

TM - NEMA CONTROL

Engineering Data

Ratings - Controllers - Type TM

Continuous ampere and maximum horsepower ratings are in accordance with the following NEMA Standards:
Starters ICS 2-32 1B, ICS 2-321F ; Contactors ICS 2-211.23, ICS 2-211.24

Power Wiring Accommodation - Type TM1

NEMA Size 2	Wire Range			Wire Type	Pressure Terminal Type	Provision For Ring Tongue Lugs 3	
	Line	Load				Terminal Width, In.	Screw Size
		Contactor	Overload				
00	#14-#6	#14-#6	#14-#4	Copper (Cu)	Saddle	.625	#10-32
0	#14-#6	#14-#6	#14-#4	Copper (Cu)	Saddle	.625	#10-32
1	#14-#6	#14-#6	#14-#4	Copper (Cu)	Saddle	.625	#10-32
2	#14-#4	#14-#4	#14-#4	Copper (Cu)	Box	.62	#10-32
3	#8-#2/0	#8-#2/0	#8-#2/0	Copper (Cu)	Box	1.04	5/16-18
4	#6-250MCM	#6-250MCM	#6-250MCM	Copper (Cu)	Box	1.04	3/4-18
5	#4-500MCM	#4-500MCM	#4-500MCM	Aluminum	Box	1.25	3/8-Hole
6	(2)#4-500MCM	(2)#4-500MCM	(2)#4-500MCM	or Copper (Cu)		1.25	3/8-Hole

1 For aluminum (Al) load wiring accommodations on Size 00-4, refer to local sales office.

2 Devices are equipped with one (1) lug p[er phase, except size 6.

3 UL specifies only one (1) wire per lug.

Control Circuit Contact & Coil Terminals - Type TM

NEMA Size	Terminal Type	Copper Wire Size 4,5 Min. - Max.	Screw Size
00-6	Pressure Saddle	#18-#12AWG	#8-32

4 One or two stranded copper wires of same size, or differing by (2) gauge sizes.

5 Coil terminal wire on TM 00-2 is #14 AWG maximum.

Control Circuit Contact Rating - Type TM

10 Ampere Continuous Rating - Maximum 600 Volts, AC or DC

NEMA Size	Contacts	Volts, AC	Amperes Continuous	A-C Inductive (0.35pf)		Volts, DC	D-C Inductive Make or Break
				Make	Break		
00-4	KTM-10 KTM-11	120V or less 120-600V	10	30A 3600VA	3A 360VA	125V	1.1
00-2	KTM-20					250V	.55A
3-4	KTM-19					(300V OR LESS) 600V	(138VA) .2A

Overload Relay Contact Ratings - Type TM

NEMA Size	Contact	Volts, AC	Continuous Amperes	A-C Inductive (0.35pf)	
				Make	Break
00-6	N.C.	120V or less	2.5	15A	1.5A
		120-600V		1800VA	180VA
	N.O	120V or less 120-600V		3A 360VA	.3A 36VA

Control Transformer Sizes For Type TM A-C Contactors Or Starters

NEMA		60Hz.		50Hz.		25Hz.	
		Volt - Amperes		Volt - Amperes		Volt - Amperes	
Size	Poles	Inrush	Sealed	Inrush	Sealed	Inrush	Sealed
00-2	2-4	210	18	210	20	135	19
3	2-4	724	30	724	32	--	--
4	2-4	880	39	880	42	--	--
5	2-3	1790	295	--	--	--	--
6 ¹	2-3	3160	435	3300	490	--	--

1. Size 6 has two operating coils connected in series. Values given for two coils so connected.

Coil Burden - Type TM

Contactor or Starter		Transformer Sizes- Volt-Amperes, 60 Hertz	
NEMA Size	No. of Poles	Standard Capacity	100W Extra Capacity
00.0.			
1 & 2	2-4	50	150
3 & 4	2-4	250	500
5	2-3	350	500
6 ²	2-3	50	150

2. For starter with control relay; starter coil is full voltage.

Ratings Of Low-Voltage Contactors For Transformer Primaries 3

Contactor Size	Transformer Rating 4 - KVA, 50/60 Hz.					8-Hour Rating of Contactor Amperes	
	Single Phase		Three Phase				
	460 or					Open	Enclosed
	115V	230V	575V	230V	575V		
0	0.9	1.4	1.9	1.7	2.5	20	18
1	1.4	1.9	3	4.1	5.3	30	27
2	1.9	4.6	5.7	7.6	12	50	45
3	4.6	8.6	14	15	23	100	90
4	5.7	11	22	23	46	150	135
5	14	28	40	46	91	300	270
6	28	57	86	91	180	600	540

3. This table does not apply to transformers in resistance welding service.

4. This table applies to contactors used with transformers having an inrush of not more than (20) times their full-load current, irrespective of the nature of the secondary load.

