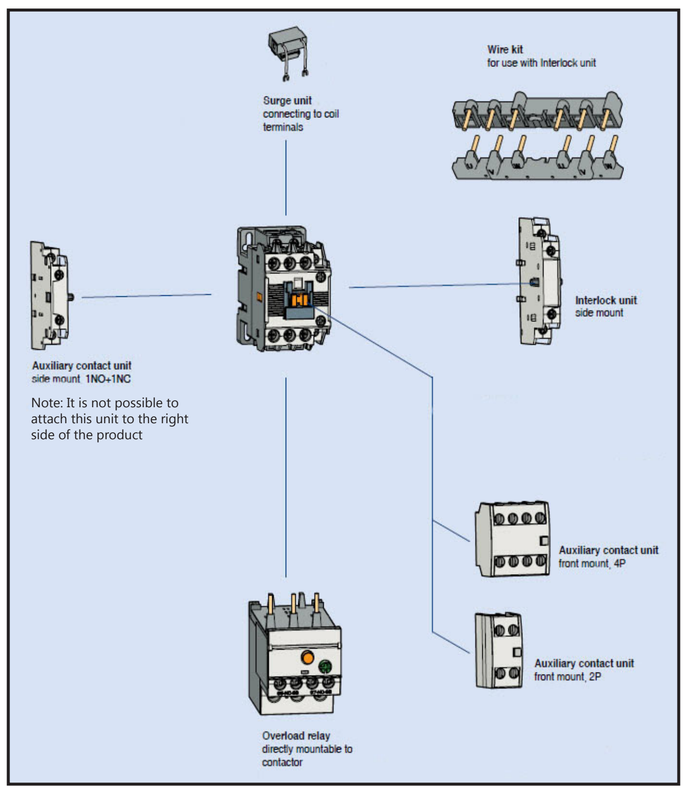
Part Number	*Price*	*AC-3 Amps (380/440 V)*	*Main Contact Poles*	*Coil Voltage*	*Coil Frequency*	*Auxiliary Contacts*	*Drawings*
HMC-9B30-11-BS	$21.50	9	3 NO	24VAC	50/60 Hz	1 NO and 1 NC	PDF
HMC-9B30-11-AS	$21.50			120VAC	50/60 Hz		PDF
HMC-9B30-11-CS	$21.50			230VAC	50/60 Hz		PDF
HMC-9B30-11-ES	$21.50			480VAC	60 Hz		PDF
HMC-12B30-11-BS	$24.50	12		24VAC	50/60 Hz		PDF
HMC-12B30-11-AS	$24.50			120VAC	50/60 Hz		PDF
HMC-12B30-11-CS	$24.50			230VAC	50/60 Hz		PDF
HMC-12B30-11-ES	$24.50			480VAC	60 Hz		PDF
HMC-18B30-11-BS	$33.50	18		24VAC	50/60 Hz		PDF
HMC-18B30-11-AS	$33.50			120VAC	50/60 Hz		PDF
HMC-18B30-11-CS	$33.50			230VAC	50/60 Hz		PDF
HMC-18B30-11-ES	$33.50			480VAC	60 Hz		PDF
HMC-22B30-11-BS	$40.00	22		24VAC	50/60 Hz		PDF
HMC-22B30-11-AS	$40.00			120VAC	50/60 Hz		PDF
HMC-22B30-11-CS	$40.00			230VAC	50/60 Hz		PDF
HMC-22B30-11-ES	$40.00			480VAC	60 Hz		PDF
HMC-9B30-11-DS	$26.00	9		24VDC	–		PDF
HMC-12B30-11-DS	$30.00	12		24VDC	–		PDF
HMC-18B30-11-DS	$41.50	18		24VDC	–		PDF
HMC-22B30-11-DS	$47.00	22		24VDC	–		PDF

22AF Contactors Description

Contactor Type			*HMC-9B*		*HMC-12B*		*HMC-18B*		*HMC-22B*	
			kW	A	kW	A	kW	A	kW	A
AC Duty	AC3	200/240V	2.5	11	3.5	13	4.5	18	5.5	22
		380/440V	4	9	5.5	12	7.5	18	11	22
		500/550V	4	7	7.5	12	7.5	13	15	20
		690V	4	6	7.5	9	7.5	9	15	18
	AC4	200/240V	1.5	8	2.2	11	3.7	16	3.7	18
		380/440V	2.2	6	4	9	4	11	5.5	13
	AC1		-	25	-	27	-	40	-	45
DC1 Duty (L/R= 1ms	2-pole in series	24V	-	10	-	12	-	18	-	20
		48V	-	10	-	12	-	18	-	20
		110V	-	6	-	10	-	13	-	15
	3-pole in series	24V	-	10	-	12	-	18	-	20
		48V	-	10	-	12	-	18	-	20
		110V	-	8	-	12	-	18	-	20
DC3,5 Duty (L/R= 15ms)	2-pole in series	24V	-	8	-	12	-	12	-	20
		48V	-	4	-	6	-	6	-	15
		110V	-	2.5	-	4	-	4	-	8
	3-pole in series	24V	-	8	-	12	-	12	-	20
		48V	-	6	-	10	-	10	-	20
		110V	-	4	-	8	-	8	-	15
Directly Mountable Overload Relay			HTOR-32							
Conductor Size (Solid, Stranded) 2 conductors max		AWG	16-10		16-8		14-8		14-8	
		mm^2	1.5-4		1.5-10		2.5-10		2.5-10	
Conductor Type			65/75°C CU wire only							

Note: Observe polarity when wiring the control power cable

Accessories



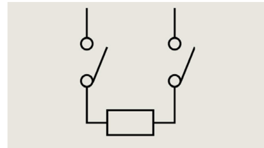
IronHorse HMC Series Contactors (40AF)

IRONHORSE

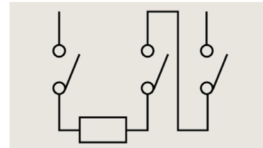
HMC-40A30-22-ES

Description

- 3-pole (NO) main contact
- Finger-proof design
- DIN rail or screw mountable
- AC or DC load ratings in different physical sizes
- Front/side mountable accessories available
- Direct-mountable overload relay
- 2NO/2NC auxiliary contact built-in
- Degree of protection: IP20



DC loads (2-pole)



DC loads (3-pole)

Certifications
CE(IEC), UL508, CCC

IronHorse HMC Series Three-Pole Contactors (40AF) Selection Guide

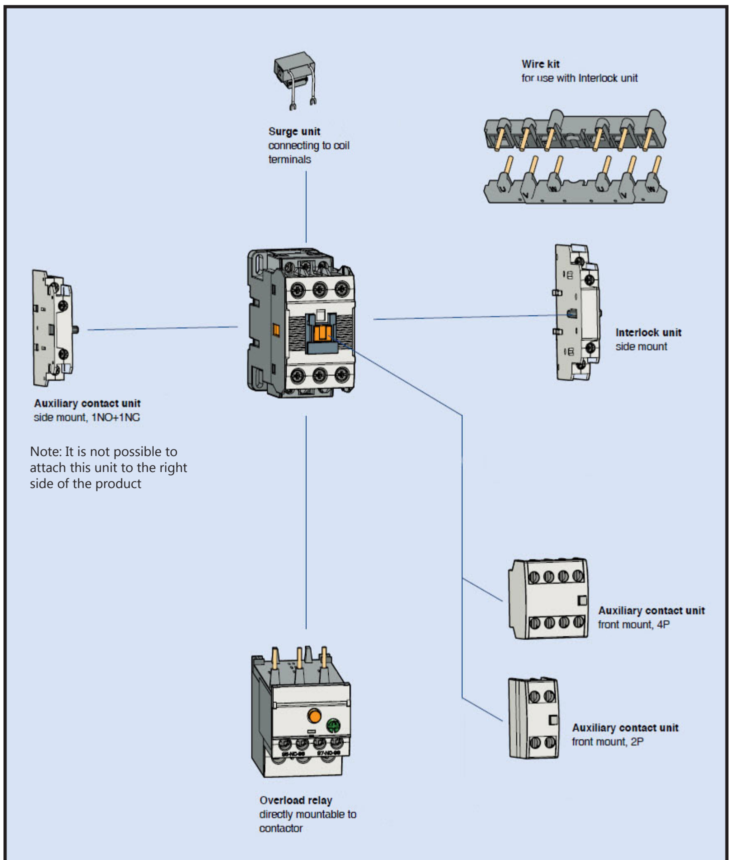
Part Number	*Price*	*AC-3 Amps (380/440 V)*	*Main Contact Poles*	*Coil Voltage*	*Coil Frequency*	*Auxiliary Contacts*	*Drawings*
HMC-32A30-22-BS	$51.00	32	3 NO	24VAC	50/60 Hz	2 NO and 2 NC	PDF
HMC-32A30-22-AS	$51.00			120VAC	50/60 Hz		PDF
HMC-32A30-22-CS	$51.00			230VAC	50/60 Hz		PDF
HMC-32A30-22-ES	$51.00			480VAC	60 Hz		PDF
HMC-40A30-22-BS	$65.00	40		24VAC	50/60 Hz		PDF
HMC-40A30-22-AS	$65.00			120VAC	50/60 Hz		PDF
HMC-40A30-22-CS	$65.00			230VAC	50/60 Hz		PDF
HMC-40A30-22-ES	$65.00			480VAC	60 Hz		PDF
HMC-32A30-22-DS	$60.00	32		24VDC	–		PDF
HMC-40A30-22-DS	$76.00	40		24VDC	–		PDF

40AF Contactors Description

Contactor Type			*HMC-32A*		*HMC-40A*	
			kW	A	kW	A
AC Duty	AC3	200/240V	7.5	32	11	40
		380/440V	15	32	18.5	40
		500/550V	18.5	28	22	32
		690V	18.5	20	22	23
		1000V	22	17	22	17
	AC4	200/240V	4.5	20	5.5	25
		380/440V	7.5	17	11	24
	AC1		-	55	-	60
DC1 Duty (L/R=1ms	2-pole in series	24V	-	25	-	35
		48V	-	25	-	35
		110V	-	25	-	25
	3-pole in series	24V	-	25	-	35
		48V	-	25	-	35
		110V	-	25	-	35
DC3,5 Duty (L/R=15ms	2-pole in series	24V	-	25	-	35
		48V	-	20	-	20
		110V	-	10	-	10
	3-pole in series	24V	-	25	-	35
		48V	-	25	-	30
		110V	-	20	-	20
Directly Mountable Overload Relay			HTOR-32			
Conductor Size (Solid, Stranded) Maximum number of conductors: 2		AWG	12-8		8-6	
		mm^2	2.5-10		10-16	
Conductor Type			65/75°C CU wire only			

Note: Observe polarity when wiring the control power cable

Accessories

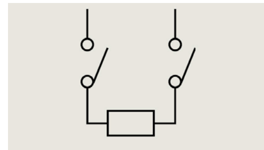


IronHorse
HMC Series Contactors (65AF)

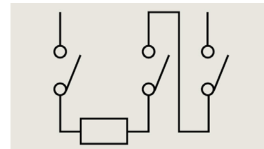
HMC-65A30-22-EL

Description

- 3-pole (NO) main contact
- Finger-proof design
- DIN rail or screw mountable
- AC or DC load ratings in different physical sizes
- Front/side mountable accessories available
- Direct-mountable overload relay
- 2NO/2NC auxiliary contact built-in
- Degree of protection: IP20



DC loads (2-pole)



DC loads (3-pole)

Certifications
CE(IEC), UL508, CCC

IronHorse HMC Series Three-Pole Contactors (65AF) Selection Guide

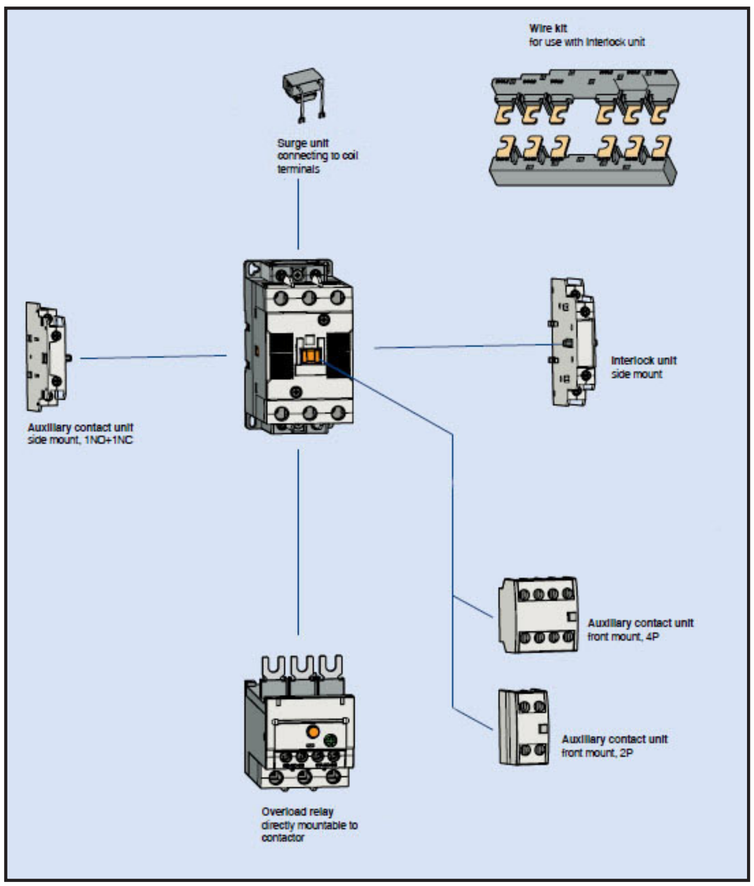
Part Number	Price	AC-3 Amps (380/440 V)	Main Contact Poles	Coil Voltage	Coil Frequency	Auxiliary Contacts	Drawings
HMC-50A30-22-BL	$90.00	50	3 NO	24VAC	50/60 Hz	2 NO and 2 NC	PDF
HMC-50A30-22-AL	$90.00			120VAC	50/60 Hz		PDF
HMC-50A30-22-CL	$90.00			230VAC	50/60 Hz		PDF
HMC-50A30-22-EL	$90.00			480VAC	60 Hz		PDF
HMC-65A30-22-BL	$104.00	65		24VAC	50/60 Hz		PDF
HMC-65A30-22-AL	$104.00			120VAC	50/60 Hz		PDF
HMC-65A30-22-CL	$104.00			230VAC	50/60 Hz		PDF
HMC-65A30-22-EL	$104.00			480VAC	60 Hz		PDF
HMC-50A30-22-DL	$97.00	50		24VDC	–		PDF
HMC-65A30-22-DL	$119.00	65		24VDC	–		PDF

65AF Contactors Description

Contactor Type			HMC-50A		HMC-65A	
			kW	A	kW	A
AC Duty	AC3	200/240V	15	55	18.5	65
		380/440V	22	50	30	65
		500/550V	30	43	33	60
		690V	30	28	33	35
		1000V	30	23	30	23
	AC4	200/240V	7.5	35	11	50
		380/440V	15	32	22	47
	AC1		-	100	-	11
DC1 Duty (L/R=1ms	2-pole in series	24V	-	50	-	40
		48V	-	40	-	40
		110V	-	35	-	35
	3-pole in series	24V	-	50	-	65
		48V	-	50	-	65
		110V	-	50	-	65
DC3,5 Duty (L/R=15ms	2-pole in series	24V	-	45	-	45
		48V	-	25	-	25
		110V	-	15	-	15
	3-pole in series	24V	-	50	-	50
		48V	-	35	-	35
		110V	-	30	-	30
Directly Mountable Overload Relay			HTOR-63			
Conductor Size (Solid, Stranded) Maximum number of conductors: 2		AWG	10-4		8-3	
		mm^2	6-25		10-35	
Conductor Type			65/75°C CU wire only			

Note: Observe polarity when wiring the control power cable

Accessories



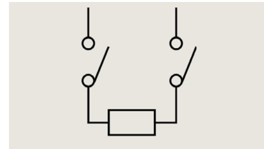
IronHorse HMC Series Contactors (100AF)

IRONHORSE®

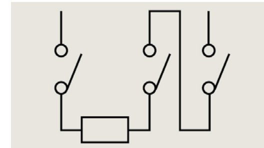
HMC-100A30-22-EL

Description

- 3-pole (NO) main contact
- Finger-proof design
- DIN rail or screw mountable
- AC or DC load ratings in different physical sizes
- Front/side mountable accessories available
- Direct-mountable overload relay
- 2NO/2NC auxiliary contact built-in
- Degree of protection: IP20



DC loads (2 pole)



DC loads (3 pole)

Certifications
CE(IEC), UL508, CCC

IronHorse HMC Series Three-Pole Contactors (100AF) Selection Guide

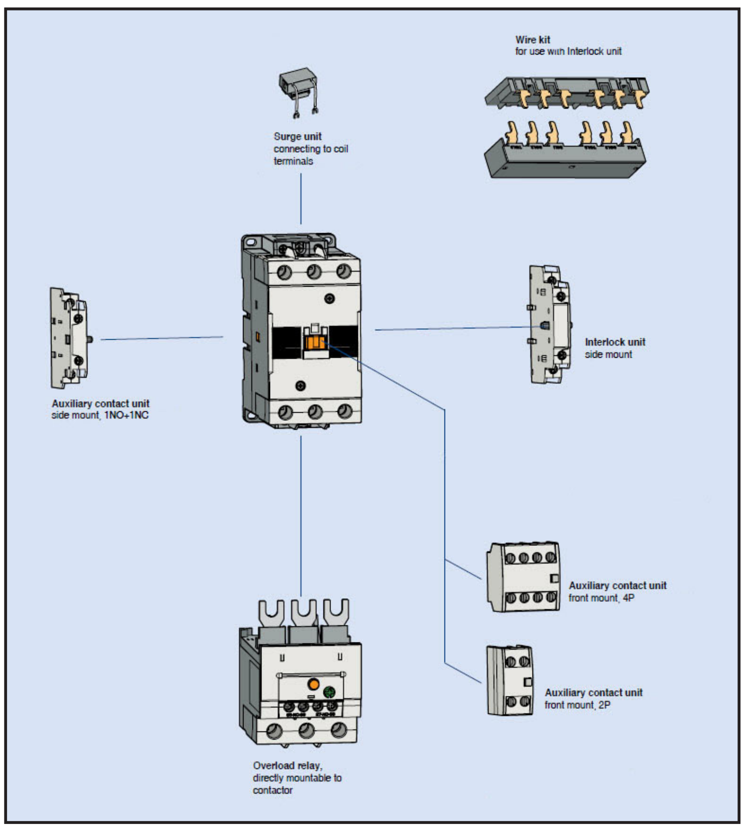
Part Number	Price	AC-3 Amps (380/440 V)	Main Contact Poles	Coil Voltage	Coil Frequency	Auxiliary Contacts	Drawings
HMC-75A30-22-BL	$119.00	75	3 NO	24VAC	50/60 Hz	2 NO and 2 NC	PDF
HMC-75A30-22-AL	$119.00			120VAC	50/60 Hz		PDF
HMC-75A30-22-CL	$119.00			230VAC	50/60 Hz		PDF
HMC-75A30-22-EL	$119.00			480VAC	60 Hz		PDF
HMC-85A30-22-BL	$136.00	85		24VAC	50/60 Hz		PDF
HMC-85A30-22-AL	$136.00			120VAC	50/60 Hz		PDF
HMC-85A30-22-CL	$136.00			230VAC	50/60 Hz		PDF
HMC-85A30-22-EL	$136.00			480VAC	60 Hz		PDF
HMC-100A30-22-BL	$188.00	100		24VAC	50/60 Hz		PDF
HMC-100A30-22-AL	$188.00			120VAC	50/60 Hz		PDF
HMC-100A30-22-CL	$188.00			230VAC	50/60 Hz		PDF
HMC-100A30-22-EL	$188.00			480VAC	60 Hz		PDF
HMC-75A30-22-DL	$148.00	75		24VDC	–		PDF
HMC-85A30-22-DL	$174.00	85		24VDC	–		PDF
HMC-100A30-22-DL	$217.00	100		24VDC	–		PDF

100AF Contactors Description

Contactor Type			HMC-75A		HMC-85A		HMC-100A	
			kW	A	kW	A	kW	A
AC Duty	AC3	200/240V	22	75	25	85	30	105
		380/440V	37	75	45	85	55	105
		500/550V	37	64	45	75	55	85
		690V	37	42	45	45	45	65
		1000V	37	28	37	28	37	28
	AC4	200/240V	13	55	15	65	19	80
		380/440V	25	52	30	62	37	75
	AC1		-	12	-	135	-	160
DC1 Duty (L/R= 1ms)	2-pole in series	24V	-	75	-	80	-	100
		48V	-	65	-	65	-	100
		110V	-	50	-	50	-	80
	3-pole in series	24V	-	75	-	80	-	100
		48V	-	75	-	80	-	100
		110V	-	75	-	80	-	100
DC3,5 Duty (L/R= 15ms)	2-pole in series	24V	-	65	-	65	-	100
		48V	-	40	-	40	-	60
		110V	-	20	-	20	-	40
	3-pole in series	24V	-	80	-	80	-	100
		48V	-	60	-	60	-	90
		110V	-	50	-	50	-	80
Directly Mountable Overload Relay			HTOR-95					
Conductor Size (Solid, Stranded) Maximum number of conductors: 2	AWG		8-2		8-0		8-00	
	mm^2		10-35		10-50		10-70	
Conductor Type			65/75°C CU wire only					

Note: Observe polarity when wiring the control power cable

Accessories

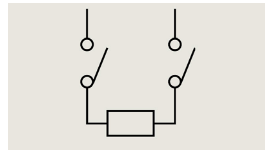


IronHorse HMC Series Contactors (150AF)

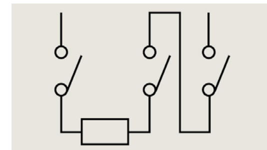
HMC-150A30-22-GL

Description

- 3-pole (NO) main contact
- Finger-proof design
- DIN rail or screw mountable
- AC or DC load ratings in different physical sizes
- Front/side mountable accessories available
- Direct-mountable overload relay
- 2NO/2NC auxiliary contact built-in
- Degree of protection: IP20



DC loads (2-pole)



DC loads (3-pole)

Certifications
CE(IEC), UL508, CCC

IronHorse HMC Series Three-Pole Contactors (150AF) Selection Guide

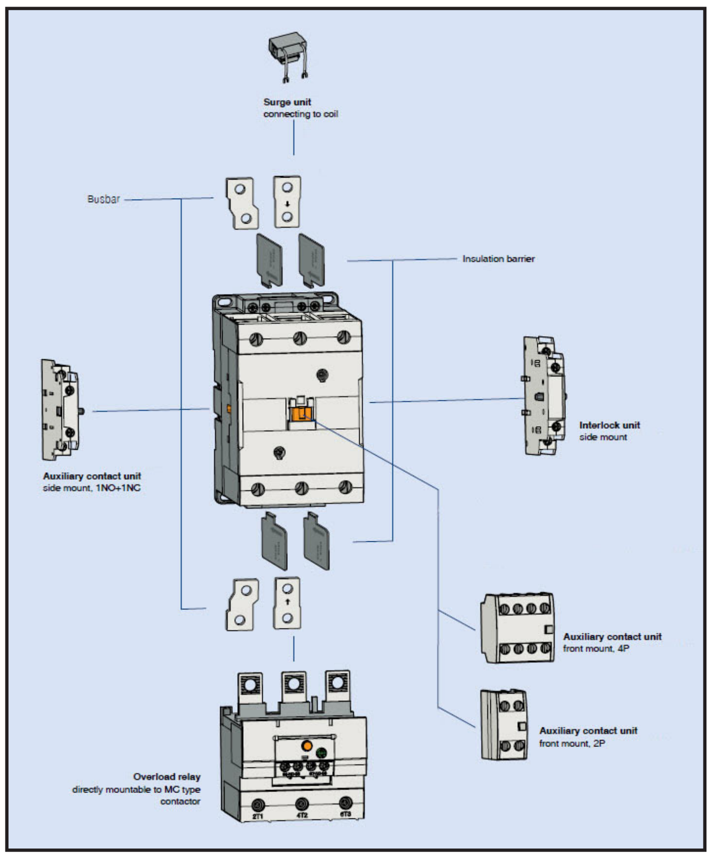
Part Number	*Price*	*AC-3 Amps (380/440 V)*	*Main Contact Poles*	*Coil Voltage*	*Coil Frequency*	*Auxiliary Contacts*	*Drawings*
HMC-130A30-22-DL	$261.00	130		24VDC	–		PDF
HMC-150A30-22-DL	$320.00	150		24VDC	–		PDF
HMC-130A30-22-FL	$223.00	130		100-240 VAC / 100-200 VDC low consumption electronic			PDF
HMC-130A30-22-GL	$223.00		3 NO	24-48 VAC/24-48 VDC coil voltage, low consumption electronic	50/60 Hz	2 NO and 2 NC	PDF
HMC-150A30-22-FL	$286.00	150		100-240 VAC / 100-200 VDC low consumption electronic			PDF
HMC-150A30-22-GL	$286.00			24-48VAC / 24-48 VDC coil voltage, low consumption electronic			PDF

