

Digital Soft Start Controls



9 thru 900 Amps
9 thru 900 Amps

208-460V 50/60 Hz.
208-575V 50/60 Hz.

Applications: Controlled ramp start and stop, minimize spillage in material handling, reduced water hammer in pumping, reduced wear on mechanical gears, eliminate high inrush current, and energy optimizing of under loaded motors. Typical applications include: pumps, conveyors, fans, reciprocating compressors and screw and rotary compressors

Features: Six SCR three phase voltage control with programmable starting ramp and current limit. Application software senses changing load conditions and adapts to increase performance. Power factor optimization eliminates motor over-fluxing and allows under-loaded or over-sized motors to operate more efficiently. NEMA 1 enclosure.

Design Specifications

- MOV protection
- Current feedback
- Microprocessor Control
- Power factor sensing
- Energy optimization
- One programmable input
- Two programmable form C outputs

Custom Product Capabilities

- NEMA 12, 4 or 3R enclosures with bypass contactor
- Flange mounted input disconnect
- Input circuit breaker or fuses
- Input contactor
- 3 wire start/stop pushbuttons
- 2 wire Hand-Off-Auto switch
- Indicating lights
- Large units up to 1800 amps

Environmental and Operating Conditions

- Input voltage
3 phase 208-575V
- Control voltage 120VAC
- Input frequency 50/60 Hz
- Humidity 90% RH condensing
- 3000 feet altitude
- 40°C ambient temperature

Protective Features

- Current limit
- Shorted SCR detection
- SCR overload
- Shear pin-over-current detection
- Low current/under-load detection
- Input phase loss on start up
- Heat sink over-temperature

Output	Voltage	208-460V, 230-575V
	Current	9-900A
	Horsepower	Voltage and application rated, 5-700Hp
	Short Circuit	5000 Amperes symmetrical
	Altitude Derate	1% per 330 feet above 3300 feet
	Temperature Derate	2% per one °C above 40°C up to 60°C
Overload	Standard Duty	300% Motor full load amps at 35 seconds, 400% Motor full load amps at 6 seconds
	Medium Duty	300% Motor full load amps at 60 seconds, 400% Motor full load amps at 12 seconds
	Heavy Duty	300% Motor full load amps at 80 seconds, 400% Motor full load amps at 35 seconds
Input Ratings	Voltage	208-460V, 230-575V
	Frequency	50/60 Hz
	Phase	Three Phase
Control Spec	Control Method	Microprocessor controlled full wave, three phase, six thyristor firing
	Start Time	Programmable 1-255 seconds
	Stop Time	Programmable 0-255 seconds
	Voltage Pedestal	Programmable: Start 10-60%, Kick 60-90%, Stop 10-60%
	Current Limit	800% of rated current
	Power Factor	Continuously monitored to eliminate motor over-flux for power optimizing
SCR Spec	Peak Inverse Voltage	460VAC controllers 1400V
		575VAC controllers 1600V
	Heat Loss	3.3 Watts per 1 Ampere running current
Ambient Conditions	Temperature	Enclosed 0-40°C
	Cooling	Convection / Forced Air included when required
	Altitude	3300 feet above sea level

Farm Duty Motors

Definite Purpose Motors

Material Unit Handling

Brake Motors

200 & 575 Volt Motors

IEC Frame Motors

50 Hertz Motors

Inverter/Vector Motors & Controls

DC Motors and Controls

Soft Starters & Dynamic Brakes



Soft Starters & Dynamic Brakes

Digital Soft Start Controls - Typical Applications

Standard Duty

- Agitator
- Axial Blower
- Axial Fan
- Band Saw
- Centrifugal Pump
- Chiller
- Escalator
- Low Inertia Fan
- Propeller Fan
- Small Pump

Medium Duty

- Circular Saw
- Conveyor, Screw Feeder
- Drilling Press
- Elevator
- Flywheel Press
- Grinder
- Hammer Press

- High Inertia Fan
- Large Pump
- Mill Mixer
- Pelletizer / Pulper
- Positive Displacement Pump
- Reciprocating Compressor
- Vibrating Screen

Heavy Duty

- Centrifugal Blower
- Centrifugal Fan
- Chipper
- Disintegrator
- Loaded Centrifuge
- Loaded Mixer
- Loaded Screw Compressor
- Loaded Reciprocating Compressor
- Pulverizer
- Rock Crusher
- Separator

