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# Hitachi SJ300 Series Introduction



The Hitachi SJ300 Series drives are robust and particularly suited for constant torque and high-starting torque applications. The SJ300 offers many features and options that make this series suitable for a wide range of applications.

| SJ300 Series Drives | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Motor Rating | kW | .4 | .75 | 1.5 | 2.2 | 3.7 | 5.5 | 7.5 | 11 | 15 | 18.5 | 22 |
| | Hp | .5 | 1 | 2 | 3 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 |
| Three-phase 230V | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Three-phase 460V | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |

## Features

- V/F control
- Sensorless vector control
- Flux vector control
- Internal dynamic braking circuit (≤15 hp)
- PID control
- P/PI control tuning for load sharing applications
- 16 programmable speed levels
- Two-stage accel/decel selection
- Feed-back option board allows for closed loop vector control and electronic gearing
- Power phase loss detection
- Automatic fan on/off selection
- Modular construction

## Configuration methods

The SJ300 Series drives can be configured multiple ways. The drive can be configured using the removable keypad that comes with the drive (OPE-SRE), the remote digital keypad with serial communications (SC-OPE3I), or the optional Windows-based programming software DOP-PRO, available for free downlaod at www.drivemanager.com. The DOP-PRO-CBL programming cable is required to download configurations to the drive.

### Control and monitoring

There are a variety of choices for controlling and monitoring the SJ300 drive. Some of the choices are listed below:

**Digital keypad —** The OPE-SRE digital keypad comes standard with every SJ300 drive. This keypad display allows you to program your drive as well as monitor specific parameters during operation. The OPE-SRE can be mounted on the SJ300 or mounted remotely with an optional cable.

**Intelligent terminal system —** The built-in intelligent terminal system allows you to connect a sourcing 4-20 mA / 0-10 VDC device, such as a PLC, to control the frequency and run/stop functions of the drive.

**Remote digital keypad with serial communications —** The SC-OPE3I has a 4-line, 20-character back-lit LCD display and built-in EEPROM program storage. The SC-OPE3I gives your drive RS-232/RS-422/RS-485 connectivity and enables you to communicate with your drive using multiple serial protocols. The SC-OPE3I has complete programming and monitoring functionality. The SC-OPE3I can be mounted on the SJ300 drive in place of the standard keypad, or it can be remotely mounted.

## Accessories

- AC line reactors
- Braking resistors
- Filters
- Remote operator interface
- Remote digital keypad with serial communications
- Windows configuration software

## Option cards

The SJ300 Series drives have two option card slots located on the interior panel of the drive. The option slots can be used for an encoder feedback card.

***The detailed descriptions and specifications for the SJ300 accessories and option cards are available later in this section. See our Web site for future additions.***

## Typical applications

- Web handling
- Grinders
- Extruding
- Strip forming
- Conveyors
- Fans/Pumps
- Spindles

## Hitachi Model Number Convention

SJ300–004 L F U

- Series name
- Applicable motor rating
  002 (0.2 kW) to 075 (7.5 kW)
- Input power specification
  - N: 1 or 3 phase (200V class)
  - L: 3 phase (200V class)
  - H: 3 phase (400V class)
- F: Operator panel equipped
- U: USA (North America)
  E: European version
  (for Europe, Australia, Singapore, etc.)

# SJ300 Specifications

| 200V Class Three-phase Input | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Model** | | SJ300-004LFU | SJ300-007LFU | SJ300-015LFU | SJ300-022LFU | SJ300-037LFU | SJ300-055LFU |
| **Price** | | <---> | <---> | <---> | <---> | <---> | <---> |
| **Motor Rating[1]** | **HP** | 1/2HP | 1HP | 2HP | 3HP | 5HP | 7.5HP |
| | **kW** | 0.4kW | 0.75kW | 1.5kW | 2.2kW | 4.0kW | 5.5kW |
| **Rated Capacity (240V) kVA** | | 1.2 | 2.0 | 3.1 | 4.3 | 6.8 | 9.9 |
| **Rated Input Voltage** | | Three-phase three-wire 200-240V ±10%, 50/60Hz ±5% | | | | | |
| **Rated Output Voltage [2]** | | Corresponds to input voltage | | | | | |
| **Rated Input Current (A)** | | 3.8 | 5.5 | 8.3 | 12.0 | 18.0 | 26.0 |
| **Rated Output Current (A)** | | 3.0 | 5.0 | 7.5 | 10.5 | 16.5 | 24 |
| **Dynamic Braking (without external resistor) [3]** | | 50% | | | 20% | | |
| **Dynamic Braking (with external resistor) [3]** | | 200% | 200% | 200% | 160% | 100% | 80% |
| **DC Injection Braking** | | Performs at start under set frequency at deceleration via an external input (braking force, time and operating frequency) | | | | | |
| **Protective Structure [4]** | | IP20 (NEMA1) | | | | | |
| **Ambient Operating Temperature [5]** | | -10 to 40°C (14-104°F) | | | | | |
| **Storage Temperature [6]** | | -20 to 65°C (-68-149°F) | | | | | |
| **Humidity** | | 20 to 90% humidity, (no condensation) | | | | | |
| **Vibration [7]** | | 5.9m/s$^2$ (0.6G), 10 to 55 Hz | | | | | |
| **Location** | | Altitude 1,000 m or less, indoors, (no corrosive gases or dust) | | | | | |
| **Coating Color** | | Gray | | | | | |
| **Watt Loss 100% (I) [8]** | | 70W | 88W | 125W | 160W | 235W | 325W |
| **Weight: kg (lb)** | | 3.5 (7.7) | | | | | |
| **Dimensions (HxWxD) (mm)** | | 255x150x140 | | | | | |
| **Accessories** | | | | | | | |
| **AC Reactor** | | HRL005L | HRL010L | HRL020L | HRL030L | HRL050L | HRL075L |
| **Braking Resistor** | | Refer to "SJ300 Dynamic Braking Resistor Selection Charts" in the "SJ300 Accessories" section of this chapter | | | | | |
| **Braking Unit** | | built into drive | | | | | |
| **RF Capacitive Filter** | | CFI-L | | | | | |
| **RF Inductive Filter** | | ZCL-B40 | | | | | |
| **EMI Filter** | | NF-CEH7 | | NF-CEH10 | NF-CEH20 | | NF-CEH30 |
| **Remote Operator Interface** | | SC-OPE3I | | | | | |
| **Remote Operator Interface Cables** | | SC-OPE3BK | | | | | |
| **Pulse Width Modulation Filter for Analog Output Metering** | | FA-4PWM | | | | | |

***Notes:***

***1: The applicable motor refers to Hitachi standard 3-phase motor (4 pole). To use another motor, the rated motor current must NOT exceed the rated output current of the inverter.***