150AF Contactors Description

Contactor Type			*HMC-130A* kW	*HMC-130A* A	*HMC-150A* kW	*HMC-150A* A
AC Duty	AC3	200/240V	37	130	45	150
		380/440V	60	130	75	150
		500/550V	60	90	70	100
		690V	55	60	55	60
		1000V	75	50	75	50
	AC4	200/240V	22	93	30	120
		380/440V	45	90	55	110
	AC1		-	200	-	250
DC1 Duty (L/R=1ms	2-pole in series	24V	-	120	-	150
		48V	-	100	-	120
		110V	-	80	-	100
	3-pole in series	24V	-	120	-	150
		48V	-	120	-	150
		110V	-	100	-	150
DC3,5 Duty (L/R=15ms	2-pole in series	24V	-	120	-	150
		48V	-	60	-	100
		110V	-	40	-	80
	3-pole in series	24V	-	120	-	150
		48V	-	90	-	130
		110V	-	80	-	120
Directly Mountable Overload Relay			HTOR-150			
Conductor Size (Solid, Stranded) Maximum number of conductors: 2		AWG	3-00		3-4/0	
		mm^2	35-70		35-95	
Conductor Type			65/75°C CU wire only			

Note: Observe polarity when wiring the control power cable

Accessories

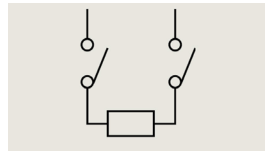


IronHorse HMC Series Contactors (225AF)

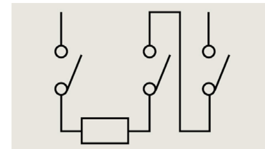
HMC-185A30-22-FB

Description

- 3-pole (NO) main contact
- Finger-proof design
- DIN rail or screw mountable
- AC or DC load ratings in different physical sizes
- Direct-mountable overload relay
- 2NO/2NC auxiliary contact built-in
- Degree of protection: IP00



DC loads (2-pole)



DC loads (3-pole)

Certifications
CE(IEC), UL508, CCC

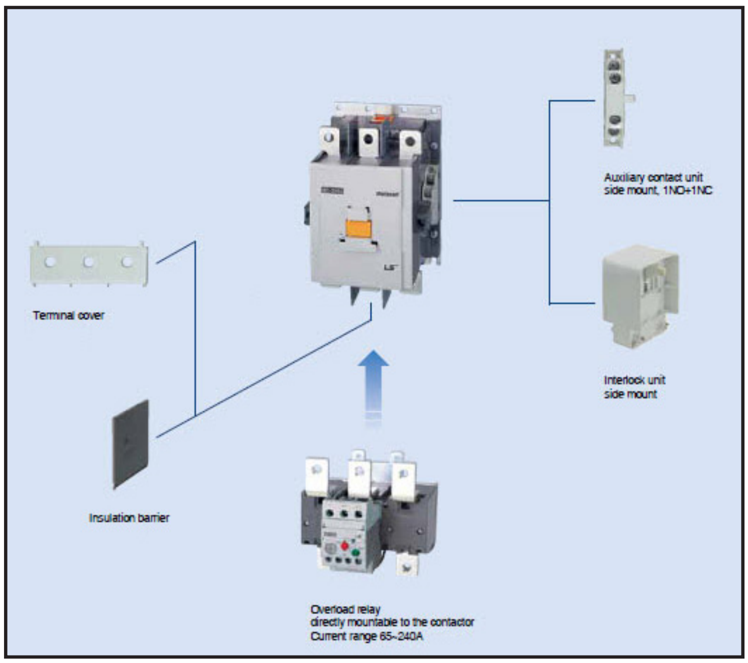
IronHorse HMC Series Three-Pole Contactors (225AF) Selection Guide

Part Number	*Price*	*AC-3 Amps (380/440 V)*	*Main Contact Poles*	*Coil Voltage*	*Coil Frequency*	*Auxiliary Contacts*	*Drawings*
HMC-185A30-22-FB	$362.00	185	3 NO	100-240 VAC / 100-200 VDC low consumption electronic	50/60 Hz	2 NO and 2 NC	PDF
HMC-185A30-22-HB	$362.00			24-25 VAC / 24 VDC low consumption electronic			PDF
HMC-225A30-22-FB	$435.00	225		100-240 VAC / 100-200 VDC low consumption electronic			PDF
HMC-225A30-22-HB	$435.00			24-25 VAC / 24 VDC low consumption electronic			PDF

225AF Contactors Description

Contactor Type			*HMC-185A*		*HMC-225A*	
			kW	A	kW	A
AC Duty	AC3	200/240V	55	185	75	225
		380/440V	90	185	132	225
		500/550V	110	180	132	200
		690V	110	120	140	150
		1000V	132	90	132	90
	AC4	200/240V	37	150	45	180
		380/440V	75	150	90	180
	AC1		-	300	-	350
DC1 Duty (L/R=1ms	2-pole in series	24V	-	180	-	220
		48V	-	180	-	180
		110V	-	150	-	150
	3-pole in series	24V	-	180	-	220
		48V	-	180	-	220
		110V	-	180	-	220
DC3,5 Duty (L/R=15ms	2-pole in series	24V	-	180	-	220
		48V	-	150	-	150
		110V	-	120	-	120
	3-pole in series	24V	-	180	-	220
		48V	-	180	-	220
		110V	-	150	-	150
Directly Mountable Overload Relay			HTOR-225			
Conductor Size (Solid, Stranded) Maximum number of conductors: 2		AWG	1-4/0		0-300	
		mm^2	50-95		50-150	
Conductor Type			75°C CU wire			

Accessories



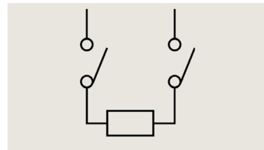
IronHorse HMC Series Contactors (400AF)

IRONHORSE®

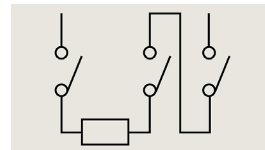
HMC-265A30-22-FB

Description

- 3-pole main contact
- AC/DC common use coil
- Wide coil operation voltage
- Screw mountable
- 2NO/2NC auxiliary contacts built-in
- Direct mountable overload relays
- Degree of protection: IP00



DC loads (2-pole)



DC loads (3-pole)

Certifications
CE(IEC), UL508, CCC

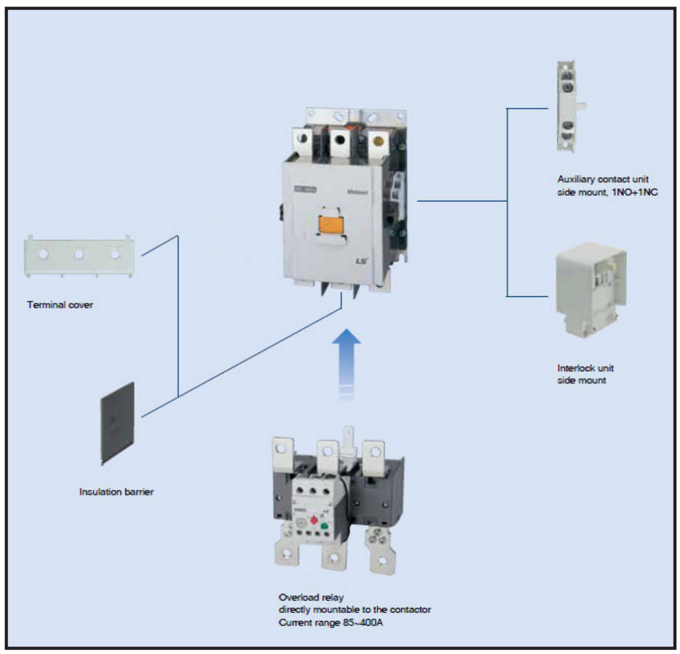
IronHorse HMC Series Three-Pole Contactors (400AF) Selection Guide

Part Number	Price	AC-3 Amps (380/440 V)	Main Contact Poles	Coil Voltage	Coil Frequency	Auxiliary Contacts	Drawings
HMC-265A30-22-FB	$631.00	265	3 NO	100-240 VAC / 100-200 VDC low consumption electronic	50/60 Hz	2 NO and 2 NC	PDF
HMC-330A30-22-FB	$716.00	330		100-240 VAC / 100-200 VDC low consumption electronic			PDF
HMC-400A30-22-FB	$782.00	400		100-240 VAC / 100-200 VDC low consumption electronic			PDF

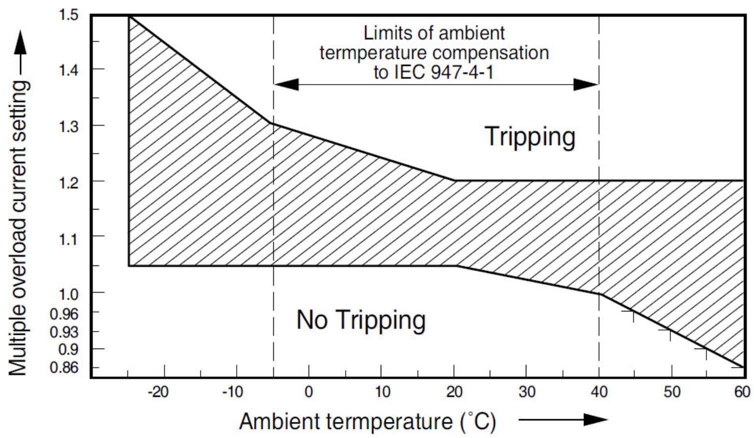
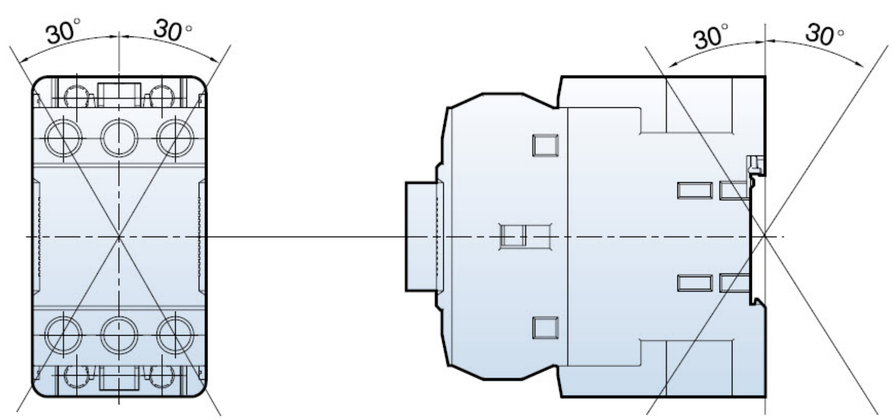
400AF Contactors Description

Contactor Type			HMC-265A		HMC-330A		HMC-400A	
			kW	A	kW	A	kW	A
AC Duty	AC3	200/240V	80	265	90	330	125	400
		380/440V	147	265	160	330	200	400
		500/550V	147	225	160	28	225	350
		690V	160	185	200	220	250	300
		1000V	147	105	147	105	147	105
	AC4	200/240V	50	200	55	220	75	300
		380/440V	102	200	110	220	150	300
	AC1		-	400	-	500	-	520
DC1 Duty (L/R= 1ms	2-pole in series	24V	-	220	-	300	-	400
		48V	-	180	-	240	-	240
		110V	-	150	-	200	-	200
	3-pole in series	24V	-	220	-	300	-	400
		48V	-	220	-	300	-	400
		110V	-	220	-	300	-	400
DC3,5 Duty (L/R= 15ms)	2-pole in series	24V	-	220	-	300	-	400
		48V	-	150	-	200	-	200
		110V	-	120	-	150	-	150
	3-pole in series	24V	-	220	-	300	-	400
		48V	-	220	-	280	-	280
		110V	-	150	-	200	-	200
Directly Mountable Overload Relay			HTOR-400					
Conductor Size (Solid, Stranded) Maximum number of conductors: 2	AWG		3/0-500		4/0-500		350-700	
	mm^2		95-240		95-240		185-370	
Conductor Type			75°C CU wire only					

Accessories



IronHorse HMC Series Contactors

HMC Series Three-Pole Contactors – Environmental	
Standards	IEC/EN 60947-1, IEC/EN 60947-4-1, UL508, K60947
Certifications	CE, UL, CCC
Rated Insulation Voltage U_i	1000V (6A-22A: 690V) (32A-800A: 1000V)
Rated Impulse Withstand Voltage U_{imp}	8kV (6A-22A: 6kV) (32A-800A: 8kV)
Degree of Protection	IP20 (Conforming to IEC60529)
Ambient Air Temperature	Storage: -30°C to 65°C [-22°F to 149°F] Operation: -5°C to 55°C [23°F to 131°F] (AC Type) -5°C to 40°C [23°F to 104°F] (MT, DC Type) -25°C to 60°C [-13°F to 140°F] (MT refer to graph) 
Operating Altitude	3000m [8900ft]
Operating Positions	
Shock Resistance (1/2 sine wave = 11ms)	Opened: 8G Closed: 10G
Vibration Resistance (Conforming to IEC68-2-6) (5 to 300 Hz)	Opened: 2G Closed: 4G
Flame Resistance	Conforming to UL 94:V0 Conforming to IEC 695-2-1: 960°C

IronHorse HMC Series Contactors

HMC Series Magnetic Contactors Specifications

Frame Size		22AF				40AF		65AF		100AF			150AF		225AF		400AF		
Type		HMC-9B	HMC-12B	HMC-18B	HMC-22B	HMC-32A	HMC-40A	HMC-50A	HMC-65A	HMC-75A	HMC-85A	HMC-100A	HMC-130A	HMC-150A	HMC-185A	HMC-225A	HMC-265A	HMC-330A	HMC-400A
Screw Clamp Terminals		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Lug Clamp Terminals								●	●	●	●	●	●	●	●	●			
Number of Poles		3																	
Rated Operational Voltage U_e		690V				1000V													
Rated Insulation Voltage U_i		690V				1000V													
Rated Frequency		50/60 Hz																	
Rated Impulse Withstand Voltage U_{imp}		6kV				8kV													
Maximum Operating Rate in Operating Cycles Per Hour (AC3)		1800 operations per hour						1200 operations per hour											
Mechanical Durability (millions of operations)		15				12							5						2.5
Electrical Durability (millions of operations)		2.5				2						1							0.5
Current and Power – AC1, Thermal Current	A	25	25	40	40	50	60	70	100	110	135	160	200	250	300	350	400	500	520
Current and Power – AC3 – 200/240 V	kW	2.5	3.5	4.5	5.5	7.5	11	15	18.5	22	25	30	37	45	55	75	80	90	125
Current and Power – AC3 – 200/240 V	A	11	13	18	22	32	40	55	65	75	85	105	130	150	185	225	265	330	400
Current and Power – AC3 – 380/440 V	kW	4	5.5	7.5	11	15	18.5	22	30	37	45	55	60	75	90	132	147	160	200
Current and Power – AC3 – 380/440 V	A	9	12	18	22	32	40	50	65	75	85	105	130	150	185	225	265	330	400
Current and Power – AC3 – 500/550 V	kW	4	7.5	7.5	15	18.5	22	30	33	37	45	55	60	70	110	132	147	160	225
Current and Power – AC3 – 500/550 V	A	7	12	13	20	28	32	43	60	64	75	85	90	100	180	200	225	250	350
Current and Power – AC3 – 690V	kW	4	7.5	7.5	15	18.5	22	30	33	37	45	55	55	55	110	140	160	200	250
Current and Power – AC3 – 690V	A	6	9	9	18	20	23	28	35	42	45	65	60	60	120	150	185	220	300
Current and Power – AC3 – 1000V	kW	-	-	-	-	22	22	30	30	37	37	37	75	75	132	132	147	147	147
Current and Power – AC3 – 1000V	A	-	-	-	-	17	17	23	23	28	28	28	53	53	90	90	105	105	105
Rated Short-Time Withstand Current (IEC 80947) – 1s	A	250	280	300	400	600	700	1000	1050	1100	1200	1320	1350	1800	2000	2500	3500	4000	4600
Rated Short-Time Withstand Current (IEC 80947) – 10s	A	110	120	154	186	260	300	550	700	750	800	900	950	1200	1500	1700	2400	3000	4400
Rated Short-Time Withstand Current (IEC 80947) – 30s	A	70	80	100	130	160	160	330	380	400	450	500	700	800	1000	1200	1500	2500	2974
Rated Short-Time Withstand Current (IEC 80947) – 1min	A	61	61	84	90	100	100	250	270	300	350	400	550	600	800	1000	1100	1700	1846
Rated Short-Time Withstand Current (IEC 80947) – 3min	A	45	50	60	60	70	70	150	200	220	270	270	350	450	520	700	800	1000	1313
Rated Short-Time Withstand Current (IEC 80947) – 10min	A	30	30	40	50	55	55	90	120	140	170	180	200	300	350	500	600	620	760
Rated Short-Time Withstand Current (IEC 80947) – ≥10min	A	26	28	40	45	50	50	87	100	114	150	160	175	280	320	400	500	553	699
UL Rating (50/60 Hz) – Continuous current	A	25	25	40	40	50	60	70	100	110	135	160	160	210	230	275	300	350	450
UL Rating (50/60 Hz) – Single Phase – 110-120 V	HP	0.5	0.75	1	2	2	2	3	5	5	7.5	10	10	15	15	15	-	-	-
UL Rating (50/60 Hz) – Single Phase – 220-240 V	HP	1.5	2	3	3	5	5	10	15	15	15	20	20	25	30	40	-	-	-
UL Rating (50/60 Hz) – Three Phase – 200-208 V	HP	2	3	7.5	7.5	7.5	15	20	25	25	30	30	40	40	60	60	75	100	125
UL Rating (50/60 Hz) – Three Phase – 220-240 V	HP	3	5	7.5	10	10	15	25	30	30	40	40	40	50	60	75	100	100	150
UL Rating (50/60 Hz) – Three Phase – 440-480 V	HP	5	7.5	10	15	20	30	40	50	50	60	75	75	100	125	150	200	200	300
UL Rating (50/60 Hz) – Three Phase – 550-600 V	HP	7.5	10	15	20	25	30	50	60	60	75	75	75	75	125	150	200	200	300
UL Rating (50/60 Hz) – NEMA Size		00	0	1		1P	2				3			4			5		
Weight – AC Control	kg [lb]	0.34 [0.75]				0.55 [1.21]		1.05 [2.31]		1.93 [4.25]			2.4 [5.29]		5.4 [11.91]		9.2 [20.28]		
Weight – DC Control	kg [lb]	0.41 [0.90]				0.77 [1.70]		1.3 [2.87]		2.8 [6.17]									
Auxiliary (Standard)		1a1b				2a2b													
Auxiliary Side Mount		HMX1-AUX11-S													HMX3-AUX11-S				
Auxiliary Front Mount		HMX1-AUXxx-F													–				

Note: Minimum conduct current of Auxiliary contactor is DC 17V, 5mA

HMC Series Thermal Overload Relays Specifications

Type	HTOR-32	HTOR-32	HTOR-63	HTOR-95	HTOR-150	HTOR-225	HTOR-400
Screw Clamp Terminals	●	●	●	●	●	●	●
Lug Clamp Terminals			●	●	●	●	
Rated Operational Voltage U_e	690V						
Rated Insulation Voltage U_i	690V						
Rated Impulse Withstand Voltage U_{imp}	6kV						
Trip Class	10A						
Setting Range	0.1 - 40 A	0.1 - 40 A	42-65 A	70-100 A	80-150 A	100-240 A	160-400 A
Weight kg [lb]	0.17 [0.37]	0.0.17 [0.37]	0.31-0.33 [0.68-0.73]	0.48-0.5 [1.06-1.10]	0.67 [1.48]	2.5 [5.51]	2.6 [5.73]

Note: The safety cover of magnetic contactor and thermal overload relay is optional.

IronHorse HMC Series Contactors Connections

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HMC Series Three-Pole Contactors – Connections							
		Main Terminal Size	AWG / mm²			mm [in] (max)	Torque lb·in [N·m]
HMC-9B		M4	18-10 / 1-4	18-10 / 1-4	18-10 / 1-4	9.6 [0.38]	20 [2.25]
HMC-12B			16-10 / 1.5-6	16-10 / 1.5-6	16-10 / 1.5-6		
HMC-18B			16-10 / 1.5-6	16-10 / 1.5-6	16-10 / 1.5-6		
HMC-22B			14-8 / 2.5-10	14-8 / 2.5-10	14-8 / 2.5-10		
HMC-32A		M5	–	12-6 / 2.5-16	12-6 / 2.5-16	12.8 [0.50]	35 [4]
HMC-40A			–	12-6 / 2.5-16	12-6 / 2.5-16		
HMC-50A		M6	–	10-3 / 4-35	10-3 / 4-35	14 [0.55]	35 [4]
HMC-65A			–	10-2 / 4-35	10-2 / 4-35		
HMC-75A		M8	–	10-1 / 6-50	10-1 / 6-50	17 [0.67]	45 [5.1]
HMC-85A			–	10-1/0 / 6-50	10-1/0 / 6-50		
HMC-100A			–	10-2/0 / 6-70	10-2/0 / 6-70		
HMC-130A		M8	–	8-3/0 / 10-95	8-3/0 / 10-95	24 [0.94]	80 [9.1]
HMC-150A			–	8-250kcmil / 10-120	8-250kcmil / 10-120		
HMC-185A		M10	–	3-350kcmil / 35-185	3-350kcmil / 35-185	25 [0.98]	130 [14.7]
HMC-225A			–	3-400kcmil / 35-185	3-400kcmil / 35-185		
HMC-265A		M12	–	2-500kcmil / 35-240	2-500kcmil / 35-240	30 [1.18]	200 [22.6]
HMC-330A			–	2-250kcmil.x2 / 35-150x2	2-250kcmil.x2 / 35-150x2		
HMC-400A			–	2-350kcmil.x2 / 35-185x2	2-350kcmil.x2 / 35-185x2		

IronHorse HMC Series Contactors Control Coil Characteristics

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HMC Series Three-Pole Contactors – AC and DC Control Coil Characteristics

Frame Size			22AF	40AF	65AF	100AF	150AF (A)
Type			HMC-9B HMC-12B HMC-18B HMC-22B	HMC-32A HMC-40A	HMC-50A HMC-65A HMD-30A	HMC-75A HMC-85A HMC-100A HMD-60A HMD-100A	HMC-130A HMC-150A
AC Coil							
Control Voltage (U_c)	50Hz	(V)	24, 120, 230				24/48, 100-240/100-220
	60Hz	(V)	24, 120, 200, 230, 480				
Voltage Limit (U_c)			85 - 110 %				
Coil Consumption at 20°C [68°F]							
220VAC** 60Hz	Inrush	(VA)	70	90	110	240	320
	Holding	(VA)	9	9	13	17	10
Heat Dissipation		(W)	2.3	2.7	2.8	5.4	4.5
Operating Time	Closing	(ms)	15 - 30	15 - 30	15 - 30	15 - 30	70
	Opening	(ms)	4 - 19	4 - 19	4 - 19	10 - 30	70
DC Coil							
Control Voltage (U_c)			24				
Voltage Limit (U_c)			85 - 110 %				
Coil Consumption at 20°C [68°F]							
24VDC**	Inrush	(W)	6	9	9	18	213
	Holding	(W)	6	9	9	18	7.5
Time Constant (L/R)		(ms)	28	28	65	75	–
Operating Time	Closing	(ms)	40 - 70*	50 - 65	50 - 65	100 - 120	70 - 80
	Opening	(ms)	4 - 19	4 - 19	4 - 19	10 - 25	60 - 70