	Standard Duty (a)			Medium Duty (b)			Heavy Duty (c)			Cont. Output Amps	Catalog Number	List Price	Mult. Sym.	Size
	208V (d)	230V	460V	208V (d)	230V	460V	208V (d)	230V	460V					
Motor Application Horsepower @ 10 Starts per hour Maximum														
	—	—	5	—	—	5	—	—	—	9	MD7-009-CB	1648	E7	1
	3	5	10	—	—	7.5	—	—	5	16	MD7-016-CB	1712	E7	1
	5	7.5	15	—	5	10	—	—	7.5	23	MD7-023-CB	1884	E7	1
	7.5	10	20	5	7.5	15	—	—	10	30	MD7-030-CB	2046	E7	1
	10	15	30	7.5	10	20	—	5	15	44	MD7-044-CB	2332	E7	1
	15	20	40	10	15	30	5	7.5	20	59	MD7-059-CB	2613	E7	1
	20	25	50	15	15	40	7.5	10	30	72	MD7-072-CB	2955	E7	1
	25	30	60	15	20	50	10	15	40	85	MD7-085-CB	3124	E7	1
	30	40	75	20	30	60	15	20	50	105	MD7-105-CB	3766	E7	1
	40	50	100	30	40	75	20	30	60	146	MD7-146-CB	4449	E7	1
	50	60	125	40	50	100	30	40	75	174	MD7-174-CB	5898	E7	2
	60	75	150	50	60	125	40	50	100	202	MD7-202-CB	6545	E7	2
	75	100	200	60	75	150	50	60	125	242	MD7-242-CB	7035	E7	2
Motor Application Horsepower @ 3 Starts per hour Maximum														
	100	125	250	75	100	200	60	75	150	300	MD7-300-CB	7841	E7	2
	125	150	300	100	125	250	75	100	200	370	MD7-370-CB	8491	E7	2
	150	200	400	125	150	300	100	125	250	500	MD7-500-CB	11610	E7	3
	200		500	150	200	400	125	150	300	600	MD7-600-CB	12606	E7	3
			600	200		500	150	200	400	750	MD7-750-CB	15049	E7	3
			700			600	200		500	900	MD7-900-CB	16292	E7	3

	Standard Duty (a)			Medium Duty (b)			Heavy Duty (c)			Cont. Output Amps	Catalog Number	List Price	Mult. Sym.	Size
	575V			575V			575V							
Motor Application Horsepower @ 10 Starts per hour Maximum														
	7.5			5			—			9	MD8-009-CB	1895	E7	1
	10			7.5			5			16	MD8-016-CB	1969	E7	1
	20			10			7.5			23	MD8-023-CB	2166	E7	1
	25			20			10			30	MD8-030-CB	2353	E7	1
	40			30			20			44	MD8-044-CB	2681	E7	1
	50			40			30			59	MD8-059-CB	3005	E7	1
	60			50			40			72	MD8-072-CB	3397	E7	1
	75			60			50			85	MD8-085-CB	3592	E7	1
	100			75			60			105	MD8-105-CB	4330	E7	1
	125			125			100			146	MD8-146-CB	5117	E7	1
	150			—			—			174	MD8-174-CB	6781	E7	2
	200			150			125			202	MD8-202-CB	7526	E7	2
	250			200			150			242	MD8-242-CB	8089	E7	2
Motor Application Horsepower @ 3 Starts per hour Maximum														
	250			—			—			300	MD8-300-CB	8891	E7	2
	300			250			—			370	MD8-370-CB	9765	E7	2
	400			300			300			500	MD8-500-CB	13349	E7	3
	500			400			400			600	MD8-600-CB	14499	E7	3
	600			500			500			750	MD8-750-CB	17309	E7	3
	700			600			600			900	MD8-900-CB	18737	E7	3

(a) 300% Motor FLA @ 35 Sec., 400% Motor FLA @ 6 Sec.
 (b) 300% Motor FLA @ 60 Sec., 400% Motor FLA @ 12 Sec.
 (c) 300% Motor FLA @ 80 Sec., 400% Motor FLA @ 35 Sec.
 (d) 208V applications are UL listed only to 196V.

