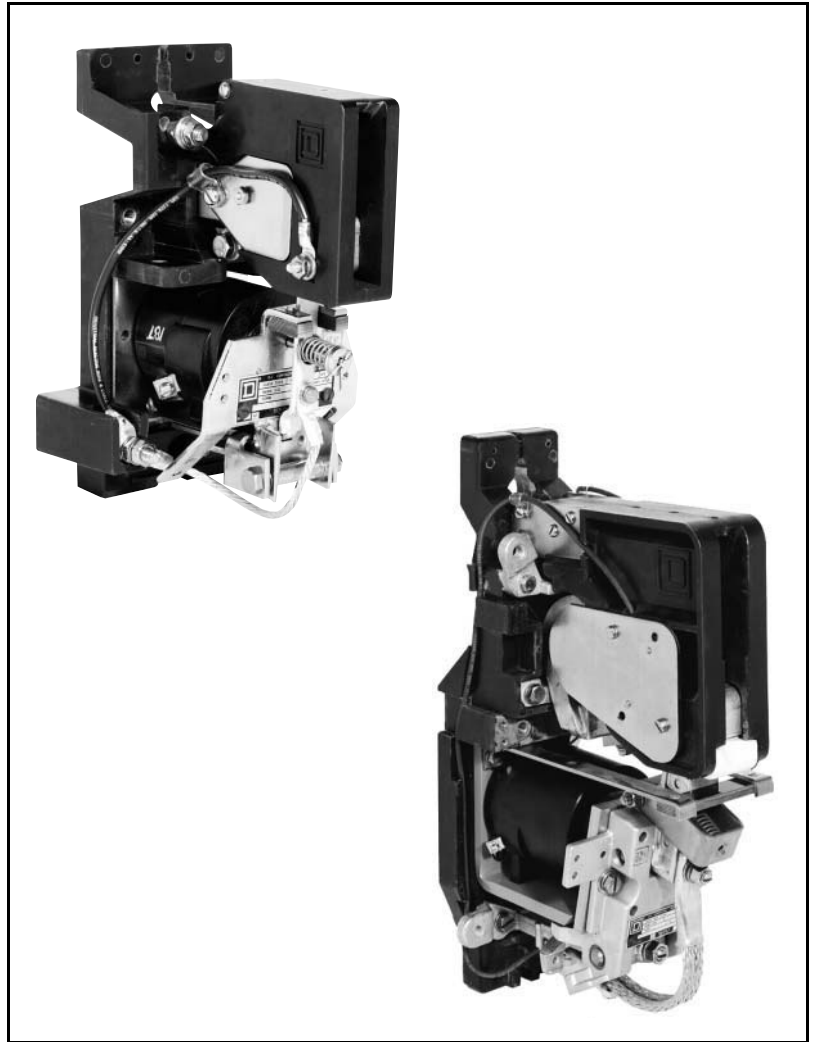


# Crane Control Class 7004

Catalog

# 03



CRANE CONTROL  
CLASS 7004

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The Electric Controller and  
Manufacturing Company, LLC

# Crane Control Class 7004

## Type M Line-Arc® DC Contactors



Class 7004  
Type MXDO1 Contactor



Class 7004  
Type MGO1 Contactor

### PRICING INFORMATION

Type M DC magnetic, mill type, clapper contactors are designed for the control of DC motors.

- Front connected
- High strength glass polyester insulating base for steel base mounting
- Line-Arc® method of arc extinction for longer tip life

### Basic Contactor

The basic contactor is furnished without power lugs, electrical or mechanical interlocks.

Note: For coil voltages other than 230 V, 120 V, 75 V, 60 V, or 45 V add \$220 to the list price per contactor.

