QUICK REFERENCE GUIDE

Hitachi Inverter

SJ100 Series

Hitachi Europe GmbH

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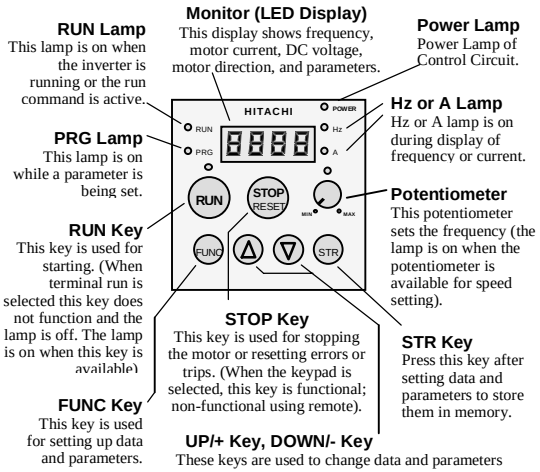
HITACHI INVERTER

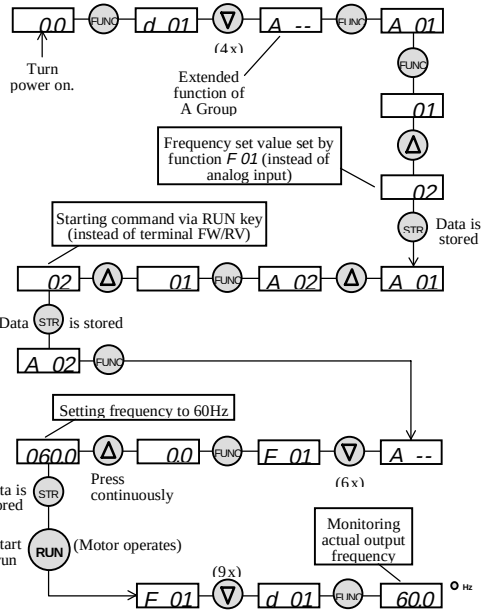
SJ100 SERIES

QUICK REFERENCE GUIDE (Part 1/2)

Single phase input 200V class
Three phase input 200V class
Three phase input 400V class

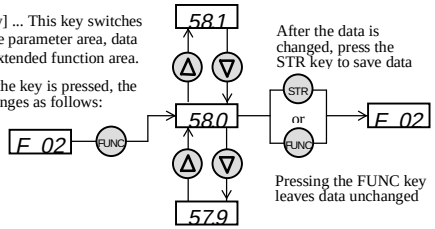


Operation procedure (example for the digital operator)

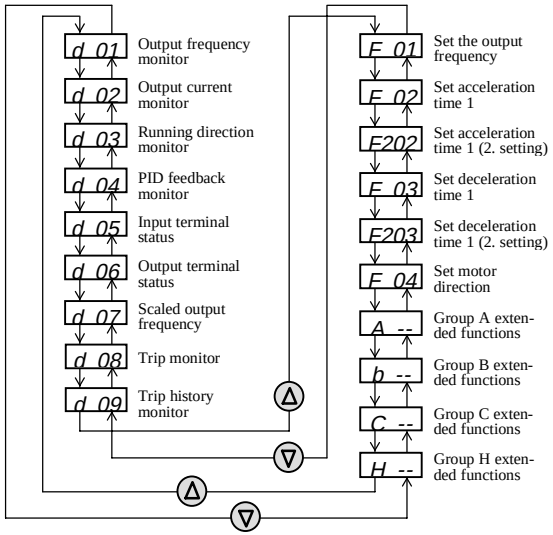


FUNC [FUNC key] ... This key switches between the parameter area, data area, and extended function area.

