



Features

- Heavy Duty NEMA Starters
- Solid State or Thermal Overload Relays
- Fusible or MCP
- Heavy Duty Disconnect Handle
- Flexibility with Field Modifications
- Alternator Transfer on De-energization
- UL Listed for Outdoor Use and Service Equipment File #E14900
- CSA Certified File #LR6535

Application

Duplex pump controls are designed to perform either or both of two distinct functions: **duplexing** and **alternation**. The duplexing function provides capacity for system peaking or above normal demand without having the full motor capacity spinning at all times. It also provides standby capacity for use when one of the motors or pumps is disabled. The duplexing function is also referred to as lead/lag or main/standby. When

two pumps or compressors are controlled by a duplex controller, they are started in sequence as necessary to attain preset values of pressure, flow or liquid level.

Two pilot devices such as pressure switches or float switches provide electrical signals to the duplex controller. One pilot device is set to initiate the starting of the lead motor. This motor is rated to handle normal system demand. The second motor is usually the same rating and is referred to as the lag motor. It is only energized when the system demand is greater than the capacity of the lead motor. The lag motor is started when the second pilot device is signalling for more output than the lead motor can produce.

The alternation function reverses the lead and lag mode for the two motors in a duplex system. Upon alternation the first motor as described above becomes the lag motor and the second motor assumes the lead function.

The alternation is usually programmed to occur at any time both pumps come to rest. The alternation function equalizes wear on the two machines and extends the life of seals and bearings.

Features

Two control transformers may be provided for low voltage control to safeguard personnel from high voltage. One transformer is required for each starter to provide independent control circuits.

A Hand-Off-Auto selector switch for each starter may be assembled in the enclosure door or furnished separately for remote control. Test push buttons or pilot lights may also be installed on the enclosure.

Solid-state or Ambient Compensated Bimetal Overload Relays are supplied as standard.

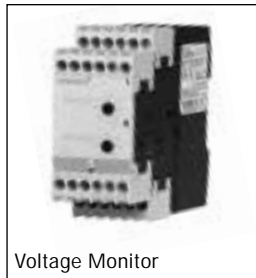
Auxiliary Equipment

- Siemens has an extensive line of water and air pressure switches. If pilot control requires a pressure switch see pages 461–462.
- For undervoltage and phase sensing relays see pages 637–638.

2
NEMA and HP
Rated Control



Pressure Switch



Voltage Monitor



Class 83 Controller Only



Class 84 Combination Controller with 2 MCPs



Duplex Heavy Duty Controllers

Selection

Solid-State and Ambient Compensated Bimetal Overload Class 83

Ordering Information	Coil Table		Overload Table		
<ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. ▶ For controllers with solid state overloads replace the (t) with the letter that corresponds to the correct FLA range in the overload table. ▶ Heater elements for bimetal overloads see page 884 (6-Required). ▶ Technical Data see pages 133-138. ▶ Field Modification Kits see page 121-125. ▶ Factory Modifications see pages 126-132. ▶ Dimensions see page 154. ▶ Wiring Diagrams see pages 167-168. ▶ Replacement parts see page 882. 	60Hz Voltage	Letter	Size	FLA	†
	24 Separate Control	J	0, 1	0.25-1	A
	120 Separate Control	F	0, 1	0.75-3	B
	200-208	D	0, 1	2.5-10	D
	220-240	G	0-1¼	9-18	E
	277	L	1-2	13-27	F
	440-480	H	1¾	20-40	G
	550-600	E	2-2½	22-45	H
	For other voltages and frequencies see page 129.		2½-3	30-60	J
			3	45-90	K
		3½	57-115	L	
		4	67-135	M	

Non-Combination (with Solid-State Overload)

Max Hp				NEMA Size	Half Size	Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts			NEMA 1 General Purpose		NEMA 4/4X Painted ^① Watertight, Dusttight		NEMA 12 NEMA 3/3R ^② Industrial Use Weatherproof	
						Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$
3	3	5	5	0	—	83CS192B*	1325.	83CS192E*	1749.	83CS1920*	1456.
7½	7½	10	10	1	—	83DS192B*	1410.	83DS192E*	1849.	83DS1920*	1541.
10	10	15	—	—	1¾	83ES192B*	1641.	83ES192E*	2080.	83ES1920*	1772.
10	15	25	25	2	—	83FS192B*	2088.	83FS192E*	3005.	83FS1920*	2427.
15	20	30	—	—	2½	83GS192B*	2496.	83GS192E*	4222.	83GS1920*	2935.
25	30	50	50	3	—	83HS192B*	2835.	83HS192E*	4561.	83HS1920*	3274.
30	40	75	—	—	3½	83IS192B*	5100.	83IS192E*	8043.	83IS1920*	6556.
40	50	100	100	4	—	83JS192B*	5716.	83JS192E*	8659.	83JS1920*	7172.