***2: The output voltage decreases as the main power supply voltage decreases. (Except when using the AVR function.)***

***3: The braking torque at capacitive feedback is the average deceleration torque at the shortest deceleration (stoppage from 50/60 Hz) of the motor itself. It is not the continuous regenerative braking torque. And the average deceleration torque varies with motor loss. This value decreases when operating beyond 50/60 Hz. Note that a braking resistor is not included in the inverter. If a large regeneration torque is required, the optional regenerative braking resistor should be used.***

***4: The protection method conforms to JEM 1030/NEMA (U.S.)***

***5: To use the inverter at 40°C or higher, it is necessary to reduce the output current and carrier frequency values.***

***6: The storage temperature refers to the short-term temperature during transport.***

***7: Conforms to the test method specified in JIS CO911 (1984).***

***8: Rated output current (In). Based upon output frequency 50 Hz or 60 Hz. Carrier frequency 5kHz.***

# SJ300 Specifications

| 200V Class Three-phase Input | | | | | | |
|---|---|---|---|---|---|---|
| **Model** | | SJ300-075LFU | SJ300-110LFU | SJ300-150LFU | SJ300-185LFU | SJ300-220LFU |
| **Price** | | <---> | <---> | <---> | <---> | <---> |
| **Motor Rating [1]** | **HP** | 10HP | 15HP | 20HP | 25HP | 30HP |
| | **kW** | 7.5kW | 11.5kW | 15kW | 18.5kW | 22kW |
| **Rated Capacity (240V) kVA** | | 13.3 | 19.1 | 26.6 | 31.5 | 39.4 |
| **Rated Input Voltage** | | Three-phase three-wire 200-240V ±10%, 50/60Hz ±5% | | | | |
| **Rated Output Voltage [2]** | | Corresponds to input voltage | | | | |
| **Rated Input Current (A)** | | 35 | 51 | 70 | 84 | 105 |
| **Rated Output Current (A)** | | 32 | 46 | 64 | 76 | 95 |
| **Dynamic Braking (without external resistor) [3]** | | 20% | 10% | 10% | 10% | 10% |
| **Dynamic Braking (with external resistor) [3]** | | 80% | 70% | 110% | 90% | 110% |
| **DC Injection Braking** | | Starts at set frequency at deceleration via an external input (braking force, time and operating frequency) | | | | |
| **Protective Structure [4]** | | IP20 (NEMA 1) | | | | |
| **Ambient Operating Temperature [5]** | | -10 to 40°C (14-104ZX°F) | | | | |
| **Storage Temperature [6]** | | -20 to 65°C (-68-149°F) | | | | |
| **Humidity** | | 25 to 90% humidity, (no condensation) | | | | |
| **Vibration [7]** | | 5.9m/s$^2$ (0.6G), 10 to 55 Hz | | | | |
| **Location** | | Altitude 1,000 m or less, indoors, (no corrosive gases or dust) | | | | |
| **Coating Color** | | Gray | | | | |
| **Watt Loss 100% (I) [8]** | | 425W | 600W | 800W | 975W | 1150W |
| **Weight: kg (lb)** | | 5 (11) | | 12 (26.4) | | |
| **Dimensions (HxWxD) (mm)** | | 260x210x170 | | 390x250x190 | | |
| **Accessories** | | | | | | |
| **AC Reactor** | | HRL110L | HRL115L | HRL120L | HRL130L | HRL130L |
| **Braking Resistor** | | Refer to "SJ300 Dynamic Braking Resistor Selection Charts" in the accessories section | | Refer to "Resistor and Braking Unit Combinations" selection tables *(Braking Unit required)* | | |
| **Braking Unit** | | built into drive | | Not available from AutomationDirect; visit www.hitachi.us/inverters | | |
| **RF Capacitive Filter** | | CFI-L | | | | |
| **RF Inductive Filter** | | ZCL-B40 | | | | |
| **EMI Filter** | | NF-CEH40 | NF-CEH60 | NF-CEH80 | NF-CEH100 | NF-CEH150 |
| **Remote Operator Interface** | | SC-OPE3I | | | | |
| **Remote Operator Interface Cables** | | SC-OPE3BK | | | | |
| **Pulse Width Modulation Filter for Analog Output Metering** | | FA-4PWM | | | | |

***Notes:***

***1: The applicable motor refers to Hitachi standard 3-phase motor (4 pole). To use another motor, the rated motor current must NOT exceed the rated output current of the inverter.***

***2: The output voltage decreases as the main power supply voltage decreases. (Except when using the AVR function.)***

***3: The braking torque at capacitive feedback is the average deceleration torque at the shortest deceleration (stoppage from 50/60 Hz) of the motor itself. It is not the continuous regenerative braking torque. And the average deceleration torque varies with motor loss. This value decreases when operating beyond 50/60 Hz. Note that a braking resistor is not included in the inverter. If a large regeneration torque is required, the optional regenerative braking resistor should be used.***

***4: The protection method conforms to JEM 1030/NEMA (U.S.)***

***5: To use the inverter at 40°C or higher, it is necessary to reduce the output current and carrier frequency values.***