Maximum VDC	Number of Poles ▲	NEMA Size	Open 8 Hr Ampere Rating	Open Type ●	
				Type	Price ★
600	Single Pole Normally Open	1	25	MXCO1	\$ 405.
		2	50	MXDO1	557.
		3	100	MEO1	846.
		4	150	MFO1	1026.
		5	300	MGO1	1524.
		5A †	400	MGAO1	1980.
		6	600	MHO1	2862.
		6A †	810	MHAO1	3455.
	Single Pole Normally Closed	1	25	MXCO3	810.
		2	50	MXDO3	932.
		3	100	MEO3	1152.
		4	150	MFO3	1404.
		5	300	MGO3	2318.
		5A †	400	MGAO3	3015.
		6 ■	600	MHO3	4244.
		8 ■	1350	MKO3	7929.

- ▲ See contactor Application Data for double pole contactors.
- † Not a NEMA size/rating.
- See Class 9998 for coil data.
- Operating coil forcing circuit may be required; consult factory.

### Factory Installed Modifications

Form	Description	NEMA Size	Price ★
Y781	Silver Faced Power Contact Tips	1	\$ 269.
		2	269.
		3	423.
		4	434.
		5 & 5A †	659.
		6 & 6A †	897.
		8	1682.

† 5A/6A is not a NEMA size/rating.

Ordering Information Required:

1. Class                      2. Type                      3. Form                      4. Coil Voltage

### Accessory Kits For User Installation

Class 9999 user modification kits include all necessary mounting hardware and installation instructions. Mechanical interlocks, pneumatic timers, and tie bars can be mounted on normally open devices only.

NEMA Size	Mechanical Interlock ●		Tie Bar ●		Power Lug ▲	
	Type	Price ★	Type	Price ★	Type	Price ★
1 & 2	MM1	\$ 153.	MT1	\$ 54.	...	
3 & 4	MM2	153.	MT2	54.	ML1	\$ 54.
5 & 5A †	MM3	216.	MT3	54.	ML2	90.
6 & 6A †	MM4	270.	MT4	90.	ML3	207.
8	MM5	318.	MT5	92.	ML3	207.

- ▲ Contains four clam shell type lugs. For copper conductors only.
- † 5A/6A is not a NEMA size/rating.
- For use with normally open contactors only.

NEMA Size	Electrical Interlock (one N.O. and one N.C. contact)	
	Type	Price ◇
1 to 8	MX11	\$140.

- ★ CP9B
- ◇ CP9C

CP9B CP9C Discount Schedule

Ordering Information Required:

1. Class  
2. Type



### APPLICATION DATA

Ratings are based on 40 °C (104 °F), per NEMA standards.

#### Mounting

The Type M contactor with its insulated base can be mounted directly on uninsulated steel panels, angle iron frames, etc. The contactors are completely front-connected.

#### Wiring

Size 1 through 5A Type M contactors have a wire accessway in the base for convenient out-of-the-way routing of cables and control wires. Size 6 through 8 contactors have a flat mounting base. Power connections to the NEMA Sizes 3 through 8 contactors can be made from either side.

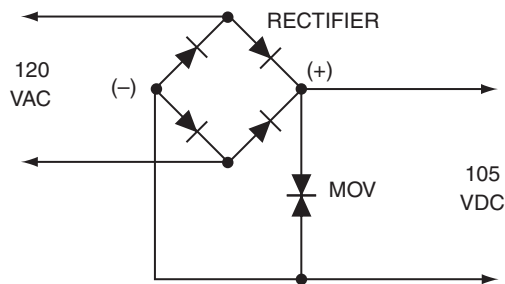
#### Coil Data

DC operating coils are designed in accordance with NEMA standards to withstand 110% of rated voltage continuously and to operate the contactor successfully at 80% of rated voltage. Standard coil voltages are 120 VDC and 240 VDC. For other available coil voltages, refer to the Class 9998 Coil Data Catalog Sheet.

#### AC to DC Control Voltage Conversion

To control the DC contactor coil from a 120 VAC supply, order each single pole contactor with 120 VDC coil or for double pole contactors, order each contactor with a 60 VDC coil.

