



SECTION 5

MOTOR STARTING AUTOTRANSFORMERS

Copper Wound Two Coil and Three Coil

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THREE PHASE MOTOR STARTING AUTOTRANSFORMERS

HPS 2A and 3A motor starting autotransformers have been an industry standard for many years. Autotransformers are a significant component of a motor controller. In its simplest form, motor starters start and stop a motor and protect against overvoltage and undervoltage. In most applications, a simple full-voltage magnetic starter places full voltage across the motor's windings on startup and maintains full voltage at the motor during the run mode.

For larger motors, or motors where the load is connected, the effect of motor-starting inrush can stress the electrical system with significantly lower currents in the distribution network. This can cause all manner of disruption to the system with subsequent interruption in the facility. In these cases, reduced-voltage starting must be applied. The addition of a motor starting autotransformer during the startup sequence limits the starting inrush current.

The 2A and 3A product line is designed for Medium Duty service including applications for drive loads such as pumps, compressors, conveyers and fans. Units are manufactured in accordance with NEMA Industrial Controls and Systems, Publication No. ICS-1970.

2A Motor Starting Autotransformer: Three phase, 2 coil, suitable for motor starters with 2 contacts, connected in an open 'V' configuration. Phase voltage across the open 'V' tends to be slightly out of balance when compared to the other two phases.

3A Motor Starting Autotransformer: Three phase, 3 coil, suitable for motor starters with 3 contacts, connected in a three phase 'Wye' configuration. This provides balanced voltages across each phase.

Special Motor Starting Autotransformers. For applications requiring heavy duty service with frequent starts or jogging, high inertia loads such as paper or steel mill drives, medium voltage or other unusual demands, HPS can offer specially designed units to meet your requirements. Please consult our sales offices.

TWO COIL

20 to 1600 HP



THREE COIL

25 to 1600 HP



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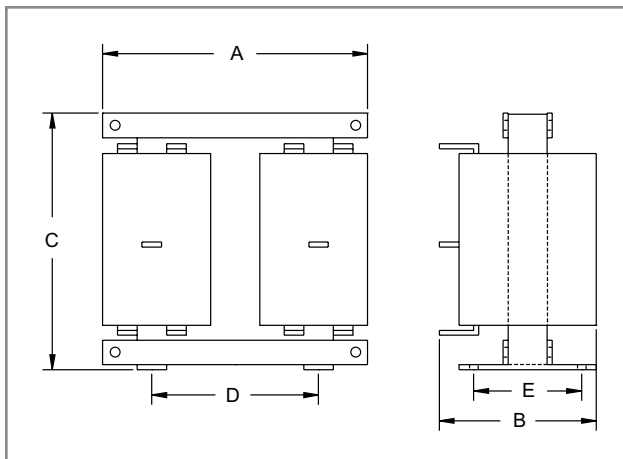
COPPER WOUND STANDARD SPECIFICATIONS



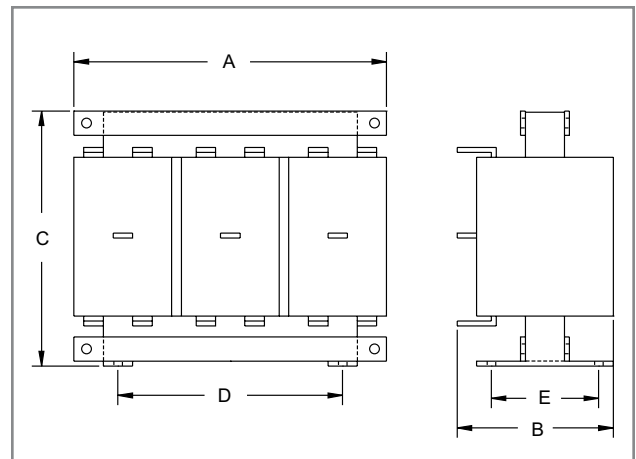
	TWO COIL	THREE COIL
	20 to 1600 HP	25 to 1600 HP
UL Listed	File: E61431	File: E61431
CSA Certified	File: LR3902	File: LR3902
Frequency	60 Hz	60 Hz
Insulation System	220°C	220°C
Standard Design	Three Phase, 2 Coil, using economical open core and coil construction.	Three Phase, 3 Coil, using economical open core and coil construction.
Standard Taps	All units have taps at 50%, 65% and 80%.	All units have taps at 50%, 65%, 80%
Termination	Heavy solid copper lugs with holes, provide reliable termination.	Heavy solid copper lugs with holes, provide reliable termination.
Thermostats	1 or 2 optional thermostats are available. (See page 148 for details.)	1, 2 or 3 optional thermostats are available. (See page 148 for details.)