***6: The storage temperature refers to the short-term temperature during transport.***

***7: Conforms to the test method specified in JIS CO911 (1984).***

***8: Rated output current (In) based upon output frequency 50 Hz or 60 Hz. Carrier frequency 5kHz.***

# SJ300 Specifications

| 400V Class Three-phase Input | | | | | | |
|---|---|---|---|---|---|---|
| **Model** | | SJ300-007HFU | SJ300-015HFU | SJ300-022HFU | SJ300-040HFU | SJ300-055HFU |
| **Price** | | <---> | <---> | <---> | <---> | <---> |
| **Motor Rating [1]** | **HP** | 1HP | 2HP | 3HP | 5HP | 7.5HP |
| | **kW** | .75kW | 1.5kW | 2.2kW | 3.7kW | 5.5kW |
| **Rated Capacity (480V) kVA** | | 2.1 | 3.1 | 4.4 | 7.1 | 9.9 |
| **Rated Input Voltage** | | Three-phase three-wire 380-480V ±10%, 50/60Hz ±5% | | | | |
| **Rated Output Voltage [2]** | | Corresponds to input voltage | | | | |
| **Rated Input Current (A)** | | 2.8 | 4.2 | 5.8 | 9.5 | 13 |
| **Rated Output Current (A)** | | 2.5 | 3.8 | 5.3 | 8.6 | 12 |
| **Dynamic Braking (without optional resistor) [3]** | | 50% | 50% | 20% | 20% | 20% |
| **Dynamic Braking (with optional resistor) [3]** | | 200 | 200 | 200 | 140% | 100% |
| **DC Injection Braking** | | Starts at set frequency at deceleration via an external input (braking force, time and operating frequency) | | | | |
| **Protective Structure [4]** | | IP20 (NEMA 1) | | | | |
| **Ambient Operating Temperature [5]** | | -10 to 40°C (14-104°F) | | | | |
| **Storage Temperature [6]** | | -20 to 65°C (-68-149°F) | | | | |
| **Humidity** | | 25 to 90% humidity, (no condensation) | | | | |
| **Vibration [7]** | | 5.9m/s$^2$ (0.6G), 10 to 55 Hz | | | | |
| **Location** | | Altitude 1,000 m or less, indoors, (no corrosive gases or dust) | | | | |
| **Coating Color** | | Gray | | | | |
| **Watt Loss 100% (I) [8]** | | 88W | 125W | 160W | 235W | 325W |
| **Weight: kg (lb)** | | 3.5 (7.7) | | | | |
| **Dimensions (mm) (HxWxD)** | | 255x150x140 | | | | |
| **Accessories** | | | | | | |
| **AC Reactor** | | HRL010H | HRL030H | HRL030H | HRL050H | HRL075H |
| **Braking Resistor** | | Refer to "SJ300 Dynamic Braking Resistor Selection Charts" in the "SJ300 Accessories" section of this chapter | | | | |
| **Braking Unit** | | built into drive | | | | |
| **RF Capacitive Filter** | | CFI-H | | | | |
| **RF Inductive Filter** | | ZCL-B40 | | | | |
| **EMI Filter** | | NF-CEH7 | | | NF-CEH10 | NF-CEH20 |
| **Remote Operator Interface** | | SC-OPE3I | | | | |
| **Remote Operator Interface Cables** | | SC-OPE3BK | | | | |
| **Pulse Width Modulation Filter for Analog Output Metering** | | FA-4PWM | | | | |

***Notes:***

***1: The applicable motor refers to Hitachi standard 3-phase motor (4 pole). To use another motor, the rated motor current must NOT exceed the rated output current of the inverter.***

***2: The output voltage decreases as the main power supply voltage decreases. (Except when using the AVR function.)***

***3: The braking torque at capacitive feedback is the average deceleration torque at the shortest deceleration (stoppage from 50/60 Hz) of the motor itself. It is not the continuous regenerative braking torque. And the average deceleration torque varies with motor loss. This value decreases when operating beyond 50/60 Hz. Note that a braking resistor is not included in the inverter. If a large regeneration torque is required, the optional regenerative braking resistor should be used.***

***4: The protection method conforms to JEM 1030/NEMA (U.S.)***

***5: To use the inverter at 40°C or higher, it is necessary to reduce the output current and carrier frequency values.***

***6: The storage temperature refers to the short-term temperature during transport.***

***7: Conforms to the test method specified in JIS CO911 (1984).***

***8: Rated output current (In). Based upon output frequency 50 Hz or 60 Hz. Carrier frequency 5kHz.***

# SJ300 Specifications

| 400V Class Three-phase Input | | | | | | |
|---|---|---|---|---|---|---|
| **Model** | | SJ300-075HFU | SJ300-110HFU | SJ300-150HFU | SJ300-185HFU | SJ300-220HFU |
| **Price** | | <---> | <---> | <---> | <---> | <---> |
| **Motor Rating [1]** | **HP** | 10HP | 15HP | 20HP | 25HP | 30HP |
| | **kW** | 7.5kW | 11kW | 15kW | 18.5kW | 22kW |
| **Rated Capacity (480V) kVA** | | 13.3 | 19.1 | 26.6 | 31.5 | 39.9 |
| **Rated Input Voltage** | | Three-phase three-wire 380-480V ±10%, 50/60Hz ±5% | | | | |
| **Rated Output Voltage [2]** | | Corresponds to input voltage | | | | |
| **Rated Input Current (A)** | | 18 | 25 | 35 | 42 | 53 |
| **Rated Output Current (A)** | | 16 | 23 | 32 | 38 | 48 |
| **Dynamic Braking (without optional resistor) [3]** | | 20% | 10% | 10% | 10% | 10% |
| **Dynamic Braking (with optional resistor) [3]** | | 100 | 70% | 200% | 200% | 200% |
| **DC Injection Braking** | | Starts at set frequency at deceleration via an external input (braking force, time and operating frequency) | | | | |
| **Protective Structure [4]** | | IP20 (NEMA 1) | | | | |
| **Ambient Operating Temperature [5]** | | -10 to 40°C (14-104°F) | | | | |
| **Storage Temperature [6]** | | -20 to 65°C (-68-149°F) | | | | |
| **Humidity** | | 25 to 90% humidity, (no condensation) | | | | |
| **Vibration [7]** | | 5.9m/s$^2$ (0.6G), 10 to 55 Hz | | | | |
| **Location** | | Altitude 1,000 m or less, indoors, (no corrosive gases or dust) | | | | |
| **Coating Color** | | Gray | | | | |
| **Watt Loss 100% (I) [8]** | | 425W | 600W | 800W | 975W | 1150W |
| **Weight: kg (lb)** | | 5 (11) | | 12 (26.4) | | |
| **Dimensions (mm) (HxWxD)** | | 260x210x170 | | 390x250x190 | | |
| **Accessories** | | | | | | |
| **AC Reactor** | | HRL110H | HRL115H | HRL120H | HRL130LH | HRL130H |
| **Braking Resistor** | | Refer to "SJ300 Dynamic Braking Resistor Selection Charts" in the accessories section | | Refer to "Resistor and Braking Unit Combinations" selection tables *(Braking Unit required)* | | |
| **Braking Unit** | | built into drive | | Not available from AutomationDirect; visit www.hitachi.us/inverters | | |
| **RF Capacitive Filter** | | CFI-H | | | | |
| **RF Inductive Filter** | | ZCL-A | | | | |
| **EMI Filter** | | NF-CEH20 | NF-CEH30 | NF-CEH40 | NF-CEH50 | NF-CEH60 |
| **Remote Operator Interface** | | SC-OPE3I | | | | |
| **Remote Operator Interface Cables** | | SC-OPE3BK | | | | |
| **Pulse Width Modulation Filter for Analog Output Metering** | | FA-4PWM | | | | |

***Notes:***

***1: The applicable motor refers to Hitachi standard 3-phase motor (4 pole). To use another motor, the rated motor current must NOT exceed the rated output current of the inverter.***

***2: The output voltage decreases as the main power supply voltage decreases. (Except when using the AVR function.)***

***3: The braking torque at capacitive feedback is the average deceleration torque at the shortest deceleration (stoppage from 50/60 Hz) of the motor itself. It is not the continuous regenerative braking torque. And the average deceleration torque varies with motor loss. This value decreases when operating beyond 50/60 Hz. Note that a braking resistor is not included in the inverter. If a large regeneration torque is required, the optional regenerative braking resistor should be used.***