Connect the rectifier and suppressor (MOV) as shown.



Rectifier part no. is 27907-34220 (800 PIV, 30 A)

MOV part no. is 52906-028-59

#### Double Pole Contactors

Double-pole, normally-open contactors can be built by ordering two single-pole, normally-open contactors with half-voltage operating coils and one tie bar kit. The two coils must be connected in series.

#### User Modification Kits

A number of Class 9999 user modification kits are available for use with Type M contactors. Power contact tip parts kits are listed under Class 9998.

#### Maximum Number of Accessories and Accessory Combinations

For single-pole, normally-open contactors, two electrical interlock kits and any one of the following:

- Two mechanical interlock kits
- One tie bar kit and one mechanical interlock kit

For single-pole, normally-closed contactors, two electrical interlock kits

# Crane Control Class 7004

## Type M Line-Arc® DC Contactors

### APPLICATION DATA

#### Electrical Interlocks

Control circuit interlocks are available in units of one normally open and one normally closed contacts. On each single pole normally open and normally closed contactor a maximum of two interlock kits can be mounted. Interlock kits include the movable and stationary contacts plus all necessary hardware for mounting.

Electrical interlocks are rated in accordance with NEMA Standard ICS- 2-125 (A600 and N600 Table Ratings).



Class 9999 Type MX11  
Electrical Interlock Kit

A600	Maximum Continuous Amperes	Maximum Make and Break Current Amperes ▲							
		120V		240V		480V		600V	
		Make	Break	Make	Break	Make	Break	Make	Break
AC	10	60	6	30	3	15	1.5	12	1.2

N600	Maximum Continuous Amperes	Maximum Make and Break Current Amperes ▲					
		125V		250V		600V	
		Make	Break	Make	Break	Make	Break
DC	10	2.2	2.2	1.1	1.1	0.4	0.4

▲ Make and break ratings apply for double-throw contacts only when both the normally open and normally closed contacts are connected to the same polarity.

#### Mechanical Interlock

A horizontal mechanical interlock is mounted between two single pole normally open or double pole tied normally open contactors mounted side by side. This interlock prevents the two contactors from operating simultaneously.



Class 9999  
Type MM2  
Mechanical  
Interlock Kit

#### Lugs

Type M contactors are furnished without power lugs. A kit is available consisting of lugs and hardware for mounting on Size 3 and larger contactors. No power lug kits are available for the NEMA Size 1 and 2 contactors. These contactors are designed to use lugs supplied by the user.

#### Lug Wire Capacity

Lug Type ▲	Minimum Wire Size	Maximum Wire Size
ML1	Number 8	Number 00
ML2	Number 0	300 MCM
ML3	250 MCM	500 MCM

▲ Contains four clam shell type lugs. For copper conductors only.

#### Power Contact Tips

A Class 9998 power contact tips part kit consists of movable and stationary contact tips with necessary mounting hardware for two single pole contactors. Consult Catalog Section 9998 for additional information.

Copper contact tips are standard. Silver-faced contact tips are available and are recommended for applications where the contactors remain closed for long periods of time. Silver-faced contact tips are standard on crane manual-magnetic disconnect switches.

#### Tie Bar

Applications requiring double pole Type M contactors can be met by supplying single pole normally open only contactors with tie bars. The tie bar is made from an insulating material and connects the armatures of the contactors together. For double pole contactors, it is recommended that the operating coils be connected in series. Each coil should be rated for one half of system voltage. See Catalog Section 9999, page 160, for additional information.

# Crane Control Class 7004 Type M Line-Arc® DC Contactors

## APPLICATION DATA

### Class 9999 AI1 Arc Suppressor

The Class 9999 AI1 arc suppressor is designed to reduce arcing of pilot devices in DC inductive control circuits of 250 VDC or less.