Note: Either semi-electronic coil (A) or electronic coil (B) can be chosen for HMC-130A and HMC-150A.
**** The operating time can increase up to 80ms when re-energizing after maintaining the ON state.***
***** See Automationdirect.com "IronHorse IEC Contactor Coil Data HMC Series" for other voltages.***

HMC Series Three-Pole Contactors – AC/DC Common Coil Characteristics[1]

Frame Size			150AF (B)	225AF	400AF
Type			HMC-130A HMC-150A	HMC-185A HMC-225A	HMC-265A HMC-330A HMC-400A
AC/DC Common Coil					
Control Voltage (U_c)	AC/DC	(V)	24/48	24/24	–
	AC/DC	(V)		–	–
	AC/DC	(V)	100-240/100-220		
	AC	(V)	–	–	–
	AC	(V)	–	–	–
	AC	(V)	–	–	–
Voltage Limit (U_c)			85 - 110 %[1]		
Coil Consumption at 20°C [68°F]					
220VAC** 50/60 Hz	Inrush	(VA)	320	380	571
	Holding	(VA)	10	11.6	14
Heat Dissipation		(W)	4.5	4.7	5
Operating Time	Closing	(ms)	70	70	55
	Opening	(ms)	70	70	55

Note 1: Either semi-electronic coil (A) or electronic coil(B) can be chosen for HMC-130A and HMC-150A
***** See Automationdirect.com "IronHorse IEC Contactor Coil Data HMC Series" for other voltages.***

IronHorse HMC Series Contactors Accessories

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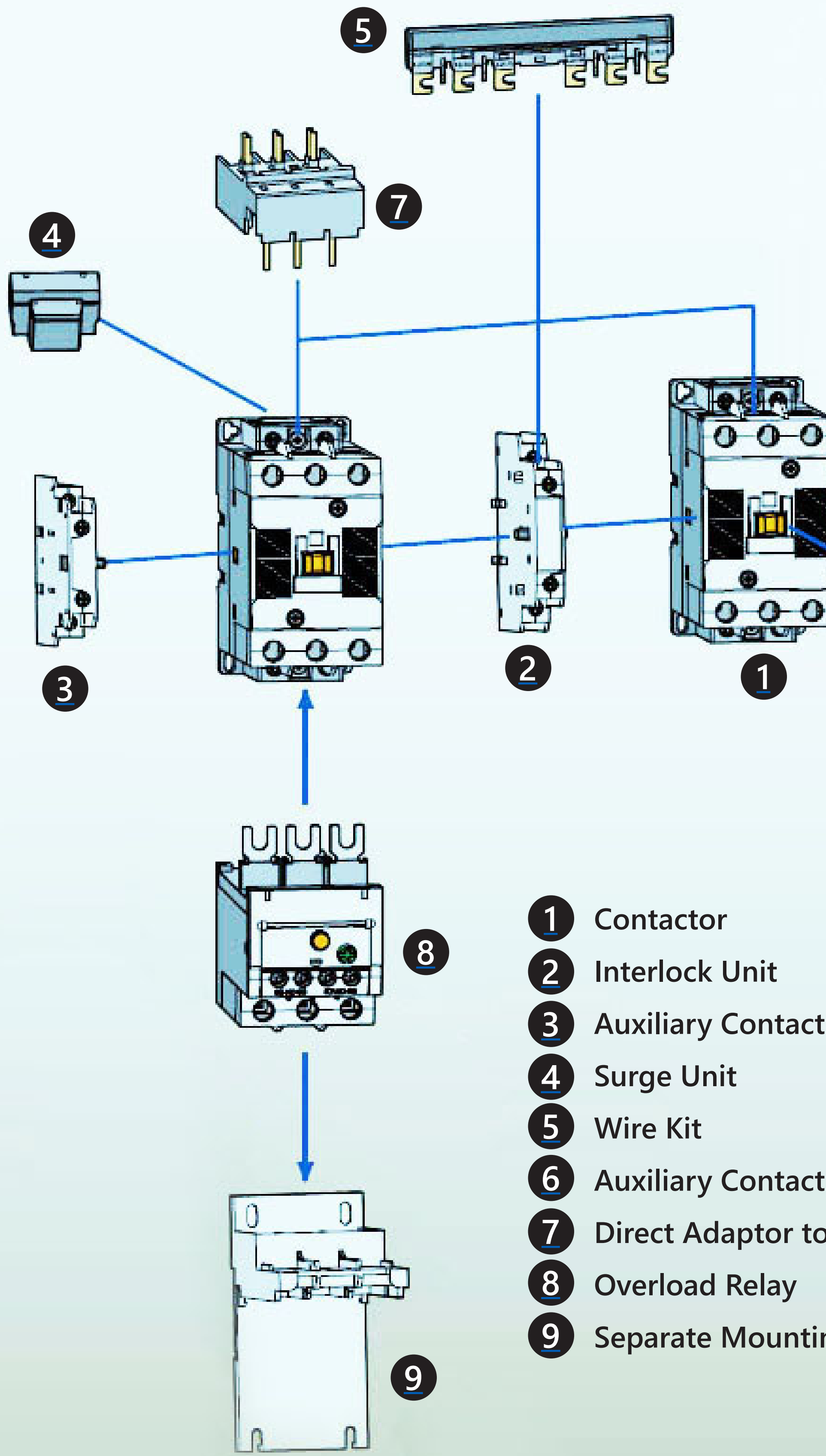

UL file numbers
E191072
E191059

1. Contactor
2. Interlock Unit
3. Auxiliary Contact Unit (Side Mount)
4. Surge Unit
5. Wire Kit
6. Auxiliary Contact Unit (Front Mount, 2P)
7. Direct Adaptor to MMS
8. Overload Relay
9. Separate Mounting Unit

IronHorse HMC Series Contactors Auxiliary Contact Units

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HMX1-AUX11-S

HMX1-AUX11-F

HMX1-AUX40-F

IronHorse HMC Series Three-Pole Contactors Accessories Selection Guide

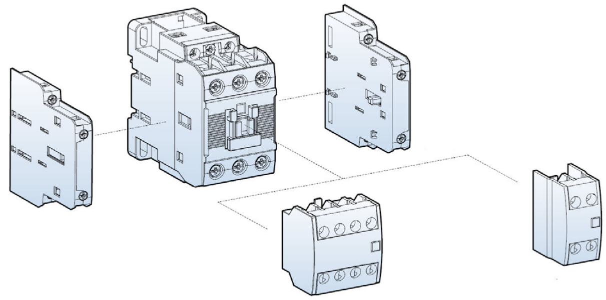
Part Number	Price	Description	Drawing
HMX1-AUX11-S	$7.25	IronHorse field installable auxiliary contact, left or right side mount, (1) NO/(1) NC contact, 10A @600 VAC/5A @ 600 VDC, screw terminal. For use with HMC-9 to HMC-150 contactors.	PDF
HMX1-AUX11-F	$7.25	IronHorse field installable auxiliary contact, front mount, (1) NO/(1) NC contact, 10A @600 VAC/2.5A @ 600 VDC, screw terminal. For use with HMC-9 to HMC-150 contactors.	PDF
HMX1-AUX40-F	$12.50	IronHorse field installable auxiliary contact, front mount, (4) NO contacts, 10A @600 VAC/2.5A @ 600 VDC, screw terminal. For use with HMC-9 to HMC-150 contactors.	PDF
HMX1-AUX04-F	$12.50	IronHorse field installable auxiliary contact, front mount, (4) NC contacts, 10A @600 VAC/2.5A @ 600 VDC, screw terminal. For use with HMC-9 to HMC-150 contactors.	PDF
HMX1-AUX13-F	$12.50	IronHorse field installable auxiliary contact, front mount, (1) NO/(3) NC contacts, 10A @600 VAC/2.5A @ 600 VDC, screw terminal. For use with HMC-9 to HMC-150 contactors.	PDF
HMX1-AUX31-F	$12.50	IronHorse field installable auxiliary contact, front mount, (3) NO/(1) NC contact(s), 10A @600 VAC/2.5A @ 600 VDC, screw terminal. For use with HMC-9 to HMC-150 contactors.	PDF
HMX3-AUX11-S	$8.25	IronHorse field installable auxiliary contact, left or right side mount, (1) NO/(1) NC contacts, 10A @600 VAC/2.5A @ 600 VDC, screw terminal. For use with HMC-185 to HMC-400 contactors.	PDF
HMX1-TMC-CR	$10.50	IronHorse terminal shroud, line and load side, 3-pole. Package of 2. For use with HMC-185 and HMC-225 contactors.	PDF
HMX2-TMC-CR	$14.50	IronHorse terminal shroud, line and load side, 3-pole. Package of 2. For use with HMC-265 to HMC-400 contactors.	PDF
HMX1-PBR-CR	$3.75	IronHorse phase barrier, package of 4. For use with HMC-185 to HMC-400 contactors.	PDF

HMX3-AUX11-S

HMX2-TMC-CR

HMX1-PBR-CR

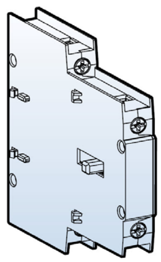
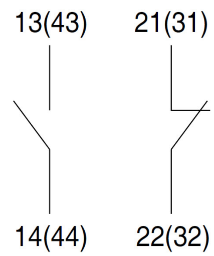
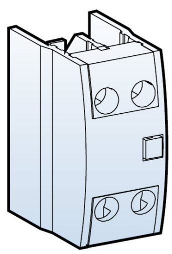
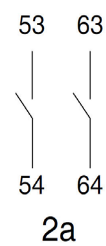
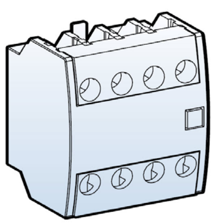
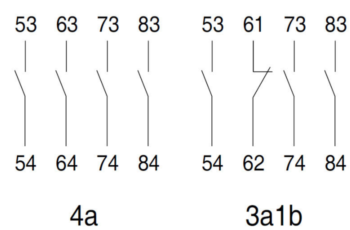
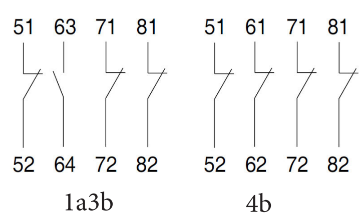
IronHorse HMC Series Contactors Auxiliary Contact Units (HMC-9 to HMC-150)



- 2- and 4-pole
- Side and front mountable
- For use with HMC-9B to HMC-150A contactors
- Auxiliary contacts meet the requirements for mirror contacts in IEC 60947-4-1. Annex F.

(A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with an NO main contact.)

IronHorse HMC Series Three-Pole Contactors Accessories Specifications

Part Number	Appearance	Poles	Composition NO	Composition NC	Contact Arrangement	Mounting	Weight (g [oz])
HMX1-AUX11-S		2	1	1		Side	53 [1.87]
HMX1-AUX11-F		2	2 1 –	– 1 2		Front	28 [0.99]
HMX1-AUX40-F		4	4	–		Front	50 [1.76]
HMX1-AUX31-F			3	1			
HMX1-AUX13-F			1	3			
HMX1-AUX04-F			–	4			

Maximum Combination of Contact Units

HMC-9B - 22B (Max 3a3b)	HMC-32A-150A (Max 4a4b)
AUX40-F – AUX04-F (on front) + AUX11-S x 1 ea (1ea on left side)	AUX40-F, AUX31-F, AUX13-F, AUX04-F (on front) + AUX11-S x 2 ea (I ea on both sides)
AUX11-F (on front) + HMX1-AUX11-S x 1 ea (1 ea on one side)	AUX11-F (on front) + AUX11-S x 2 ea (1 ea on both sides)
AUX11-S x 1 ea (1 ea on left side)	AUX11-S x 4 ea (2 ea on both sides) *For AC coil
HMC-9B~22B DC Type can be installed up to 2a2b	–

**** To use HMX1-AUX11-S, HMC-9B-22B Type is available on left side only***

IronHorse HMC Series Contactors Auxiliary Contact Units (HMC-185A to HMC-400A)

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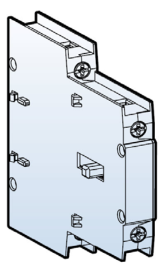
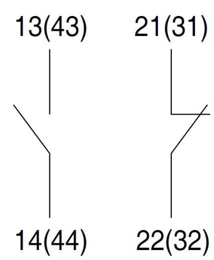
- 2-pole
- Side mountable
- For use with HMC-185A to HMC-400A contactors
- Auxiliary contacts meet the requirements for mirror contacts in IEC 60947-4-1. Annex F.

(A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with an NO main contact.)

IronHorse HMC Series Three-Pole Contactors Accessories Specifications							
Part Number	***Appearance***	***Poles***	***Composition***		***Contact Arrangement***	***Mounting***	***Weight (g [oz])***
			NO	***NC***			
HMX3-AUX11-S		2	1	1		Side	53 [1.87]

HMX3-AUX11-S

Maximum Combination of Contact Units
HMC185 to HMC400 (Max 4a4b)
HMX3-AUX11-S (2 per side, max)

IronHorse HMC Series Contactors Auxiliary Contact Units

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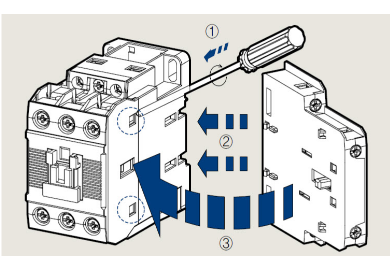
Iron Horse HMC Series Contactors Specifications					
			HMX1-AUX11-S	HMX1-AUX11-F HMX1-AUX40-F HMX1-AUX31-F HMX1-AUX13-F HMX1-AUX04-F	HMX3-AUX11-S
Rated Operation Voltage (U_e)			600V		
Rated Insulation Voltage (U_i)			600V		
Rated Impulse Withstand Voltage (U_{imp})			8kV	6kV	
Rated Frequency			50/60 Hz		
Contact Sensibility	***AC15 Duty (A600)***	***120V***	6A		
		240V	3A		
		380V	1.9 A		
		480V	1.5 A		
		500V	1.4 A		
		600V	1.2 A		
	DC13 Duty (Q600) ***HMX1-AUX11-S (P600)***	***125V***	1.1 A	0.55 A	
		250V	0.55 A	0.27 A	
		400V	0.31 A	0.15 A	
		500V	0.27 A	0.13 A	
		600V	0.2 A	0.1 A	
Rated Short-Time Withstand Current		***1s***	100A	–	100A
		0.5 s	125A	–	120A
		0.1 s	145A	–	140A
Electrical Lifetime (millions of operations)	***AC15 Duty***	***220V***	0.25	0.25	0.25
		440V	0.25	0.25	0.25
	DC13 Duty	***220V***	0.25	0.25	0.25
		440V	0.25	0.25	0.25
Maximum Operating Cycles Per Hour			1800	1800	1200
Conductor Size (Solid, Stranded) (Max number of conductors: 2)	***AWG***		18-10	18-10	18-10
	mm^2		1-2.5	1-2.5	1-2.5

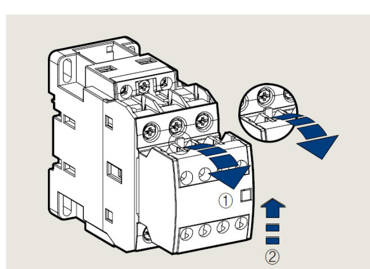
Installation

Side Installation



To install side mounting unit, first remove the indicated parts in the circle as shown in the illustration. Then fit each part as shown. To separate, push forward and pull.

Front Installation



To install front mounting unit, fit it onto the upper part of the front of the contactor and push it down. To separate, pull the lever of the unit and push the unit upward.

IronHorse HMC Series Contactors Accessories

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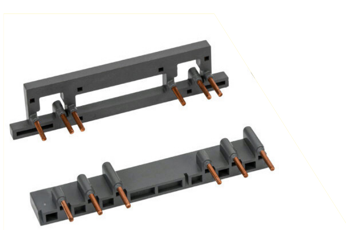
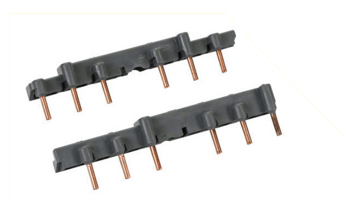
IronHorse HMC Series Contactors Accessories Selection Guide			
Part Number	**Price**	**Description**	**Drawing**
HMX1-MI	$14.00	IronHorse mechanical interlock, side mount. For use with HMC-9 to HMC-150 contactors. Allows for mechanical connection of two contactors to prevent both from being pulled in at the same time.	PDF
HMX2-MI	$40.00	IronHorse mechanical interlock, side mount. For use with HMC-185 to HMC-400 contactors. Allows for mechanical connection of two contactors to prevent both from being pulled in at the same time.	PDF
HMX1-BBREV	$14.50	IronHorse reversing connection kit, for use with HMC-9 to HMC-22 contactors, includes line and loadside connection bars.	PDF
HMX2-BBREV	$14.50	IronHorse reversing connection kit, for use with HMC-32 and HMC-40 contactors, includes line and loadside connection bars.	PDF
HMX3-BBREV	$22.00	IronHorse reversing connection kit, for use with HMC-50 and HMC-65 Contactors, includes line and loadside connection bars.	PDF
HMX4-BBREV	$46.00	IronHorse reversing connection kit, for use with HMC-75 to HMC-100 contactors, includes line and loadside connection bars.	PDF
HMX1-LUG-CR	$40.00	IronHorse box type wiring lug, line or load mount, 1 opening, #1 AWG-300 MCM wire(s). Package of 3. For use with HMC-185 and HMC-225 contactors.	PDF
HMX2-LUG-CR	$79.00	IronHorse box type wiring lug, line or load mount, 2 openings, #3 AWG-4/0 MCM wire(s). Package of 3. For use with HMC-265 to HMC-400 contactors.	PDF
HMX1-SSVRC-AC	$10.50	IronHorse surge suppressor, varistor-resistor-capacitor, 24-48 VAC. For use with HMC-9 to HMC-150 contactors.	PDF
HMX2-SSVRC-AC	$10.50	IronHorse surge suppressor, varistor-resistor-capacitor, 100-125 VAC. For use with HMC-9 to HMC-150 contactors.	PDF
HMX3-SSVRC-AC	$10.50	IronHorse surge suppressor, varistor-resistor-capacitor, 200-240 VAC. For use with HMC-9 to HMC-150 contactors.	PDF
HMX1-SSVRC-DC	$10.50	IronHorse surge suppressor, varistor-resistor-capacitor, 24-48 VDC. For use with HMC-9 to HMC-150 contactors.	PDF
HMX1-SSV-ACDC	$8.50	IronHorse surge suppressor, varistor, 24-48 VAC/VDC. For use with HMC-9 to HMC-150 contactors.	PDF
HMX2-SSV-ACDC	$8.50	IronHorse surge suppressor, varistor, 100-125 VAC/VDC. For use with HMC-9 to HMC-150 contactors.	PDF
HMX3-SSV-ACDC	$8.50	IronHorse surge suppressor, varistor, 200-240 VAC/VDC. For use with HMC-9 to HMC-150 contactors.	PDF


HMX1-MI


HMX2-MI


HMX1-BBREV

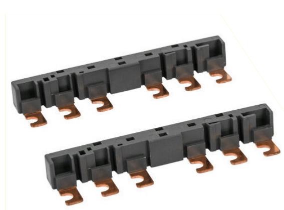

HMX2-BBREV

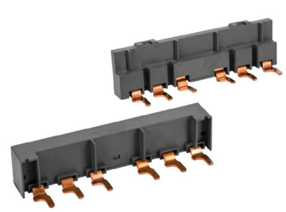

HMX1-SSVRC-AC


HMX1-SSVRC-DC


HMX1-LUG-CR

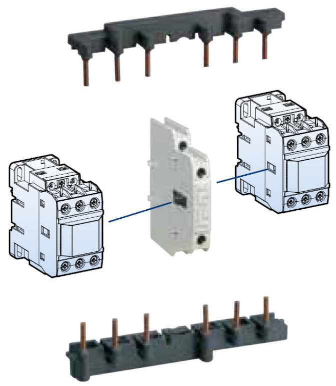

HMX2-LUG-CR


HMX3-BBREV


HMX4-BBREV


HMX1-SSV-ACDC

IronHorse HMC Series Contactors Accessories



Interlocks

Component parts for assembly by customer

HMX1-MI is a mechanical interlock unit which provides 2 NC contacts for use in electrical interlocking. HMX1-BBREV is used for making a reversing circuit between two contactors.

Component parts are for assembly by customer.

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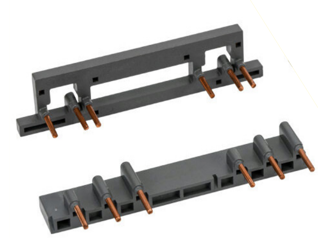
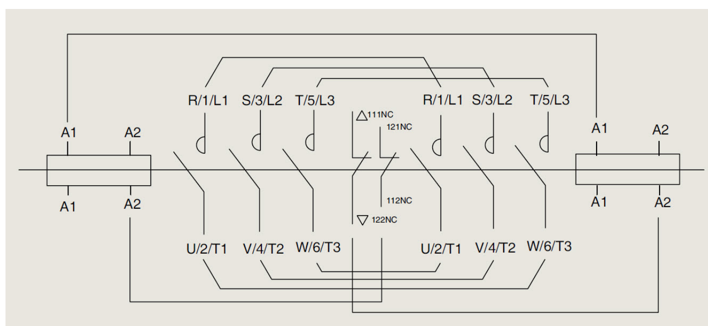
IronHorse Interlock Units for Contactors						
Contactor Type	***Pole***	***Wire Kit***		***Interlock Unit***		***Auxiliary Contacts***
		Type	***Weight (kg [oz])***	***Type***	***Weight (kg [oz])***	
HMC-9A - 22B	3P	HMX1-BBREV	0.04 [1.41]	HMX1-MI	0.06 [2.12]	2 NC
HMC-32A - 40A		HMX2-BBREV	0.05 [1.76]			
HMC-50A - 65A		HMX3-BBREV	0.12 [4.23]			
HMC-75A - 100A		HMX4-BBREV	0.33 [11.64]			
HMC-130A - 150A		–	–			

HMX1-MI



HMX1-BBREV

Interlock Contact Ratings			
Rated Operation Voltage			600V
Rated Insulation Voltage			600V
Rated Frequency			50/60 Hz
Rated Thermal Current			15A
Rated Operation Current	AC15 duty (A600)	120V	6A
		240V	3A
		380V	1.9 A
		480V	1.5 A
		500V	1.4 A
		600V	1.2 A
	DC13 duty (Q300)	125V	0.55 A
		250V	0.27 A

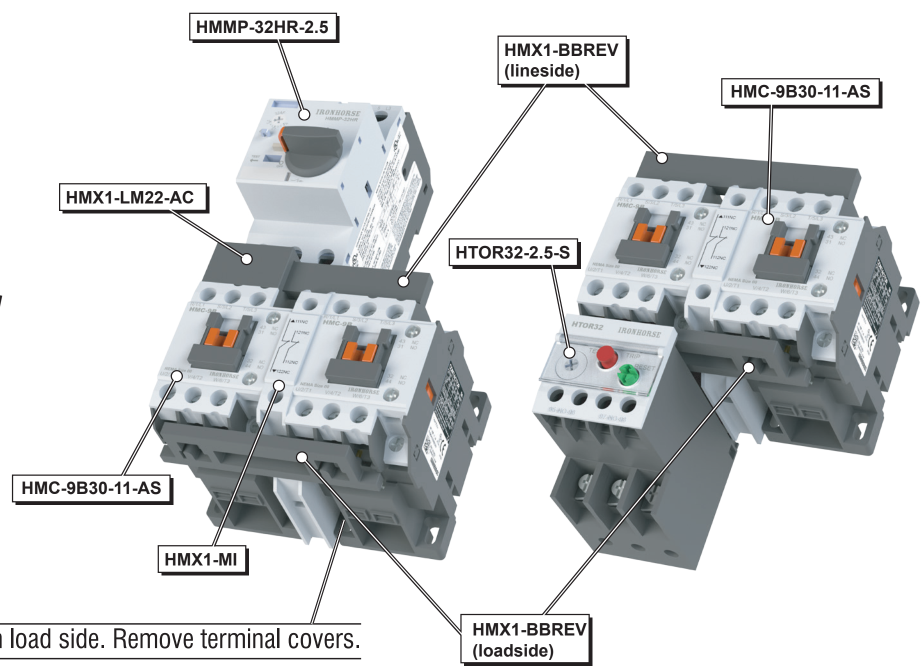


Typical circuit diagram for reversing contactor assembly (HMC-9B - HMC-150A)

IronHorse Manual Motor Protector with Two Options:

Option 1: MMP with direct connect to reversing contactors using busbar wiring kit

Option 2: Reversing contactors using busbar wiring kit and direct connect to overload relay



NOTE: Coil connection on load side. Remove terminal covers.