DIMENSIONAL DRAWINGS

TWO COIL



THREE COIL



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COPPER WOUND, THREE PHASE, TWO COIL



Two Coil - 240 Volts

60 Hz

HP	Voltage	Catalog Number	Dimensions			Mtg. Width D	Mtg. Depth E	Approx. Weight (Lbs.)
			A	B	C			
20/25	240	2909B.2	11.50	6.00	10.25	9.00	4.00	45
30/40	240	2909B.4	11.50	6.25	10.75	9.00	4.00	65
50	240	2909B.5	11.50	7.25	11.00	9.00	6.00	75
60/75	240	2909B.75	13.50	8.00	11.50	9.00	6.00	120
100	240	2909B1.	13.50	9.25	11.50	9.00	7.50	150
125/150	240	2909B1.5	14.50	10.00	12.75	9.00	7.50	190
200	240	2909B2.	14.50	10.50	12.75	9.00	7.50	220
250	240	2909B2.5	14.50	11.75	13.25	9.00	9.00	230
300	240	2909B3.	14.50	12.00	14.00	9.00	9.00	260
400	240	2909B4.	17.00	12.50	15.75	9.00	9.00	330
500	240	2909B5.	17.00	13.00	16.25	9.00	9.00	375
600	240	2909B6.	23.00	16.00	18.00	12.00	9.00	550
800	240	2909B8.	25.00	17.00	20.00	12.00	9.00	700
1000	240	2909B10.	26.00	18.00	22.00	12.00	9.00	800
1200	240	2909B12.	29.00	19.00	24.00	12.00	12.00	1050
1600	240	2909B16.	32.00	20.00	26.00	12.00	12.00	1350

Two Coil - 480 Volts

60 Hz

HP	Voltage	Catalog Number	Dimensions			Mtg. Width D	Mtg. Depth E	Approx. Weight (Lbs.)
			A	B	C			
20/25	480	2909C.2	11.50	6.00	10.25	9.00	4.00	45
30/40	480	2909C.4	11.50	6.25	10.75	9.00	4.00	65
50	480	2909C.5	11.50	7.25	11.00	9.00	6.00	75
60/75	480	2909C.75	13.50	8.00	11.50	9.00	6.00	120
100	480	2909C1.	13.50	9.25	11.50	9.00	7.50	150
125/150	480	2909C1.5	14.50	10.00	12.75	9.00	7.50	190
200	480	2909C2.	14.50	10.50	12.75	9.00	7.50	220
250	480	2909C2.5	14.50	11.75	13.25	9.00	9.00	230
300	480	2909C3.	14.50	12.00	14.00	9.00	9.00	260
400	480	2909C4.	17.00	12.50	15.75	9.00	9.00	330
500	480	2909C5.	17.00	13.00	16.25	9.00	9.00	375
600	480	2909C6.	23.00	16.00	18.00	12.00	9.00	550
800	480	2909C8.	25.00	17.00	20.00	12.00	9.00	700
1000	480	2909C10.	26.00	18.00	22.00	12.00	9.00	800
1200	480	2909C12.	29.00	19.00	24.00	12.00	12.00	1050
1600	480	2909C16.	32.00	20.00	26.00	12.00	12.00	1350

Two Coil - 600 Volts

60 Hz

HP	Voltage	Catalog Number	Dimensions			Mtg. Width D	Mtg. Depth E	Approx. Weight (Lbs.)
			A	B	C			
20/25	600	2909D.2	11.50	6.00	10.25	9.00	4.00	45
30/40	600	2909D.4	11.50	6.25	10.75	9.00	4.00	65
50	600	2909D.5	11.50	7.25	11.00	9.00	6.00	75
60/75	600	2909D.75	13.50	8.00	11.50	9.00	6.00	120
100	600	2909D1.	13.50	9.25	11.50	9.00	7.50	150
125/150	600	2909D1.5	14.50	10.00	12.75	9.00	7.50	190
200	600	2909D2.	14.50	10.50	12.75	9.00	7.50	220
250	600	2909D2.5	14.50	11.75	13.25	9.00	9.00	230
300	600	2909D3.	14.50	12.00	14.00	9.00	9.00	260
400	600	2909D4.	17.00	12.50	15.75	9.00	9.00	330
500	600	2909D5.	17.00	13.00	16.25	9.00	9.00	375
600	600	2909D6.	23.00	16.00	18.00	12.00	9.00	550
800	600	2909D8.	25.00	17.00	20.00	12.00	9.00	700
1000	600	2909D10.	26.00	18.00	22.00	12.00	9.00	800
1200	600	2909D12.	29.00	19.00	24.00	12.00	12.00	1050
1600	600	2909D16.	32.00	20.00	26.00	12.00	12.00	1350

Other voltages and 50Hz units are available upon request.