Kilowatt Ratings Of Low-Voltage Transformers

For Resistive-Heating Loads Other Than Infrared-Lamp Loads 5 Per NEMA ICS 2.210-1

Contactor Size	1 Φ 2-Pole Contactors (Open or Closed) Heating Load, KW				3 Φ 3-Pole Contactors (Open or Closed) Heating Load, KW			8-Hour Rating of Contactor Amperes	
	115V	230V	460V	575V	230V	460V	575V		
1	3	6	12	15	10	20	25	30	27
2	5	10	20	25	17	34	43	50	45
3	10	20	40	50	34	68	86	100	90
4	15	30	60	75	52	105	130	150	135
5	30	60	120	150	105	210	260	300	270
6	60	120	240	300	210	415	515	600	540
7	90	180	360	450	315	625	775	900	810

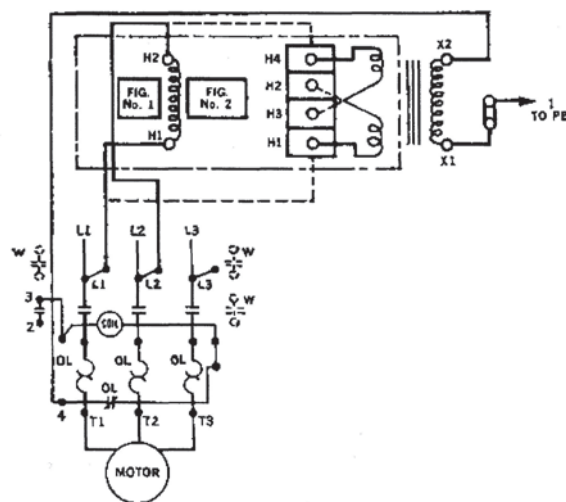
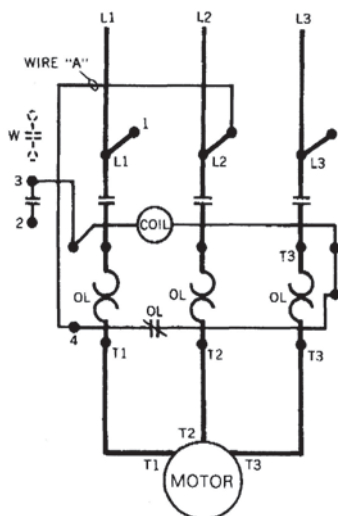
5. This Table applies to contactors used to switch the load at the utilization voltage of the heat-producing elements with a duty which requires continuous operation of not more than five (5) openings per minute.

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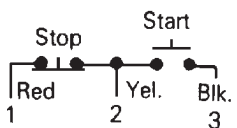
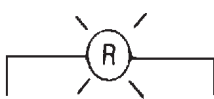
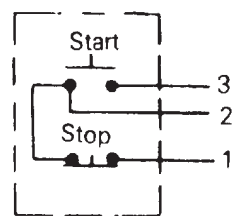
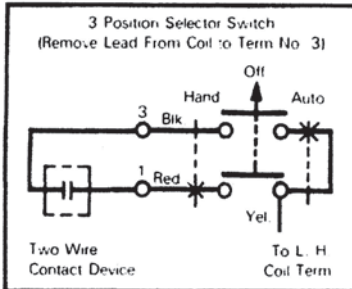
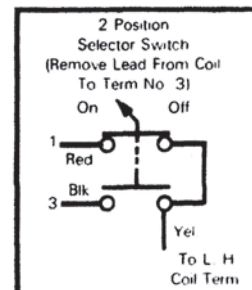
Engineering Data

