

A low cost, user-friendly PWM controller in compact NEMA 1 and 4x/12 enclosures



Reliance® Electric's SP500 controller is a compact, low-cost AC PWM inverter that is designed and built in North America. Utilizing state-of-the-art digital microprocessing concepts and IGBT (insulated gate bi-polar) transistors, SP500 offers "trip-free" adjustable-speed performance for AC induction and synchronous motors.

The SP500 offers the advanced technology to provide high performance and flexibility without the high-cost and complex programming common to many other drive controllers. Because it's available in a water-tight, dust-tight, corrosive resistant enclosure, the SP500 is ideal for the harsh environments found in many processing applications.

Standard Features

- Quiet motor operation with selectable 4, 6 or 8 kHz carrier frequency
- "Trip-free" operation
- 208-230 VAC, 380-460 VAC and 575 VAC three-phase input (+/-10%); 115 VAC and 208-230 VAC single-phase input
- 0.5 to 240 Hz three-phase voltage output
- Standard on-board keypad and display:
 - Start/Stop-Reset
 - Program mode
 - Forward/Reverse (plus reverse lock-out)
 - Increment and decrement
 - Selectable display of motor RPM, % load, and output voltage
- LED indication of:
 - Run, Forward, Reverse, Remote Control, Program Mode, Motor RPM, % Load, Output Voltage
- 3 preset speeds
- Password lockout
- Power-up start
- Frequency avoidance
- Auto restart after fault
- Remote start/stop with local or remote speed control
- Reverse disable
- Available low energy snubber braking kit
- 150% load for one minute
- 500 millisecond power dip ride-through
- Capable of starting into a rotating motor (either direction) without tripping.
- Internal terminal board for:
 - Remote Start/Stop IET reset operation
 - Remote Forward/Reverse selection
 - External speed control via customer supplied:
 - 5K ohm speed potentiometer
 - 0-10 VDC reference
 - 0-20 milliamp reference
- 0-10 VDC output proportional to either: Output frequency, Output amps or Output voltage
- IET or controller running form "C" contact
- Function loss
- Controller fault display for:
 - Over current, short circuit or ground fault
 - Over voltage
 - Under voltage
 - Controller high temperature
 - External function loss
 - Electronic thermal overload
- Coast-to-rest or ramp-to-rest selection
- Meets CE96 with the addition of an optional Mains Filter
- UL/CSA electronic motor overload which meets NEC/CEC requirements

Software Parameters

00	Local or Remote Control (4 choices) (default = local)
01	Acceleration Time (.5 - 90 seconds)
02	Deceleration Time (.5 - 90 seconds)
03	Minimum Speed (.5 - 30 Hz)
04	Maximum Speed (30 - 240 Hz)
05	Current Limit (10 - 150%)
06	Manual Torque Boost (2 - 10%)
07	V/Hz (voltage tops out at 30 - 240 Hz)
08	RPM Monitor Base Selection (10 - 9999)
09	Configurable Output Relay
10	Selectable Carrier Frequency (4, 6, 8 kHz (default = 4 KHz)
11	Remote Reference Gain (60 - 100%)
12	Remote Reference Offset (0 - 40%)
13	Percent Selected Speed Reference Display Enable
14	Electronic Thermal Overload (20 - 100%)
15	Electronic Thermal Overload Enable (default = enable)
16	Coast Stop Enable (default = coast)
17	Reverse Disable (default = off)
18	RPM Setpoint Enable (default = off)
19	Power-up Start Enable (default = off)
20	Password Lockout Enable (default = off)
21	Avoidance Frequency (min. to max. speed)
22	Avoidance Bandwidth (0 - 30 Hz)
23, 24 & 25	3 Preset Speeds (range = min. to max. speed)
26	Auto-Restart After Fault (0 - 10 attempts)
27	Auto-Restart Retry Wait Time (1 - 30 seconds)
28	Controller Voltage/Select (set at factory)
29	Analog Output Reference Selection
49	Software Version Number (x.xx)

