



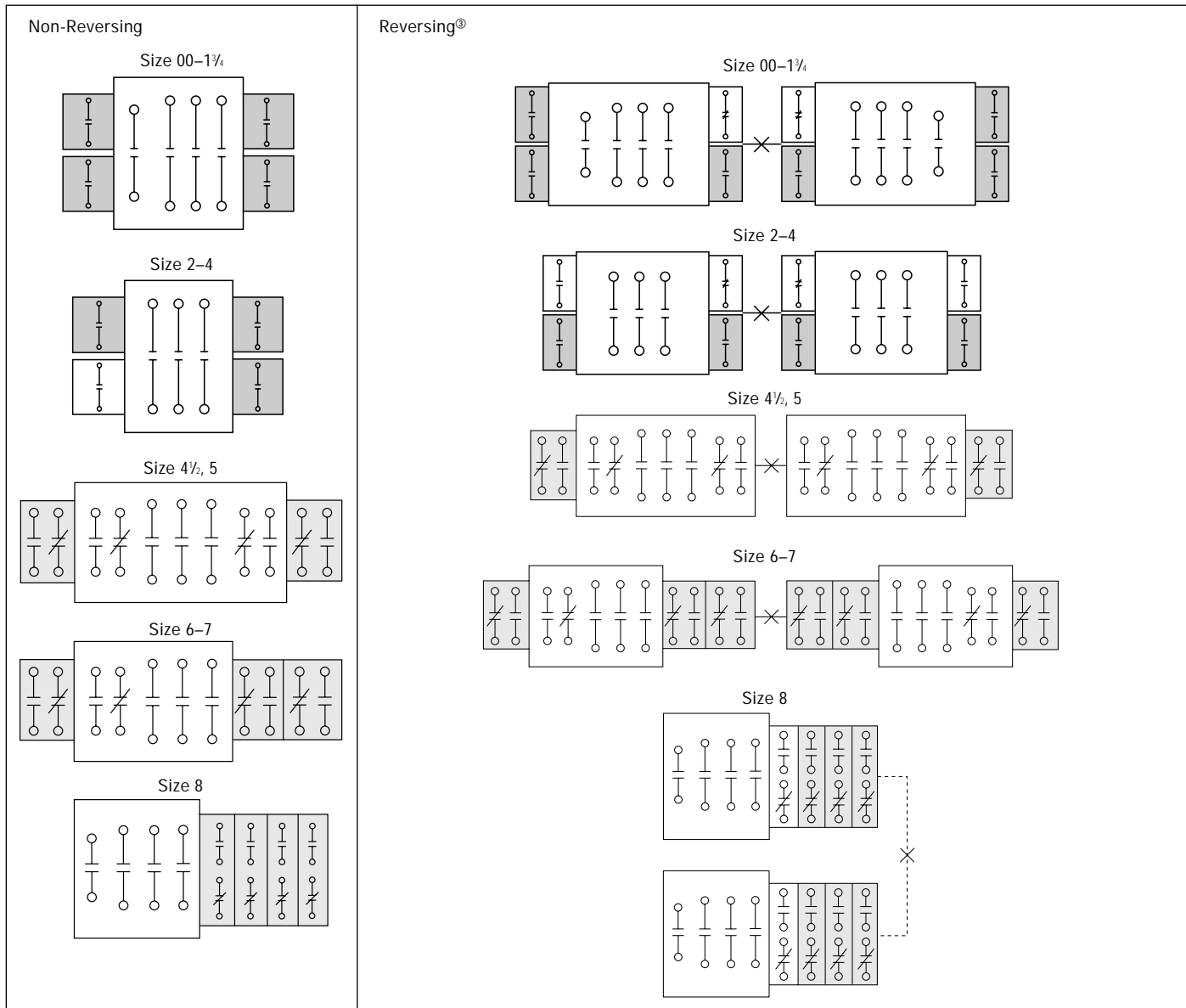
Auxiliary Contact Configurations

Heavy Duty Non-Reversing Contactor And Starter Auxiliary Contact Configurations

Size	Standard Contacts at No Additional Price	Extra Contacts in Addition To Standard Contacts for an Additional Price ^{①②}	
		Left Hand Side	Right Hand Side
00-1½	1-NO	2-NO or NC	2-NO or NC
2-4	1-NO	1-NO or NC	2-NO or NC
4½, 5	2-NO and 2-NC	1-NO and 1-NC	1-NO and 1-NC
6, 7	1-NO and 1-NC	1-NO and 1-NC	2-NO and 2-NC
8	1-NO	—	4-NO and 4-NC