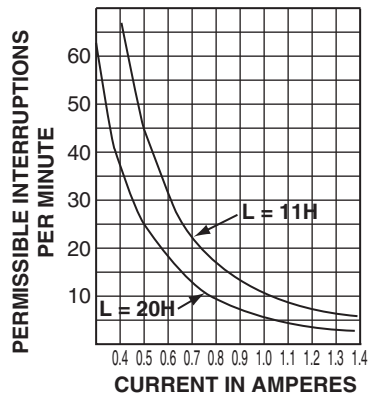


**Class 9999  
Type AI1  
Arc Suppressor**

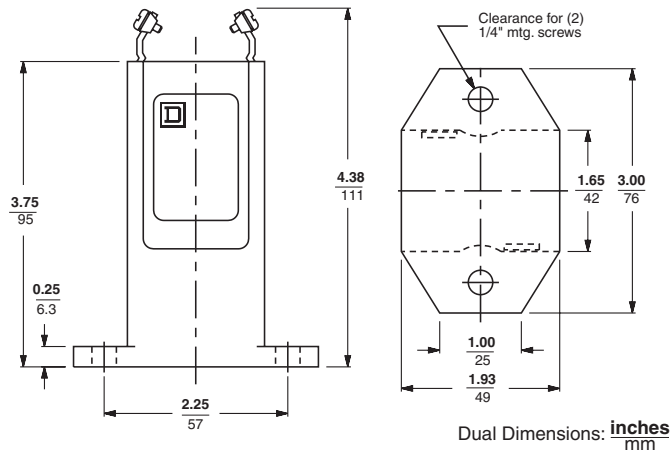
Type	Price
AI1	\$167.

The AI1 arc suppressor will limit the inductive voltage surge to a maximum of 600 VDC when applied in accordance with the application chart. When applying the arc suppressor to a circuit, two factors must be considered, the current drawn by the inductive load and the number of times per minute that the load will be interrupted. Once these two factors are determined, the application is checked against the application chart. The chart shows the maximum interruptions per minute that the arc suppressor can handle at a given current. As long as an application falls below the curve, the arc suppressor will handle the load. The arc suppressor is connected in parallel with the inductive load and is in the circuit at all times.

### Application Chart for AI1 Arc Suppressor



### Approximate Dimensions And Weights



Net Weight – 1 lb (0.45 kg)