***4: The protection method conforms to JEM 1030/NEMA (U.S.)***

***5: To use the inverter at 40°C or higher, it is necessary to reduce the output current and carrier frequency values.***

***6: The storage temperature refers to the short-term temperature during transport.***

***7: Conforms to the test method specified in JIS CO911 (1984).***

***8: Rated output current (In). Based upon output frequency 50 Hz or 60 Hz. Carrier frequency 5kHz.***

# SJ300 Specifications — General

| SJ300 Drives Specifications | | |
|---|---|---|
| ***Control Method*** | | Sine-wave pulse width modulation (PWM) control |
| ***Voltage/Frequency Characteristics*** | | V/F free setting (30-400Hz of base frequency), constant torque and reduced torque of V/F control, sensorless vector control |
| ***Speed Fluctuation*** | | ±0.5% (sensorless vector control) |
| ***Overload Current Rating*** | | 150% for 60 seconds, 200% for 0.5 seconds |
| ***Acceleration/Deceleration Time*** | | 0.1-3000 sec. (linear/curve, acceleration/deceleration selection), two-stage acceleration/deceleration |
| ***Starting Torque*** | | 200% at 0.5Hz (sensorless vector control), 150% at 0Hz (sensorless vector control with a motor one size frame down |
| ***Output Frequency Range*** [1] | | 0.1 to 400 Hz |
| ***Frequency Accuracy*** | | Digital command: ±0.01% of the max. frequency. Analog command:±0.2% of the max frequency (25°C ± 10°C) |
| ***Frequency Setting Resolution*** | | Digital: 0.1 Hz, analog: max. frequency/4000 (O terminal: 12bit 0 to 10V, O2 terminal: 12bit -10 to 10V) |
| **Control Input Signal** | | |
| ***Frequency Setting*** | ***Digital Operator Panel*** | Up and Down keys & value setting and potentiometer |
| | ***External Signal*** | 0 to 10VDC (input impedance 10kΩ)<br>-10V to 10V (input impedance 10kΩ), 4-20mA (input impedance 100Ω), |
| | ***External Port*** | Set by external device |
| ***Forward/Reverse Start/Stop*** | ***Digital Operator Panel*** | Run key/Stop key (Forward/reverse run change by function command) |
| | ***External Signal*** | Forward run/stop (NO contact), Reverse operation command available at terminal assignment (NO/NC selectable), 3-wire input connection |
| | ***External Port*** | set by external device |
| ***Intelligent Input Terminal*** | | Selection of 8 functions from:<br>RV(Reverse), CF1-CF4(Multispeed command), JG(Jogging), DB(External DC braking),<br>SET(Second motor constants setting), 2CH(Second accel./decel.), FRS(Free-run stop), EXT(External trip), USP(Unattended start protection), CS(Change to/from commercial power supply), SFT(Software lock), AT(Analog input selection), SET3(Third motor constants setting), RS(Reset), STA(3-wire start),<br>STP(3-wire stop), F/R(3-wire fwd./rev.), PID(PID On/Off), PIDC(PID reset), CAS(Control gain setting), UP/DWN(Remote-controlled accel./decel.) UDC(Remote-controlled data clearing),<br>OPE(Operator control), SF1-SF7(Multispeed bit command 1-7), OLR(Overload limit change),<br>TL(Torque limit enable), TRQ1,TRQ2(Torque limit selection (1)(2)), PPI(P/PI selection),<br>BOK(Brake verification), ORT(Orientation), LAC(LAD cancel), PCLR(Positioning deviation reset), STAT(90-degree phase difference permission), NO(Not selected) |
| ***Thermistor Input*** | | One terminal (PTC characteristics) |
| **Control Output Signal** | | |
| ***Intelligent Output Terminals*** | | Five open collector terminals and one NO-NC combined contact. Selection from:<br>RUN(Run signal), FA1(frequency arrival signal (at the set frequency)), FA2(Frequency arrival signal (at or above the set frequency)), OL(Over-load advance notice signal), OD(Output deviation for PID control), AL(Alarm signal), FA3(Frequency arrival signal (only at the set frequency)),OTQ(Over-torque), IP(Instantaneous power failure signal), UV(Under-voltage signal), TRQ(In torque limit), RNT(Operation time over), ONT(Plug-in time over), THM(Thermal alarm), BRK(Brake release), BER(Brake error), ZS(Zero speed), Frequency arrival signal (at or above the set frequency)(2)), Frequency arrival signal (only at the set frequency)(2), OL2(Overload advance notice signal(2)),(Terminal 11-13 or 11-14 are automatically configured as AC0-AC2 or AC0-AC3 when alarm code output is selected at C62.) |
| ***Intelligent Monitor Output Terminals*** | | Analog voltage, analog current, pulse line output |
| ***Display Monitor*** | | Output frequency, output current, motor torque, scaled value of output frequency, trip history, I/O terminal condition, input power, output voltage |
| ***Other Functions*** | | V/f free-setting (up to 5 points), frequency upper/lower limit, frequency jump, accel./decel. curve selection, manual torque boost value and frequency adjustment, analog meter tuning, start frequency setting, carrier frequency setting, electronic thermal free-setting, external frequency output zero/span reference, external frequency input bias start/end, analog input selection, retry after trip, restart after instantaneous power failure, various signal outputs, reduced voltage start, overload restriction, default value setting, deceleration and stop after power failure, AVR function, fuzzy accel./decel., auto-tuning (on-line/off-line), high-torque multi-operation |
| ***Carrier Frequency Range*** | | 0.5-15kHz |
| ***Protective Functions*** | | Over-current protection, overload protection, braking resistor overload protection, over-voltage protection, EEPROM error, under-voltage error, CT (Current transformer) error, CPU error, external trip, USP error, ground fault, input over-voltage protection, instantaneous power failure, option 1 connection error, option 2 connection error, inverter thermal trip, phase failure detection, IGBT error, thermistor error |

***Note: To operate the motor above 60 Hz, refer to the motor manufacturer's specification of maximum rotation speed.***

# SJ300 Specifications — Installation

It is important to understand the installation requirements for your SJ300 drive. This will help to insure that the SJ300 series drives operate within their environmental and electrical limits.