Non-Combination (with Ambient Compensated Bimetal Overload)

Max Hp				NEMA Size	Half Size	Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts			NEMA 1 General Purpose		NEMA 4/4X Painted ^① Watertight, Dusttight		NEMA 12 NEMA 3/3R ^② Industrial Use Weatherproof	
						Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$
3	3	5	5	0	—	83CP92B* 81	1256.	83CP92E* 81	1679.	83CP920* 81	1387.
7½	7½	10	10	1	—	83DP92B* 81	1340.	83DP92E* 81	1780.	83DP920* 81	1471.
10	10	15	15	—	1¾	83EP92B* 81	1572.	83EP92E* 81	2011.	83EP920* 81	1703.
10	15	25	25	2	—	83FP92B* 81	2018.	83FP92E* 81	2935.	83FP920* 81	2357.
15	20	30	30	—	2½	83GP92B* 81	2427.	83GP92E* 81	4152.	83GP920* 81	2866.
25	30	50	50	3	—	83HP92B* 81	2766.	83HP92E* 81	4491.	83HP920* 81	3205.
30	40	75	75	—	3½	83IP92B* 81	5031.	83IP92E* 81	7974.	83IP920* 81	6487.
40	50	100	100	4	—	83JP92B* 81	5647.	83JP92E* 81	8590.	83JP920* 81	7103.

①For NEMA 4X Stainless Steel enclosures see factory modifications on page 130.

②NEMA 12 may be field modified for NEMA 3/3R, see page 125.

2
NEMA & HP
Rated Control



Combination Duplex Heavy Duty Controllers

Selection

Disconnect Type, Non-Fusible with Solid State or Ambient Comp. Bimetal Overload Class 84

2

NEMA & HP
Rated Control

Ordering Information	Coil Table		Overload Table		
<ul style="list-style-type: none"> ▶ Use complete catalog number. Replace the (*) with letter from the coil table. ▶ For controllers with solid state overloads replace the (t) with the letter that corresponds to the correct FLA range in the overload table. ▶ For bimetal overloads order 6 heater elements by code number at \$11.60 each page 884. ▶ Technical Data see pages 133–138. ▶ Field Modification Kits see page 121–125. ▶ Factory Modifications see pages 126–132. ▶ Dimensions see page 154. ▶ Wiring Diagrams see pages 167–168. ▶ Replacement parts see page 882. ▶ Hubs available for NEMA 4 see page 125. ▶ Refer to page 127 for factory assembled fuse clips. 	60Hz Voltage	Letter	Size	FLA	†
	24 Separate Control	J	0, 1	0.25–1	A
	120 Separate Control	F	0, 1	0.75–3	B
	200–208	D	0, 1	2.5–10	D
	220–240	G	0–1¾	9–18	E
	277	L	1–2	13–27	F
	440–480	H	1¾	20–40	G
	550–600	E	2–2½	22–45	H
	For other voltages and frequencies see page 129.		2½–3	30–60	J
			3	45–90	K
		3½	57–115	L	
		4	67–135	M	

With Two Non Fusible Disconnect Switches Field Convertible to Fusible Disconnects (with Solid-State Overload)

Max Hp				NEMA Size	Half Size	Disc Amp Rating	Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X ^① Watertight Painted		NEMA 12 NEMA 3/3R ^② Industrial Use Weatherproof	
							Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$
3	3	5	5	0	—	30	84CS192BD*	2088.	84CS192ED*	3713.	84CS1920D*	2496.
7½	7½	10	10	1	—	30	84DS192BD*	2173.	84DS192ED*	3798.	84DS1920D*	2581.
10	10	15	15	—	1¼	60	84ES192BD*	2404.	84ES192ED*	4029.	84ES1920D*	2812.
10	15	25	25	2	—	60	84FS192BD*	3120.	84FS192ED*	5632.	84FS1920D*	3698.
15	20	30	30	—	2½	60	84GS192BD*	4491.	84GS192ED*	8867.	84GS1920D*	5239.
25	30	50	50	3	—	100	84HS192BD*	4830.	84HS192ED*	9206.	84HS1920D*	5578.
30	40	75	75	—	3½	200	84IS192BD*	8197.	84IS192ED*	13790.	84IS1920D*	10269.
40	50	100	100	4	—	200	84JS192BD*	8813.	84JS192ED*	14406.	84JS1920D*	10886.