For Starters 6013-TM;
Contactors 7707-TM Non-Combination

Wiring Diagram Front View

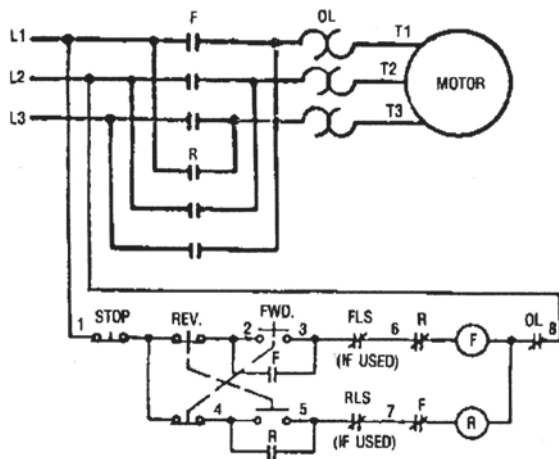


Connection For Pilot Devices

Cover Mounted Pilot Devices		3 Wire Control Remote Pilot Devices	Transformer Connections				
	 Connect To Coil Terminals		Volts	Connections	L1	L2	Fig.
			240	H1 & H3, H2 & H4	H1	H4	2
			480	H2 & H3	H1	H4	2
			All	--			
Others							
Start-Stop Pushbutton	Pilot Light	Momentary Contact Pushbutton	Automatic Reset				
			Automatic reset operation should not be used with two wire control.				
							
			Separate Control				
			Remove wire "A" when it is supplied.				
			Connect separate control lines to the "1" terminal on the pilot device and the "4" terminal on the starter.				
			Coil Terminal wire to be #14 AWG maximum.				

For Starters 6030-TM; Contactors 6031-TM

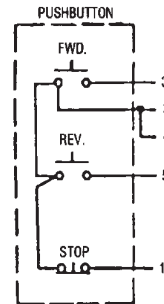
Elementary Diagram



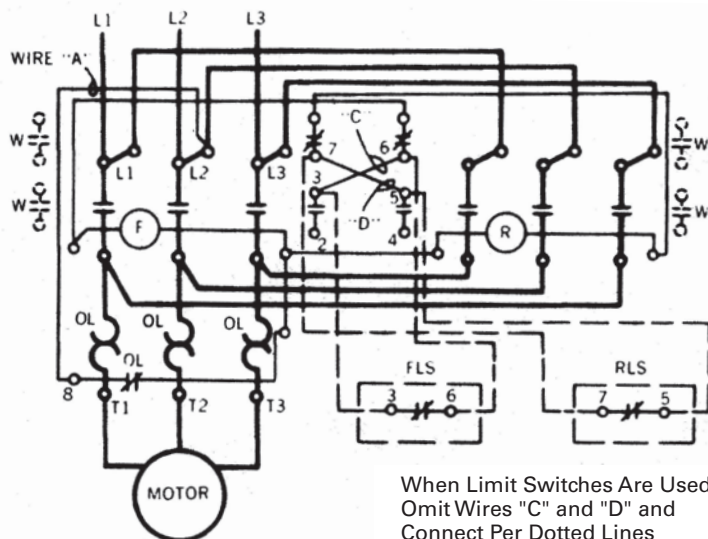
Separate Control

Remove wire "A" when it is supplied. Connect separate control lines to the "1" terminal on the pilot device and the "8" terminal on the starter. Coil terminal wire to be No. 14 AWG maximum.

Push button Control



Wiring Diagram Front View



Contactors "F" & "R" Are
Mechanically Interlocked

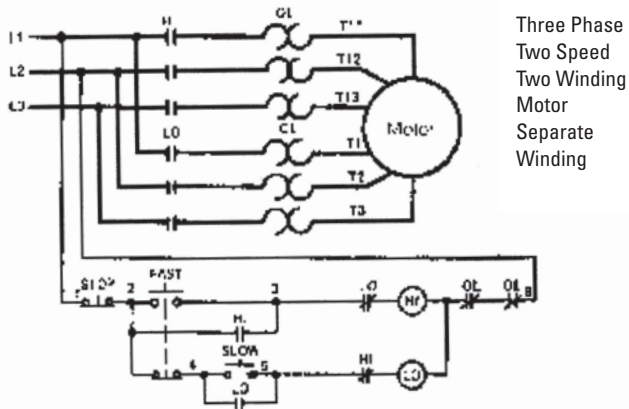
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Engineering Data