IronHorse HMC Series Contactors Accessories

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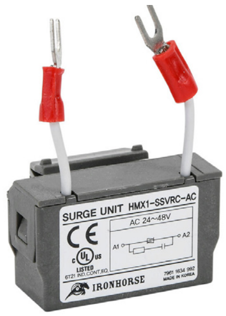
Surge Unit

Surge units are easily installed on the contactor and absorb contactor coil surges.

- Rated operation voltage (U_e): AC 24-440V / DC 24-125 V
- Rated insulation voltage (U_i): 1000V
- Rated impulse withstand voltage (U_{imp}): 8kV
- Degree of protection: IP20

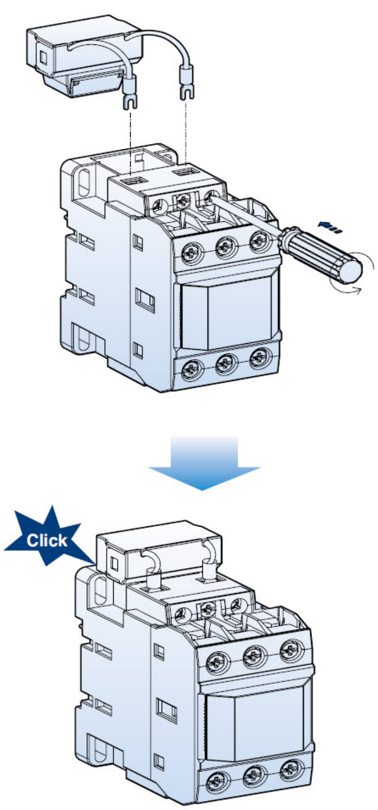


HMX Type
(HMX1-SSVRC-AC shown)

Surge Unit Selection Guide

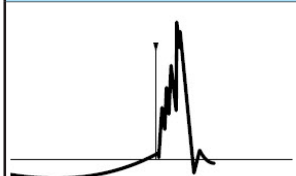
Type	*Circuit Type*	*Rated Voltage*		*Internal Elements Specifications* V	R	C	*Contactor*
HMX1-SSVRC-AC	Varistor + RC	AC	24-48 V	120V	100Ω	0.1 uF	3 pole HMC-9B-150A
HMX2-SSVRC-AC			100-125 V	270V	100Ω	0.1 uF	
HMX3-SSVRC-AC			200-240 V	470V	100Ω	0.1 uF	
HMX1-SSV-ACDC	Varistor	AC/DC common	24-48 V	120V	–	–	
HMX2-SSV-ACDC			100-125 V	270V	–	–	
HMX3-SSV-ACDC			200 - 240 V	470V	–	–	

Surge Unit Installation



Connect the lead wires to the coil terminals of the contactor first. Then insert the body into the mounting space of the contactor, as shown above.

Effects of Adding a Surge Unit

Without Surge Unit	*With Varistor Unit*	*with RC Varistor Unit*
		
Surge voltage may appear when the coil is de-energized and may lead to incorrect operation of or damage to the circuit.	Varistor has the effect of cutting down the peak voltage.	Varistor has the effect of cutting down the peak voltage and the high frequency wave.

IronHorse HMC Series Contactors Accessories

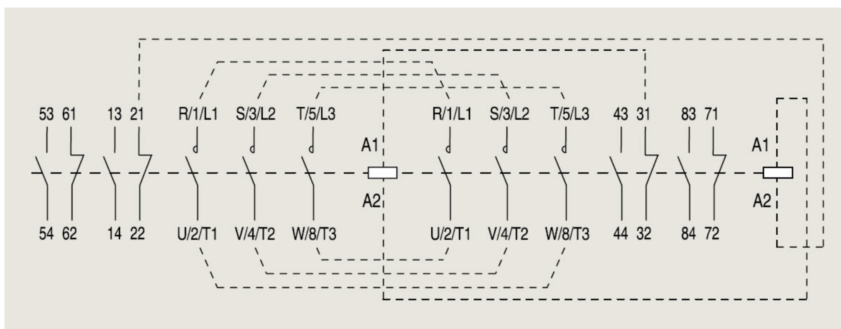
Interlock Unit

Mechanical interlock units do not include electrical contacts for electrical interlocking. Use the auxiliary contacts on the sides of the contactors for that purpose.

HMC-185A30-22-FB

Interlock Unit Specifications

Contactor Type	Number of Poles	Interlock Unit	
		Type	Weight (kg [oz])
HMC-185A	3	HMX2-MI	0.09 [3.17]
HMC-225A			
HMC-265A			
HMC-330A			
HMC-400A			



Typical circuit diagram for reversing contactor assembly

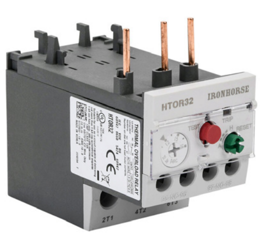
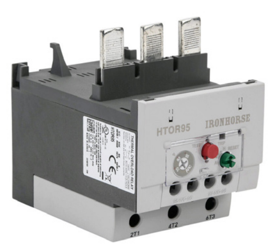
IronHorse HTOR Series Overload Relays

Type HTOR bimetal-style overload relays are designed to protect AC circuits and motors against overloads, phase failure, long starting times, and prolonged stalling of the motor.

Protection Type – Differential: 3 pole-3 bimetal (heater) and trip class 10A

UL file numbers
E191072

Front Configuration

HTOR32	HTOR63	HTOR95
 HTOR32-18-S shown	 HTOR63-65-L shown	 HTOR95-95-L shown

IronHorse HTOR Series Overload Relays

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IronHorse HTOR Series Overload Relays Selection Guide

Part Number	Price	Description	Drawing
HTOR32-0.16-S	$26.50	IronHorse thermal overload relay, 0.10-0.16A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-0.25-S	$26.50	IronHorse thermal overload relay, 0.16-0.25A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-0.40-S	$26.50	IronHorse thermal overload relay, 0.25-0.40A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-0.63-S	$26.50	IronHorse thermal overload relay, 0.40-0.63A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-1-S	$26.50	IronHorse thermal overload relay, 0.63-1A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-1.6-S	$26.50	IronHorse thermal overload relay, 1-1.6A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-2.5-S	$26.50	IronHorse thermal overload relay, 1.6-2.5A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-4-S	$26.50	IronHorse thermal overload relay, 2.5-4A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-6-S	$26.50	IronHorse thermal overload relay, 4-6A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-8-S	$26.50	IronHorse thermal overload relay, 5-8A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-10-S	$26.50	IronHorse thermal overload relay, 7-10A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-13-S	$26.50	IronHorse thermal overload relay, 9-13A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-18-S	$26.50	IronHorse thermal overload relay, 12-18A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-22-S	$26.50	IronHorse thermal overload relay, 16-22A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-25-S	$26.50	IronHorse thermal overload relay, 18-25A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-32-S	$26.50	IronHorse thermal overload relay, 22-32A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR32-40-S	$26.50	IronHorse thermal overload relay, 28-40A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-9 to HMC-40 contactors.	PDF
HTOR63-50-L	$53.00	IronHorse thermal overload relay, 34-50A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-50 and HMC-65 contactors.	PDF
HTOR63-65-L	$53.00	IronHorse thermal overload relay, 45-65A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-50 and HMC-65 contactors.	PDF
HTOR95-75-L	$77.00	IronHorse thermal overload relay, 54-75A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-75 to HMC-100 contactors.	PDF
HTOR95-85-L	$77.00	IronHorse thermal overload relay, 63-85A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-75 to HMC-100 contactors.	PDF
HTOR95-95-L	$77.00	IronHorse thermal overload relay, 70-95A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-75 to HMC-100 contactors.	PDF
HTOR95-100-L	$77.00	IronHorse thermal overload relay, 80-100A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-75 to HMC-100 contactors.	PDF
HTOR150-105-L	$147.00	IronHorse thermal overload relay, 80-105A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-130 and HMC-150 contactors.	PDF
HTOR150-130-L	$147.00	IronHorse thermal overload relay, 95-130A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-130 and HMC-150 contactors.	PDF
HTOR150-150-L	$147.00	IronHorse thermal overload relay, 110-150A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-130 and HMC-150 contactors.	PDF
HTOR225-160-B	$221.00	IronHorse thermal overload relay, 100-160A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-185 and HMC-225 contactors.	PDF
HTOR225-185-B	$221.00	IronHorse thermal overload relay, 120-185A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-185 and HMC-225 contactors.	PDF
HTOR225-240-B	$221.00	IronHorse thermal overload relay, 160-240A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-185 and HMC-225 contactors.	PDF
HTOR400-240-B	$270.00	IronHorse thermal overload relay, 160-240A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-265 to HMC-400 contactors.	PDF
HTOR400-330-B	$270.00	IronHorse thermal overload relay, 200-330A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-265 to HMC-400 contactors.	PDF
HTOR400-400-B	$270.00	IronHorse thermal overload relay, 260-400A adjustable, bi-metallic, direct mount power connection(s). For use with HMC-265 to HMC-400 contactors.	PDF

IronHorse HTOR Series Overload Relays

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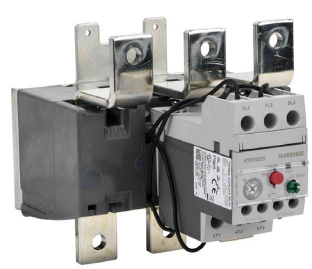
IronHorse HTOR Series Environment and Auxiliary Circuit Characteristics			
Environment			
Standards			IEC/EN 60947-1, IEC/EN 60947-4-1
Certifications			CE, CSA, UL, CCC
Rated Operation Voltage			Max. 690V
Rated Insulation Voltage			690V
Rated Frequency			50/60 Hz
Degree of Protection (Conforming to IEC 60 529)			IP 20
Ambient Air Temperature	Storage		-30°C to +65°C [-22°F to 149°F]
	Operation		-25°C to +60°C [-13°F to 140°F]
Mounting Position			Vertical plane
Shock Resistance (Conforming to IEC 68-2-7)			15gn - 11ms
Vibration Resistance (Conforming to IEC68-2-6)			6G
Insulation Strength (Conforming to IEC 255-5)			6kV
Rated Impulse Withstand Voltage (Conforming to IEC 801-5)			6kV
Auxiliary Contacts Characteristics			
Composition			1 NO + 1 NC
Rated Thermal Current			5A
Rated Operation Current			C600, R300
	AC15 Duty (C600)	120V	1.5 A
		240V	0.75 A
		380V	0.47 A
		480V	0.375 A
		500V	0.35 A
		600V	0.3 A
	DC13 Duty (R300)	120V	0.22 A
		240V	0.1 A
Connecting Conductor			18AWG /1mm^2
Connection to Screw Clamp Terminals			65/75°C Cu wire

HTOR150-150-L



HTOR225-240-B

HTOR400-400-B

IronHorse HTOR Series Overload Relays

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IronHorse HTOR Series Thermal Overload Relays Specifications

Frame Size		40AF	65AF	100AF
Trip Class		10A	10A	10A
Differential Protection		Yes	Yes	Yes
Terminals	Main Upstream	Screw clamp	Lug clamp	Lug clamp
	Main Downstream	Screw clamp	Lug clamp	Lug clamp
	Auxiliary	Screw clamp	Screw clamp	Screw clamp
Number of Poles		3	3	3
Rated Operational Voltage (U_e)		690V	690V	690V
Rated Insulation Voltage (U_i)		Up to 690V	Up to 690V	Up to 690V
Rated Impulse Voltage (U_{imp})		6kV	6kV	6kV
Degree of protection (IEC 60 529)		IP 20	IP 20	IP 20
Temperature Compensation (°C)		-5 to +40°C [23 to +40°F]	-5 to +40°C [23 to +40°F]	-5 to +40°C [23 to +40°F]
Functions	Trip Indicating	●	●	●
	Stop	●	●	●
	Test	●	●	●
	Manual/Automatic Reset	●	●	●
Setting Range		0.1-40 A	34-65 A	54-100A

Nominal Current Rating	Wire Size mm²	Wire Size AWG	40AF	65AF	100AF
0.14	1	18	0.1-0.16	–	–
0.21			0.16-0.25	–	–
0.33			0.25-0.4	–	–
0.52			0.4-0.63	–	–
0.82			0.63-1	–	–
1.3			1-1.6	–	–
2.1			1.6-2.5	–	–
3.3			2.5-4	–	–
5			4-6	–	–
6.5			5-8	–	–
7.5	1-1.5	18-16	6-9	–	–
8.5			7-10	–	–
11	1.5-2.5	16-14	9-13	–	–
15	2.5	14-12	12-18	–	–
19	2.5-4	12-10	16-22	–	–
21.5			18-25	–	–
27	4-6	10	22-32	–	–
30	4-10	10-8	–	–	–
34	6-10	10-8	28-40	–	–
42	10	8	–	34-50	–
54			–	45-65	–
65	16-25	6-4	–	–	54-75
74			–	–	63-85
83	25-35	4-3	–	–	70-95
90			–	–	80-100
Applied Contactors			HMC-9B, 12B, 18B, 22B, 32A, 40A	HMC-50A, 65A	HMC-75A, 85A, 100A
Separate Mounting Unit			HMX1-PADT-OR	HMX2-PADT-OR	HMX3-PADT-OR

Note: Lug types are available for the main terminals of 65AF, 100AF and 150AF relays. Other AF relays provide screw clamp types only.

IronHorse HTOR Series Overload Relays

IRONHORSE

IronHorse HTOR Series Thermal Overload Relays Specifications (continued)

Frame Size		150AF	225AF	400AF
Trip Class		10A	10A	10A
Differential Protection		Yes	Yes	Yes
Terminals	Main Upstream	Lug clamp	Screw clamp	Screw clamp
	Main Downstream	Lug clamp	Screw clamp	Screw clamp
	Auxiliary	Screw clamp	Screw clamp	Screw clamp
Number of Poles		3	3	3
Rated Operational Voltage (U_e)		690V	690V	690V
Rated Insulation Voltage (U_i)		690V	690V	690V
Rated Impulse Voltage (U_{imp})		6kV	6kV	6kV
Degree of protection (IEC 60 529)		IP 20	IP 20	IP 20
Temperature Compensation (°C)		-5°C to +40°C [23°F to 104°F]	-5°C to +40°C [23°F to 104°F]	-5°C to +40°C [23°F to 104°F]
Functions	Trip Indicating	●	●	●
	Stop	●	●	●
	Test	●	●	●
	Manual/Automatic Reset	●	●	●
Setting Range		80-150 A	100-240 A	160-400 A

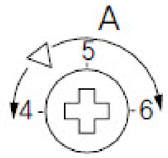
Nominal Current Rating	Wire Size		150AF	225AF	400AF
	mm^2	AWG			
42	10	8	–	–	–
55	16	6	–	–	–
65	25	4	–	–	–
74	25	4	–	–	–
80	35	3	–	–	–
93	35	2	–	–	–
107	50	1	80-150	–	–
113	50	1	95-130	–	–
130	50	0	110-150	–	–
130	70	00	–	100-160	–
153	95	000	–	120-185	–
200	120	250	–	160-240	160~240
265	185	350	–	–	200-330
350	240	500	–	–	260-400
515	185x2n	350x2n	–	–	–
660	240x2n	300x3n	–	–	–
Applied Contactors			HMC-130A, 150A	HMC-185A, 225A	HMC-265A, 330A, 400A
Separate Mounting Unit			HMX4-PADT-OR	–	–

Note: Lug types are available for the main terminals of 65AF, 100AF and 150AF relays. Other AF relays provide screw clamp types only.

IronHorse HTOR Series Overload Relays

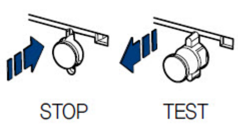
Overload Relay Operation

Adjustment Dial



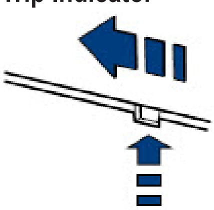
Before adjusting the dial open the protection cover. Current setting can be done easily by using) or (-) driver. Do not rotate the dial out of the setting range.

Stop/Test Button



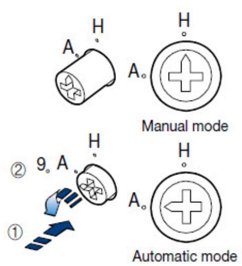
The STOP function is executed by pushing the button, which causes the next sequence. In case eration test, pull this button.

Trip Indicator



If relay is tripped, the indicator comes out.

Reset Button/Selector



Using a driver, the reset mode can be set. In case of Manual mode (H), push the button to reset lay.

To change to Automatic mode (A) from Manual mode, push the button and rotate as shown in agram

Auxiliary Contact Operation

Terminal no.	Normal	STOP	TEST/TRIP	RESET
NC 95-96				
NO 97-98				

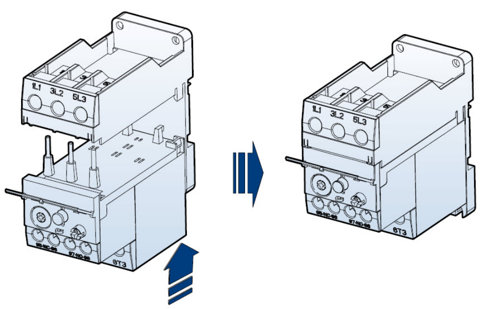
IronHorse HTOR Series Overload Relays Accessories

Mounting Adapters

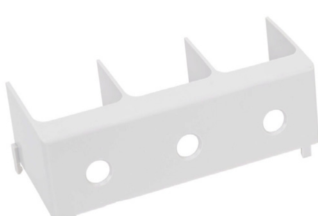
These mounting units are used to mount the relays separately from contactors. If a relay is combined with a unit, it can be mounted on DIN rail or on a panel using screws.

HMX1-PADT-OR

IronHorse HTOR Series Overload Relays 35mm DIN Rail/Panel Mount Adapter Selection Guide			
Part Number	**Price**	**Description**	**Drawing**
HMX1-PADT-OR	$7.75	IronHorse 35mm DIN rail/panel mount adapter, for use with HTOR32 thermal overload relays.	PDF
HMX2-PADT-OR	$10.50	IronHorse 35mm DIN rail/panel mount adapter, for use with HTOR63 thermal overload relays.	PDF
HMX3-PADT-OR	$12.50	IronHorse 35mm DIN rail/panel mount adapter, for use with HTOR95 thermal overload relays.	PDF
HMX4-PADT-OR	$22.00	IronHorse 35mm DIN rail/panel mount adapter, for use with HTOR150 thermal overload relays.	PDF
HMX1-TMC-OR	$7.00	IronHorse terminal shroud, load side, 3-pole. For use with HTOR225 thermal overload relays.	PDF
HMX2-TMC-OR	$9.00	IronHorse terminal shroud, load side, 3-pole. For use with HTOR400 thermal overload relays.	NA



IronHorse HTOR Series Overload Relays Mounting Adapters		
Relay	**Unit**	
	Adapter	**Weight (g [oz])**
HTOR32	HMX1-PADT-OR	68 [2.40]
HTOR63	HMX2-PADT-OR	134 [4.73]
HTOR95	HMX3-PADT-OR	230 [8.11]
HTOR150	HMX4-PADT-OR	284 [10.02]



HMX1-TMC-OR

IronHorse HTOR Series Overload Relays Terminal Cover Units	
Relay	**Quantity**
HMX1-TMC-OR	1 piece
HMX2-TMC-OR	

IronHorse HMMP Manual Motor Protectors

IRONHORSE

Overview

The IronHorse line of manual motor protectors includes models rated up to 100A. Applications include motor protection, starter protection, phase failure protection, protection of circuits, and protection of group installations.

They offer a wide range of ambient temperature compensation as well as phase failure protection.

A broad lineup of accessories allows great flexibility in overall system design.

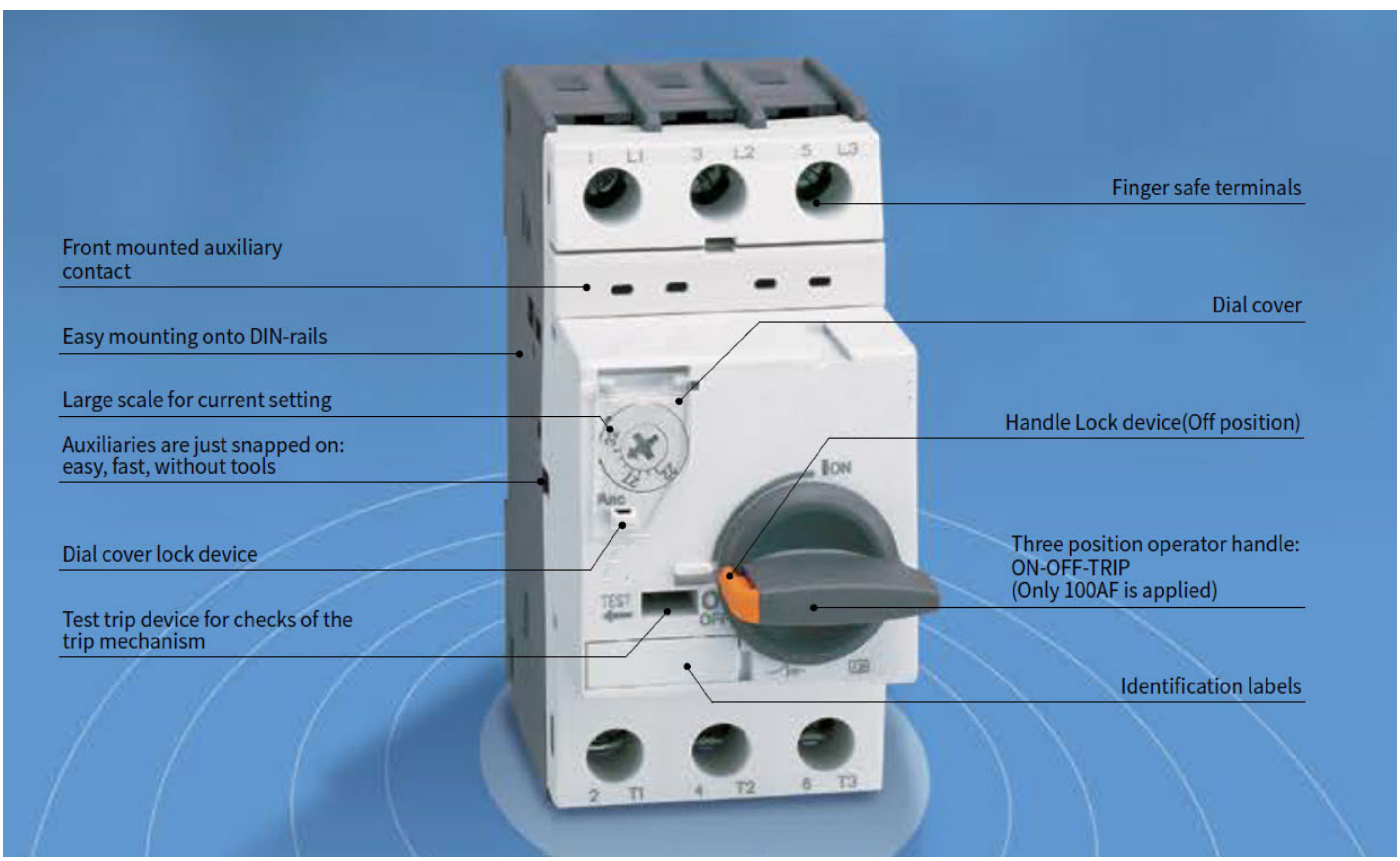
UL File No. E195426, E531281
Accessories E191059, E195426

Features

- Three-position operator (ON-OFF-TRIP)
- Handle locks in the OFF position
- Class 10 overload trip characteristics
- Trip test
- Finger-safe terminals
- DIN rail or screw mounting
- Ready for IE3

Certifications and Compliance

- Complies with specifications in accordance with IEC 60947-2 and IEC 60947-4-1
- UL508 (manual motor controller)
- UL508 (combination motor controller type E starter)
- CSA C22.2 N0. 14
- GB14048



IronHorse HMMP Manual Motor Protectors

What is IE3?