***Never use only this catalog for installation or operation of equipment; refer to the user manual.***

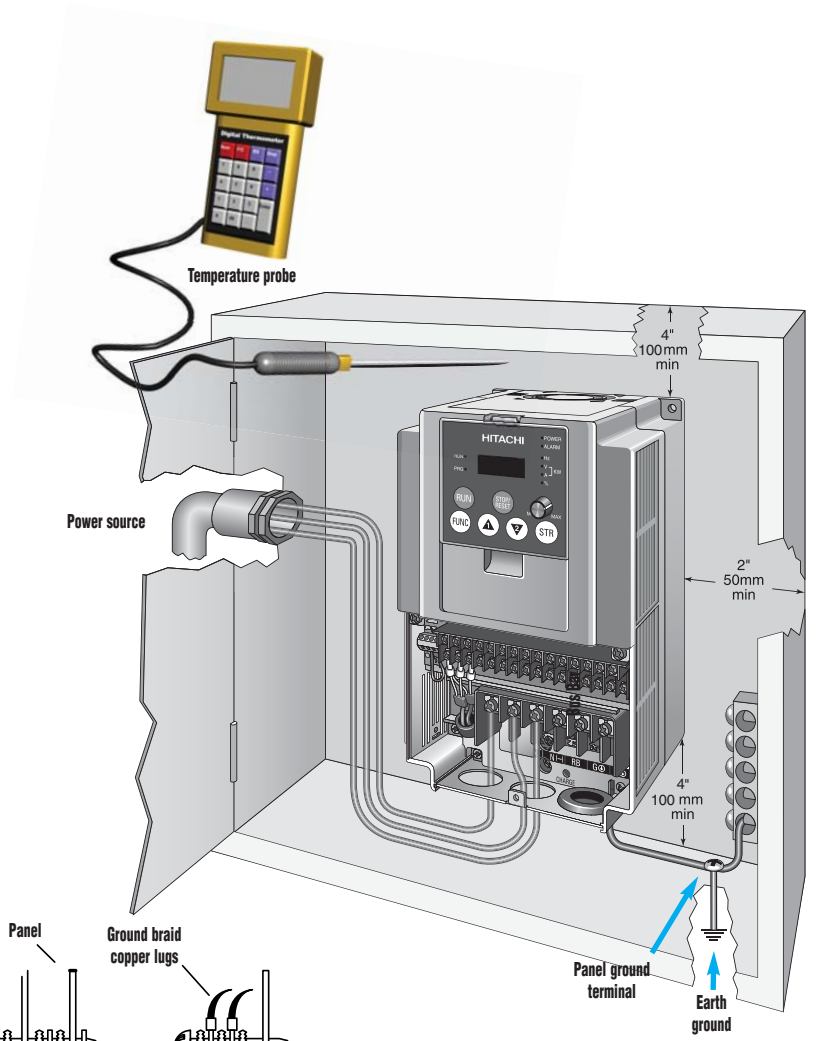
| Environmental Specifications | |
|---|---|
| ***Protective Structure*** [1] | IP20 (NEMA 1) |
| ***Ambient Operating Temperature*** [2] | -10 to 40°C (14-104°F) |
| ***Storage Temperature*** [3] | -20 to 65°C (-68-149°F) |
| ***Humidity*** | 20 to 90% RH (no condensation) |
| ***Vibration*** [4] | 5.9 m/S$^2$ (0.6G), 10 to 55 Hz |
| ***Location*** | Altitude 1,000 m or less, indoors (no corrosive gases or dust) |
| ***Coating Color*** | Gray |

***1: The protection method conforms to JEM 1030/ NEMA (U.S.)***

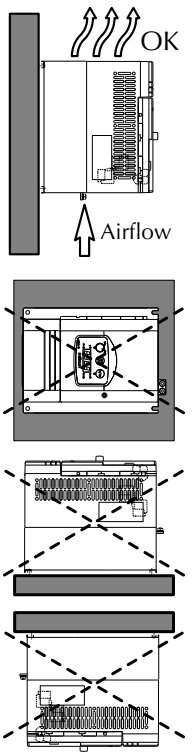
***2: To use the inverter at 40°C or higher, it is necessary to reduce the output current and carrier frequency values.***

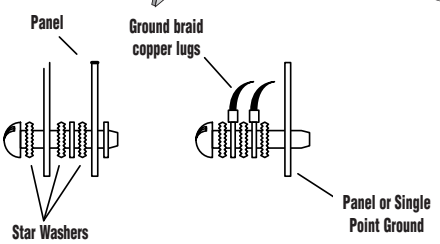
***3: The storage temperature refers to the short-term temperature during transport.***

***4: Conforms to the test method specified in JIS CO911 (1984)***




## Installation Notes



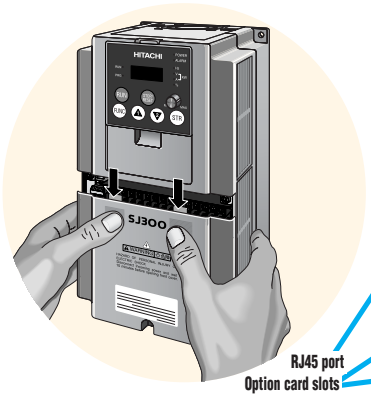



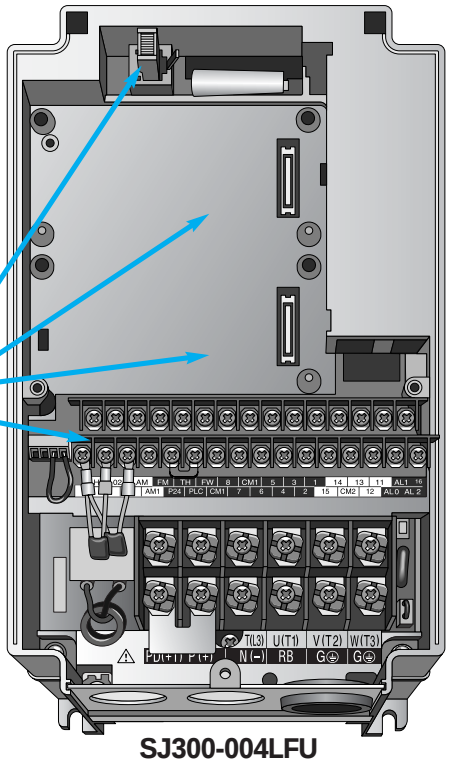

| Watt-loss Chart | |
|---|---|
| ***SJ300 Drive Model*** | ***100% I**** |
| ***004LFU/HFU*** | 70W |
| ***007LFU/HFU*** | 88W |
| ***015LFU/HFU*** | 125W |
| ***022LFU/HFU*** | 160W |
| ***037LFU/040HFU*** | 235W |
| ***055LFU/HFU*** | 325W |
| ***075LFU/HFU*** | 425W |
| ***110LFU/HFU*** | 600W |
| ***150LFU/HFU*** | 800W |
| ***185LFU/HFU*** | 975W |
| ***220LFU/HFU*** | 1150W |
| ***300LFU/HFU*** | 1550W |
| ***370LFU/HFU*** | 1900W |
| ***450LFU/HFU*** | 2300W |
| ***550LFU/HFU*** | 2800W |