For Starters 6050-TM

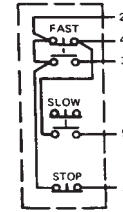
Elementary Diagram



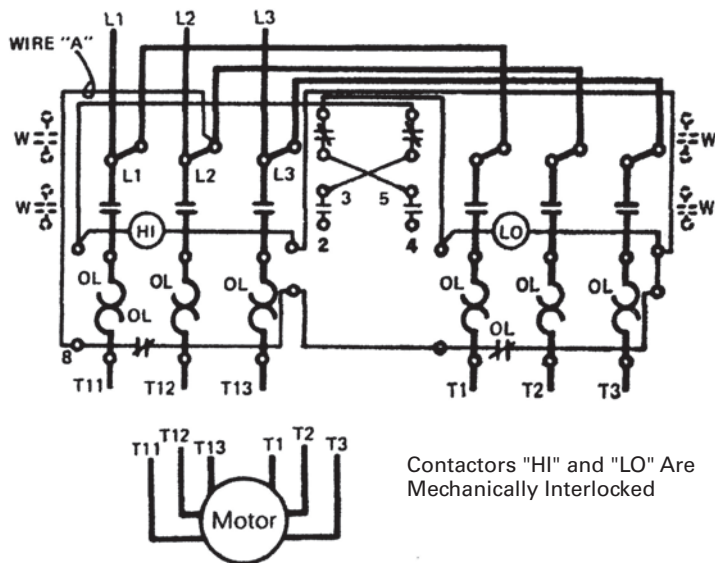
Separate Control

Remove wire "A" when it is supplied
Connect separate control lines to the
"1" terminal on the pilot device and
the "8" terminal on the starter. Coil
terminal wire to be No. 14 AWG
maximum.

Pushbutton Control

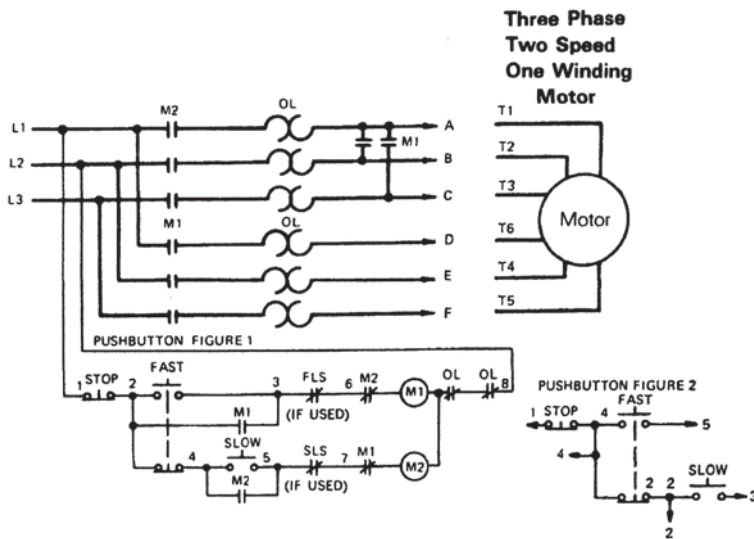


Wiring Diagram Front View

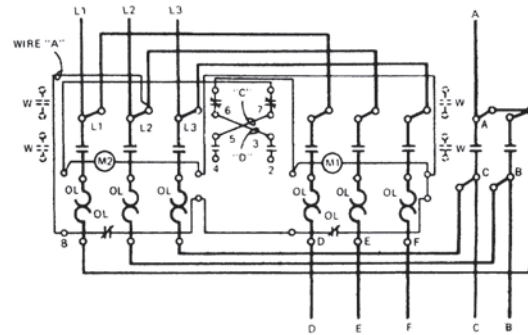


For Starters 6050-TM

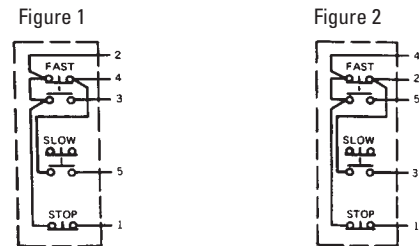
Elementary Diagram



Wiring Diagram Front View



Momentary Contact Pushbuttons



Connections Of Motor And Push-button Terminals To Starter Terminals

Motor	Push-button	A	B	C	D	E	F	M1	M2
Figure 1	Figure 2	T6	T4	T5	T1	T2	T3	Low	High
Figure 2	Figure 1	T1	T2	T3	T6	T4	T5	High	Low
Figure 3	Figure 1	T1	T2	T3	T6	T4	T5	High	Low

Three Phase Two Speed One Winding Motor Connection Data

Figure 1 Constant Horsepower						Figure 2 Constant Torque						Figure 3 Variable Torque					
L1	L2	L3	Open	Together	Speed	L1	L2	L3	Open	Together	Speed	L1	L2	L3	Open	Together	Speed
T1	T2	T3	_____	T4,T5,T6	Low	T1	T2	T3	T4,T5,T6	_____	Low	T1	T2	T3	T4,T5,T6	_____	Low
T6	T4	T5	T1,T2,T3	_____	High	T6	T4	T5	_____	T1,T2,T3	High	T6	T4	T5	_____	T1,T2,T3	High