Motor is rated from IE1 through IE4 depending on its energy efficiency. IE3 is more efficient compared to IE1- and IE2-rated motors.

Why IE3?

As part of the EU Environmental policy "20/30-20-20" strategy, the EU is committed to achieve the following by 2020.

- Reduce greenhouse gas emissions by up to 30%
- Increase the share of renewable energy to 20% and
- Boost energy efficiency by 20% in general.

The IEC 60034-30 standard specifies IE classes for motors in accordance with the above requirements. Therefore, consumers must comply with the standard when using HMMP products.

- IEC 60034-30-1 standard
- IE1 Standard Efficiency
- IE2 High Efficiency
- IE3 Premium Efficiency
- IE4 Super Premium Efficiency

Selecting HMMP manual motor protectors

To meet the IE3 motor starting current and Inrush current, use of a de-rating table is recommended (13 times the rated current).

Example

Th choose between product A or B:

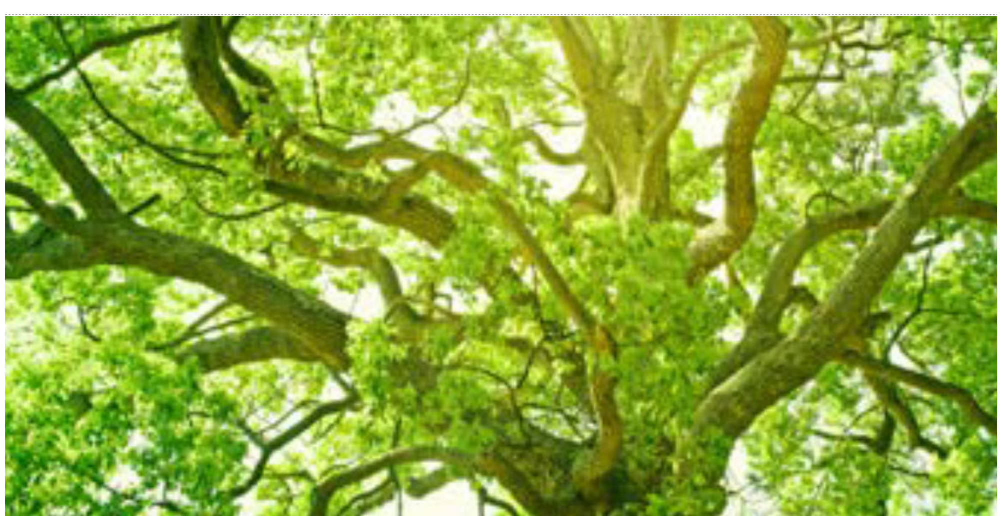
A : MMP setting scale: 11 to 17A

B : MMP setting scale: 14 to 22A

Rated motor current: 16A

The short-circuit current of MMP A is 221A (17x13), and the short-circuit current of MMP B is 286A (22x13).

When applying the motor's rated current (16A) to MMP A, the multiplier for the short-circuit current is 13.8. When applying the motor's rated current (16A) to MMP B, the multiplier for the short-circuit current is 17.9. If a motor of IE3-grade or above is used here, malfunction can be caused due to higher starting current compared to that of an IE1- or IE2-graded motor. Therefore, MMP B is recommended since it has the higher multiplier of the short-circuit current.



IronHorse HMMP Manual Motor Protectors

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HMMP Series Contactor Catalog Number Sequence

HMMP	-	32	H	R	-	22

Contactor Series
- *HMMP*

Frame
- *32: 32A*
- *63: 63A*
- *100: 100A*

Instantaneous Range
- *H=High*
- *N=Normal*

Operator
- *T=Toggle*
- *R=Rotary*

Amp Rating
- *22 Amps*

Table intended as reference only and not to create part numbers.

IronHorse HMMP Manual Motor Protectors (HMMP-32)

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IronHorse HMMP Series Three-Pole Manual Motor Protectors (HMMP-32) Selection Guide			
Part Number	***Price***	***Description***	***Drawing***
HMMP-32HR-0.16	$48.50	IronHorse manual motor protector, rotary, 0.16A, thermal overload, 0.1-0.16A adjustable, 2.1A instantaneous trip rating, 45mm frame.	PDF
HMMP-32HR-0.25	$48.50	IronHorse manual motor protector, rotary, 0.25A, thermal overload, 0.16-0.25A adjustable, 3.3A instantaneous trip rating, 45mm frame.	PDF
HMMP-32HR-0.40	$48.50	IronHorse manual motor protector, rotary, 0.4A, thermal overload, 0.25-0.4A adjustable, 5.2A instantaneous trip rating, 45mm frame.	PDF
HMMP-32HR-0.63	$48.50	IronHorse manual motor protector, rotary, 0.63A, thermal overload, 0.4-0.63A adjustable, 8.2A instantaneous trip rating, 45mm frame.	PDF
HMMP-32HR-1	$48.50	IronHorse manual motor protector, rotary, 1A, thermal overload, 0.63-1A adjustable, 13A instantaneous trip rating, 45mm frame.	PDF
HMMP-32HR-1.6	$48.50	IronHorse manual motor protector, rotary, 1.6A, thermal overload, 1-1.6A adjustable, 20.8A instantaneous trip rating, 45mm frame.	PDF
HMMP-32HR-2.5	$48.50	IronHorse manual motor protector, rotary, 2.5A, thermal overload, 1.6-2.5A adjustable, 32.5A instantaneous trip rating, 45mm frame.	PDF
HMMP-32HR-4	$48.50	IronHorse manual motor protector, rotary, 4A, thermal overload, 2.5-4A adjustable, 52A instantaneous trip rating, 45mm frame.	PDF
HMMP-32HR-6	$48.50	IronHorse manual motor protector, rotary, 6A, thermal overload, 4-6A adjustable, 78A instantaneous trip rating, 45mm frame.	PDF
HMMP-32HR-8	$48.50	IronHorse manual motor protector, rotary, 8A, thermal overload, 5-8A adjustable, 104A instantaneous trip rating, 45mm frame.	PDF
HMMP-32HR-10	$48.50	IronHorse manual motor protector, rotary, 10A, thermal overload, 6-10A adjustable, 130A instantaneous trip rating, 45mm frame.	PDF
HMMP-32HR-13	$58.00	IronHorse manual motor protector, rotary, 13A, thermal overload, 9-13A adjustable, 169A instantaneous trip rating, 45mm frame.	PDF
HMMP-32HR-17	$58.00	IronHorse manual motor protector, rotary, 17A, thermal overload, 11-17A adjustable, 221A instantaneous trip rating, 45mm frame.	PDF
HMMP-32HR-22	$58.00	IronHorse manual motor protector, rotary, 22A, thermal overload, 14-22A adjustable, 286A instantaneous trip rating, 45mm frame.	PDF
HMMP-32HR-26	$58.00	IronHorse manual motor protector, rotary, 26A, thermal overload, 18 -26A adjustable, 338A instantaneous trip rating, 45mm frame.	PDF
HMMP-32HR-40	$58.00	IronHorse manual motor protector, rotary, 40A, thermal overload, 28-40A adjustable, 520A instantaneous trip rating, 45mm frame.	PDF

HMMP-32HR-1

HMMP-100HR-100

IronHorse HMMP Manual Motor Protectors

IronHorse HMMP Series Three-Pole Contactors (HMMP-63 and HMMP-100) Selection Guide			
Part Number	*Price*	*Description*	*Drawing*
HMMP-63HR-26	$147.00	IronHorse manual motor protector, rotary, 26A, thermal overload, 18-26A adjustable, 338A instantaneous trip rating, 55mm frame.	PDF
HMMP-63HR-32	$147.00	IronHorse manual motor protector, rotary, 32A, thermal overload, 22-32A adjustable, 416A instantaneous trip rating, 55mm frame.	PDF
HMMP-63HR-40	$147.00	IronHorse manual motor protector, rotary, 40A, thermal overload, 28-40A adjustable, 520A instantaneous trip rating, 55mm frame.	PDF
HMMP-63HR-50	$147.00	IronHorse manual motor protector, rotary, 50A, thermal overload, 34-50A adjustable, 650A instantaneous trip rating, 55mm frame.	PDF
HMMP-63HR-63	$147.00	IronHorse manual motor protector, rotary, 63A, thermal overload, 45-63A adjustable, 819A instantaneous trip rating, 55mm frame.	PDF
HMMP-100HR-75	$269.00	IronHorse manual motor protector, rotary, 75A, thermal overload, 55-75A adjustable, 975A instantaneous trip rating, 70mm frame.	PDF
HMMP-100HR-90	$269.00	IronHorse manual motor protector, rotary, 90A, thermal overload, 70-90A adjustable, 1170A instantaneous trip rating, 70mm frame.	PDF
HMMP-100HR-100	$269.00	IronHorse manual motor protector, rotary, 100A, thermal overload, 80-100A adjustable, 1300A instantaneous trip rating, 70mm frame.	PDF

HMMP-63HR-26

HMMP-100HR-100

IronHorse HMMP Manual Motor Protectors Accessories

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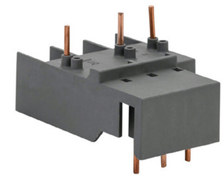
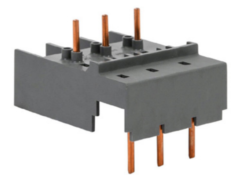
IronHorse HMMP Series Link Modules Selection Guide

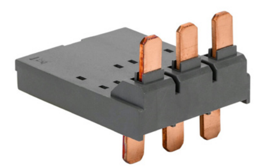
Part Number	Price	Description	Drawing
HMX1-LM22-AC	$9.00	IronHorse link module, for use with HMMP-32H manual motor protectors and HMC-9 to HMC-22 contactors with AC coils.	PDF
HMX1-LM22-DC	$9.00	IronHorse link module, for use with HMMP-32H manual motor protectors and HMC-9 to HMC-22 contactors with DC coils.	PDF
HMX2-LM32-AC	$10.00	IronHorse link module, for use with HMMP-32H manual motor protectors and HMC-32 or HMC-40 contactors with AC coils.	PDF
HMX2-LM32-DC	$10.00	IronHorse link module, for use with HMMP-32H manual motor protectors and HMC-32 or HMC-40 contactors with DC coils.	PDF
HMX3-LM63-AC	$10.50	IronHorse link module, for use with HMMP-63H manual motor protectors and HMC-50 or HMC-65 contactors with AC coils.	PDF
HMX3-LM63-DC	$10.50	IronHorse link module, for use with HMMP-63H manual motor protectors and HMC-50 or HMC-65 contactors with DC coils.	PDF
HMX4-LM100-AC	$11.50	IronHorse link module, for use with HMMP-100H manual motor protectors and HMC-75 to HMC-100 contactors with AC coils.	PDF
HMX4-LM100-DC	$11.50	IronHorse link module, for use with HMMP-100H manual motor protectors and HMC-75 to HMC-100 contactors with DC coils.	PDF



HMX1-LM22-AC



HMX2-LM32-AC



HMX3-LM63-AC

IronHorse HMMP Series Field Installable Auxiliary Contacts Selection Guide

Part Number	Price	Description	Drawing
HPX1-AUX20-F	$9.50	IronHorse field installable auxiliary contact, front mount, (2) N.O. contact(s), 10A @600 VAC/2.5A @ 300 VDC, screw terminal. For use with HMMP-32H to HMMP-100H manual motor protectors.	PDF
HPX1-AUX11-F	$9.50	IronHorse field installable auxiliary contact, front mount, (1) N.O./(1) N.C. contact(s), 10A @300 VAC/1A @ 300 VDC, screw terminal. For use with HMMP-32H to HMMP-100H manual motor protectors.	PDF
HPX1-AUX02-F	$9.50	IronHorse field installable auxiliary contact, front mount, (2) N.C. contact(s), 10A @300 VAC/1A @ 300 VDC, screw terminal. For use with HMMP-32H to HMMP-100H manual motor protectors.	PDF
HPX1-AUX20-S	$11.00	IronHorse field installable auxiliary contact, left side mount, (2) N.O. contact(s), 10A @600 VAC/2.5A @ 300 VDC, screw terminal. For use with HMMP-32H to HMMP-100H manual motor protectors.	PDF
HPX1-AUX11-S	$11.00	IronHorse field installable auxiliary contact, left side mount, (1) N.O./(1) N.C. contact(s), 10A @600 VAC/2.5A @ 300 VDC, screw terminal. For use with HMMP-32H to HMMP-100H manual motor protectors.	PDF
HPX1-AUX02-S	$11.00	IronHorse field installable auxiliary contact, left side mount, (2) N.C. contact(s), 10A @600 VAC/2.5A @ 300 VDC, screw terminal. For use with HMMP-32H to HMMP-100H manual motor protectors.	PDF

HPX1-AUX20-F

HPX1-AUX20-S

IronHorse HMMP Series Field Installable Alarm Contacts Selection Guide

Part Number	Price	Description	Drawing
HPX1-ALM11-S	$15.00	IronHorse field installable alarm contact, left side mount, (1) N.O./(1) N.C. contact(s), 10A @600 VAC/2.5A @ 300 VDC, screw terminal. For use with HMMP-32H manual motor manual motor protectors.	PDF
HPX2-ALM11-S	$15.00	IronHorse field installable alarm contact, left side mount, (1) N.O./(1) N.C. contact(s), 10A @600 VAC/2.5A @ 300 VDC, screw terminal. For use with HMMP-63H and HMMP-100H manual motor protectors.	PDF
HPX1-MALM11-S	$16.00	IronHorse field installable short circuit alarm contact, left side mount, (1) N.O./(1) N.C. contact(s), 10A @600 VAC/2.5A @ 300 VDC, screw terminal. For use with HMMP-32H to HMMP-100H manual motor protectors.	PDF

HPX1-ALM11-S

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IronHorse HMMP Manual Motor Protectors Accessories (continued)

IronHorse HMMP Series Field Installable Undervoltage Trip Selection Guide

Part Number	Price	Description	Drawing
HPX1-UVT-120VAC	$23.00	IronHorse field installable undervoltage trip, right side mount, 120 VAC (60Hz)/110 VAC (50Hz) sensing range, screw terminal. For use with HMMP-32H to HMMP-100H manual motor protectors.	PDF
HPX1-UVT-480VAC	$23.00	IronHorse field installable undervoltage trip, right side mount, 460-480 VAC (60Hz)/415-440 VAC (50Hz) sensing range, screw terminal. For use with HMMP-32H to HMMP-100H manual motor protectors.	PDF
HPX1-UVT-220VAC	$23.00	IronHorse field installable undervoltage trip, right side mount, 200-220 VAC (60Hz)/200 VAC (50Hz) sensing range, screw terminal. For use with HMMP-32H to HMMP-100H manual motor protectors.	PDF

HPX1-UVT-120VAC

IronHorse HMMP Series Field Installable Shunt Trip Selection Guide

Part Number	Price	Description	Drawing
HPX1-SHT-120VAC	$23.00	IronHorse field installable shunt trip, right side mount, 120 VAC (60Hz)/110 VAC (50Hz) coil voltage, screw terminal. For use with HMMP-32H to HMMP-100H manual motor protectors.	PDF
HPX1-SHT-480VAC	$23.00	IronHorse field installable shunt trip, right side mount, 460-480 VAC (60Hz)/415-440 VAC (50Hz) coil voltage, screw terminal. For use with HMMP-32H to HMMP-100H manual motor protectors.	PDF
HPX1-SHT-220VAC	$23.00	IronHorse field installable shunt trip, right side mount, 200-220 VAC (60Hz)/200 VAC (50Hz) coil voltage, screw terminal. For use with HMMP-32H to HMMP-100H manual motor protectors.	PDF

HPX1-SHT-120VAC

IronHorse HMMP Series Rotary Handle Selection Guide

Part Number	Price	Description	Drawing
HPX1-EHRN3R-GY1	$29.50	IronHorse rotary handle, selector, black, external front mount, 2-position, lockable in ON-OFF, defeatable, NEMA 3R, IP65. For use with HMMP-32H manual motor manual motor protectors. 115mm shaft, operator and mounting screws included.	PDF
HPX2-EHRN3R-GY1	$29.50	IronHorse rotary handle, selector, black, external front mount, 2-position, lockable in ON-OFF, defeatable, NEMA 3R, IP65. For use with HMMP-63H manual motor protectors. 115mm shaft, operator and mounting screws included.	PDF
HPX3-EHRN3R-GY1	$29.50	IronHorse rotary handle, selector, black, external front mount, 2-position, lockable in ON-OFF, defeatable, NEMA 3R, IP65. For use with HMMP-100H manual motor protectors. 115mm shaft, operator and mounting screws included.	PDF
HPX1-EHRN3R-GY3	$29.50	IronHorse rotary handle, selector, black, external front mount, 2-position, lockable in ON-OFF, defeatable, NEMA 3R, IP65. For use with HMMP-32H manual motor protectors. 315mm shaft, operator and mounting screws included.	PDF
HPX2-EHRN3R-GY3	$29.50	IronHorse rotary handle, selector, black, external front mount, 2-position, lockable in ON-OFF, defeatable, NEMA 3R, IP65. For use with HMMP-63H manual motor protectors. 315mm shaft, operator and mounting screws included.	PDF
HPX3-EHRN3R-GY3	$29.50	IronHorse rotary handle, selector, black, external front mount, 2-position, lockable in ON-OFF, defeatable, NEMA 3R, IP65. For use with HMMP-100H manual motor protectors. 315mm shaft, operator and mounting screws included.	PDF

HPX1-EHRN3R-GY1

HPX2-EHRN3R-GY3

IronHorse HMMP Series Incoming Power Terminal Block Selection Guide

Part Number	Price	Description	Drawing
HPX1-PTB-MP	$14.50	IronHorse incoming power terminal block, 3-pole, 64A, 12-4 AWG. For use with unused exposed busbar pins on the HPX1-BB3P busbar system. For incoming power to busbar system.	PDF

HPX1-PTB-MP

IronHorse HMMP Manual Motor Protectors Accessories (continued)

IRONHORSE®

IronHorse HMMP Series Busbar Selection Guide

Part Number	Price	Description	Drawing
HPX1-BB3P-2SP	$11.00	IronHorse busbar, 64A, 600 VAC, cut to length not permitted, connects up to 2 HMMP-32H Manual motor protectors without accessories. Use HPX1-PTB-MP power terminal to connect feeder.	PDF
HPX2-BB3P-2SP	$15.50	IronHorse busbar, 108A, 600 VAC, cut to length not permitted, connects up to 2 HMMP-63H Manual motor protectors without accessories.	PDF
HPX1-BB3P-3SP	$13.50	IronHorse busbar, 64A, 600 VAC, cut to length not permitted, connects up to 3 HMMP-32H Manual motor protectors without accessories. Use HPX1-PTB-MP power terminal to connect feeder.	PDF
HPX2-BB3P-3SP	$21.00	IronHorse busbar, 108A, 600 VAC, cut to length not permitted, connects up to 3 HMMP-63H Manual motor protectors without accessories.	PDF
HPX1-BB3P-4SP	$15.50	IronHorse busbar, 64A, 600 VAC, cut to length not permitted, connects up to 4 HMMP-32H Manual motor protectors without accessories. Use HPX1-PTB-MP power terminal to connect feeder.	PDF
HPX1-BB3P-5SP	$23.50	IronHorse busbar, 64A, 600 VAC, cut to length not permitted, connects up to 5 HMMP-32H Manual motor protectors without accessories. Use HPX1-PTB-MP power terminal to connect feeder.	PDF

IronHorse HMMP Series Mounting Plate Selection Guide

Part Number	Price	Description	Drawing
HPX1-MBPT	$10.50	IronHorse mounting plate adapter, for use with HMMP-32H manual motor protector and HMC-9 to HMC-40 contactors with AC or DC coils.	PDF
HPX2-MBPT	$15.50	IronHorse mounting plate adapter, for use with HMMP-63H manual motor protector and HMC-50 and HMC-65 contactors with AC or DC coils.	PDF
HPX3-MBPT	$21.00	IronHorse mounting plate adapter, for use with HMMP-100H manual motor protector and HMC-75 to HMC-100 contactors with AC or DC coils.	PDF

IronHorse HMMP Series Phase Barrier Selection Guide

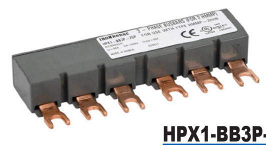
Part Number	Price	Description	Drawing
HPX3-PBR-MP	$5.00	IronHorse phase barrier, package of 4. For use with HMMP-100H manual motor protectors. Required by UL to increase clearance distance.	PDF

IronHorse HMMP Series Busbar Cover Selection Guide

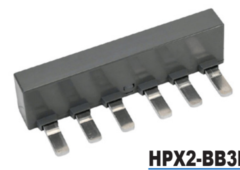
Part Number	Price	Description	Drawing
HPX1-TMC-BB	$3.25	IronHorse busbar cover, for use with unused exposed busbar pins on the HPX1-BB3P busbar system.	N/A
HPX2-TMC-BB	$5.00	IronHorse busbar cover, for use with unused exposed busbar pins on the HPX2-BB3P busbar system.	N/A

IronHorse HMMP Series Incoming Power Terminal Block Selection Guide

Part Number	Price	Description	Drawing
HPX1-PTBE-MP	$16.50	IronHorse incoming power terminal block, 3-pole, 64A, 12-4 AWG. For use with HMMP-32H manual motor protectors. Required when using a HMMP-32H in a UL Type E application.	PDF



HPX1-BB3P-2SP



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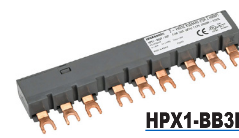
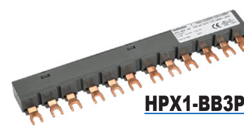
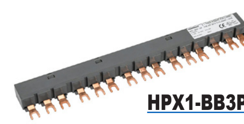


HPX1-BB3P-3SP



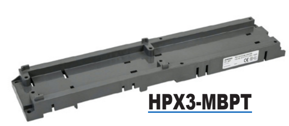
HPX1-BB3P-4SP



HPX1-BB3P-5SP

HPX1-MBPT

HPX2-MBPT



HPX3-MBPT

HPX3-PBR-MP

HPX1-TMC-BB

HPX2-TMC-BB

HPX1-PTBE-MP

IronHorse HMMP Manual Motor Protectors

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IronHorse HMMP Manual Motor Protectors Specifications		
Frame		***32AF***
Type	Current Adjustable	HMMP-32H
Breaking Capacity		High Breaking
Handle Type		Rotary
Number of Poles		3
Rated Operating Voltage U_e		Up to 690V
Rated Frequency		50/60 Hz
Rated Insulation Voltage U_i		690V
Rated Impulse Voltage U_{imp}		6kV
Utilization Category	***IEC 60947-2 (Breaker)***	Cat. A
	IEC 60947-4 (Motor Starter)	AC3
Mechanical Endurance (Operating)		100,000
Electrical Endurance (Cycles)		100,000
Max Operating Frequency Per Hour (Oper/h)		25
Temperature Compensation (Operation)		-20°C to +60°C [-4°F to 140°F]
Instantaneous Short Circuit Release		13 x I_e max
Overload Protection		✓
Phase Failure Function		✓
Trip Indicating Function		✓
Test Function		✓
Weight (g [oz])		360 [12.7]