With Two Non Fusible Disconnect Switches Field Convertible to Fusible Disconnects (with Ambient Compensated Bimetal Overload)

Max Hp				NEMA Size	Half Size	Disc Amp Rating	Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts				NEMA 1 General Purpose		NEMA 4/4X ^① Watertight Painted		NEMA 12 NEMA 3/3R ^② Industrial Use Weatherproof	
							Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$
3	3	5	5	0	—	30	84CP92BD* 81	2018.	84CP92ED* 81	3644.	84CP920D* 81	2427.
7½	7½	10	10	1	—	30	84DP92BD* 81	2103.	84DP92ED* 81	3729.	84DP920D* 81	2512.
10	10	15	15	—	1¼	60	84EP92BD* 81	2334.	84EP92ED* 81	3960.	84EP920D* 81	2743.
10	15	25	25	2	—	60	84FP92BD* 81	3051.	84FP92ED* 81	5562.	84FP920D* 81	3629.
15	20	30	30	—	2½	60	84GP92BD* 81	4422.	84GP92ED* 81	8798.	84GP920D* 81	5169.
25	30	50	50	3	—	100	84HP92BD* 81	4761.	84HP92ED* 81	9137.	84HP920D* 81	5508.
30	40	75	75	—	3½	200	84IP92BD* 81	8128.	84IP92ED* 81	13721.	84IP920D* 81	10200.
40	50	100	100	4	—	200	84JP92BD* 81	8744.	84JP92ED* 81	14337.	84JP920D* 81	10816.

①For NEMA 4X enclosures see factory modifications on page 130.

②NEMA 12 may be field modified for NEMA 3/3R, see page 125.



Combination Duplex Heavy Duty Controllers

Selection

Circuit Breaker Type, with Solid State or Ambient Compensated Bimetal Overload Class 84

Ordering Information	Coil Table		Overload Table		
<ul style="list-style-type: none"> ▶ Replace the (*) with a letter from the coil table. ▶ For controllers with solid state overloads replace the (t) with the letter that corresponds to the correct FLA range in the overload table. ▶ For bimetal overloads order 6 heater elements by code number at \$11.60 each page 884. ▶ Technical Data see pages 133–138. ▶ Field Modification Kits see page 121–125. ▶ Factory Modifications see pages 126–132. ▶ Dimensions see page 154. ▶ Wiring Diagrams see pages 167–168. ▶ Replacement parts see page 882. ▶ Hubs available for NEMA 4 see page 125. 	60Hz Voltage	Letter	Size	FLA	†
	24 Separate Control	J	0, 1	0.25–1	A
	120 Separate Control	F	0, 1	0.75–3	B
	200–208	D	0, 1	2.5–10	D
	220–240	G	0–1¾	9–18	E
	277	L	1–2	13–27	F
	440–480	H	1¾	20–40	G
	550–600	E	2–2½	22–45	H
	For other voltages and frequencies see page 129.		2½–3	30–60	J
			3	45–90	K
			3½	57–115	L
			4	67–135	M