### Ordering Information Required:

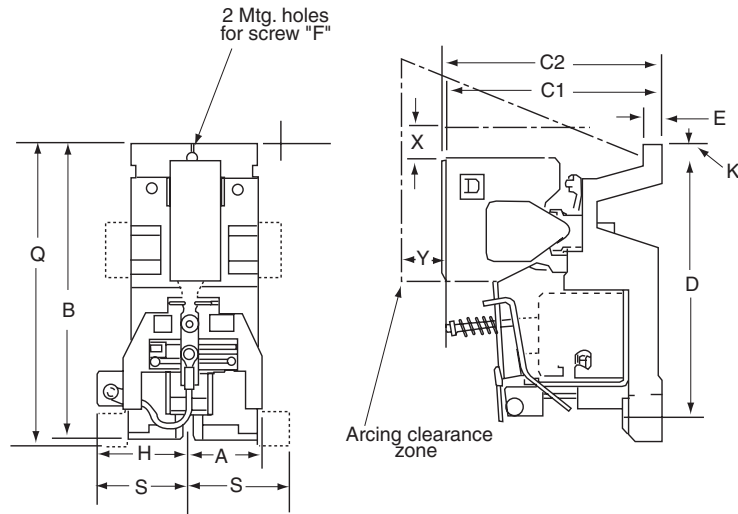
1. Class 9999
2. Type AI1

CP9B

Discount  
Schedule


**Crane Control Class 7004**  
**Type M Line-Arc® DC Contactors**

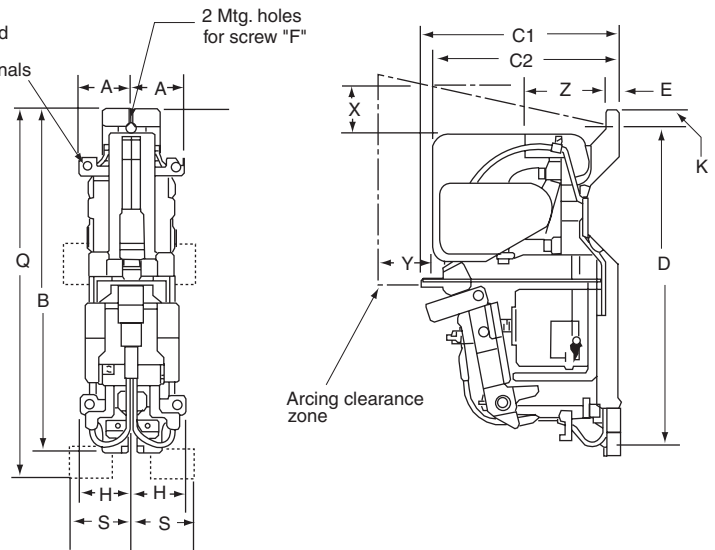
**APPROXIMATE DIMENSIONS**



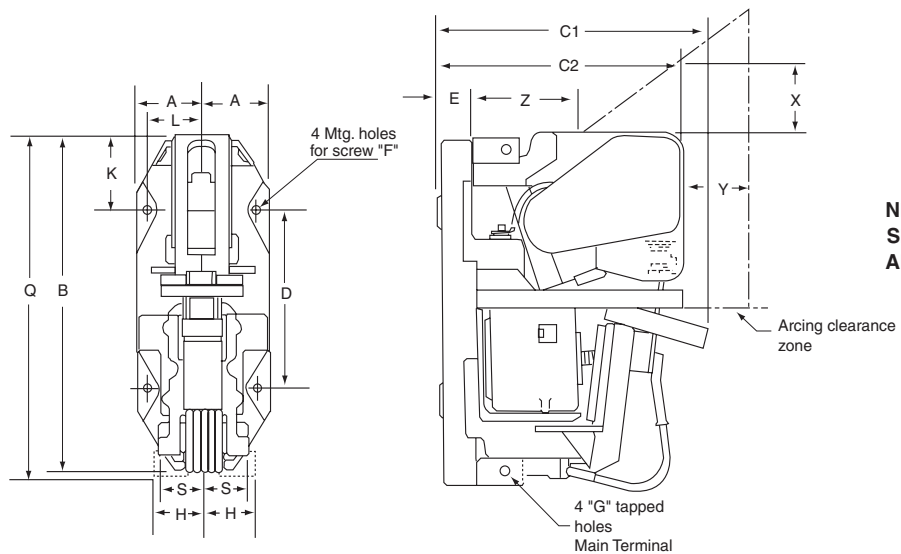
**NEMA SIZES 1, 2  
 SPNO AND SPNC**  
 Figure 1