Heavy Duty Reversing Contactor And Starter Auxiliary Contact Configurations

Size	Standard Contacts ^③ Per Contactor at No Additional Price	Extra Contacts Per Contactor in Addition to Standard Contacts for an Additional Price ^{①②}	
		Left Hand Side	Right Hand Side
00-1½ (Left Cont.)	1-NO and 1-NC	2-NO or NC	1-NO or NC
00-1½ (Right Cont.)	1-NO and 1-NC	1-NO or NC	2-NO or NC
2-4	1-NO and 1-NC	1-NO or NC	1-NO or NC
4½, 5 (Left Cont.)	2-NO and 2-NC	1-NO and 1-NC	—
4½, 5 (Right Cont.)	2-NO and 2-NC	—	1-NO and 1-NC
6, 7 (Left Cont.)	1-NO and 1-NC	1-NO and 1-NC	2-NO and 2-NC
6, 7 (Right Cont.)	1-NO and 1-NC	2-NO and 2-NC	1-NO and 1-NC
8	2-NO and 1-NC	—	3-NO and 3-NC



① If extra auxiliary contacts are required in addition to the maximum available, add a control relay to the enclosed starter from the factory modifications.
 ② See page 122 for price on additional auxiliary contacts.
 ③ For each contactor, 1-NC contact used for standard electrical interlocking scheme and 1-NO for seal in contact.

□ — White box: Existing contacts
 ■ — Shaded box: Contacts can be field added

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 NEMA and HP
 Rated Control



Control Ratings

Max HP Plugging and Jogging

Ratings shown are for applications requiring repeated interruptions of stalled motor current or repeated closing of high transient currents encountered in rapid motor reversal, involving more than five openings or closings per minute and more than ten in a ten minute period, such as plug stop, plug reverse or jogging duty. Ratings apply to single speed and multi speed controllers.

Continuous Amp Rating, Service Limit

The service limit current represents the maximum RMS current, in amperes, which the controller may be expected to carry for protracted periods in normal service. At service limit current ratings, temperature rises may exceed those obtained by testing the controller at its continuous current rating. The trip current of overload relays or other motor protective devices shall not exceed the service limit current ratings of the controller.

Ballast Type, Tungsten and Other Discharge Type Lighting Loads

The characteristics of ballast type lamps are such that it is not necessary to derate Class 40 contactors below their normal continuous current rating.

Class 40 contactors may also be used for controlling tungsten and other discharge type lighting loads, Class 40 contactors are specifically designed for such loads and are applied at their full rating as listed in the Class 40 section.

Resistance Heating Loads

Ratings apply to Class 40 contactors which are employed to switch the load at the utilization voltage of the resistance heating or light producing element with a duty which requires continuous operation of not more than five openings per minute.

Capacitor Switching KVA Rating

When discharged, a capacitor has essentially zero impedance. For repetitive switching by a contactor, sufficient impedance should be connected in series to limit inrush current to not more than 6 times the contactor rated continuous current. In many installations, the impedance of connecting conductors may be sufficient for the purpose. When switching to connect additional banks, the banks already on the line may be charged and can supply additional available short circuit current which should be considered when selecting impedance to limit the current.

The ratings shown for capacitor switching assume the following maximum available fault currents:

Size 2-3: 5,000 Amp
RMS Sym

Size 3½-5: 10,000 Amp
RMS Sym

Size 6: 18,000 Amp
RMS Sym

If available fault current is greater than these values, connect sufficient impedance in series as noted in the previous paragraph.

The motor ratings in the table are NEMA standard ratings and apply only when the code letter of the motor is the same as or occurs earlier in the alphabet than is shown in the table below.

Motors having code letters occurring later in the alphabet may require a larger controller.