Digital Soft Start Controls - Dimensions

Dimensions

Size	Outside			Mounting		Ap'x. Shpg. Wgt. lbs. (kg)
	Height Inches (mm)	Width Inches (mm)	Depth Inches (mm)	Height Inches (mm)	Width Inches (mm)	
1	16.5 (420)	8.7 (222)	7.7 (195)	15.7 (400)	5.9 (150)	16.1 (7.3) or 18.3 (8.3) > 44 amp
2	20.2 (520)	13.4 (340)	10.4 (265)	19.7 (500)	9.8 (250)	34.5 (15.7) or 48.4 (22) > 200 amp
3	24 (610)	26.6 (675)	15.7 (400)	22.7 (575)	19.7 (500)	143 (65) or 158.4 (72) > 600 amp

Digital Soft Start Controls - Accessories



External MOV

(Metal Oxide Varistor type voltage surge suppressor)

- Protects from line-to-line voltage spikes
- Recommended for all low line impedance applications

Catalog Number	Volts	List Price	Mult. Sym.
MOV505L	460	99	E7
MOV620EL	575	94	E7



Remote Keypad with Cable

- 32 Character English alphanumeric display
- NEMA 4X indoor enclosure
- Backlit LCD

Catalog Number	Cable Length	List Price	Mult. Sym.
CBLDS015KP	5 ft.	379	E8

Expansion Board

- Two programmable relay outputs with FORM C contact (normally open and normally closed)
- Two programmable analog outputs (0-10V @ 10mA maximum)
- One programmable or 4-20mA analog input

Catalog Number	List Price	Mult. Sym.
EB0389A00SP	570	E8

Farm Duty Motors

Definite Purpose Motors

Material Unit Handling

Brake Motors

200 & 575 Volt Motors

IEC Frame Motors

50 Hertz Motors

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DC Motors and Controls

Soft Starters & Dynamic Brakes



BALDOR

Soft Starters & Dynamic Brakes

Farm Duty Motors

Multipurpose Solid State Soft Starter

8 thru 420 Amps
8 thru 30 Amps

208/230/460V 60 Hz.
208/230/460/575V 60 Hz.

Definite Purpose Motors



Material Unit Handling

Applications: Controlled ramp start and stop, minimize spillage in material handling applications and water hammer in pumping equipment. Current limit provides a current ceiling to limit peak demand on start and constant current starting of high inertial loads such as chippers, centrifuges and compressors. Typical applications include: small and large pumps, conveyors, low and high inertia fans, reciprocating compressors, screw and rotary compressors.

Features: Six SCR power devices and several enclosure options. Tachometer feedback may be used to provide consistent starting independent of load conditions on textile, material handling and pumping equipment.

Brake Motors

Design Specifications

- Current feedback
- Microprocessor Control
- Power factor sensing
- Energy optimization
- One programmable input
- Two programmable form C outputs
- Programmable current limit

Environmental and Operating Conditions

- Input voltage
3 phase 208-575V
- Control voltage 120VAC
- Input frequency 50/60 Hz
- Humidity 90% RH condensing
- 3000 feet altitude
- 40°C ambient temperature

Protective Features

- Current limit
- Shorted SCR detection
- SCR overload
- Shear pin-over-current detection
- Low current/under-load detection
- Input phase loss on start up
- Heat sink over-temperature

200 & 575 Volt Motors

Model Number	208/230/460 VAC 60 Hz.	MA7-008-CA	MA7-016-CA	MA7-030-CA	MB7-055-CP	MB7-080-CP	MB7-160-CP	MB7-250-CP	MB7-420-CP
Control only	208/230/460/575 VAC 60 Hz.	MA8-008-CA	MA8-016-CA	MA8-030-CA	—	—	—	—	—
Output Ratings	230 VAC	2	5	10	20	30	60	100	150
	460 VAC	5	10	20	40	60	125	200	350
	575 VAC	5	10	20	—	—	—	—	—
Current Rating		8 Amp	16 Amp	30 Amp	55 Amp	80 Amp	160 Amp	240 Amp	420 Amp
Overload Rating		Continuous 115% of FLA; 400% for 30 seconds							
Derate		Above 1000m (3300 Ft.) decrease amp rating 1% for each additional 100m (330 ft.) Above 45° (115°F) decrease amp rating 1.0% for each additional °C (0.84%/°F)							
Input Rating	Frequency	60 Hz. ±5%							
	Voltage	+10% to -15% (except for 575 VAC units max. VAC is 620)							
	Phase	Three Phase							
Control Spec.	Control Method	6 SCRs connected in inverse parallel for full-wave control							
	Start Time	Adjustable 3-50 seconds (current limit starting is not timed)							
	Stop Time	Adjustable 5-50 seconds to extend stopping time							
	Initial Torque	Adjustable starting 0-75%: Stopping 0-100%							
	Current Limit	Adjustable 75-400% of full load amps							
	Pulse Time	Adjustable 0-1.5 seconds							
	Current Monitor	Adjustable 50-400% of full load amps (causes a contact closure or control shut down when current level is reached after starting)							
	Power Factor	Adjustable for max. reduced motor voltage dependent on motor load							
	Control Power	Self-powered				External Transformer			
	Status Contacts	125 VAC at 0.5 Amp normally open							
SCR Spec.	Peak Inverse Voltage	460 VAC Starters 1200 VAC 575 VAC Starters 1600 VAC							
	Heat Loss	3.3 watts per running amp							
Protective Functions	Over Current	Over current shut down at 450% of motor full load amps							
	Shorted SCR Detection	Shunt trip contact							
	SCR Thermostat	Trips on over temperature of heat sink on 55 amp sizes and above							
	Voltage Transient	Metal oxide varistor (MOV)							
Ambient Conditions	Temperature	Enclosed 0-45°C (32 to 113°F) open/panel 0 to 50°C (32 to 122°F)							
	Cooling	Convection				Forced Air			