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SECTION 5 MOTOR STARTING AUTOTRANSFORMER

COPPER WOUND, THREE PHASE, THREE COIL



Three Coil - 240 Volts

60 Hz

HP	Voltage	Catalog Number	Dimensions			Mtg. Width D	Mtg. Depth E	Approx. Weight (Lbs.)
			A	B	C			
25/30	240	3009B.3	11.50	6.50	8.75	9.00	4.00	65
40/50	240	3009B.5	11.50	7.75	9.00	9.00	6.00	80
60/75	240	3009B.75	13.50	8.00	10.25	9.00	6.00	125
100	240	3009B1.	13.50	8.75	10.25	9.00	6.00	140
125/150	240	3009B1.5	14.50	10.00	10.75	9.00	7.00	165
200	240	3009B2.	15.00	10.50	10.75	9.00	7.00	210
250	240	3009B2.5	15.75	12.00	11.50	9.00	8.25	245
300	240	3009B3.	15.75	12.25	12.00	9.00	8.25	275
400	240	3009B4.	17.00	12.50	14.00	9.00	8.25	320
500	240	3009B5.	17.00	12.50	14.50	9.00	8.25	345
600	240	3009B6.	21.00	14.00	16.00	12.00	9.00	450
800	240	3009B8.	23.00	15.00	18.00	12.00	9.00	600
1000	240	3009B10.	24.00	16.00	20.00	12.00	9.00	700
1200	240	3009B12.	27.00	17.00	22.00	12.00	12.00	900
1600	240	3009B16.	30.00	18.00	24.00	12.00	12.00	1200

Three Coil - 480 Volts

60 Hz

HP	Voltage	Catalog Number	Dimensions			Mtg. Width D	Mtg. Depth E	Approx. Weight (Lbs.)
			A	B	C			
25/30	480	3009C.3	11.50	6.50	8.75	9.00	4.00	65
40/50	480	3009C.5	11.50	7.75	9.00	9.00	6.00	80
60/75	480	3009C.75	13.50	8.00	10.25	9.00	6.00	125
100	480	3009C1.	13.50	8.75	10.25	9.00	6.00	140
125/150	480	3009C1.5	14.50	10.00	10.75	9.00	7.00	165
200	480	3009C2.	15.00	10.50	10.75	9.00	7.00	210
250	480	3009C2.5	15.75	12.00	11.50	9.00	8.25	245
300	480	3009C3.	15.75	12.25	12.00	9.00	8.25	275
400	480	3009C4.	17.00	12.50	14.00	9.00	8.25	320
500	480	3009C5.	17.00	12.50	14.50	9.00	8.25	345
600	480	3009C6.	21.00	14.00	16.00	12.00	9.00	450
800	480	3009C8.	23.00	15.00	18.00	12.00	9.00	600
1000	480	3009C10.	24.00	16.00	20.00	12.00	9.00	700
1200	480	3009C12.	27.00	17.00	22.00	12.00	12.00	900
1600	480	3009C16.	30.00	18.00	24.00	12.00	12.00	1200

Three Coil - 600 Volts

60 Hz

HP	Voltage	Catalog Number	Dimensions			Mtg. Width D	Mtg. Depth E	Approx. Weight (Lbs.)
			A	B	C			
25/30	600	3009D.3	11.50	6.50	8.75	9.00	4.00	65
40/50	600	3009D.5	11.50	7.75	9.00	9.00	6.00	80
60/75	600	3009D.75	13.50	8.00	10.25	9.00	6.00	125
100	600	3009D1.	13.50	8.75	10.25	9.00	6.00	140
125/150	600	3009D1.5	14.50	10.00	10.75	9.00	7.00	165
200	600	3009D2.	15.00	10.50	10.75	9.00	7.00	210
250	600	3009D2.5	15.75	12.00	11.50	9.00	8.25	245
300	600	3009D3.	15.75	12.25	12.00	9.00	8.25	275
400	600	3009D4.	17.00	12.50	14.00	9.00	8.25	320
500	600	3009D5.	17.00	12.50	14.50	9.00	8.25	345
600	600	3009D6.	21.00	14.00	16.00	12.00	9.00	450
800	600	3009D8.	23.00	15.00	18.00	12.00	9.00	600
1000	600	3009D10.	24.00	16.00	20.00	12.00	9.00	700
1200	600	3009D12.	27.00	17.00	22.00	12.00	12.00	900
1600	600	3009D16.	30.00	18.00	24.00	12.00	12.00	1200

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OPTIONAL THERMOSTATS



All HPS Motor Starting Autotransformers are available with optional thermostats. Thermostats are supplied with normally closed contacts and will provide a corresponding signal when coil temperatures exceed safe operating conditions. Each thermostat installed is supplied with standard leads.

Two Coil - Thermostat Options

Part Number	Description	Installation
T1	One Thermostat	Single thermostat installed in the left coil.
T2	Two Thermostats	One thermostat installed in both coils.



Three Coil - Thermostat Options

Part Number	Description	Installation
T1	One Thermostat	Single thermostat installed in the center coil.
T2	Two Thermostats	One thermostat installed in the left hand coil and one installed in the right coil.
T3	Three Thermostats	One thermostat installed in each of the three coils.



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