SP120

RELIANCE ELECTRIC

AC Drives

Compact, Cost-Effective 3-Phase AC Drives 1/4 - 5 HP

The Reliance Electric SP120 AC drive provides variable speed control and a wide range of features in a user-friendly package designed for panel or machine mounting. Available with either 115 VAC or 230 VAC single or three-phase input and 460 VAC three-phase input, the SP120 is a cost-effective solution for control of three-phase induction motors.

Primary Applications

SP120 AC drives are designed to be used in any low horsepower (1/4 to 5 HP) application where cost, size, and ease of use are critical considerations. Primary application examples include:

- fan control
- water pumping
- material handling
- converting
- packaging

Four different control modes built into all models make it easy to control a wide variety of processes, from those requiring simple speed pot control, to more complex PID applications in which two variables must be controlled. The SP120's easy-to-configure PID mode makes it an excellent choice in applications such as pumps with pressure control or fans with temperature control.

Standard Features

- Comes standard with integral local keypad for programming and speed adjustment.
- 5 parameter groups help simplify programming:
  - D group - display & diagnostic parameters
  - F group - basic function parameters
  - A group - control parameters
  - B group - protection parameters
  - C group - I/O setup parameters
- Screw control terminals provide reliable connections.
- Small adjustment set makes it easy to understand.
- Diagnostic parameters to easily track faults.

Designed for Global Use

- UL listed and cUL listed for North America.
- CE marked for Europe, except for 115 V input units.
- C-Tick N223 (pending) for Australia.

Drive Specifications

- Input voltage:
  - 100 V -10% to 120 V +5%, 1Φ 1/4 to 1 HP
  - 200 V -10% to 240 V +5%, 50/60 Hz ± 5%, 1Φ or 3Φ 1/4 to 5 HP
  - 400 V -10% to 460 V +10%, 50/60 Hz ± 5%, 3Φ 460 VAC 1/2 to 5 HP
- Output voltage:
  - 3Φ from 0-230 VAC
  - 3Φ from 0-460 VAC
- Rated output power: 1/4 to 5 HP
- Output frequency: 0.5 to 360 Hz
- IP20 enclosure (finger-safe)
- Ambient temperature:
  - -10 to +40°C
  - 50°C with derating of output to 80% and reducing carrier frequency
- Digital inputs compatible with internal 24 VDC or external 24 VDC

Performance Features

- 360 Hz maximum output frequency
- 0.5 - 16 kHz switching frequency (adjustable, derating above 12 kHz)
- 150% current overload for one minute, 220% maximum for 10 seconds

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Performance Features cont'd

- Frequency resolution:
  - Digital: 0.1 Hz
  - Analog: 0.1% of max frequency
- Accuracy of speed reference:
  - Digital: ± 0.01% of max frequency
  - Analog: ± 0.2% of max frequency

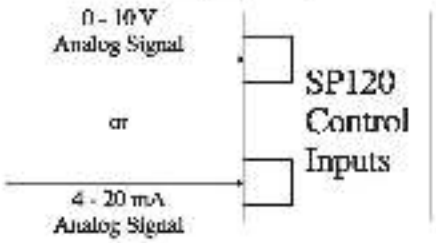
Control Mode 1: Speed Pot Control

For applications where speed is adjusted by means of the integrated speed pot.

Sample applications:
- Fans, pumps, and conveyors

Control Mode 2: Single Channel Analog Input

For applications where speed is proportional to either a 0 to −10 V or 4 to 20 mA analog input signal.



Sample applications:
- Fans and pumps
- Conveyors
- Compressors

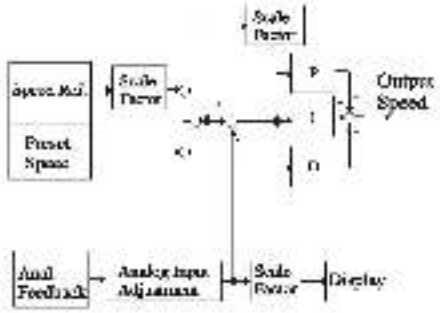
Control Mode 3: Preset Speeds

For applications needing up to 15 speeds selected by combinations of 4 digital inputs. Provides a low cost speed control method where an analog signal is unavailable or too costly to provide.