****Rated output current***
***Based on output frequency 50 Hz or 60 Hz***
***Carrier frequency 5kHz***

# SJ300 Specifications — Terminals

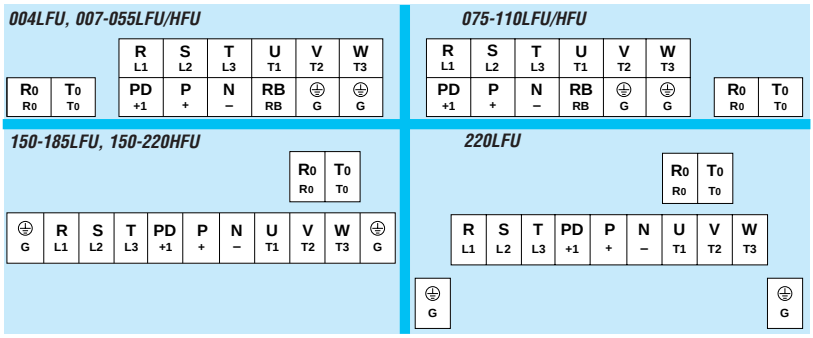
| Main Circuit Terminals | |
|---|---|
| ***Symbol*** | ***Description*** |
| ***R(L1), S(L2), T(L3)*** | Main power supply input terminals |
| ***U(T1), V(T2), W(T3)*** | Inverter output terminals |
| ***PD(+1), P(+)*** | DC link choke connection terminals |
| ***P(+), RB(RB)*** | External braking resistor connection terminals |
| ***P(+), N(-)*** | External braking unit connection terminals |
| ***G or ⏚*** | Ground terminal |
| ***R0(R0), T0(T0)*** | Control power supply input terminals |




SJ300-004LFU

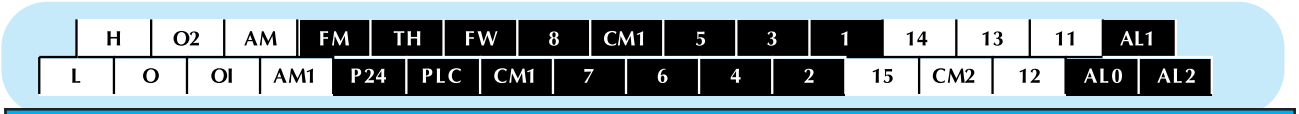
## Terminal arrangement




| Standard Wiring | | | | |
|---|---|---|---|---|
| ***Inverter Model SJ300-*** | ***Motor Output kW (Hp)*** | ***Wiring*** | | ***Fuse (Class J)*** |
| | | ***Power Wires*** | ***Signal Lines*** | |
| ***004LFU*** | 0.4 (0.5) | AWG 16 | 0.75mm² shielded wire 18AWG | 5A |
| ***007LFU*** | 0.75 (1) | AWG 16 | | 10A |
| ***015LFU*** | 1.5 (2) | AWG 14 | | 15A |
| ***022LFU*** | 2.2 (3) | AWG 14 | | 20A |
| ***037LFU*** | 3.7 (5) | AWG 10 | | 30A |
| ***055LFU*** | 5.5 (7.5) | AWG 8 | | 40A |
| ***075LFU*** | 7.5 (10) | AWG 6 | | 60A |
| ***110LFU*** | 11 (15) | AWG 4 | | 80A |
| ***150LFU*** | 15 (20) | AWG 2 | | 100A |
| ***185LFU*** | 18.5 (25) | AWG 1 | | 120A |
| ***220LFU*** | 22 (30) | AWG 1/0 | | 150A |
| ***007HFU*** | 0.75 (1) | AWG 16 | | 6A |
| ***015HFU*** | 1.5 (2) | AWG 16 | | 10A |
| ***022HFU*** | 2.2 (3) | AWG 16 | | |
| ***040HFU*** | 3.7 (5) | AWG 14 | | 15A |
| ***055HFU*** | 5.5 (7.5) | AWG 12 | | 20A |
| ***075HFU*** | 7.5 (10) | AWG 10 | | 30A |
| ***110HFU*** | 11 (15) | AWG 8 | | 40A |
| ***150HFU*** | 15 (20) | AWG 6 | | 50A |
| ***185HFU*** | 18.5 (25) | AWG 6 | | 60A |
| ***220HFU*** | 22 (30) | AWG 4 | | 80A |