2 Motor Circuit Protectors (with Solid-State Overload)

Max Hp				NEMA Size	Half Size	Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts			NEMA 1 General Purpose		NEMA 4/4X [Ⓛ] Watertight Painted		NEMA 12 NEMA 3/3R [Ⓜ] Industrial Use Weatherproof	
						Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$
½	½	1	1	0	—	84CS†92BM*	2696.	84CS†92EM*	4322.	84CS†920M*	3105.
1½	1½	3	3	0	—	84CS†92BM*	2696.	84CS†92EM*	4322.	84CS†920M*	3105.
3	3	5	5	0	—	84CS†92BM*	2696.	84CS†92EM*	4322.	84CS†920M*	3105.
5	5	7½	10	1	—	84DS†92BM*	2781.	84DS†92EM*	4407.	84DS†920M*	3189.
7½	7½	10	10	1	—	84DS†92BM*	2781.	84DS†92EM*	4407.	84DS†920M*	3189.
10	10	15	15	—	1¾	84ES†92BM*	3012.	84ES†92EM*	4638.	84ES†920M*	3421.
10	15	25	25	2	—	84FS†92BM*	3713.	84FS†92EM*	6225.	84FS†920M*	4291.
15	20	30	30	—	2½	84GS†92BM*	4815.	84GS†92EM*	9191.	84GS†920M*	5562.
25	30	50	50	3	—	84HS†92BM*	5154.	84HS†92EM*	9530.	84HS†920M*	5901.
30	40	60	75	—	3½	84IS†92BM*	10046.	84IS†92EM*	15639.	84IS†920M*	12111.
—	—	75	75	—	3½	84IS†92BM*	10046.	84IS†92EM*	15639.	84IS†920M*	12111.
40	50	100	100	4	—	84JS†92BM*	10662.	84JS†92EM*	16255.	84JS†920M*	12727.

2 Motor Circuit Protectors (with Ambient Compensated Bimetal Overload)

Max Hp				NEMA Size	Half Size	Enclosure					
200 Volts	230 Volts	460 Volts	575 Volts			NEMA 1 General Purpose		NEMA 4/4X [Ⓛ] Watertight Painted		NEMA 12 NEMA 3/3R [Ⓜ] Industrial Use Weatherproof	
						Catalog No	Price \$	Catalog No	Price \$	Catalog No	Price \$
½	½	1	1	0	—	84CPA92BM* 81	2627.	84CPA92EM* 81	4253.	84CPA920M* 81	3035.
1	1	3	3	0	—	84CPB92BM* 81	2627.	84CPB92EM* 81	4253.	84CPB920M* 81	3035.
3	3	5	5	0	—	84CPC92BM* 81	2627.	84CPC92EM* 81	4253.	84CPC920M* 81	3035.
½	½	1	1	1	—	84DPC92BM* 81	2712.	84DPA92EM* 81	4337.	84DPA920M* 81	3120.
1	1	3	3	1	—	84DPB92BM* 81	2712.	84DPB92EM* 81	4337.	84DPB920M* 81	3120.
3	3	7½	7½	1	—	84DPD92BM* 81	2712.	84DPD92EM* 81	4337.	84DPD920M* 81	3120.
7½	7½	10	10	1	—	84DPE92BM* 81	2712.	84DPE92EM* 81	4337.	84DPE920M* 81	3120.
10	10	—	—	—	1¾	84EPG92BM* 81	2943.	84EPG92EM* 81	4568.	84EPG920M* 81	3351.
—	—	15	15	—	1¾	84EPF92BM* 81	2943.	84EPF92EM* 81	4568.	84EPF920M* 81	3351.
7½	10	20	20	2	—	84FPH92BM* 81	3644.	84FPH92EM* 81	6155.	84FPH920M* 81	4222.
10	15	25	25	2	—	84FPJ92BM* 81	3644.	84FPJ92EM* 81	6155.	84FPJ920M* 81	4222.
—	—	30	30	—	2½	84GPK92BM* 81	4746.	84GPK92EM* 81	9122.	84GPK920M* 81	5493.
15	20	—	—	—	2½	84GPL92BM* 81	4746.	84GPL92EM* 81	9122.	84GPO920M* 81	5493.
—	—	30	30	3	—	84HPM92BM* 81	5085.	84HPM92EM* 81	9461.	84HPM920M* 81	5832.
25	30	50	50	3	—	84HPN92BM* 81	5085.	84HPN92EM* 81	9461.	84HPN920M* 81	5832.
30	40	75	75	—	3½	84IPP92BM* 81	9977.	84IPP92EM* 81	15570.	84IPP920M* 81	12041.
40	50	100	100	—	4	84JPR92BM* 81	10593.	84JPR92EM* 81	16186.	84JPR920M* 81	12658.

[Ⓛ]For NEMA 4X enclosures see factory modifications on page 130.

[Ⓜ]NEMA 12 may be field modified for NEMA 3/3R, see page 125.

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NEMA & HP
Rated Control