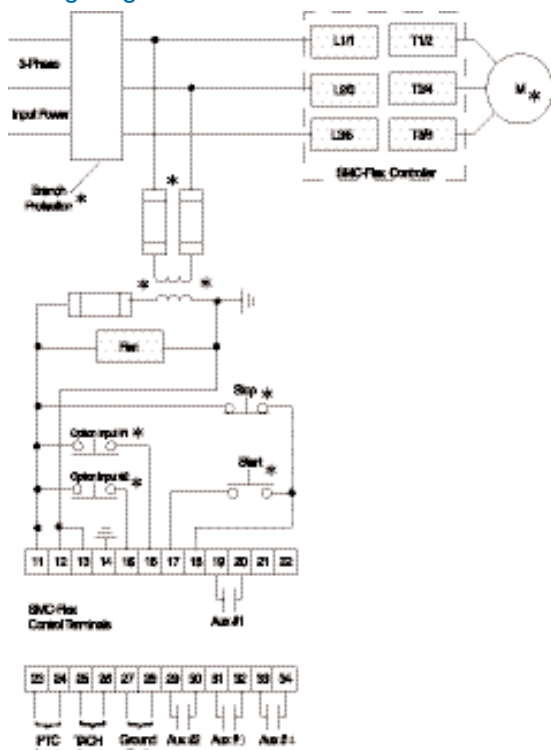


Specifications

Functional Design Specifications			
Standard Features	Installation	Power Wiring	Standard squirrel-cage induction motor or a Wye-Delta, six-lead motor.
		Control Wiring	2- and 3-wire control for a wide variety of applications.
	Setup	Keypad	Front keypad and backlit LCD display.
		Software	Parameter values can be downloaded to the SMC-Flex Controller with DriveTools programming software and the Cat. No. 20-COMM... DPI communication module.
	Communications		One DPI provided for connection to optional human interface and communication modules.
	Starting and Stopping Modes		Soft Start Current Limit Start Dual Ramp Full Voltage Linear Speed Acceleration Preset Slow Speed Soft Stop
	Protection and Diagnostics		Power loss, line fault, voltage unbalance, excessive starts/hour, phase reversal, undervoltage, overvoltage, controller temp, stall, jam, open gate, overload, underload, communication fault.
	Metering		Amps, volts, kW, kWh, mW, mWh, elapsed time, power factor, motor thermal capacity usage.
	Alarm Contact		Overload, underload, undervoltage, overvoltage, unbalance, jam, stall, and ground fault
	Status Indication		Stopped, starting, stopping, at speed, alarm, and fault.
Auxiliary Contacts		Four fully programmable contacts as normal/up-to-speed/fault/alarm/network (N.O./N.C.), or external bypass (N.O. only).	
Optional Features	Pump Control		Helps reduce fluid surges in centrifugal pumping systems during starting and stopping period. Starting time is adjustable from 0...30 seconds. Stopping time is adjustable from 0...120 seconds.
	Braking Control	SMB Smart Motor Braking	Provides motor braking without additional equipment for applications that require the motor to stop quickly. Braking current is adjustable from 0...400% of the motor's full-load current rating.
		Accu-Stop	Provides controlled position stopping. During stopping, braking torque is applied to the motor until it reaches preset slow speed (7% or 15% of rated speed) and holds the motor at this speed until a stop command is given. Braking torque is then applied until the motor reaches zero speed. Braking current is programmable from 0...450% of full-load current.
		Slow Speed with Braking	Used on applications that require slow speed (in the forward direction) for positioning or alignment and also require braking control to stop.

Wiring Diagram — Line Controller



* Customer supplied.