IEC Frame Motors

50 Hertz Motors

Inverter/Vector Motors & Controls

DC Motors and Controls

Soft Start & Dynamic Brakes

Multipurpose Solid State Soft Starter

Amp Size	Max Hp at VAC				Catalog Number	List Price	Mult. Sym.
	208	230	460	575			
Combination Starter ^(a)							
NEMA 12 (can also be used for NEMA 1)							
55	15	20	40	—	MB7-055-GC ^(b)	5376	E7
80	25	30	60	—	MB7-080-GC ^(b)	5896	E7
160	50	60	125	—	MB7-160-GC ^(b)	12564	E7
250	75	100	200	—	MB7-250-GC ^(b)	14454	E7
420	150	150	350	—	MB7-420-GC ^(b)	18533	E7
NEMA 1 - 208/230/460 Volts							
80	25	30	60	—	MB7-080-AB	7140	E7
160	50	60	125	—	MB7-160-AB	9415	E7
250	60	75	150	—	MB7-250-AB-1	11243	E7
250	75	100	200	—	MB7-250-AB	11753	E7
420	150	150	350	—	MB7-420-AB	13496	E7
Non-Combination Starter ^(a)							
NEMA 1							
160	50	60	125	—	MB7-160-BB	7963	E7
250	75	100	200	—	MB7-250-BB	8860	E7
420	150	150	350	—	MB7-420-BB	10650	E7
Control Only							
Open/Panel							
8	2	2	5	—	MA7-008-CA	1169	E7
16	3	5	10	—	MA7-016-CA	1230	E7
30	7.5	10	20	—	MA7-030-CA	1443	E7
55	15	20	40	—	MB7-055-CP	2735	E7
80	25	30	60	—	MB7-080-CP	3919	E7
160	50	60	125	—	MB7-160-CP	5100	E7
250	75	100	200	—	MB7-250-CP	6989	E7
420	150	150	350	—	MB7-420-CP	8778	E7
8	2	2	5	5	MA8-008-CA	1220	E7
16	3	5	10	10	MA8-016-CA	1292	E7
30	7.5	10	20	25	MA8-030-CA	1493	E7
NEMA 1							
160	50	60	125	—	MB7-160-CB	6196	E7
250	75	100	200	—	MB7-250-CB	8121	E7
420	150	150	350	—	MB7-420-CB	9781	E7

^(a) Combination Starter includes control, overload relay and circuit breaker. Non-combination Starter includes control and overload relay.

^(b) Uses a shunt bypass contactor to short SCR after ramp up (not a full voltage bypass starter). Custom controls available.

Single Phase Starter

7 thru 110 Amps

115/230V 50/60 Hz.



Applications: Use with existing or new magnetic starter. This industrial solid state control will reduce initial starting torque and current of single phase motors allowing them to be started with minimum voltage drop. High starting torque problems such as belt slippage may be eliminated. Ideal for crop driers, augers, bucket elevators and fan or pump applications.

Features: Two adjustable starting torque settings. Adjustable starting ramp time to 30 seconds.

Amp Size	Max Hp at VAC		Catalog Number	List Price	Mult. Sym.	Notes ^(a)
	115	230				
Open/Panel - 115/230 Volts						
7	1/4	3/4	S20CA	495	E7	19
12	1/2	2	S21CA	515	E7	19
24	2	3	S22CA	550	E7	19
40	3	7.5	S23CA	587	E7	19
110	10	—	S25CA	981	E7	19

NOTE: To size single phase starters use the motor FLA. There is a great variation in FLA between motor manufacturers in these sizes.

^(a) See notes on inside back flap and pages 5-6.

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