Rated Breaking Capacity (kA)											
Rated Operational Current I_e	***Thermal Release Adjustment Range (I_e)***	***220V 240V 230V***		***415V 400V***		***460V 440V***		***525V 500V***		***690V 600V***	
		Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics
0.16	0.1 - 0.16	100	100	100	100	100	100	100	100	100	100
0.25	0.16 - 0.25	100	100	100	100	100	100	100	100	100	100
0.4	0.25 - 0.4	100	100	100	100	100	100	100	100	100	100
0.63	0.4 - 0.63	100	100	100	100	100	100	100	100	100	100
1	0.63 - 1	100	100	100	100	100	100	100	100	100	100
1.6	1 - 1.6	100	100	100	100	100	100	100	100	100	100
2.5	1.6 - 2.5	100	100	100	100	100	100	100	100	8	8
4	2.5 - 4	100	100	100	100	100	100	100	100	8	8
6	4 - 6	100	100	100	100	100	100	100	100	6	6
8	5 - 8	100	100	100	100	50	38	50	38	6	6
10	6 - 10	100	100	100	100	50	38	50	38	6	6
13	9 - 13	100	100	100	100	50	38	42	32	6	6
17	11 - 17	100	100	50	38	20	15	10	8	4	4
22	14 - 22	100	100	50	38	25	15	10	8	4	4
26	18 - 26	100	100	50	38	25	15	10	8	4	4
40	28 - 40	100	100	40	30	25	11	8	6	3	3

IronHorse HMMP Manual Motor Protectors

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IronHorse HMMP Manual Motor Protectors Specifications

Frame		***63AF***	***100AF***
Type	Current Adjustable	HMMP-63H	HMMP-100H
Breaking Capacity		High Breaking	High Breaking
Handle Type		Rotary	Rotary
Number of Poles		3	3
Rated Operating Voltage U_e		Up to 690V	Up to 690V
Rated Frequency		50/60 Hz	50/60 Hz
Rated Insulation Voltage U_i		1000V	1000V
Rated Impulse Voltage U_{imp}		8kV	8kV
Utilization Category	***IEC 60947-2 (Breaker)***	Cat. A	Cat. A
	IEC 60947-4 (Motor Starter)	AC3	AC3
Mechanical Endurance (Operating)		50,000	50,000
Electrical Endurance (Cycles)		25,000	25,000
Max Operating Frequency Per Hour (Oper/h)		25	25
Temperature Compensation (Operation)		-20°C to +60°C [-4°F to 140°F]	-20°C to +60°C [-4°F to 140°F]
Instantaneous Short Circuit Release		13 x I_e max	13 x I_e max
Overload Protection		✓	✓
Phase Failure Function		✓	✓
Trip Indicating Function		✓	✓
Test Function		✓	✓
Weight (g [oz])		1000 [35.3]	2200 [77.6]

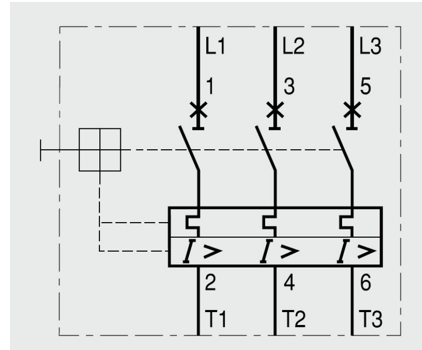
Rated Breaking Capacity (kA)

Rated Operational Current I_e	***Thermal Release Adjustment Range (I_e)***	***220V 240V 230V***		***415V 400V***		***460V 440V***		***525V 500V***		***690V 600V***		***220V 240V 230V***		***415V 400V***		***460V 440V***		***525V 500V***		***690V 600V***	
		Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics
26	18 - 26	100	100	50	50	35	27	12	9	5	5	–	–	–	–	–	–	–	–	–	–
32	22 - 32	100	100	50	50	35	27	10	8	5	5	–	–	–	–	–	–	–	–	–	–
40	28 - 40	100	100	50	50	35	27	10	8	5	5	–	–	–	–	–	–	–	–	–	–
50	34 - 50	100	100	50	50	35	27	10	8	5	5	–	–	–	–	–	–	–	–	–	–
63	45-63	100	100	50	50	35	27	10	8	5	5	–	–	–	–	–	–	–	–	–	–
75	55 - 75	–	–	–	–	–	–	–	–	–	–	100	100	75	50	50	38	12	9	6	6
90	70 - 90	–	–	–	–	–	–	–	–	–	–	100	100	75	50	50	38	12	9	6	6
100	80 - 100	–	–	–	–	–	–	–	–	–	–	100	100	75	50	50	38	12	9	6	6

IronHorse HMMP Manual Motor Protectors High Breaking Type

Features

- Adjustable thermal release
- Magnetic release 13 I_e max
- Trip Class 10 overload protection
- Phase-failure, short circuit, and overload protection



IronHorse HMMP Manual Motor Protectors (High Breaking Type) Specifications											
Type	Rated Operational Current I_e (A)	Thermal Release Adjustment Range (A)	Magnetic Release Operating Current (A)	Switching of 3-Phase AC Motors, AC-2, AC-3						400/415 V	
				3-Phase (50/60 Hz) (kW)			3-Phase (60Hz))kW)				
				230V	400V	690V	230V	460V	575V	I_{cu} (kA)	I_{cs} (kA)
HMMP-32H	0.16	0.1 - 0.16	2.1	–	0.02	–	–	–	–	100	100
	0.25	0.16 - 0.25	3.3	0.03	0.06	–	–	–	–	100	100
	0.4	0.25 - 0.4	5.2	0.06	0.09	–	–	–	–	100	100
	0.63	0.4 - 0.63	8.2	0.09	0.12	0.25	–	–	–	100	100
	1	0.63 - 1.0	13	0.12	0.25	0.55	–	0.5	0.5	100	100
	1.6	1.0 - 1.6	20.8	0.25	0.55	1.1	0.33	0.75	1	100	100
	2.5	1.6 - 2.5	32.5	0.37	0.75	1.5	0.5	1.5	1.5	100	100
	4	2.5 - 4.0	52	0.75	1.5	3	1	2	3	100	100
	6	4 - 6	78	1.5	2.2	4	1.5	5	5	100	100
	8	5 - 8	104	1.5	3	5.5	2	5	5	100	100
	10	6 - 10	130	3	4	7.5	3	7.5	10	100	100
	13	9 - 13	169	3	5.5	11	3	7.5	10	100	100
	17	11 - 17	221	4	7.5	11	5	10	15	50	38
	22	14 - 22	286	4	7.5	15	7.5	15	20	50	38
	26	18 - 26	338	5.5	11	18.5	7.5	15	20	50	38
	40	28 - 40	520	7.5	18.5	30	15	30	40	40	30
HMMP-63H	26	18 - 26	338	5.5	11	18.5	10	20	25	50	50
	32	22 - 32	416	7.5	15	22	10	25	30	50	50
	40	28 - 40	520	7.5	18.5	30	15	30	40	50	50
	50	34 - 50	650	11	22	45	15	40	50	50	50
	63	45 - 63	819	15	30	55	20	50	60	50	50
HMMP-100H	75	55 - 75	975	22	37	63	25	60	75	75	50
	90	70 - 90	1170	30	45	75	30	75	100	75	50
	100	80 - 100	1300	30	45	90	40	75	100	75	50

IronHorse HMMP Manual Motor Protectors Accessories

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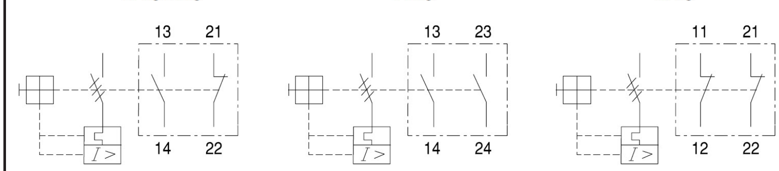
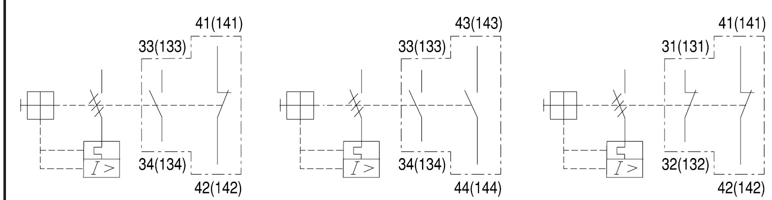
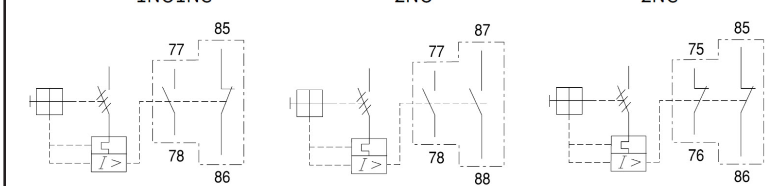
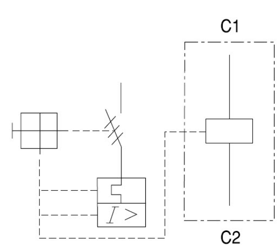
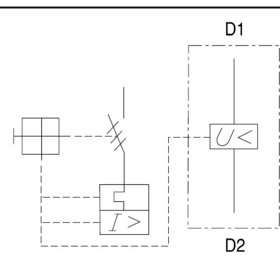
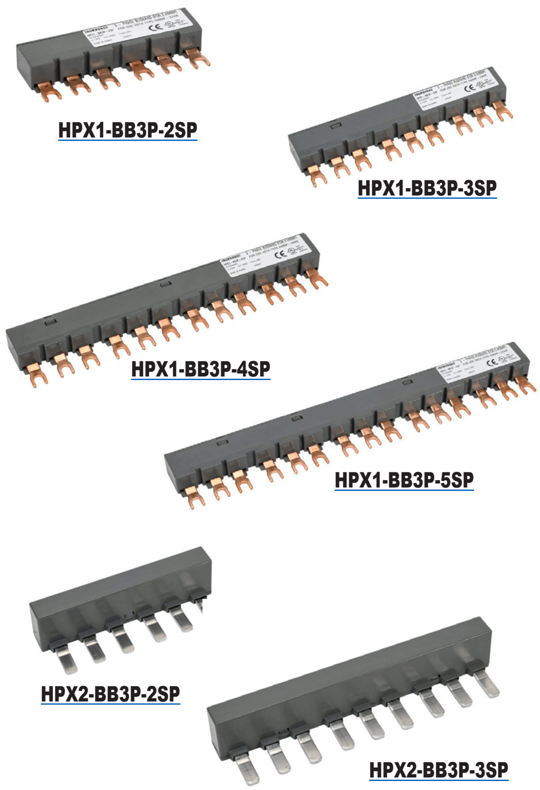
Type	*Description*	*Connection Diagram*
HPX1-AUXxx-F	***Auxiliary Switch*** • Front mounting • 2-pole • One front mounting module per circuit breaker	1NO1NC 2NO 2NC 
HPX1-AUXxx-S	***Auxiliary Switch*** • Side Mounting on the left • 2-pole • One side mounting module per circuit breaker	1NO1NC 2NO 2NC 
HPX1-ALM **HPX2-ALM**	***Any Trip Alarm Switch*** • Operates in case of trip • Side mounting on the left • 2-pole • Set ALM first when using with AUXxx-S (HMMP-63 cannot accept AUXxx-S and ALM together) • For HMMP-32 and HMMP-63/100, products are separated	1NO1NC 2NC 
HPX1-MALM11-S	***Magnetic Trip Alarm Switch*** • Operates in case of short circuit accidents more than 20 times the rated current • Side mounting on the left • 2-pole • Set magnetic trip alarm first when using with HPX1-AUXxx-S	1NO1NC 2NO 2NC 
HPX1-SHT-xxxxx	***Shunt Release*** • Side mounting on the right • One side mounting module per circuit breaker • Cannot use with HPX1-UVT-xxxx	 110V 50Hz /120V 60Hz 200V 50Hz / 200-220 V 60Hz 415-440 V 50Hz / 460-480V 60Hz
HPX1-UVT-xxxxx	***Undervoltage Release*** • Side mounting on the right • One side mounting module per circuit breaker • Cannot use with HPX1-SHT-xxxx	

IronHorse
HMMP Manual Motor Protectors
Phase Bus System



The phase bus allows for a parallel connection with power terminals in the circuit lined up by MMP, simplifying wiring and requiring minimal space.

- Application Model: HMMP-32, 63
- CE and UL certified
- Safety cover built in
- RoHS compliance

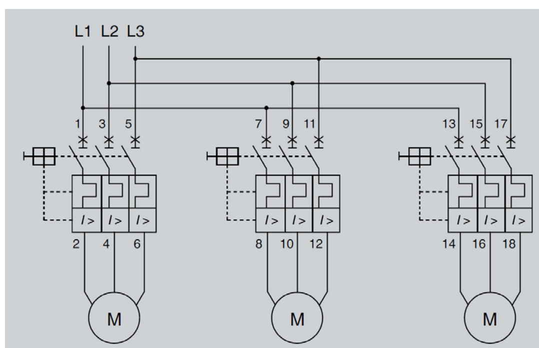
Phase Bus System Selection Guide

Part Number	Price	For Use With	Number of Terminals	Rated Current	Drawing
HPX1-BB3P-2SP	$11.00	HMMP-32H	2	63A	PDF
HPX1-BB3P-3SP	$13.50		3		PDF
HPX1-BB3P-4SP	$15.50		4		PDF
HPX1-BB3P-5SP	$23.50		5		PDF
HPX2-BB3P-2SP	$15.50	HMMP-63H	2	108A	PDF
HPX2-BB3P-3SP	$21.00		3		PDF

HPX1-PTB-MP Specifications

Poles	3P
Mounting Location	Lineside
IP Degree of Protection	IP20 according to IEC 60592
Rated insulation voltage (Ui)	690V according to IEC 60947-1
Rated operational current (Ie)	63A
Terminal torque	1.7 N•m- on screw clamp terminals

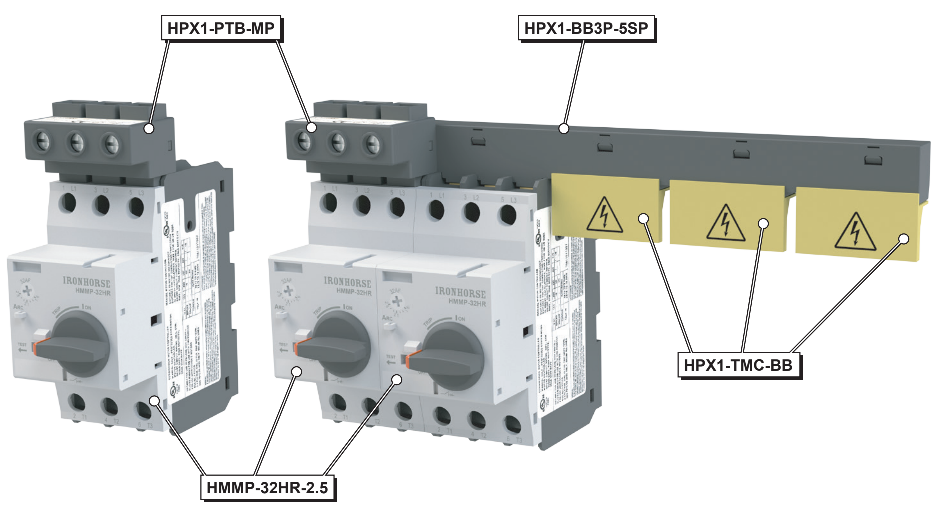
Wiring Diagram



IronHorse Manual Motor Protector with Two Options:

Option 1: MMP with power terminal block

Option 2: MMP with power terminal block and busbar system using busbar cover



IronHorse HMMP Manual Motor Protectors Direct Adapter and Mounting Unit

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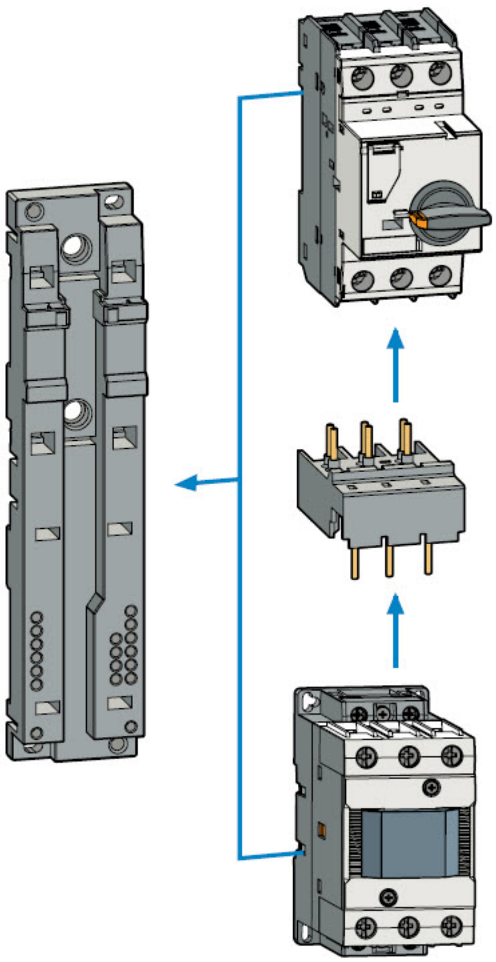

The direct adapter is used to connect the MMP directly to a contactor.
The mounting unit is used to connect the MMP with a contactor.

Direct Adapter and Mounting Unit Selection Guide

Direct Adapter			Mounting Unit			Combined Devices
Part Number	Price	Drawing	Part number	Price	Drawing	
HMX1-LM22-AC	$9.00	PDF	HPX1-MBPT	$10.50	PDF	HMMP-32H + HMC-9 to HMC-22 (AC coil)
HMX1-LM22-DC	$9.00	PDF				HMMP-32H + HMC-9 to HMC-22 (DC coil)
HMX2-LM32-AC	$10.00	PDF				HMMP-32H + HMC-32 to HMC-40 (AC coil)
HMX2-LM32-DC	$10.00	PDF				HMMP-32H + HMC-32 to HMC-40 (DC coil)
HMX3-LM63-AC	$10.50	PDF	HPX2-MBPT	$15.50	PDF	HMMP-63H + HMC-50 to HMC-65 (AC coil)
HMX3-LM63-DC	$10.50	PDF				HMMP-63H + HMC-50 to HMC-65 (DC coil)
HMX4-LM100-AC	$11.50	PDF	HPX3-MBPT	$21.00	PDF	HMMP-100H + HMC-75 to HMC-100 (AC coil)
HMX4-LM100-DC	$11.50	PDF				HMMP-100H + HMC-75 to HMC-100 (DC coil)

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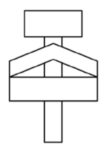
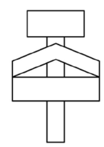
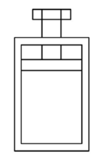
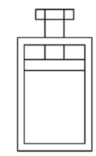
IronHorse HMMP Manual Motor Protectors Technical Information and General Data

Manual Motor Starters Terminals					
Conformity to Standards		IEC60947 UL508, UL508 Type E			
Approvals		CE, UL			
Terminal Parts					
Wire (mm² [AWG])					
Single-Core	1 conductor	1-10 [18-8]	1-10 [18-8]	0.75-35 [18-2]	2.5-70 [12-2/0]
	2 conductor	1-6 [18-10]	1-6 [18-10]	0.75-25 [18-4]	2.5-50 [12-1/0]
Stranded	1 conductor	1-6 [18-10]	1-6 [18-10]	0.75-35 [18-2]	2.5-70 [12-2/0]
	2 conductor	1-6 [18-10]	1-6 [18-10]	0.75-25 [18-4]	2.5-50 [12-1/0]
Flexible	1 conductor	1-6 [18-10]	1-6 [18-10]	0.75-25 [18-4]	2.5-50 [12-1/0]
	2 conductor	0.75-4 [18-10]	0.75-4 [18-10]	0.75-16 [18-6]	2.5-35 [10-2]
Tightening Torque (N•m [lb•in])		0.8-2.5 [7-22]	0.8-2.5 [7-22]	3-4.5 [26-39]	4-6 [35-53]

Manual Motor Starters Power Consumption			
	HMMP-32H	***HMMP-63H***	***HMMP-100H***
Total Power Loss Pv Circuit Breaker at Rated Load Operating Temperature (W)	In = 0.16 to 1.6 A: 4.4 In=2.5 to 26 A: 7.4 In=32A: 4.0	In = 10 to 22 A:10.2 In = 26 to 63 A: 9.7	In = 17 to 32 A: 15 In = 40 to 63 A: 21.8 In = 75 to 100 A: 17.8

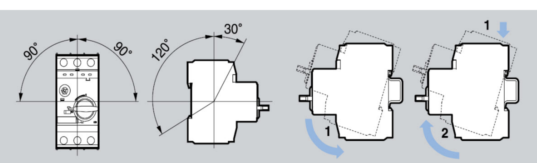
Manual Motor Starters Environmental	
Ambient Air Temperature Storage	50°C to +80°C [-58°F to 176°F]
Operation	-20°C to +60°C [-4°F to +140°F]
Ambient Temperature Compensation	-5°C to +40°C [23°F to 104°F]
Maximum Operating Altitude	2000m [6562 ft]
Protection Degree	IP20
Shock Resistance	25g
Vibration Resistance	5-150 Hz

Mounting

35mm DIN rail for HMMP-32H to HMMP-63H

35mm or 75mm DIN rail for HMMP-100H

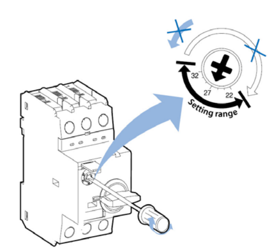
- Use 15mm depth for 35mm DIN rail



Operating positions   DIN rail mounting

Thermal Adjustments Considerations

- Keep the setting range as shown below.
- Turning the adjustment control counterclockwise out of the setting range may cause damage to the device.



Dial setting method

Calibration by Ambient Air Temperature

A: Set to one point lower	Calibrated automatically	B: Set to one point higher

-20°C [-4°F]   -5°C [23°F]   +40°C [104°F]   +60°C [140°F]

When used outside of the standard air temperature range of -5C to +40C [23F to 104F], adjust calibration by one point.

IronHorse HMMP Manual Motor Protectors Auxiliaries

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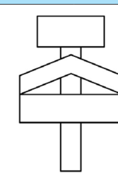
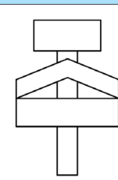
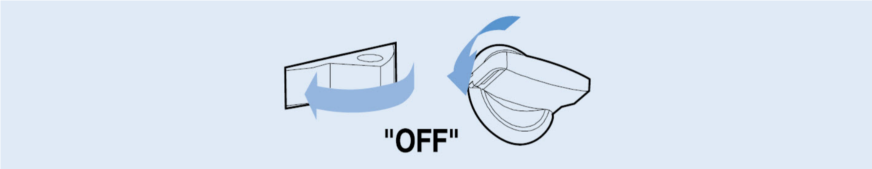
Manual Motor Starters Auxiliaries							
		Auxiliary Contacts for Front Mounting (AUXxx-F)		*Auxiliary Contacts for Left-Side Mounting (AUXxx-S)*		*Alarm Switch For Left-Side Mounting (ALM)*	
Rated Thermal Current / I_{th}							
At 40°C ambient temperature	A	5		10		10	
At 60°C ambient temperature	A	3		6		6	
Contact Class Coordination According to NEMA (UL / CSA standards)	AC	A600		A600		A600	
	DC	Q300		Q300		Q300	
Back-up Fuses gG, gL	A	16		16		16	
Rated Supply Current AC15	V	–	240	24	240	24	240
AC15	A	–	3	6	4	6	4
DC-13	V	24	220	24	220	24	220
DC-13	A	1	0.1	2	0.25	2	0.25
Weight	g [oz]	18		30		40	
Terminal Parts							
				 Pozidriv Size 2			
Wire Single-Core, 1 Conductor		0.5-2.5 [20-14]		0.5-2.5 [20-14]			
Single-Core, 2 Conductor		–		0.5-2.5 [20-14]			
Stranded, 1 conductor		0.5-4 [20-10]		0.5-4 [20-10]			
Stranded, 2 conductor		0.75-2.5 [18-14]		0.75-2.5 [18-14]			
Tightening Torque	N•m [lb•in]	0.8-1.2 [7-10]		0.8-1.2 [7-10]			

Manual Motor Starters Auxiliaries			
		Undervoltage Release For Right-Side Mounting (HPX1-UVT)	*Shunt Release For Right-Side Mounting (HPX1-SHT)*
Actuating Voltage	Pull-in	0.7 to 1.1 x Us	0.85 to 1.1 x Us
	Drop-out		0.7 to 0.35 x Us
Rated Control Voltage	Min	24V 50Hz / 28V 60Hz	24V 50Hz / 28V 60Hz
	Max	415 to 440 V 50Hz / 460 to 480 V 60Hz	415 to 440 V 50Hz / 460 to 480 V 60Hz
Coil Rating	Pull-in	8.5 VA, 6W	8.5 VA, 6W
	Hold	3VA, 1.2 W	3VA, 1.2 W
Opening Time (ms)		–	20
Weight		18	40
Terminal Parts			
		 Pozidriv Size 2	
Wire Single-Core, 1 Conductor		0.5-2.5 [20-14]	
Single-Core, 2 Conductor		0.5-2.5 [20-14]	
Stranded, 1 conductor		0.5-4 [20-10]	
Stranded, 2 conductor		0.75-2.5 [18-14]	
Tightening Torque (N•m [lb•in])		0.8-1.2 [7-10]	

IronHorse HMMP Manual Motor Protectors Auxiliaries

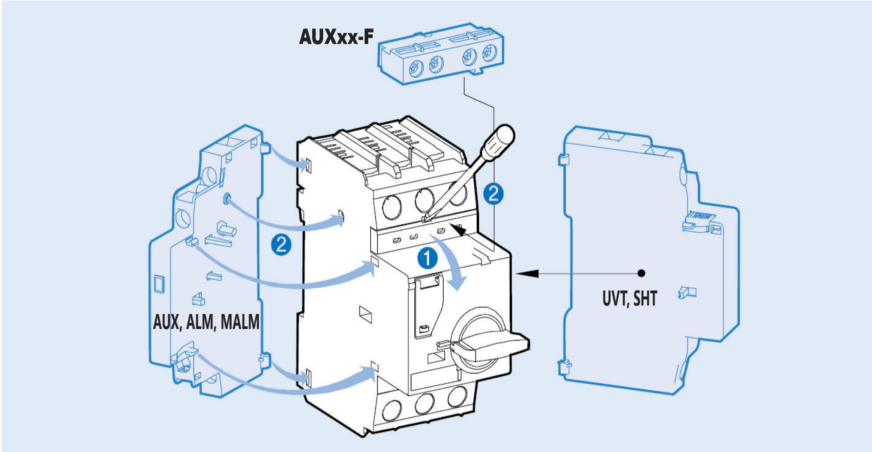
Installation of Auxiliaries

Be sure to turn off the main switch of the MMS before performing any installation or separation.