Bulletin 150
SMC™ Flex Smart Motor Controller
 Specifications, Continued

		Electrical Ratings		
		Device Rating	UL/CSA/NEMA	IEC
Power Circuit	Rated Operation Voltage	480V	200...480V AC (-15%, +10%)	200...415V
		600V	200...600V AC (-15%, +10%)	200...500V
		690V	230...600V AC (-15%, +10%)	230...690V/Y
	Rated Insulation Voltage	480V	N/A	500V
		600V		500V
		690V		690V
	Rated Impulse Voltage	480V	N/A	6000V
		600V		
		690V		
	Dielectric Withstand	480V	2200V AC	2500V
		600V		
		690V		
	Repetitive Peak Inverse Voltage Rating	480V	1400V	1400V
		600V	1600V	1600V
		690V	1800V	1800V
	Operating Frequency	All	50/60 Hz	
	Utilization Category	5...480 A	MG 1	AC-53B:3.0-50:1750
		625...1250 A	MG 1	AC-53B:3.0-50:3550
	Protection Against Electrical Shock	5...85 A	N/A	IP20
		108...480 A		IP2X (with terminal covers)
625...1250 A		IP00 (open device)		
DV/DT Protection	480V & 600V	RC Snubber Network		
	690V	None		
Transient Protection	480V & 600V	Metal Oxide Varistors: 220 Joules		
	690V	None		
Rated Operational Voltage§	5...480 A	100...240V AC or 24V AC/DC		
	625...1250 A	110/120V AC and 230/240V AC		
Rated Insulation Voltage	All	N/A	240V	
Rated Impulse Voltage	All	N/A	3000V	
Dielectric Withstand	All	1600V AC	2000V	
Operating Frequency	All	50/60 Hz		
Input onstate voltage minimum		85V AC, 19.2V DC / 20.4V AC		
Input onstate current		20 mA @120V AC / 40 mA @ 240V AC, 7.6 mA @ 24V AC/DC		
Input offstate voltage maximum		50V AC, 10V DC / 12V AC		
Input offstate current @ input offstate voltage		<10 mA AC, <3 mA DC		

§ 690V power is only available with 100...240V control.

Electrical Ratings								
SCPD Performance 200...600V		Type 1						
SCCR List*		Max. Standard Available Fault	Max. Standard Fuse (A)*	Max. Standard Available Fault	Max. Circuit Breaker (A)	Max. High Fault	Max. Fuse (A) ‡	
Line Device Operational Current Rating (A)	5	10 kA	20	10 kA	20	70 kA	10	
	25	10 kA	100	10 kA	100	70 kA	50	
	43	10 kA	150	10 kA	150	70 kA	90	
	60	10 kA	225	10 kA	225	70 kA	125	
	85	10 kA	300	10 kA	300	70 kA	175	
	108	18 kA	400	18 kA	300	70 kA	200	
	135	18 kA	500	18 kA	400	70 kA	225	
	201	30 kA	600	30 kA	600	70 kA	350	
	251	30 kA	700	30 kA	700	70 kA	400	
	317	42 kA	800	30 kA	800	69 kA	500	
	361	42 kA	1000	30 kA	1000	69 kA	600	
	480	42 kA	1200	30 kA	1200	69 kA	800	
	625	42 kA	1600	42 kA	1600	74 kA	1600	
	780	42 kA	1600	42 kA	2000	74 kA	1600	
	970	85 kA	2500	85 kA	2500	85 kA	2500	
	1250	85 kA	3000	85 kA	3200	85 kA	3000	
	Delta Device Operational Current Rating (A)	8.7	10 kA	35	10 kA	35	70 kA	17.5
		43	10 kA	150	10 kA	150	70 kA	90
		74	10 kA	300	10 kA	300	70 kA	150
		104	10 kA	400	10 kA	300	70 kA	200
147		10 kA	400	10 kA	400	70 kA	200	
187		18 kA	500	18 kA	500	70 kA	300	
234		18 kA	700	18 kA	700	70 kA	400	
348		30 kA	1000	30 kA	1000	70 kA	600	
435		42 kA	1200	30 kA	1200	70 kA	800	
549		42 kA	1600	30 kA	1600	69 kA	1000	
625		42 kA	1600	30 kA	1600	69 kA	1200	
831		42 kA	1600	30 kA	1600	69 kA	1600	
850		42 kA	1600	42 kA	2000	74 kA	1600	
900	42 kA	1600	42 kA	2000	74 kA	1600		
1200	85 kA	3000	85 kA	3200	85 kA	3000		
1600	85 kA	3000	85 kA	3200	85 kA	3000		
SCPD Performance 690V		Type 1						
SCCR List*	Device Rating	Max. Standard Available Fault		Max. Ampere Tested — North American Style		Max. Ampere Tested — European Style		
Maximum FLC	108	70 kA		A070URD33xxx500		6,9 gRB 73xxx400 6,6URD33xxx500		
	135	70 kA		A070URD33xxx500		6,9 gRB 73xxx400 6,6URD33xxx500		
	201	70 kA		A070URD33xxx700		6,9 gRB 73xxx630 6,6URD33xxx700		
	251	70 kA		A070URD33xxx700		6,9 gRB 73xxx630 6,6URD33xxx700		
	317	70 kA		A070URD33xxx900		6,9 gRB 73xxx800 6,6URD33xxx900		
	361	70 kA		A070URD33xxx900		6,9 gRB 73xxx800 6,6URD33xxx900		
	480	70 kA		A070D33xxx1250 A100URD73xxx1250		9 URD 73xxx1250 6,6URD33xxx1250		
	625	70 kA		A070URD33xxx1400		6,6URD33xxx1400		
	780	70 kA		A070URD33xxx1400		6,6URD33xxx1400		
	970	85 kA		2 fuses in parallel A070URD33xxx1250		2 fuses in parallel 6,6URD33xxx1250		
1250	85 kA		2 fuses in parallel A070URD33xxx1250		2 fuses in parallel 6,6URD33xxx1250			