Motor HP Rating	Maximum Allowable Motor Code Letter
1½, 2	L
3-5	K
7½ & above	H

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NEMA and HP
Rated Control

NEMA Electrical/Mechanical Ratings

Size	Load Volts	Max HP				Cont Amps	Service Limit Amps	Tungsten & Ballast Type Lamp Amps 480 Volts Max	Resistance Heating kW		Transformer Switching 50-60Hz KVA Rating Inrush Peak Time Continuous Amps				Capacitor KVA Switching Rating 3 Ph KVAR	Mechanical Life
		Normal Duty		Plugging & Jogging Duty					1 Ph	3 Ph	20 Times		20-40 Times			
		1 Ph	3 Ph	1 Ph	3 Ph						1 Ph	3 Ph	1 Ph	3 Ph		
00	115	½	—	—	—	9	11	—	1.15	2.0	—	—	—	—	10 million operations	
	200	—	1½	—	—	9	11	—	2.0	3.46	—	—	—	—		
	230	1	1½	—	—	9	11	—	2.3	4.0	—	—	—	—		
	380	—	1½	—	—	9	11	—	—	6.5	—	—	—	—		
	460	—	2	—	—	9	11	—	4.6	8.0	—	—	—	—		
	575	—	2	—	—	9	11	—	5.8	10.0	—	—	—	—		
0	115	1	—	½	—	18	21	20	2.3	4.0	0.6	—	0.3	—	10 million operations	
	200	—	3	—	1½	18	21	20	4.0	6.92	—	1.8	—	0.9		
	230	2	3	1	1½	18	21	20	4.6	8.0	1.2	2.1	0.6	1.0		
	380	—	5	—	1½	18	21	20	—	13.1	—	—	—	—		
	460	—	5	—	2	18	21	20	9.2	15.9	2.4	4.2	1.2	2.1		
	575	—	5	—	2	18	21	—	11.5	19.9	3.0	5.2	1.5	2.6		
1	115	2	—	1	—	27	32	30	3.5	6.0	1.2	—	0.6	—	10 million operations	
	200	—	7½	—	3	27	32	30	6	10.4	—	3.6	—	1.8		
	230	3	7½	2	3	27	32	30	6.9	11.9	2.4	4.3	1.2	2.1		
	380	—	10	—	5	27	32	30	—	19.7	—	—	—	—		
	460	—	10	—	5	27	32	30	13.8	23.9	4.9	8.5	2.5	4.3		
	575	—	10	—	5	27	32	—	17.3	29.8	6.2	11.0	3.1	5.3		
1P	115	3	—	1½	—	35	42	45	5.8	—	—	—	—	—	10 million operations	
	230	5	—	3	—	35	42	45	11.5	—	—	—	—	—		
1¾	115	—	—	—	—	40	40	45	5.8	9.9	1.6	—	0.8	—	10 million operations	
	200	—	10	—	5	40	40	45	10	17.3	—	4.9	—	2.4		
	230	—	10	—	5	40	40	45	11.5	19.9	3.2	5.75	1.6	2.8		
	380	—	15	—	7½	40	40	45	—	32.9	—	—	—	—		
	460	—	15	—	7½	40	40	45	23	39.8	6.6	11.2	3.3	5.7		
	575	—	15	—	7½	40	40	—	28.8	49.7	8.1	14.5	4.1	7.1		