**NEMA SIZES 3, 4, & 5  
 SPNO AND SPNC**  
**SIZE 5A  
 SPNO AND SPNC**

Figure 2



CRANE CONTROL CLASS 7004



**NEMA SIZES 6, 8  
 SPNO AND SPNC**  
**AND SIZE 6A SPNO**  
 Figure 3



# Crane Control Class 7004 Type M Line-Arc® DC Contactors

## APPROXIMATE DIMENSIONS AND WEIGHTS

NEMA Size	Type	Fig. No.	Contactor Dimensions ▲											Weight	Center to Center Spacing of S.P. Tied or Mechanically Interlocked Contactors
			A	B	C1	C2	D	E	F	G	H	K	L		
1	MXCO1	1	<u>1.79</u>	<u>8.65</u>	<u>6.00</u>	<u>6.38</u>	<u>7.56</u>	<u>0.52</u>	<u>0.25</u>	...	<u>2.29</u>	<u>0.44</u>	...	<u>7</u>	<u>5.63</u>
2	MXDO1		46	220	153	162	192	13	6	...	58	11	...	3	143
1	MXCO3	1	<u>1.79</u>	<u>8.65</u>	<u>6.00</u>	<u>6.38</u>	<u>7.56</u>	<u>0.52</u>	<u>0.25</u>	...	<u>2.29</u>	<u>0.44</u>	...	<u>7</u>	<u>5.63</u>
2	MXDO3		46	220	153	162	192	13	6	...	58	11	...	3	143
3	MEO1	2	<u>2.12</u>	<u>13.10</u>	<u>7.83</u>	<u>7.40</u>	<u>11.50</u>	<u>0.56</u>	<u>0.375</u>	5/16-	<u>2.13</u>	<u>0.80</u>	...	<u>15</u>	<u>6.00</u>
4	MFO1		54	333	199	188	292	14	10	18	55	20	...	7	153
3	MEO3	2	<u>2.12</u>	<u>13.10</u>	<u>7.83</u>	<u>7.40</u>	<u>11.50</u>	<u>0.56</u>	<u>0.375</u>	5/16-	<u>2.13</u>	<u>0.80</u>	...	<u>15</u>	<u>6.00</u>
4	MFO3		54	333	199	188	292	14	10	18	55	20	...	7	153
5	MGO1	2	<u>2.75</u>	<u>16.54</u>	<u>9.50</u>	<u>9.68</u>	<u>14.50</u>	<u>0.96</u>	<u>0.375</u>	3/8-16	<u>2.78</u>	<u>1.02</u>	...	<u>30</u>	<u>7.00</u>
5A†	MGAO1		70	420	242	246	368	25	10	...	71	26	...	14	178
5	MGO3	2	<u>2.75</u>	<u>16.54</u>	<u>9.50</u>	<u>9.68</u>	<u>14.50</u>	<u>0.96</u>	<u>0.375</u>	3/8-16	<u>2.78</u>	<u>1.02</u>	...	<u>30</u>	<u>7.00</u>
5A†	MGAO3		70	420	242	246	368	25	10	...	71	26	...	14	178
6	MHO1	3	<u>3.50</u>	<u>19.15</u>	...	<u>13.64</u>	<u>6.00</u>	...	<u>0.375</u>	1/2-13	<u>2.85</u>	<u>8.30</u>	<u>2.94</u>	<u>70</u>	<u>9.00</u>
6A†	MHAO1		89	487	...	346	153	...	10	...	73	211	75	32	229
6	MHO3	3	<u>3.50</u>	<u>19.15</u>	...	<u>13.64</u>	<u>6.00</u>	...	<u>0.375</u>	1/2-13	<u>2.85</u>	<u>8.30</u>	<u>2.94</u>	<u>70</u>	<u>9.00</u>
			89	487	...	346	153	...	10	...	73	211	75	32	229
8	MKO1	3	<u>4.50</u>	<u>22.90</u>	<u>17.40</u>	<u>15.80</u>	<u>12.00</u>	<u>2.30</u>	<u>0.50</u>	1/2-13	<u>6.90</u>	<u>5.38</u>	<u>3.69</u>	<u>160</u>	<u>11.30</u>
			114	582	442	402	305	59	13	...	176	137	94	73	287
8	MKO3	3	<u>4.50</u>	<u>22.90</u>	<u>17.40</u>	<u>15.80</u>	<u>12.00</u>	<u>2.30</u>	<u>0.50</u>	1/2-13	<u>6.90</u>	<u>5.38</u>	<u>3.69</u>	<u>160</u>	<u>11.30</u>
			114	582	442	402	305	59	13	...	176	137	94	73	287