Sample applications:
- Packaging machines
- Conveyors
- Mixers

Control Mode 4: PID Control

For applications where speed is controlled by the result of an operation between two signals.



Sample applications:
- Synchronizing conveyors
- Fans with temperature control
- Pumps with pressure control
- Feeders with mass flow rate control

Adjustable Features

- Motor overload current to match specified motor full load amps (FLA).
- Primary acceleration and deceleration rates provide smooth, energy saving starts, and permit on the fly changes to match unique application needs.
- Minimum and maximum speed limits prevent known extremes that can damage equipment.
- 2 or 3 wire control accommodates either maintained or momentary start methods.
- Linear or S-curve acceleration and deceleration modes.
- Ramp, coast, and DC stop modes permit the choice of best stopping performance to match different application requirements.
- Automatic torque boost provides robust out of the box torque performance reducing the need for manual adjustments.
- V/Hz adjustments provide optimal matching between motors and loads.
- Carrier frequency adjustment provides optimization for low audible motor noise or low electromagnetic noise.
- 3 avoidance frequency bands prevent motor and/or machine from dwelling at unstable speeds.
- Current limit automatically adapts speed and ramp times during momentary overload conditions to prevent nuisance trips up to 150% of rated output current.
- Program lock select prevents unintentional changes to settings.
- Reverse disable prevents reverse operation where dangerous conditions may be generated if accidental reversal were to occur.

Configurable I/O (Group C Parameters)

- 5 configurable inputs can be programmed for many different functions:
  - Forward/reverse run
  - Preset frequencies
  - Frequency command select
  - 2nd accel/decel ramp
  - Enable
  - External fault
  - Restart lock
  - Parameter protection
  - Reset
  - Jog
  - Positive temperature coefficient (PTC) input
  - 3 wire run
  - 3 wire stop
  - 3 wire forward/reverse
  - Coast to stop
  - Unintentional start protection (USP)
  - 4-20 mA select
  - Remote control up
  - Remote control down
- Inputs can be programmed as NO or NC contacts:
  - Compatible with internal 24 VDC or external 24 VDC
  - Level triggered inputs
- 2 digital outputs (transistor) can be programmed to be a NO or NC contact and change state to indicate:
  - Running
  - At frequency
  - Above frequency
  - Motor overload/above current
  - PID error
  - Fault
- 1 relay output provides ready/fault indication
- 1 programmable analog output
  - Output frequency or output current

Instruction Manual part number is D2-3456-2.

SP120 Drive Power Ratings

Model Number	HP (kW)	Input Voltage	Input Current (A) at 230 VAC single-phase	Input Current (A) at 230 VAC three-phase	Input Current (A) at 460 VAC three-phase	Input Current (A) at 115 VAC single-phase	Output Current (A)	Watts (W) Loss
S12-2G1P4-L	0.25 (0.2)	230	3.1	1.8	N/A	N/A	1.4	17
S12-2G2P8-L	0.50 (0.4)	230 [1]	5.8	3.4	N/A	N/A	2.6	29
S12-2G3P7-L	0.75 (0.6)	230 [1]	8.7	5.0	N/A	N/A	3.7	33
S12-2G4P0-L	1.00 (0.75)	230 [1]	10.0	6.2	N/A	N/A	4.0	41
S12-2G5P0-L	1.50 (1.1)	230 [1]	11.2	6.6	N/A	N/A	5.0	53
S12-2G7P0-L	2.00 (1.5)	230 [1]	16.0	9.3	N/A	N/A	7.0	78
S12-2G010-L	3.00 (2.2)	230	22.5	13.0	N/A	N/A	10.0	101
S12-2G015-L	5.00 (3.7)	230 [2]	N/A	20.0	N/A	N/A	15.0	169
S12-4G1P5-L	0.50 (0.4)	460	N/A	N/A	2.0	N/A	1.5	32
S12-4G2P5-L	1.00 (0.75)	460	N/A	N/A	3.3	N/A	2.5	41
S12-4G3P8-L	2.00 (1.5)	460	N/A	N/A	5.0	N/A	3.8	65
S12-4G5P5-L	3.00 (2.2)	460	N/A	N/A	7.0	N/A	5.5	92
S12-4G8P8-L	5.00 (3.7)	460	N/A	N/A	11.0	N/A	8.8	138
S12-1G1P4-L	0.25(0.2)	115 [3]	N/A	N/A	N/A	5.5	1.4	17
S12-1G2P8-L	0.50(0.4)	115 [3]	N/A	N/A	N/A	13.0	2.8	29
S12-1G4P0-L	1.00(0.75)	115 [3]	N/A	N/A	N/A	16.0	4.0	41