Each time the key is pressed, the display changes as follows:



[UP key, DOWN key] ... These keys change the values of data area, and parameters:



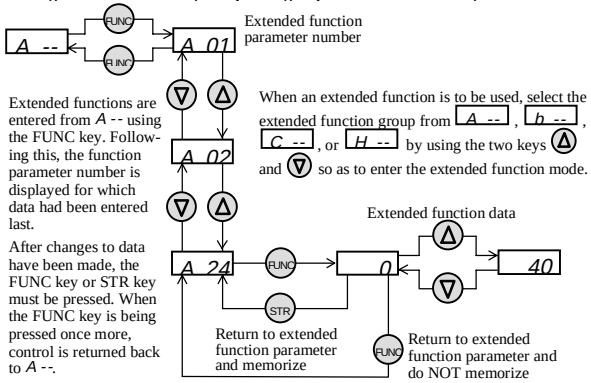
RUN [START key] ... This key starts the SJ100 inverter.

The set value of *F 04* determines forward or reverse run.

STOP RESET [STOP key] ... This key stops the SJ100 inverter.

When a trip occurs, this key becomes the RESET key

Setting extended functions (example for group A extended functions)



Explanation of display at power on

When the inverter is turned on, the display returns to what was displayed when the power was last turned off (except in the extended function mode).

Protective Functions

The SJ100 series inverter will trip on overcurrent, overvoltage and undervoltage to protect the inverter.The output is shut down and the motor runs free. This condition is held until it is reset.

Trip	Contents	Display
Overcurrent protection	When the output of the inverter is short circuited, the motor is locked, or a heavy load is suddenly applied, and the inverter output current exceeds a predetermined level, the inverter is shut off.	Const. speed: E 01 At decelerat.: E 02 At accelerat.: E 03 At the others: E 04
Overload protection	When a motor overload is detected by the electronic thermal function, the inverter is shut off.	E 05
Braking resistor overload	When the operation of the braking resistor exceeds a certain time duration, the inverter is shut off.	E 06
Overvoltage protection	When the inverter DC bus voltage exceeds a predetermined level due to regenerative energy from the motor, this trip occures and the inverter is shut off.	E 07
EEPROM error (*NOTE 1*)	When the inverter memory has a problem due to noise or excessive temperature rise, this trip occurs and the inverter is shut off.	E 08
Undervoltage protection	A decrease of DC bus voltage may result in improper function of the control unit. It may also cause motor heating and low torque. The inverter is shut off when the DC bus voltage goes below a certain level.	E 09
CT error	When a large noise source is near the inverter or an abnormality occurs on built-in CT, inverter output is cut off.	E 10
CPU error	Malfunction or abnormality of the CPU. The inverter is shut off.	E 11 E 22
External trip	A trip signal from external equipment shuts off the inverter. It is necessary to assign the external trip to an intelligent terminal.	E 12
USP error	Indicates an error when power is turned on while the inverter run is enabled (with USP function selected).	E 13
Ground fault protection	The inverter is protected by detection of ground faults between the drive output and the motor at power on. Protection is for the inverter only and not for humans.	E 14
Input overvoltage	When the input voltage is higher than a specified value, it is detected and 100 seconds after power is turned on, the inverter is shut off.	E 15
Thermal protection	When the temperature of the inverter module is beyond specification, the built-in thermal sensor detects the temperature and the inverter is shut off.	E 21
PTC error	When the resistance value of the external thermistor is too large, the equipment detects the abnormal condition of the thermistor and then shuts off the inverter (when PTC function is selected).	E 35
Waiting (undervoltage)	Waiting with the output turned off, because the inverter receiving voltage has dropped.	_ _ U

NOTE 1: If an EEPROM error occurs, be sure to observe ist value. If power is turned off while the [RS] input terminal is held ON, the EEPROM error occurs when power is turned back on.

SJ100 data setting values SJ100 inverters provide many functions whose parameters can be set by the user. It is recommended that the parameters that have been set by the user be recorded in order to speed the investigation and repair in the event of a failure.

SJ100 _____

Mfg.No. _____

This information is written on the nameplate located on the right side of the SJ100 inverter.

