

REDUCED VOLTAGE STARTERS

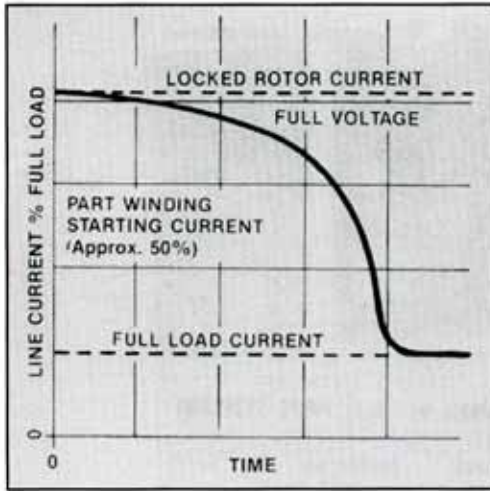
Full Voltage and Part Winding Starters

Full Voltage Magnetic Starters provide the simplest method of starting and stopping AC squirrel cage motors. A full voltage starter connects the motor windings directly to the power line. It consists of magnetically actuated switch and thermal overload relay.

A typical squirrel cage motor when started across-the-line will result in a line current of approximately 6 times full load current as shown in the diagram.

Part-winding Reduced Voltage Starters are the simplest type reduced voltage starters.

Part-winding motors have two sets of identical winding which are energized in sequence to reduce the starting inrush current. The two identical windings are operated in parallel. Most (but not all) 230/460 volt motors are suitable for part-winding start is required. During the period when one winding only is energized, a part-winding motor will draw approximately 60-70% inrush current and will develop approximately 45-50% torque.

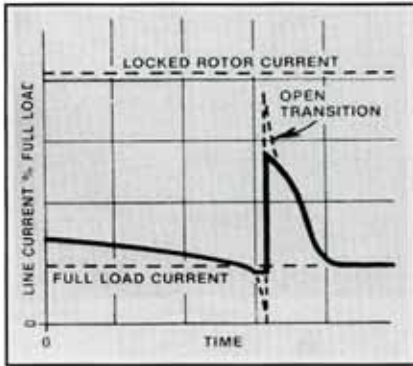


Wye-Delta Starters

Wye-Delta motors are similar in construction to standard squirrel cage motors, except that both ends of each of the three (3) windings are brought out to terminals. By using starters having the required number of contacts properly wired, the motor starts in Wye and runs in Delta. This starter can be built as either an open or closed transition device. The closed transition starter requires an extra contactor and resistor bank and are considerably more expensive. By far, the majority of Wye-Delta starters supplied world wide are OPEN transition type.

By starting with Wye connection, line current is reduced to one-third (1/3) of the current which would be obtained with a Delta connection.

This starter is frequently applied to unload compressors and other loads that require less than 33% of normal starting torque.



REDUCED VOLTAGE STARTERS / WYE DELTA COIL & OVERLOAD SUFFIXES

For LS4K-LS18K (3 pole)			
AC	60Hz	50HZ	
-G	24	24	24
-A	120	120	120
-B	200	200	200
-C	220	220	220
-H	277	230	
-E	480	380	
-F	600	500	
DC add \$60 to list			
-MSW	12 VDC		
-NSW	24VDC		
-OSW	48 VDC		
-PSW	110 VDC		
-RSW	220 VDC		

For LS22K-LS55K (3 pole)			
AC	60Hz	50HZ	
-G	24	24	24
-A	120	120	120
-B	200	200	200
-C	220	220	220
-H	277	230	
-E	480	380	
-F	600	500	
DC add \$90 to list			
-NSW	24-28 VDC		
-OSW	42-48 VDC		
-PSW	110-127 VDC		
-RSW	220-250 VDC		

For LS75K-LS375K (3 Pole)	
AC/DC	50/60 Hz + DC
-N	24-28V
-AP	110-127V
-CR	220-250V
-EX	440-500V

* Coil Suffix Chart

** Overload Relay Suffix				
Suffix	O.L. Relay Setting Range		O.L. Relay Setting Range	
	(Amps)		Suffix	(Amps)
-B	0.16-0.26		-ON	21-26
-C	0.25-0.41		-P	25-32
-D	0.4-0.65		-Q	30-43
-E	0.65-1.1		-QN	42-55
-F	1.1.5		-RN	54-65
-G	1.3-1.9		-SN	64-82
-H	1.8-2.7		-TM	78-97
-I	2.5-4		-TN	90-110
-K	4-6.3		-TT	110-140
-L	5.5-8.5		-U	140-190
-M	8-12		-V	175-280
-N	10-16		-W	200-310
-O	14.5-18		-WT	250-400
-OM	17.5-22		-X	315-500

Discount Schedule ST Modification & Accessories

DC Coil list adders for reduced voltage starters add 2 speed starters.