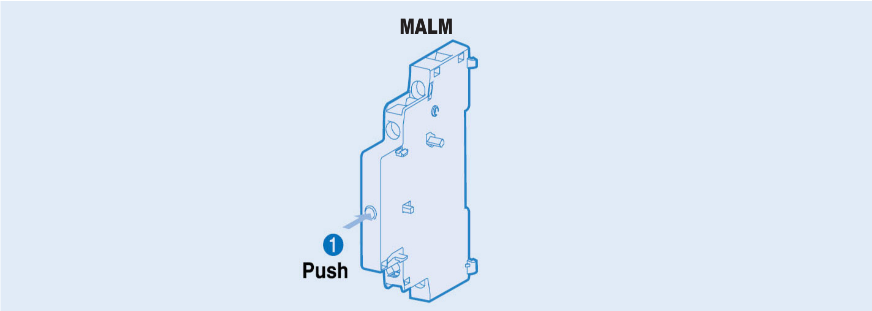


HMMP-32H

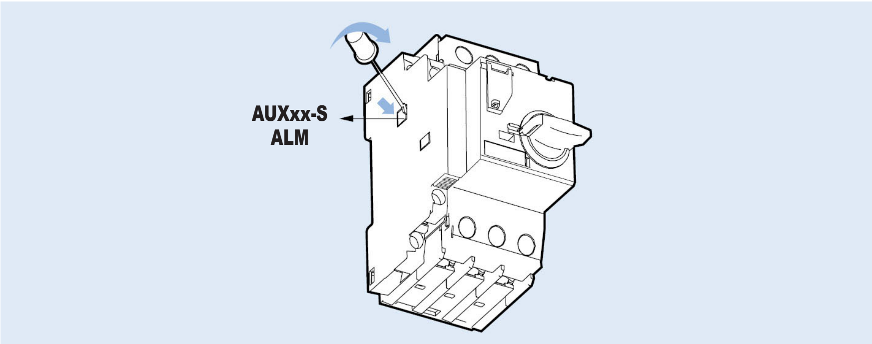
- To install AUXxx-F, first remove the cover (1).
- Two AUXxx-S units can be installed together.
- Only one of the UVT or SHT auxiliary units can be mounted on the right side of MMP.
- Do not give the trip signal to SHT for longer than 10 sec.
- Refer to the possible combination chart for the mounting of AUXxx-S. ALM, MALM on left side of MMP.



- Push the trip button before installation of MALM.

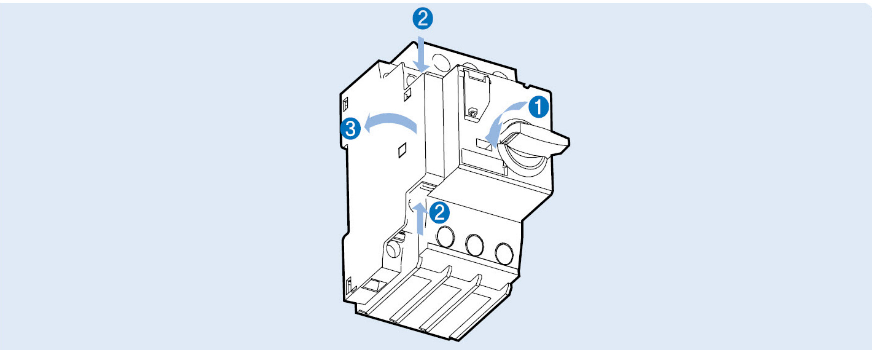


Remove the indicated part, as shown in the illustration at right, before installing the AUXxx-S unit.



Separation of auxiliaries from MMP

- Be sure to turn off the main switch of MMP before performing any installation or separation.
- Gently press the separation button on the side of the auxiliary and pull it.



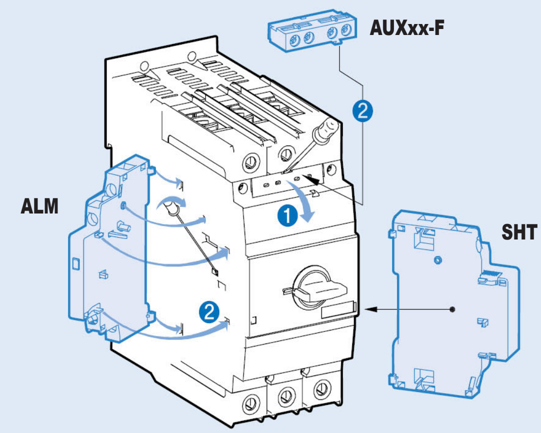
NOTE: Make sure that you choose the proper version of the ALM unit, as the ALM units used for HMMP-32H and HMMP-63/100H are different.

IronHorse HMMP Manual Motor Protectors Auxiliaries

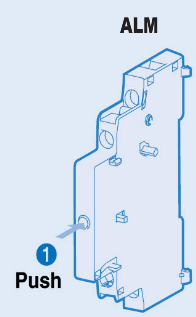
Installation of Auxiliaries, continued

HMMP-63H

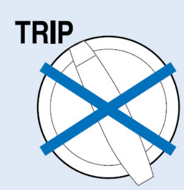
- To install AUXxx-F, first remove the cover (1).
- Two LX units can be installed together (only 1 each for HMMP-63H)
- Only one of the UVT or SHT auxiliary units can be mounted on the right side of HMMP.
- Do not give the trip signal to RS for longer than 10 sec.
- Refer to the possible combination chart for the mounting of AUXxx-S, ALM, and MALM on left side of HMMP.
- Push the trip button before installation of ALM.
- Remove the indicated part, as shown in the illustration at right, before installing the AUXxx-S unit.
- Refer to the possible combination chart for the mounting of AUXxx-S, ALM, MALM on left side of MMP.
- Do not use with HPX1-ALM11-S. This unit is only for use with HMMP-32H.



- Push the trip button before installation of ALM.



- Do not install ALM with status set to TRIP on the HMMP-100H.

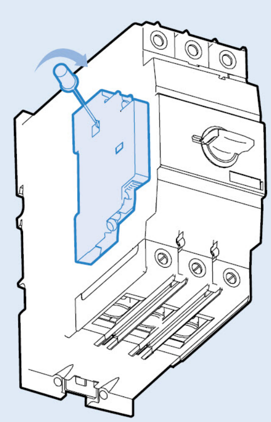


- Remove the indicated part, as shown in the illustration, before installation of AUXxx-F.

Separation of Auxiliaries From MMP

Be sure to turn off the main switch of the MMP before performing any installation or separation.

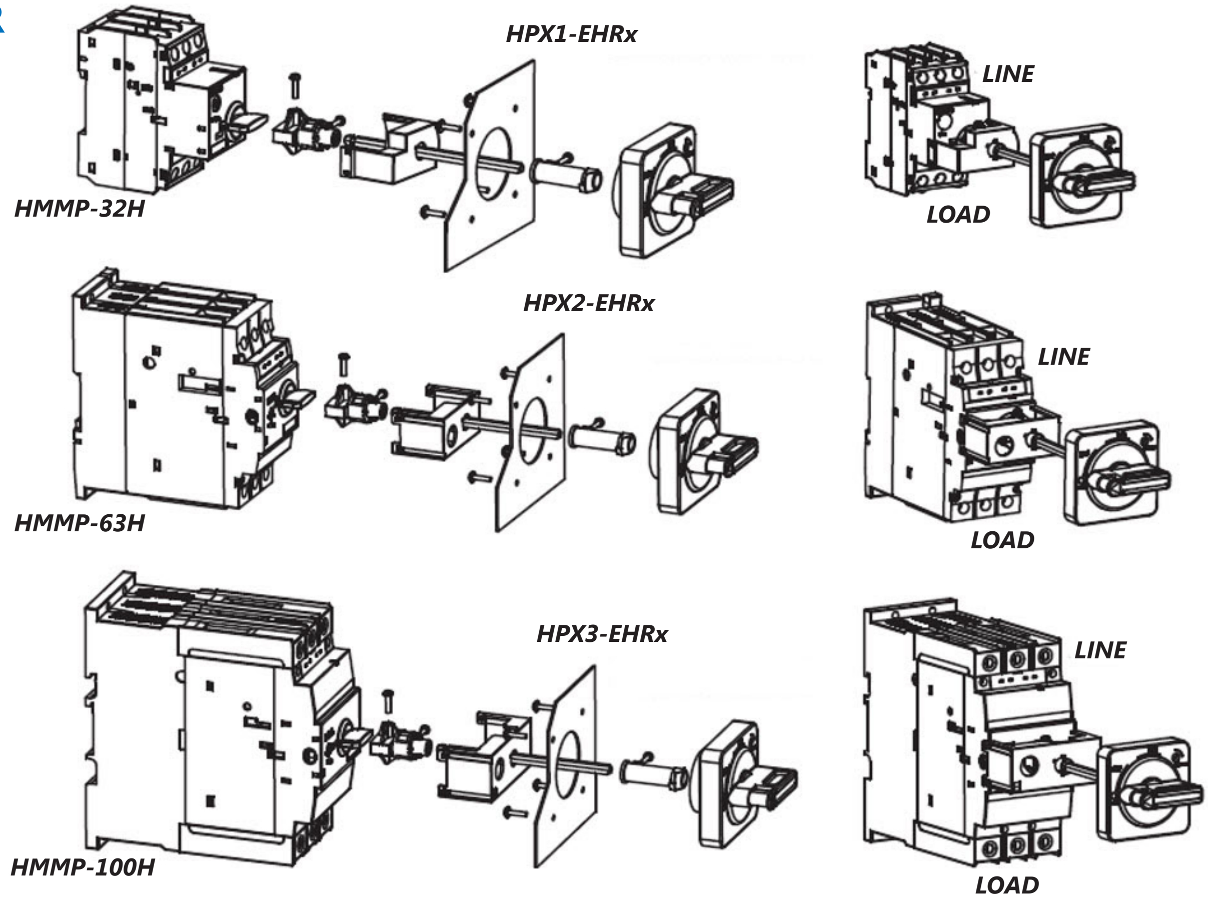
- Gently push the separation button on the side of the auxiliary and pull it.



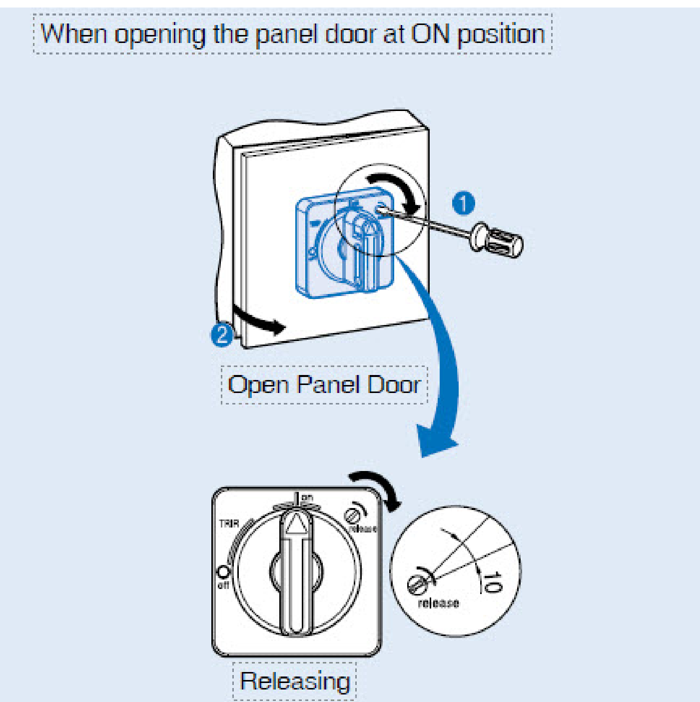
NOTE: Make sure that you choose the proper version of the ALM unit, as the ALM units used for HMMP-32H and HMMP-63/100H are different.

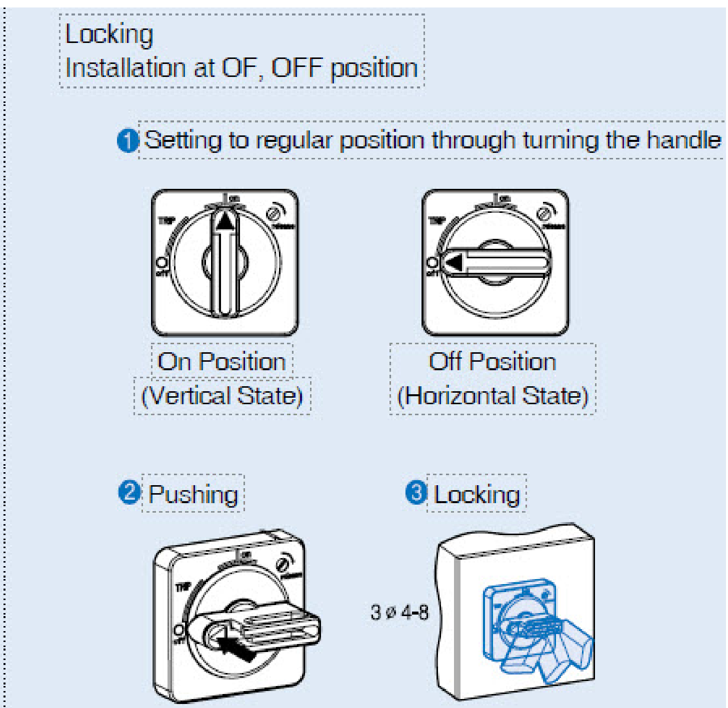
IronHorse HMMP Manual Motor Protectors Auxiliaries

HPXx-EHR Overview



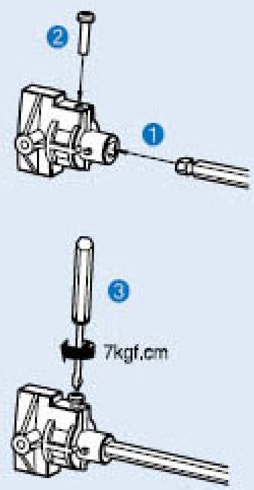
Locking Device



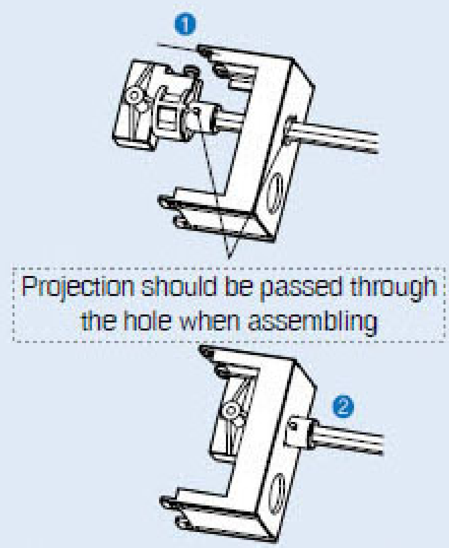


IronHorse HMMP Manual Motor Protectors Auxiliaries – E-Handle

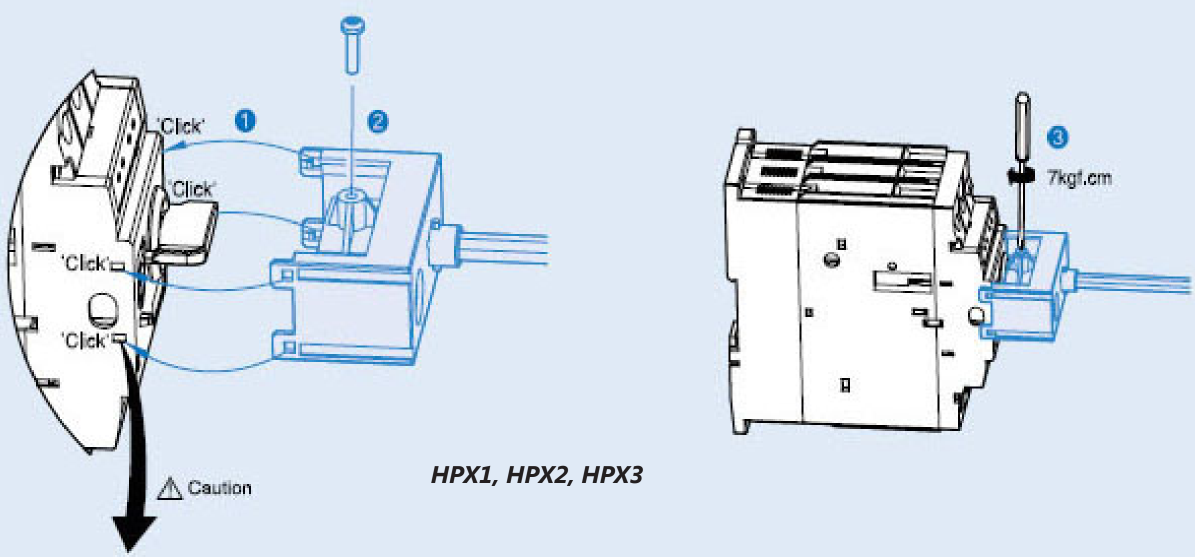
E-Handle Installation



HPX1, HPX2, HPX3



HPX1, HPX2, HPX3



HPX1, HPX2, HPX3

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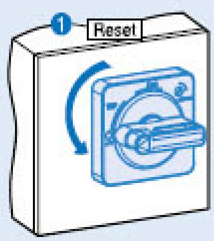
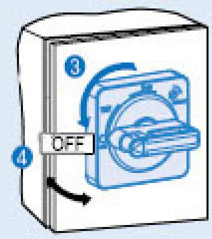
HMMP Manual Motor Protectors Auxiliaries – E-Handle

E-Handle Installation, continued

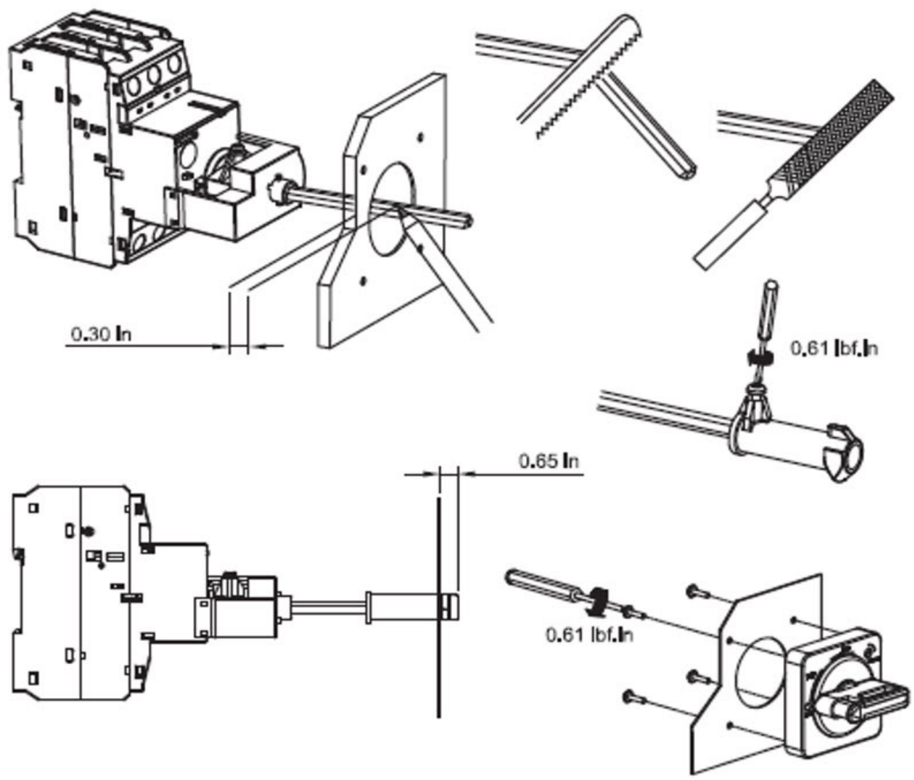


***CAUTION* Attempting to open the door while the handle is in the ON or TRIP position can cause damage to the locking knob.**

When in the ON position, the panel door cannot be opened.



When in the TRIP position, the panel door cannot be opened. In the OFF position, the panel door can be opened.