Control Ratings

NEMA Electrical/Mechanical Ratings

Size	Load Volts	Max HP				Cont Amps	Service Limit Amps	Tungsten & Ballast Type Lamp Amps 480 Volts Max	Resistance Heating kW		Transformer Switching 50–60Hz KVA Rating Inrush Peak Time Continuous Amps				Capacitor KVA Switching Rating 3 Ph KVAR	Mechanical Life
		Normal Duty		Plugging & Jogging Duty					1 Ph	3 Ph	20 Times		20–40 Times			
		1 Ph	3 Ph	1 Ph	3 Ph						1 Ph	3 Ph	1 Ph	3 Ph		
2	115	3	—	2	—	45	52	60	8.1	13.9	2.1	—	1.0	—	10 million operations	
	200	—	10	—	7½	45	52	60	14	24.2	—	6.3	—	3.1		
	230	7½	15	5	10	45	52	60	16.1	27.8	4.1	7.2	2.1	3.6		
	380	—	25	—	15	45	52	60	—	46.0	—	—	—	—		
	460	—	25	—	15	45	52	60	32.2	55.7	8.3	14	4.2	7.2		
	575	—	25	—	15	45	52	—	40.3	69.6	10.0	18	5.2	8.9		
2½	115	5	—	—	—	60	65	75	10.4	17.9	3.1	—	1.5	—	10 million operations	
	200	—	15	—	10	60	65	75	18	31.1	—	9.1	—	4.6		
	230	10	20	—	15	60	65	75	20.7	35.8	6.1	10.6	3.1	5.3		
	380	—	30	—	20	60	65	75	—	59.2	—	—	—	—		
	460	—	30	—	20	60	65	75	41.4	71.6	12	21	6.1	10.6		
	575	—	30	—	20	60	65	—	51.8	89.5	15	26.5	7.6	13.4		
3	115	7½	—	—	—	90	104	100	14.4	24.8	4.1	—	2.0	—	5 million operations	
	200	—	25	—	15	90	104	100	25	43.3	—	12	—	6.1		
	230	15	30	—	20	90	104	100	28.8	50.0	8.1	14	4.1	7.0		
	380	—	50	—	30	90	104	100	—	82.2	—	—	—	—		
	460	—	50	—	30	90	104	100	57.5	99.4	16	28	8.1	14		
	575	—	50	—	30	90	104	—	71.9	124	20	35	10	18		
3½	115	—	—	—	—	115	125	150	18.4	31.8	—	—	—	—	5 million operations	
	200	—	30	—	20	115	125	150	32	55.4	—	16	—	8		
	230	—	60	—	25	115	125	150	36.8	63.7	11	18.5	5.4	9.5		
	380	—	60	—	30	115	125	150	—	105	—	—	—	—		
	460	—	75	—	40	115	125	150	73.6	127	21.5	37.5	11.0	18.5		
	575	—	75	—	40	115	125	—	92	159	37	47	13.5	23.5		
4	200	—	40	—	25	135	156	200	39	67.5	—	20	—	10	5 million operations	
	230	—	50	—	30	135	156	200	44.9	77.6	14	23	6.8	12		
	380	—	75	—	50	135	156	200	—	128	—	—	—	—		
	460	—	100	—	60	135	156	200	89.7	155	27	47	14	23		
	575	—	100	—	60	135	156	—	112	194	34	59	17	29		
	200	—	50	—	30	210	225	—	53	91.7	—	30.5	—	15		—
4½	230	—	75	—	40	210	225	—	60.9	105	20.5	35	10.4	18	10 million operations	
	380	—	100	—	75	210	225	—	—	174	—	—	—	—		
	460	—	150	—	100	210	225	—	122	211	40.5	70.5	20.5	35		
	575	—	150	—	100	210	225	—	152	264	51	88	25.5	44		
	200	—	75	—	60	270	311	—	70	121	—	41	—	20		10 million operations
	230	—	100	—	75	270	311	—	80.5	139	27	47	14	24		
380	—	150	—	125	270	311	—	—	230	—	—	—	—			
460	—	200	—	150	270	311	—	161	278	54	94	27	47			
575	—	200	—	150	270	311	—	201	348	68	117	34	59			
200	—	150	—	125	540	621	—	—	162	—	81	—	41	—	5 million operations	
230	—	200	—	150	540	621	—	120	210	54	94	27	47			
380	—	300	—	250	540	621	—	—	342	—	—	—	—			
460	—	400	—	300	540	621	—	240	415	108	188	54	94			
575	—	400	—	300	540	621	—	300	515	135	234	68	117			
200	—	—	—	—	810	932	—	—	—	—	—	—	—	—		5 million operations
230	—	300	—	—	810	932	—	180	315	—	—	—	—			
380	—	—	—	—	810	932	—	—	—	—	—	—	—			
460	—	600	—	—	810	932	—	360	625	—	—	—	—			
575	—	600	—	—	810	932	—	450	775	—	—	—	—			
200	—	—	—	—	1215	1398	—	—	—	—	—	—	—	—	5 million operations	
230	—	450	—	—	1215	1398	—	—	—	—	—	—	—			
380	—	—	—	—	1215	1398	—	—	—	—	—	—	—			
460	—	900	—	—	1215	1398	—	—	—	—	—	—	—			
575	—	900	—	—	1215	1398	—	—	—	—	—	—	—			

Max HP 380V 50Hz Ratings

Class	Description	Control Size 3 Phase													
		00	0	1	1½	2	2½	3	3½						
14, 40	Across The Line	2	5	10	15	25	30	50	60	75	100	150	300	500	700
30, 32	Var & Const Torque Constant HP	—	5	10	15	25	30	50	60	75	100	150	300	500	700
		—	3	7½	10	20	25	40	50	60	75	100	200	300	400
36, 37	Auto Transformer Wye Delta	—	—	10	15	25	30	50	60	75	100	150	300	500	700
		—	—	15	25	40	50	75	100	150	200	250	500	800	1000