* Consult local codes for proper sizing of short circuit protection.

* Non-time delay fuses (K5 — 5...480V (8.7...831 A) devices; Class L — 625...1250V (850...1600 A) devices).

‡ High capacity fault rating when used with time delay class CC, J, or L fuses.

Bulletin 150
SMC™ Flex Smart Motor Controller
 Specifications, Continued

Electrical Ratings					
Power Requirements	Control Module	1...480 A	120...240V AC	Transformer	75 VA
			24V AC	Transformer	130 VA
			24V DC	Inrush Current	5 A
				Inrush Time	250 ms
				Transient Watts	60 W
				Transient Time	500 ms
				Steady State Watts	24 W
				Minimum Allen-Bradley Power Supply	1606-XLP50E
			625...1250 A	751 VA (recommended 800 VA)	
			Heatsink Fan(s) (A)✦	5...135 A, 20 VA	
201...251 A, 40 VA					
317...480 A, 60 VA					
625...1250 A, 150 VA					
Steady State Heat Dissipation with Control and Fan Power (Watts)	Controller Rating (A)	5	70		
		25	70		
		43	81		
		60	97		
		85	129		
		108	91		
		135	104		
		201	180		
		251	198		
		317	225		
		361	245		
		480	290		
		625	446		
		780	590		
970	812				
1250	1222				
Auxiliary Contacts 19/20 (Aux #1) 29/30 (Aux #2) 31/32 (Aux #3) 33/34 (Aux #4)	Type of Control Circuit	Electromagnetic relay			
	Number of Contacts	1			
	Type of Contacts	programmable N.O./N.C.			
	Type of Current	AC			
	Rated Operational Current	3 A @ 120V AC, 1.5 A @ 240V AC			
	Conventional Thermal Current I_{th} AC/DC	5 A			
	Make/Break VA	3600/360			
PTC Input Ratings	Utilization Category	AC-15/DC			
	Response Resistance	3400 Ω \pm 150 Ω			
	Reset Resistance	1600 Ω \pm 100 Ω			
	Short-Circuit Trip Resistance	25 Ω \pm 10 Ω			
	Max. Voltage at PTC Terminals ($R_{PTC} = 4 \text{ k}\Omega$)	< 7.5V			
	Max. Voltage at PTC Terminals ($R_{PTC} = \text{open}$)	30V			
	Max. No. of Sensors.	6			
	Max. Cold Resistance of PTC Sensor Chain	1500 Ω			
Tach Input	Response Time	800 ms			
		0...5V DC, 4.5V DC = 100% Speed			