# SJ300 Specifications — Control Terminals

## Control terminal arrangement

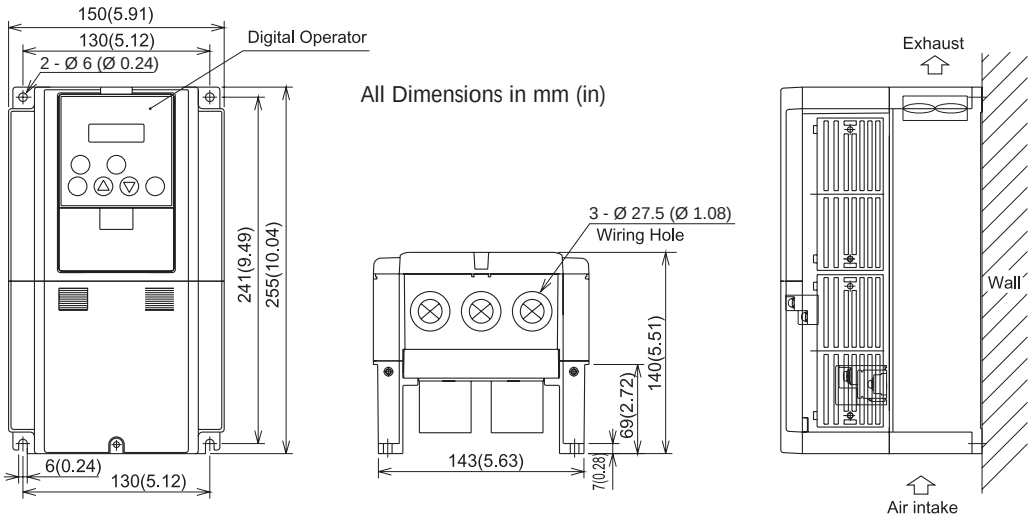



**Control Terminal Specifications**

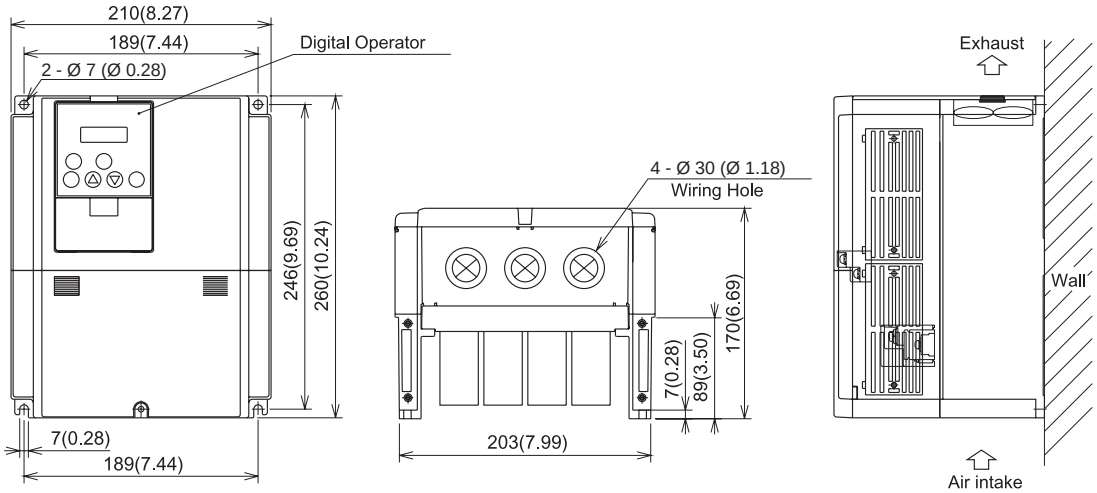
| | | Symbol | Name | Explanation of Terminals | Ratings |
|---|---|---|---|---|---|
| ***Power Supply*** | | L | Common terminal for analog power source | Common terminal for H, O, O2, OI, AM, and AMI. **Do not ground.** | — |
| ***Frequency Setting*** | | H | Power source for frequency | Power supply for frequency command input | DC 10V, 20mA max. |
| | | O | Frequency command terminal | Maximum frequency is attained at DC 10V in DC 0-10V range. Set the voltage at A014 to command maximum frequency below DC 10V. | Input impedance: 10kΩ, Allowable input voltage range: DC -0.3 to +12V |
| | | O2 | Frequency command extra terminal (Voltage) | O2 signal is added to the frequency command of O or OI in DC 0-±10V range. By changing configuration, frequency command can be inputted also at O2 terminal. | Input impedance: 10kΩ, Allowable input voltage range: DC 0 to±12V |
| | | OI | Frequency command terminal (Current) | Maximum frequency is attained at DC 20mA in DC 4-20mA range. When the intelligent terminal configured as AT is on, OI signal is enabled. | Input impedance: 100kΩ, Allowable input voltage range: DC 0-24mA |
| ***Monitor Output*** | | AM | Analog output monitor (Voltage) | Selection of one function from: output frequency, output current, torque, output voltage, input power, electronic thermal load ratio | DC 0-10V, 2mA max |
| | | AMI | Analog output monitor (Current) | | DC 4-20mA, 250Ω max. |
| ***Monitor Output*** | | FM | Digital monitor (Voltage) | DC0-10V output (PWM output) Selection of one function from: Output frequency, output current, torque, output voltage, input power, electronic thermal load ratio. Digital pulse output (Pulse voltage DC 0/10V) Outputs the value of output frequency as digital pulse (duty50%) | Digital output frequency range: 0-3.6kHz, 1.2mA max. |
| ***Power Supply*** | | P24 | Power terminal for interface | Internal power supply for input terminals. In case of source type logic, common terminal for contact input terminals. | DC 24V, 100mA max. |
| | | CM1 | Common terminal for interface | Common terminal for P24, TH, and FM. In case of sink type logic, common terminal for contact input terminals. ***Do not ground.*** | — |
| ***Contact Input*** | Run Command | FW | Forward command input | Forward command input | Input ON condition<br>Voltage between each terminal and PLC: DC 18V min.<br>Input OFF condition<br>Voltage between each terminal and PLC: DC 3V max.<br>Input impedance between each terminal and PLC: 4.7Ω<br>Allowable maximum voltage between each terminal and PLC: DC 27V |
| | Functions | 1 | Intelligent input terminals | Selection of 8 functions from: RV(Reverse), CF1-CF4(Multispeed command), JG(Jogging), DB(External DC braking), SET(Second motor constants setting), 2CH(Second accel./decel.), FRS(Free-run stop), EXT(External trip), USP(Unattended start protection), CS(Change to/from commercial power supply), SFT(Software lock), AT(Analog input selection), RS(Reset), STA(3-wire start), STP(3-wire stop), F/R(3-wire fwd./rev.), PID(PID On/Off), PIDC(PID reset), UP/DWN(Remote-controlled accel./decel.) UDC(Remote-controlled data clearing), SF1-SF7(Multispeed bit command 1-7), OLR(Overload limit change), and NO(Not selected) | |
| | | 2 | | | |
| | | 3 | | | |
| | | 4 | | | |
| | | 5 | | | |
| | | 6 | | | |
| | | 7 | | | |
| | | 8 | | | |
| | Common Terminal | PLC | Common terminal for intelligent input terminals | Select sink or source logic with the short-circuit bar on the control terminals. Sink logic: Short P24 to PLC / Source logic: Short CM1 to PLC. When applying external power source, remove the short-circuit bar and connect PLC terminal to the external device. | |
| ***Open Collector Output*** | State | 11 | Intelligent output terminals | Select 5 functions of inverter state and configure them at terminal 11-15. When the alarm code is selected at C062, terminal 11-13 or 11-14 are reserved for error codes of inverter trip. Both sink and source logic is always applicable between each terminal and CM1. | Decrease in voltage between each terminal and CM2: 4V max. during ON<br>Allowable maximum voltage: DC 27V<br>Allowable maximum current: 50mA |
| | | 12 | | | |
| | | 13 | | | |
| | | 14 | | | |
| | | 15 | | | |
| | | CM2 | Common terminal for intelligent output terminals | Common terminal for intelligent output terminal 11-15. | |
| ***Thermistor Input*** | Sensor | TH | Thermistor input terminal | The inverter trips when the external thermistor detects abnormal temperature. Common terminal is CM1 [recommended thermistor characteristics]. Allowable rated power: 100mW or over. Impedance in case of abnormal temperature: 3kΩ<br>Note: Thermal protection level can be set between 0-9999Ω | — |
| ***Relay Output*** | State/ Alarm | AL0 | Alarm output terminals | In default setting, an alarm is activated when inverter output is turned off by a protective function. | Maximum capacity of relays AL1-AL0: AC 250V, 2A(R load)/0.2A(I load)<br>AL2-AL0: AC 250V, 1A(R load)/0.2A(I load)<br>Minimum capacity of relays AL1-AL0: AC100V, 10mA DC5V, 100mA |
| | | AL1 | | | |
| | | AL2 | | | |