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 NEMA and HP
 Rated Control



AC/DC Coil and Operating Information

AC Coils For NEMA Contactors

Controller Size	Sealed Watts	Volts 60Hz	Inrush (Open Magnet)		Normal (Sealed Magnet)		Normal Coil Operating Limits	Typical Drop-Out Volts	Operating Times (msec)	
			Amps	VA	Amps	VA			Pick-Up	Drop-Out
00 thru 2 1/2	8.6	24 120 208 240 277 480 600	9.08 1.82 1.05 .91 .79 .45 .36	218	1.04 .21 .12 .105 .090 .052 .042	25	85%–110% of Rated Voltage	50% of Rated Voltage	19–29	10–14
3, 3 1/2	14	24 120 208 240 277 480 600	12.9 2.58 1.49 1.29 1.12 .646 .516	310	1.08 .217 .125 .108 .094 .054 .043	26			26–41	14–19
4	22	120 208 240 277 480 600	4.25 2.45 2.14 1.77 1.08 .85	510	.425 .245 .215 .183 .112 .085	51			18–34	10–12
4 1/2, 5	—	120 240 480 600	13.25 6.63 3.31 2.65	1590	.783 .392 .196 .157	94			25–40	10–30
6	—	240 480 600	12.08 6.04 4.83	2900	.438 .219 .175	105			30–50	10–20
7	—	120 240 480 600	33.33 16.67 8.33 6.67	4000	1.17 .583 .292 .233	140			30–50	10–20
8	—	120 240 480 600	35.00 17.50 8.75 7.00	4200	.833 .417 .208 .167	100			40–80	140–240

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NEMA and HP Rated Control

DC Coils

Controller Size	00–2 1/2		3, 3 1/2		4	
	Inrush Amps	Normal Amps	Inrush Amps	Normal Amps	Inrush Amps	Normal Amps
12	14.0	0.5	20.0	1.0	26.0	1.30
24	7.3	0.25	10.0	0.50	12.0	0.64
32	6.0	0.19	7.8	0.43	9.3	0.48
48	3.6	0.12	5.2	0.284	6.2	0.32
125	1.4	0.05	2.0	0.136	2.7	0.130
250	0.7	0.025	1.0	0.052	1.3	0.064

AC-DC Rectifier

Controller Size	AC Input Volts 50–120Hz	DC Output				
		Volts	Amps			.016 Sec
25°C	50°C		75°C			
00–6	120	125	2	1	.7	15
00–5	240	250	2	1	.7	15



Size 4–6 Operating Information

Specifications

Description	Size		
	4	5	6
Poles	3	3	3
Maximum voltage rating	600V	600V	600V
Ampere rating (enclosed)	135A	270A	540A
Frequency, Hz	50/60	50/60	50/60
Maximum closing current	1600A	3000A	6000A
Maximum interrupting current	1600A	3000A	6000A
Short time current:			
1 Second	2400A RMS	4500A RMS	9000A RMS
2 Second	1600A RMS	3000A RMS	6000A RMS
Dielectric strength	2200V AC	5375V AC	5375V AC
Maximum allowable interrupting	1200/Hr.	—	—
Impulse voltage (1 × 40 mS)	15 kV	15 kV	15 kV
Maximum motor horsepower at:			
200V	40 HP	75 HP	150 HP
230V	50 HP	100 HP	200 HP
380V	75 HP	150 HP	300 HP
460V	100 HP	200 HP	400 HP
575V	100 HP	200 HP	400 HP
795V	—	—	—
1000V	—	—	—
1500V	—	—	—
3 Phase capacitive switching (kVAR)			
230V	40 kVAR	80 kVAR	160 kVAR
460V	80 kVAR	160 kVAR	320 kVAR
575V	100 kVAR	200 kVAR	400 kVAR
Transformer switching (kVA) [Ⓛ]			
Single phase, 2 pole:			
120V	6.8 kVA	14 kVA	27 kVA
240V	14 kVA	27 kVA	54 kVA
480V	27 kVA	54 kVA	108 kVA
600V	34 kVA	68 kVA	135 kVA
Three phase, 3 pole:			
240V	23 kVA	47 kVA	94 kVA
480V	47 kVA	94 kVA	188 kVA
600V	59 kVA	117 kVA	234 kVA
Dimensions:			
Length	6.63"	12.50"	13.99"
Width	4.63"	7.90"	7.90"
Depth	5.96"	7.25"	7.00"

Electrical Characteristics Coil Data (AC Supply Rectified)

Burden	Size		
	4	5	6
Inrush VA	300	600	1700
Sealed VA	30	20	28
Sealed Watts	6	20	28
Pick-up volts	70% of rated coil volts		
Drop-out volts	50% of rated coil volts		
Pick-up time in hertz	1.5–2	1.5–2	1.5–2
Drop-out time in hertz	6–7.5	6–6.15	6–6.15

[Ⓛ]For transformers having inrush currents of not more than 20 times the rated full load current.

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 NEMA and HP
 Rated Control