Reduced Voltage:

YLS4K-18- \$90 Adder
 YLS22K-55K \$135 Adder
 YLS75K-37K No Adder
 WLS22K-45K \$90 Adder
 WLS750-375K No Adder

2 Speed Starters

2SH/2STLS7K-15K Add \$60
 2SH/2ST22K-45K Add \$90
 1SH/1STLS7K-15K Add \$90
 1SH/1STLS22K-45K Add \$135
 1SH/1STLS75K-280K No Adder



Reduced Voltage Starters WYE-DELTA TYPE YLS

OPEN TRANSITION TYPE YLS

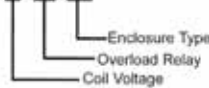


HORSEPOWER RATING (MAX HP RATINGS)				(Includes 3-pole O.L.) Catalogue No.	- OO Open	ENCLOSURE SUFFIX - (LIST PRICES)			Comparable NEMA	
208V HP	240V HP	440/ 480V HP	550/ 600V HP			- M1 NEMA 1 General Purpose	- M4+ NEMA 12/4 Water Tight / Dust Tight	- MB Add For Main Breaker	460/ 575V HP	SIZE
5	7 ^{1/2}	15	15	YLS7K-**-**	\$ 673	\$ 764	\$ 812	\$+ 490		0YD
7 ^{1/2}	10	20	20	YLS11K-**-**	692	775	845	+ 490		1YD
15	15	30	30	YLS15K-**-**	840	903	963	+ 490		1 ^{1/2} YD
20	20	40	40	YLS18K-**-**	873	946	1,094	+ 702		
25	25	60	60	YLS22K-**-**	1,076	1,382	1,520	+ 880	40	2YD
40	40	75	100	YLS30K-**-**	1,384	1,630	2,080	+ 960	2 ^{1/2}	YD
40	50	100	125	YLS45K-**-**	1,759	2,162	2,347	+ 960	75	3YD
60	75	150	200	YLS55K-**-**	2,095	2,595	2,781	+ 1,770		3 ^{1/2} YD
	85	175	200	YLS75K-**-**	3,190	3,757	3,906	+ 1,770	150	4YD
	125	250	300	YLS110K-**-**	4,400	5,396	5,564	+ 3,460		4 ^{1/2} YD
	175	350	400	YLS160K-**-**	5,307	6,822	6,970	+ 3,460	300	5YD
	250	500	750	YLS220K-**-**	7,557	8,918	9,066	+ 5,070		5 ^{1/2} YD
	350	700	850	YLS280K-**-**	10,160	10,966	11,014	+ 5,070	700	6YD
	450	900	1100	YLS375K-**-**	12,800	14,600	14,800	+ 5,070		

The Y-Delta overload is in the phase winding and set at 0.58 of the line current. When sizing overload use this formula:
Example: Y Delta, 75 HP, 460 Volt, 3 phase = 88 FLA
88 FLA X .58 = 51 Amps
Use overload suffix "RN"

Order Example: 150HP 460V
120VAC coil

YLS55K-A-TN-M1



For larger sizes thru 4,000 HP, check with main office.
For modifications and accessories, see page 68
For NEMA 4X Enclosure add \$200 List.



SIZE 2^{1/2} Y-D
75 H.P.

(Check with Factory for
Deduction for omission of wiring)

Reduced Voltage Starters PART-WINDING TYPE WLS

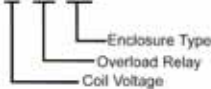
All Starters Supplied with BUILT-IN Heaters & Single Phasing Protection as Standard.

HORSEPOWER RATING (MAX HP RATINGS)				(Includes 3-pole O.L.) Catalogue No.	ENCLOSURE SUFFIX - (LIST PRICES)		Comparable NEMA			SIZE
208V HP	240V HP	440/ 480V HP	550/ 600V HP		- M1 NEMA 1 General Purpose	- M4+ NEMA 12/4 Water Tight / Dust Tight	200V HP	230 HP	460/ 575V HP	
30	30	60	60	WLS22K-**-**	\$1,350	\$1,550	25	25	40	2PW
40	40	90	90	WLS30K-**-**	1,485	1,692				2 ^{1/2} PW
50	50	100	100	WLS37K-**-**	1,750	1,950	50	50	75	3PW
60	80	150	150	WLS45K-**-**	2,192	2,345				3 ^{1/2} PW
100	100	200	200	WLS75K-**-**	3,513	3,718	75	75	150	4PW
150	150	300	300	WLS110K-**-**	5,340	5,490				4 ^{1/2} PW
200	200	400	400	WLS160K-**-**	6,590	6,615	150	150	300	5PW
350	350	700	700	WLS220K-**-**	8,088	8,425				5 ^{1/2} PW
400	400	800	800	WLS280K-**-**	9,880	10,250	300	300	600	6PW
500	500	1000	1000	WLS375K-**-**	13,265	13,668				

NOTE: For larger sizes thru 4,000 HP, check with main office. For modifications and accessories consult factory. The contactor overload is in the phase winding and set at 1/2 of the full motor current. Example 150 HP 460 = 172FLA ÷ 2 = 86Amps

Order Example: 150HP 460V 120VAC Coil

YLS55K-A-TM-M1



* For NEMA 4X Enclosure add \$200 List.



SIZE3 PW
100 HP Less Wiring
(Check with Factory for Deduction
for omission of wiring)