# SJ300 Specifications — Dimensions

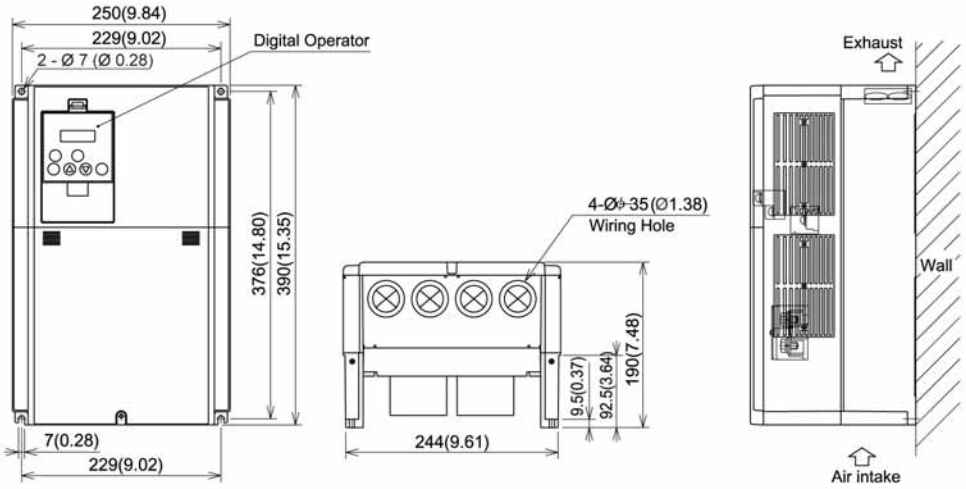
## SJ300 -004LFU, 007–055LFU/HFU




## SJ300 -075 – 110LFU/HFU

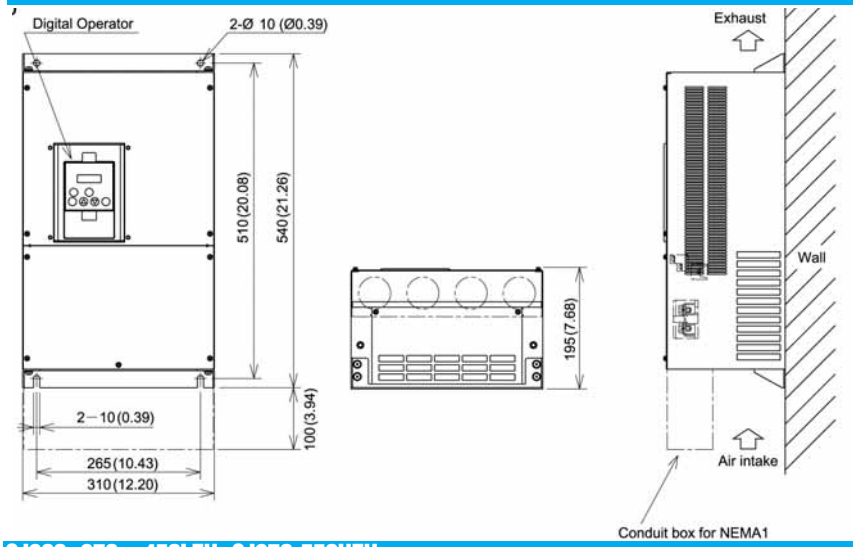



## SJ300 -150 – 220LFU/HFU



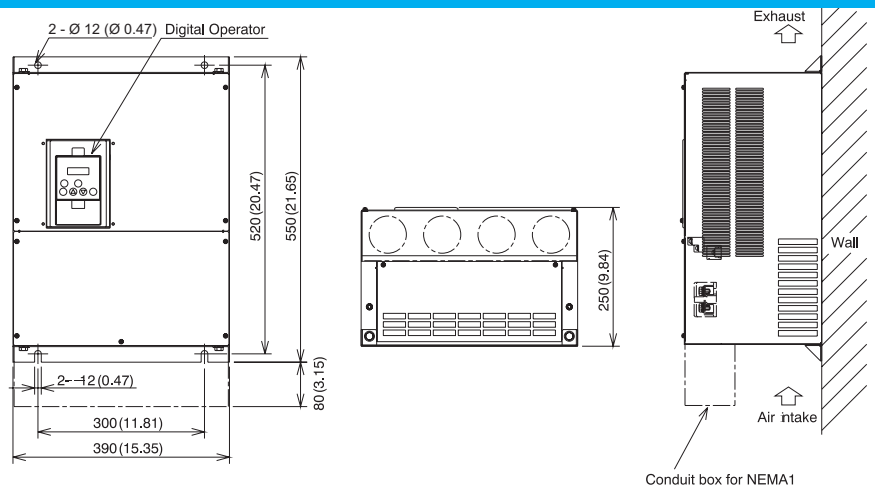
# SJ300 Specifications — Dimensions

## SJ300 -300LFU/HFU

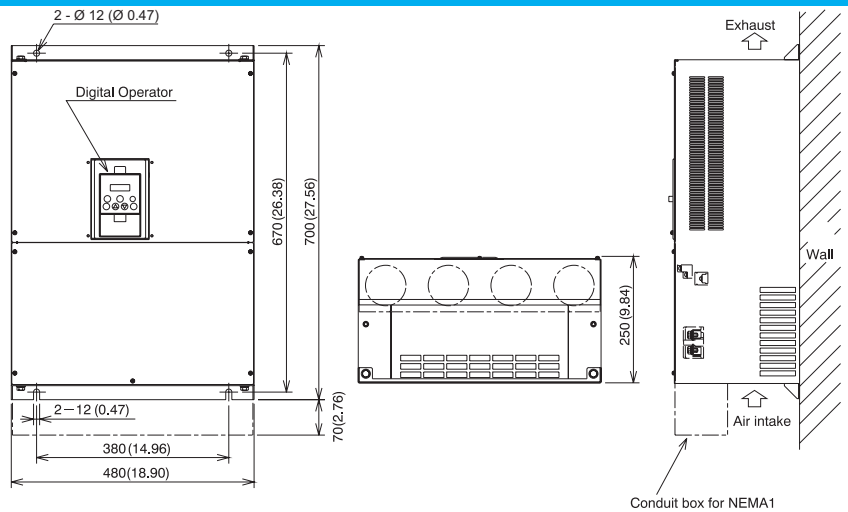



All Dimensions in mm (in)

## SJ300 -370 – 450LFU, SJ370-550HFU




## SJ300-550LFU



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