[1] 230 VAC single-phase or 230 VAC three-phase input produces three-phase output from 0 to 230 VAC.

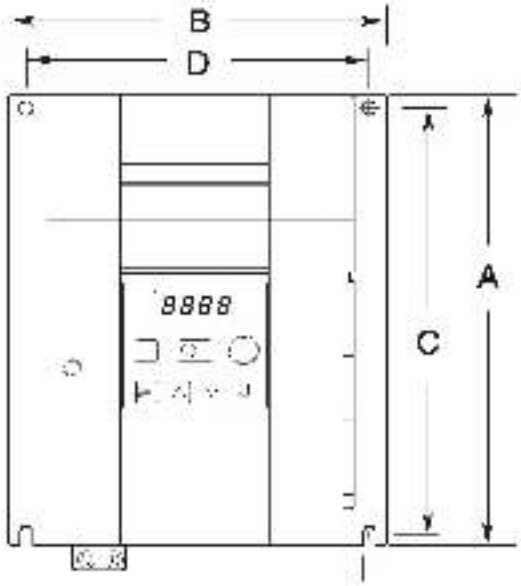
[2] 230 VAC three-phase input only produces three-phase output from 0 to 230 VAC.

[3] 115 VAC single phase input only produces three phase output from 0 to 230 VAC.

Drive Dimensions

SP120 Models	A	B	C	D	Depth*
SI2-201P1LU SI2-202P5LU SI2-203P5LU	4.72" (120 mm)	3.15" (80 mm)	4.33" (110 mm)	2.64" (67 mm)	4.59"** (117 mm)
SI2-201P5LU SI2-203P5LU SI2-401P5LU	5.12" (130 mm)	4.33" (110 mm)	4.65" (118 mm)	3.86" (98 mm)	5.39" (136 mm)
SI2-207P1LU	7.09" (180 mm)	5.5" (140 mm)	6.61" (168 mm)	5.04" (128 mm)	6.33" (160 mm)
SI2-205P5LU SI2-207P5LU SI2-405P5LU	7.09" (180 mm)	5.51" (140 mm)	6.61" (168 mm)	5.04" (128 mm)	6.71" (171 mm)
SI2-401P1LU SI2-402P5LU	5.12" (130 mm)	5.04" (128 mm)	4.65" (118)	4.69" (119 mm)	4.61" (117 mm)
SI2-404P5LU	7.09" (180 mm)	5.04" (128 mm)	6.61" (168 mm)	4.69" (119 mm)	4.61" (117 mm)
SI2-402P5LU SI2-403P5LU SI2-405P5LU	5.12" (130 mm)	4.33" (110 mm)	4.85" (118 mm)	3.86" (98 mm)	6.42" (163 mm)

Dimensions are in inches (mm)
*Depth dimension includes depth of potentiometer
**3.94" (100 mm) for SI2-201P1LU only



Front View

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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