✦ Heatsink fans can be powered by either 110/120V AC or 220/240V AC.

Environmental			
Operating Temperature Range			-5...50 °C (23...122 °F) (open) -5...40 °C (23...104 °F) (enclosed)
Storage and Transportation Temperature Range			-20...+75 °C
Altitude			2000 m (6560 ft)
Humidity			5...95% (non-condensing)
Pollution Degree			2
Mechanical			
Resistance to Vibration	Operational	All	1.0 G Peak, 0.15 mm (0.006 in.) displacement
	Non-Operational	5...480 A	2.5 G Peak, 0.38 mm (0.015 in.) displacement
Resistance to Shock	Operational	625...1250 A	1.0 G Peak, 0.15 mm (0.006 in.) displacement
		5...85 A	15 G
	Non-Operational	108...480 A	5.5 G
		625...1250 A	4 G
		5...85 A	30 G
		108...480 A	25 G
Construction	Power Poles	5...85 A	Heatsink thyristor modular design
	Power Poles	108...1250 A	Heatsink hockey puck thyristor modular design
	Control Modules		Thermoset and Thermoplastic Moldings
	Metal Parts		Plated Brass, Copper, or Painted Steel
Terminals	Power Terminals	5...85 A	Cable size — Line Upper — 2.5...95 mm ² (14...3/0 AWG) Line Lower — 0.8...2.5 mm ² (18...14 AWG) Load Upper — 2.5...50 mm ² (14...1 AWG) Load Lower — 0.8...2.5 mm ² (18...14 AWG) Tightening torque — 14.7 N•m (130 lb.-in.) Wire strip length — 18...20 mm (0.22...0.34 in.)
		108...135 A	One M10 x 1.5 diameter hole per power pole
		201...251 A	Two M10 x 1.5 diameter holes per power pole
		317...480 A	Two M12 x 1.75 diameter holes per power pole
		625...1250 A	Two 13.5 mm (0.53 in.) diameter holes per power pole
	Power Terminal Markings		NEMA, CENELEC EN50 012
Control Terminals	M3 screw clamp	Clamping yoke connection	
Other			
EMC Emission Levels	Conducted Radio Frequency Emissions Radiated Emissions		Class A Class A
EMC Immunity Levels	Electrostatic Discharge Radio Frequency Electromagnetic Field Fast Transient Surge Transient		8 kV Air Discharge Per EN/IEC 60947-4-2 Per EN/IEC 60947-4-2 Per EN/IEC 60947-4-2
Overload Characteristics	Current Range		Line Delta
		5	1...5 1.7...9
		25	5...25 8.6...43
		43	8.6...43 14.8...75
		60	12...60 20.8...104
		85	17...85 29.4...147
		108	27...108 47...187
		135	34...135 59...234
		201	67...201 116...348
		251	84...251 145...435
		317	106...317 183...549
		361	120...361 208...625
		480	160...480 277...831
		625	208...625 283...850
		780	260...780 300...900
970	323...970 400...1200		
1250	416...1250 533...1600		
	Trip Classes Trip Current Rating Number of Poles		10, 15, 20, and 30 117% of Motor FLC 3
Certifications	Open Type Controllers		CE Marked Per Low Voltage Directive 73/23/EEC, 93/68/EEC UL Listed (File No. E96956)