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HMMP Manual Motor Protectors

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HMMP-32HR-x High Breaking Type Specifications																	
Rated Operational Current I_e		***0.16***	***0.25***	***0.4***	***0.63***	***1***	***1.6***	***2.5***	***4***	***6***	***8***	***10***	***13***	***17***	***22***	***26***	***40***
Switching of Standard 3-Phase Motors – AC-2, AC-3																	
230/240 V	kW	–	0.03	0.06	0.09	0.12	0.18/0.25	0.37	0.55/0.75	1.1/1.5	1.5	2.2/3	3	3.7/4	4	5.5	7.5
400/415 V	kW	0.02	0.06	0.09	0.12	0.18/0.25	0.37/0.55	0.75	1.1/1.5	2.2	3	3.7/4	5.5	7.5	5	11	18
500V	kW	–	–	–	0.25	0.37	0.55/0.75	1.1	1.5/2.2	3	3.7	4/5.5	7.5	11	11	15	22
690V	kW	–	–	–	0.25	0.37/0.55	0.75/1.1	1.5	2.2/3	3.7/4	5.5	7.5	11	11	15	18.5	30
Back-Up Fuses – gG, gL, only if I_{cc}>I_{cu} (* indicates no back-up fuse required)																	
230/240 V	kA	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
400/415 V	kA	*	*	*	*	*	*	*	*	*	*	*	*	100	125	125	160
440/460 V	kA	*	*	*	*	*	*	*	*	*	80	80	80	80	100	100	125
500V	kA	*	*	*	*	*	*	*	*	*	63	80	80	80	80	80	100
690V	kA	*	*	*	*	*	*	35	40	50	63	63	63	63	63	63	80
Ultimate Short-Circuit Breaking capacity I_{cu}																	
230/240 V	kA	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
400/415 V	kA	100	100	100	100	100	100	100	100	100	100	100	100	50	50	50	40
440/460 V	kA	100	100	100	100	100	100	100	100	100	50	50	50	20	20	20	15
500V	kA	100	100	100	100	100	100	100	100	100	50	50	42	10	10	10	8
690V	kA	100	100	100	100	100	100	8	8	6	6	6	6	4	4	4	3
Rated Service Short-Circuit Breaking Capacity I_{cs}																	
230/240 V	kA	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
400/415 V	kA	100	100	100	100	100	100	100	100	100	100	100	100	38	38	38	30
440/460 V	kA	100	100	100	100	100	100	100	100	100	38	38	38	15	15	15	11
500V	kA	100	100	100	100	100	100	100	100	100	38	38	32	8	8	8	6
690V	kA	100	100	100	100	100	100	8	8	6	6	6	6	4	4	4	3

**** Short-circuit proof up to 50 or 100 kA. No back-up fuse required.***

IronHorse
HMMP Manual Motor Protectors

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HMMP-63HR-x High Breaking Type Specifications

Rated Operational Current I_e		26	32	40	50	63
Switching of Standard 3-Phase Motors – AC-2, AC-3						
230/240 V	kW	5.5	7.5	7.5	11	15
400/415 V	kW	11	15	18.5	22	30
500V	kW	15	18.5	22	30	37
690V	kW	18.5	22	30	45	55
Back-Up Fuses – gG, gL, only if $I_{cc}>I_{cu}$ (* indicates no back-up fuse required)						
230/240 V	kA	*	*	*	*	*
400/415 V	kA	125	125	160	160	160
440/460 V	kA	125	125	125	125	160
500V	kA	100	100	100	100	100
690V	kA	80	80	80	80	80
Ultimate Short-Circuit Breaking capacity I_{cu}						
230/240 V	kA	100	100	100	100	100
400/415 V	kA	50	50	50	50	50
440/460 V	kA	35	35	35	35	35
500V	kA	12	10	10	10	10
690V	kA	5	5	5	5	5
Rated Service Short-Circuit Breaking Capacity I_{cs}						
230/240 V	kA	100	100	100	100	100
400/415 V	kA	50	50	50	50	50
440/460 V	kA	27	27	27	27	27
500V	kA	9	8	8	8	8
690V	kA	5	5	5	5	5

*** Short-circuit proof up to 50 or 100 kA. No back-up fuse required.**

HMMP-100HR-x High Breaking Type Specifications

Rated Operational Current I_e		75	90	100
Switching of Standard 3-Phase Motors – AC-2, AC-3				
230/240 V	kW	22	30	30
400/415 V	kW	37	45	45
500V	kW	45	55	63
690V	kW	63	75	90
Back-Up Fuses – gG, gL, only if $I_{cc}>I_{cu}$ (* indicates no back-up fuse required)				
230/240 V	kA	*	*	*
400/415 V	kA	*	*	*
440/460 V	kA	200	200	200
500V	kA	160	160	160
690V	kA	125	160	160
Ultimate Short-Circuit Breaking capacity I_{cu}				
230/240 V	kA	100	100	100
400/415 V	kA	75	75	75
440/460 V	kA	50	50	50
500V	kA	12	12	12
690V	kA	6	6	6
Rated Service Short-Circuit Breaking Capacity I_{cs}				
230/240 V	kA	100	100	100
400/415 V	kA	50	50	50
440/460 V	kA	38	38	38
500V	kA	9	9	9
690V	kA	6	6	6

*** Short-circuit proof up to 50 or 100 kA. No back-up fuse required.**

IronHorse
HMMP Manual Motor Protectors

Manual Motor Controller (UL 508, CSA C22.2 as Manual Motor Controllers)

- Group Installation
- Type E Starter

HMMP-32HR-x High Breaking Type Specifications

Rated Operational Current I_e			0.16	0.25	0.4	0.63	1	1.6	2.5	4	6	8	10	13	17	22	26	40
Maximum Short-Circuit Current	240V	(kA)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	480V	(kA)	65	65	65	65	65	65	65	65	65	65	65	65	30	30	30	30
	600V	(kA)	25	25	25	25	25	25	25	25	25	25	25	25	10	10	10	10
Motor Load, 1-Phase	115V	(HP)	–	–	–	–	–	–	–	1/8	1/4	1/3	1/2	1/2	1	1.5	2	3
	230V	(HP)	–	–	–	–	–	1/10	1/6	1/3	1/2	1	1.5	2	3	3	3	7.5
Motor Load, 3-Phase	200V	(HP)	–	–	–	–	–	–	1/2	3/4	1	2	2	3	3	5	7.5	10
	230V	(HP)	–	–	–	–	–	–	1/2	3/4	1.5	2	3	3	5	7.5	7.5	10
	460V	(HP)	–	–	–	–	–	3/4	1	2	3	5	5	7.5	10	15	15	30
	575V	(HP)	–	–	–	–	1/2	3/4	1.5	3	5	5	7.5	10	15	20	20	30
Maximum Rated Current of Fuse or Breaker	(A)		500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500

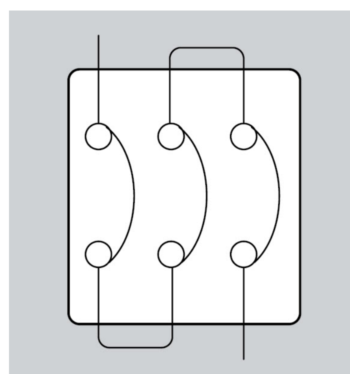
HMMP-63HR-x High Breaking Type Specifications

Rated Operational Current I_e			26	32	40	50	63
Maximum Short-Circuit Current	240V	(kA)	100	100	100	100	100
	480V	(kA)	50	50	50	50	50
	600V	(kA)	10	10	10	10	10
Motor Load, 1-Phase	115V	(HP)	2	2	3	3	5
	230V	(HP)	3	5	7.5	10	10
Motor Load, 3-Phase	200V	(HP)	7.5	7.5	10	15	20
	230V	(HP)	7.5	10	10	15	20
	460V	(HP)	15	20	30	30	40
	575V	(HP)	20	30	30	40	60
Maximum Rated Current of Fuse or Breaker	(A)		600	600	600	600	600

HMMP-100HR-x High Breaking Type Specifications

Rated Operational Current I_e			75	90	100
Maximum Short-Circuit Current	240V	(kA)	100	100	100
	480V	(kA)	50	50	50
	600V	(kA)	10	10	10
Motor Load, 1-Phase	115V	(HP)	5	7.5	10
	230V	(HP)	15	20	20
Motor Load, 3-Phase	200V	(HP)	20	25	30
	230V	(HP)	25	30	30
	460V	(HP)	50	60	75
	575V	(HP)	60	75	100
Maximum Rated Current of Fuse or Breaker	(A)		1000	1000	1000

For 1-phase applications, use in series as shown below.



IronHorse HMMP Manual Motor Protectors

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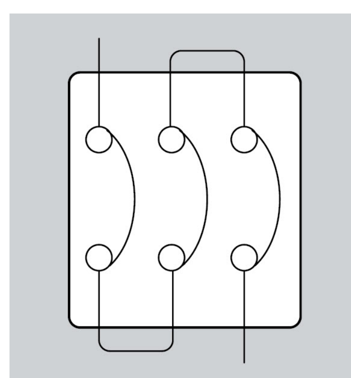
Manual Motor Controller (UL 508)

HMMP-32HR-x Manual Motor Controller (UL 508) Specifications																		
Rated Operational Current I_e			***0.16***	***0.25***	***0.4***	***0.63***	***1***	***1.6***	***2.5***	***4***	***6***	***8***	***10***	***13***	***17***	***22***	***26***	***40***
Maximum Short-Circuit Current	240V	(kA)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	480V	(kA)	65	65	65	65	65	65	65	65	65	65	65	65	30	30	30	30
	600V	(kA)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Motor Load, 1 Phase	115V	(HP)	–	–	–	–	–	–	–	1/8	1/4	1/3	1/2	1/2	1	1.5	2	3
	230V	(HP)	–	–	–	–	–	1/10	1/6	1/3	1/2	1	1.5	2	3	3	3	7.5
Motor Load, 3 Phase	200V	(HP)	–	–	–	–	–	–	1/2	3/4	1	2	2	3	3	5	7.5	10
	230V	(HP)	–	–	–	–	–	–	1/2	3/4	1.5	2	3	3	5	7.5	7.5	10
	460V	(HP)	–	–	–	–	–	3/4	1	2	3	5	5	7.5	10	15	15	30
	575V	(HP)	–	–	–	–	1/2	3/4	1.5	3	5	5	7.5	10	15	20	20	30
Max Fuse Size	(A)		1	1	1	1	3	6	10	15	20	30	40	50	60	80	100	150
Max Breaker Size	(A)		15	15	15	15	15	15	15	15	20	30	40	50	60	80	100	150

HMMP-63HR-x Manual Motor Controller (UL 508) Specifications							
Rated Operational Current I_e			***26***	***32***	***40***	***50***	***63***
Maximum Short-Circuit Current	240V	(kA)	100	100	100	100	100
	480V	(kA)	50	50	50	50	50
	600V	(kA)	10	10	10	10	10
Motor Load, 1 Phase	115V	(HP)	2	2	3	3	5
	230V	(HP)	3	5	7.5	10	10
Motor Load, 3 Phase	200V	(HP)	7.5	7.5	10	15	20
	230V	(HP)	7.5	10	10	15	20
	460V	(HP)	15	20	30	30	40
	575V	(HP)	20	30	30	40	60
Max Fuse Size	(A)		100	125	150	200	250
Max Breaker Size	(A)		100	125	150	200	250

HMMP-100HR-x Manual Motor Controller (UL 508) Specifications					
Rated Operational Current I_e			***75***	***90***	***100***
Maximum Short-Circuit Current	240V	(kA)	100	100	100
	480V	(kA)	50	50	50
	600V	(kA)	10	10	10
Motor Load, 1 Phase	115V	(HP)	5	7.5	10
	230V	(HP)	15	20	20
Motor Load, 3 Phase	200V	(HP)	20	25	30
	230V	(HP)	25	30	30
	460V	(HP)	50	60	75
	575V	(HP)	60	75	100
Max Fuse Size	(A)		300	350	400
Max Breaker Size	(A)		300	350	400

For 1-phase applications, use in series as shown below.



IronHorse
HMMP Manual Motor Protectors

Type 2 Coordination According to IEC60947-4-1

Short-circuit current I_q: 50kA
Voltage: 400/415 V, 50/60 Hz

Type 2 Coordination According to IEC60947-4-1

Standard Motors AC-3 at 400/415 V 1500RPM		Manual Motor Starter			Contactor	
kW	A	Circuit Breaker	Thermal Overload Release Setting Range (A)	Magnetic Release Response Current (A)	Type	(A)
5.5	11.5	HMMP-32HR-13	9 to 13	169	HMC-22B	22
7.5	15.5	HMMP-32HR-17	11 to 17	221	HMC-22B	22
10	20	HMMP-32HR-22	14 to 22	286	HMC-32A	32
11	22	HMMP-32HR-26	18 to 26	338	HMC-32A	32
18.5	35	HMMP-63HR-40	28 to 40	520	HMC-40A	40
22	41	HMMP-63HR-50	34 to 50	650	HMC-50A	50
30	55	HMMP-63HR-63	45 to 63	819	HMC-65A	65

Definition of Type 2 Coordination According to IEC 60947-4-1

- The contactor or the starter must not endanger persons or systems in the event of a short-circuit.
- The contactor or the starter must be suitable for further use.
- No damage to the overload relay or other parts may occur, with the exception of welding of the contactor or starter contacts, provided that these can be easily separated without significant deformation (such as with a screwdriver).

IronHorse
HMMP Manual Motor Protectors

IRONHORSE®

IEC-Rated Motor

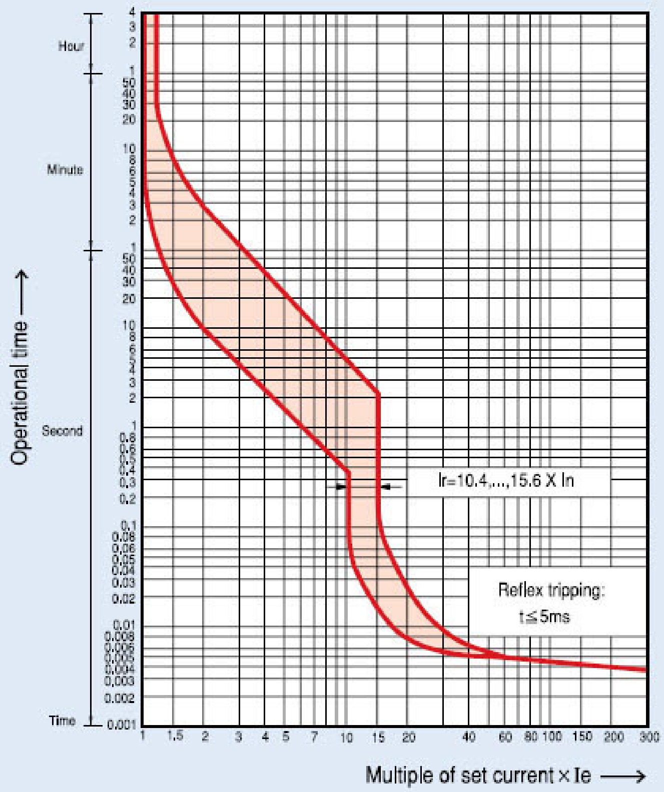
IronHorse HMMP ready for IE3-rated motors

Technical Specifications For Use With IE3-rated Motors								
Type	***Rated Current (A)***	***Short-Circuit Current (A)***	***Current Range (A)***			***Short-Circuit Current Ratio***		
			Min	***Mid***	***Max***	***Min***	***Mid***	***Max***
32	0.16	2.1	0.1	0.13	0.16	20.8	16.0	13.0
	0.25	3.3	0.16	0.2	0.25	20.3	16.3	13.0
	0.4	5.2	0.25	0.33	0.4	20.8	15.8	13.0
	0.63	8.2	0.4	0.52	0.63	20.5	15.8	13.0
	1	13.0	0.63	0.81	1	20.6	16.0	13.0
	1.6	20.8	1	1.3	1.6	20.8	16.0	13.0
	2.5	32.5	1.6	2.1	2.5	20.3	15.5	13.0
	4	52	2.5	3.3	4	20.8	115.8	13.0
	6	78	4	5	6	19.5	15.6	13.0
	8	104	5	6.5	8	20.8	16.0	13.0
	10	130	6	8	10	21.7	16.3	13.0
	13	169	9	11	13	18.8	15.4	13.0
	17	221	11	14	17	20.1	15.8	13.0
	22	286	14	18	22	20.4	15.9	13.0
	26	338	18	22	26	18.8	15.4	13.0
	40	520	28	34	40	18.6	15.3	13.0
63	26	338	18	22	26	18.8	15.4	13.0
	32	416	22	27	32	18.9	15.4	13.0
	40	520	28	34	40	18.6	15.3	13.0
	50	650	34	42	50	19.1	15.5	13.0
	63	819	45	54	63	18.2	15.2	13.0
100	75	975	55	65	75	17.7	15.0	13.0
	90	1170	70	80	90	16.7	14.6	13.0
	100	1300	80	90	100	16.3	14.4	13.0

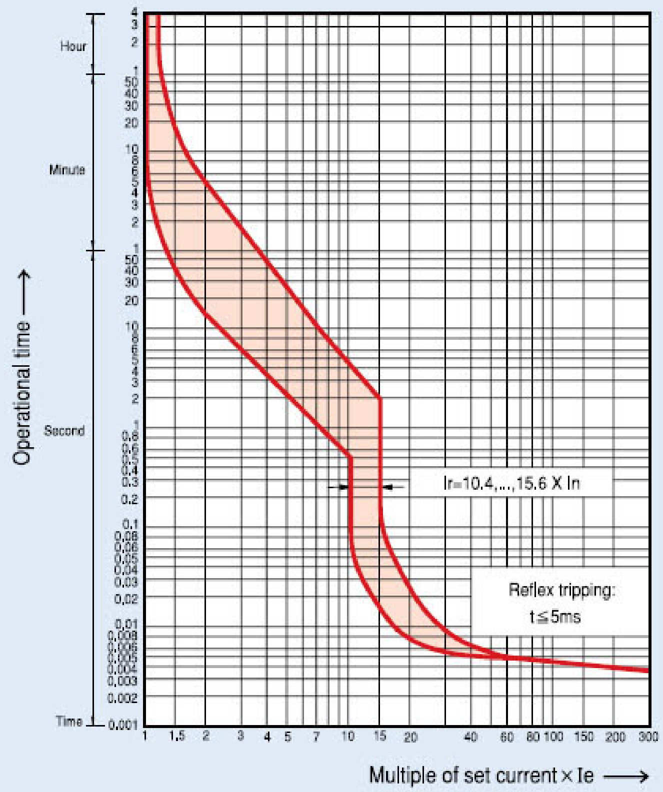
IronHorse HMMP Manual Motor Protectors

Thermal limit on short circuits

HMMP-32 Tripping Curve



HMMP-63, HMMP-100 Tripping Curve



I. Thermal release trip current :

The adjustable inverse bimetal trip reliability protects motors against overloads.

The curve shows the mean operating current at an ambient temperature of 20°C [68°F] starting from cold. Careful testing and setting ensures effective motor protection even in the case of single-phasing.

II. Magnetic release trip current :

The instantaneous magnetic trip has a fixed operating current setting that corresponds to 13 times the maximum value of the setting range. At a lower setting, it is correspondingly higher.

III. Current setting I_e :

The overload trip corresponds to a thermal overload relay in a motor starter conforming to IEC 947-4-1. If a different value is prescribed (e.g. reduced I_e for a cooling medium having a temperature higher than 40°C [104°F] or a place of installation higher than 2000m [6562ft] above sea level), the setting current is equal to the reduced rated current I_e of the motor.

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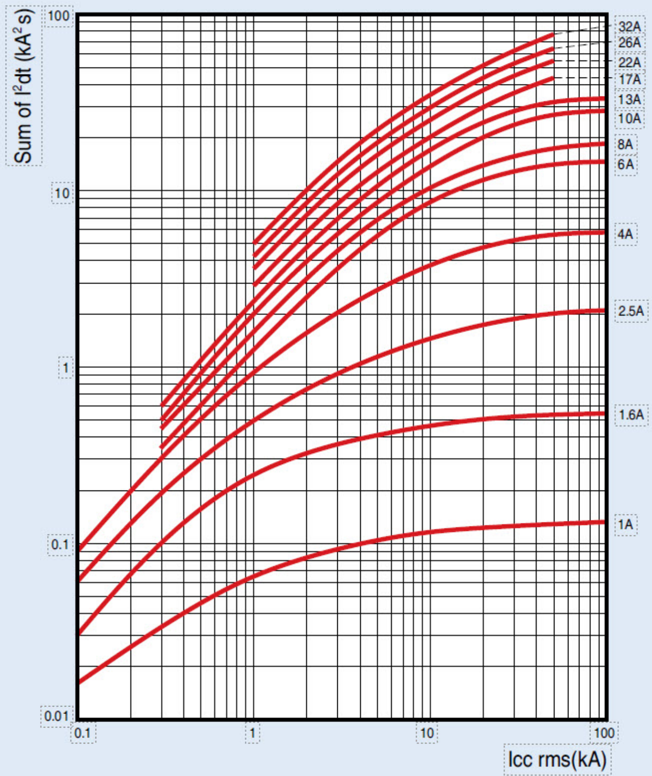
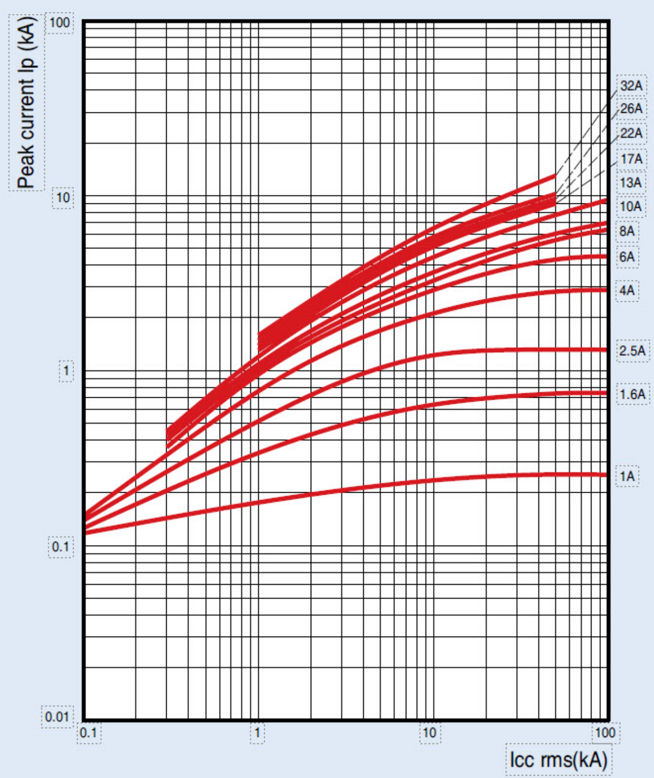
Thermal limit in kA^2s in the magnetic operating zone (U_e=415V) – HMMP-32HR-xx





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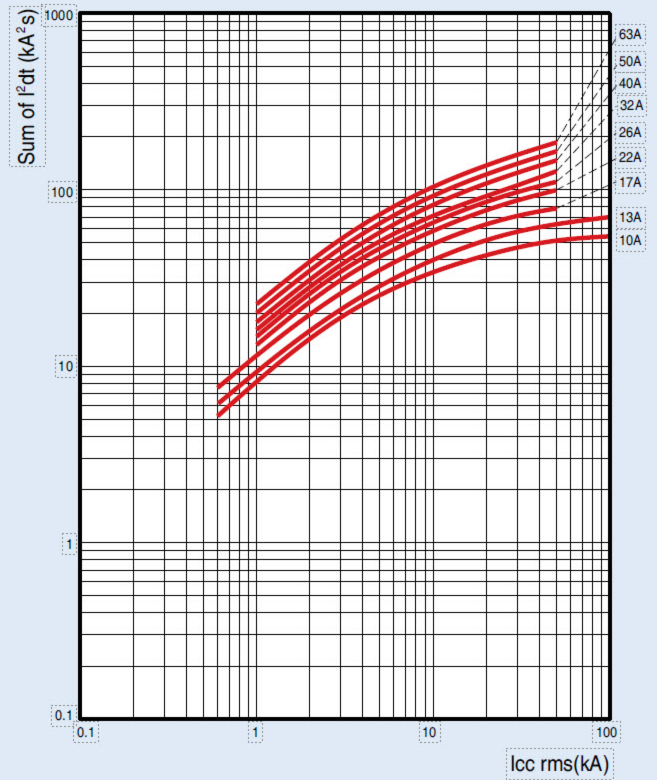
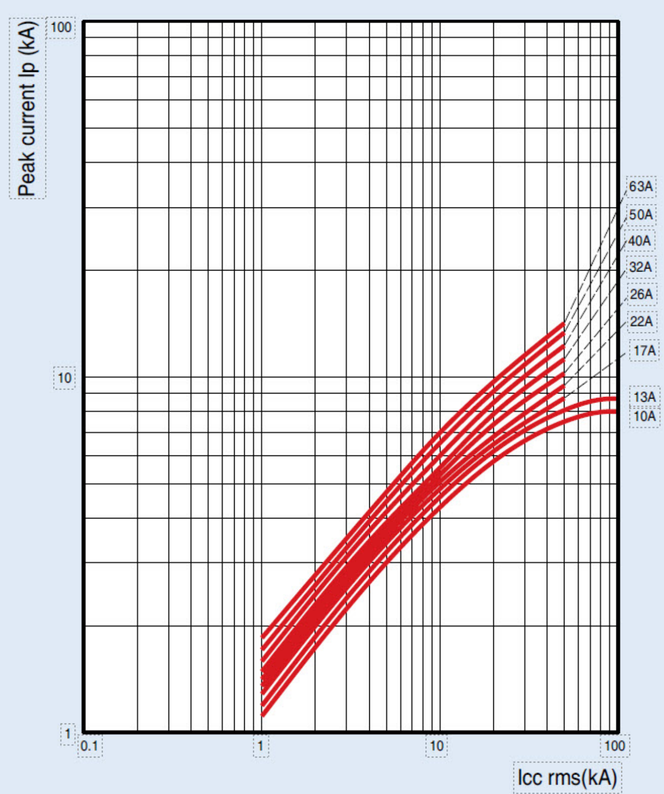
Thermal limit in kA^2s in the magnetic operating zone (U_e=415V) – HMMP-63HR-xx





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Thermal limit in kA^2s in the magnetic operating zone (U_e=415V) – HMMP-100HR-xx