NEMA Size	Type	Fig. No.	Accessory Dimensions▲				Arcing Clearances					
			Electrical Interlock		240 VDC			600 VDC				
			Q	S	X	Y	Z	X	Y	Z		
1	MXCO1	1	<u>9.98</u>	<u>2.34</u>	<u>1.70</u>	<u>1.70</u>	...	<u>3.00</u>	<u>3.00</u>	...		
2	MXDO1		253	60	43	43	...	76	76	...		
1	MXCO3	1	<u>9.98</u>	<u>2.34</u>	<u>1.70</u>	<u>1.70</u>	...	<u>3.00</u>	<u>3.00</u>	...		
2	MXDO3		253	60	43	43	...	76	76	...		
3	MEO1	2	<u>13.74</u>	<u>2.43</u>	<u>2.00</u>	<u>2.00</u>	<u>4.00</u>	<u>2.00</u>	<u>6.00</u>	<u>4.00</u>		
4	MFO1		349	62	51	51	102	51	153	102		
3	MEO3	2	<u>13.74</u>	<u>2.43</u>	<u>2.00</u>	<u>2.00</u>	<u>4.00</u>	<u>2.00</u>	<u>6.00</u>	<u>4.00</u>		
4	MFO3		349	62	51	51	102	51	153	102		
5	MGO1	2	<u>16.72</u>	<u>2.60</u>	<u>2.04</u>	<u>2.80</u>	...	<u>2.04</u>	<u>6.00</u>	...		
5	MGO3		424	66	52	71	...	52	153	...		
5A†	MGAO1	2	<u>16.72</u>	<u>2.60</u>	<u>2.50</u>	<u>3.2</u>	...	<u>2.50</u>	<u>6.00</u>	...		
5A†	MGAO3		424	66	64	82	...	64	153	...		
6	MHO1	3	<u>18.54</u>	<u>2.43</u>	<u>2.0</u>	<u>2.60</u>	<u>3.50</u>	<u>4.00</u>	<u>11.00</u>	<u>3.50</u>		
			471	62	51	66	89	102	280	89		
6A†	MHAO1	3	<u>18.54</u>	<u>2.43</u>	<u>4.0</u>	<u>6.0</u>	<u>3.50</u>	<u>7.00</u>	<u>12.00</u>	<u>3.50</u>		
			471	62	102	153	89	178	305	89		
6	MHO3	3	<u>18.54</u>	<u>2.43</u>	<u>2.0</u>	<u>2.60</u>	...	<u>4.00</u>	<u>11.00</u>	...		
			471	62	51	66	...	102	280	...		
8	MKO1	3	<u>23.5</u>	<u>3.45</u>	<u>4.5</u>	<u>4.5</u>	<u>4.00</u>	<u>9.00</u>	<u>12.00</u>	<u>4.00</u>		
8	MKO3		597	88	115	115	102	229	305	102		

The table lists recommended minimum enclosure sizes for single pole-240 VDC contactors with contactor mounted accessories. For double pole contactors, increase width by 50%.

NEMA Size	Height	Width	Depth
1	<u>12.00</u>	<u>12.00</u>	<u>9.00</u>
2	305	305	229
3	<u>18.00</u>	<u>12.00</u>	<u>12.00</u>
4	457	305	305
5	<u>22.00</u>	<u>15.00</u>	<u>15.00</u>
	559	381	381
5A†	<u>28.00</u>	<u>17.00</u>	<u>18.00</u>
	714	434	457
6	<u>32.00</u>	<u>18.00</u>	<u>20.00</u>
	813	457	508
6A†	<u>40.00</u>	<u>22.00</u>	<u>24.00</u>
	1020	561	610
8	<u>48.00</u>	<u>24.00</u>	<u>24.00</u>
	1219	610	610

▲ Electrical interlocks and all live electrical parts must have a  $\frac{50}{13}$  clearance to ground and other live electrical parts. Dual Dimensions:  $\frac{\text{in}}{\text{mm}}$   
 † Not a NEMA size/rating. Dual Weights:  $\frac{\text{lb}}{\text{kg}}$

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