Service Conditions

- Elevation to 3300 ft (1000 meters)
- Ambient Temperature Range:
 - Cabinet: 0°C to 40°C (32°F to 104°F)

- Chassis: 0°C to 55°C (32°F to 131°F)

- Atmosphere: Non-Condensing
Relative Humidity 5 to 95%
- AC Line Voltage Variation plus or minus 10%
- AC Line Frequency: 48 Hz to 62 Hz

Dimensions (in/mm)

Style	Height	Width	Depth	Weight (lb/kg)
A	12 / 305	5.7 / 146	4.8 / 122	7 / 3.2
B	11.1 / 282	8.8 / 224	6.25 / 159	12 / 5.4
C	13.3 / 338	11 / 280	6.25 / 159	18 / 8.2
D	18.3 / 465	11.4 / 290	9.4 / 239	25 / 11.3

Controller Selection

Contr. HP	Input Volt.	NEMA Encl.	Model Number	Max. Cont. Output Amps	Dim. Style
1/4-1	115	1	1SU11001	6.8	A
1/4-1	208-230	1	1SU21001	5.0	A
2	208-230	1	1SU21002	7.5 ⁽¹⁾	A
3	208-230	1	1SU21003	10.6	C
5	208-230	1	1SU21005	14.2	C
1/4-1	208-230	4x/12	1SU24001	4.5 ⁽¹⁾	A
2	208-230	4x/12	1SU24002	7.5	C
3	208-230	4x/12	1SU24003	10.6	C
5	208-230	4x/12	1SU24005	14.2	C
1/4-1	380-460	1	1SU41001	2.1	B
2	380-460	1	1SU41002	3.4	B
3	380-460	1	1SU41003	5.3	B
5	380-460	1	1SU41005	8.2	B
7-1/2	380-460	1	1SU41007	11.1	C
10	380-460	1	1SU41010	14.2	C

Contr. HP	Input Volt.	NEMA Encl.	Model Number	Max. Cont. Output Amps	Dim. Style
15	380-460	1	1SU41015	19.2	D
20	380-460	1	1SU41020	25.5	D
1/4-1	380-460	4x/12	1SU44001	2.1	B
2	380-460	4x/12	1SU44002	3.4	B
3	380-460	4x/12	1SU44003	5.3	B
5	380-460	4x/12	1SU44005	8.2	B
1/4-1	380-460	4x/12	1SU44007	11.1	C
10	380-460	4x/12	1SU44010	14.2	C
15	380-460	12	1SU42015	19.2	D
20	380-460	12	1SU42020	25.5	D
1/4-1	575	1	1SU51001	1.6	B
2	575	1	1SU51002	2.7	B
3	575	1	1SU51003	4.3	B
5	575	1	1SU51005	6.2	B
7-1/2	575	1	1SU51007	9.0	C
10	575	1	1SU51010	12.0	C
1/4-1	575	4x/12	1SU54001	1.6	B
2	575	4x/12	1SU54002	2.7	B
3	575	4x/12	1SU54003	4.3	B
5	575	4x/12	1SU54005	6.2	B
7-1/2	575	4x/12	1SU54007	9.0	C
10	575	4x/12	1SU54010	12.0	C
DEMO	120	4x/12	D1SP5101	2.0	A

Instruction Manual

- Installation and Operation Manual D2-3356-5

(1) Amp and KVA data is based on a controller programmed for a carrier frequency of 4 kHz. For carrier frequency settings of 6 or 8 kHz, refer to the instruction manual or Reliance Electric for Amp and KVA data.

This document located at:
<http://www.reliance.com/drives>

NOTE: This material is not intended to provide operational instructions. Appropriate Reliance Electric Drives instruction manuals precautions should be studied prior to installation, operation, or maintenance of equipment.

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