Drive keypad display sequence

Display	Function	Standard Setting	Set Value
d 01 .. .. d 09	Display functions	*Refer to page 4*	
F 01	Set output frequency (Hz)	0.0	
F 02	Set acceleration 1 (s)	10.0	
F202	Set acceleration 1 (s), 2. setting	10.0	
F 03	Set deceleration 1 (s)	10.0	
F203	Set deceleration 1 (s), 2. setting	10.0	
F 04	Set motor direction	00 (rechts)	
A --	Set extended function group A	*Refer to pages 6 through 8*	
b --	Set extended function group B		
C --	Set extended function group C		
H --	Set extended function group H		

Display	Function	Standard Setting	Set Value
A 01	Frequency Source setting 00-Potentiometer 01-Terminal O/OI 02-Functions *F 01* / *A 20*	01	
A 02	Run command source setting 01-Terminal FW/RV 02-RUN key	01	
A 03	Base frequency setting	50.0	
A203	Base frequency setting (2. setting)		
A 04	Maximum frequency setting	50.0	
A204	Maximum frequency setting (2. setting)		
A 11	External frequency setting start point	0	
A 12	External frequency setting end point	0	
A 13	External frequency setting start point bias (in %)	0	
A 14	External frequency setting end point bias (in %)	100	
A 15	External frequency start pattern setting 00-Per *A11* and *A13* 01-0Hz	01	
A 16	Time constant of the filter for analog inputs	8	
A 20 – A 35	Multispeed frequency setting	All are 0.0Hz	
A 38	Jog frequency setting	1.0	
A 39	Jog stop mode 00-Freerun 01-Deceleration 02-DC brake	00	
A 41	Torque boost selection method 00-Manual 01-Automatic	00	
A241	Torque boost selection method (2. setting)		
A 42	Value of manual torque boost setting	11	
A242	Value of manual torque boost setting (2. setting)	11	
A 43	Manual torque boost frequency adjustment (in %)	10.0	
A243	Manual torque boost frequency adjustment (in %) (2. setting)		
A 44	V/F characteristic setting 00-Constant torque 01-Variable torque 02-SLV	02	
A244	V/F characteristic setting (2. setting)		
A 45	V-Gain setting (in %)	100	
A 51	Selection of DC braking operation 00-NO 01- YES	00	
A 52	DC braking frequency setting	0.5	
A 53	DC braking waiting time setting	0.0	
A 54	DC braking force setting	0	
A 55	DC braking time setting	0.0	
A 61	Frequency upper limit setting	0.0	
A 62	Frequency lower limit setting	0.0	
A 63, A 65, A 67	Jump frequency setting	0.0	
A 64, A 66, A 68	Jump frequency width setting	0.5	
A 71	Selection of PID control 00-NO 01- YES	00	
A 72	P (proportional) gain setting	1.0	
A 73	I (integral) gain setting	1.0	
A 74	D (differential) gain setting	0.0	
A 75	Scale conversion of PID control setting	1.00	
A 76	Feedback signal location setting 00-Current 01-Voltage	00	
A 81	Selection of AVR function 00-Available 01-Not available 02-Not available at deceleration	02	
A 82	Selection of voltage of AVR function for the motor	FE:230/400 FE:230/460	
A 92	Second acceleration time setting	15.0	
A292	Second acceleration time setting (2. setting)		
A 93	Second deceleration time setting	15.0	
A293	Second deceleration time setting (2. setting)		

(Table to be continued on next page)

(Continued from previous page)

Display	Function	Standard Setting	Set Value
A 94	Selection of method to enable second acceleration/deceleration (acc2/dec2) 00-Terminal 2CH 01-*A 95* / *A 96*	00	
A294	Selection of method to enable second acceleration/deceleration (acc2/dec2) (2. setting)		
A 95	Changed frequency from acc1 to acc2 setting	0.0	
A295	Changed frequency from acc1 to acc2 setting (2. setting)		
A 96	Changed frequency from dec1 to dec2 setting	0.0	
A296	Changed frequency from dec1 to dec2 setting (2. setting)		
A 97	Pattern of acceleration setting 00-Linear 01-S-curve	00	
A 98	Pattern of deceleration setting 00-Linear 01-S-curve	00	

Display	Function	Standard Setting	Set Value
b 01	Selection of restart mode 00-Alarm 01-0.0Hz restart 02-Motor speed match restart 03-Motor speed match restart /decel to stop	00	
b 02	Allowable undervoltage power failure time setting	1.0	
b 03	Retry waiting time	1.0	
b 12	Level of electronic thermal setting	Rated current of inverter	
b212	Level of electronic thermal setting (2. setting)		
b 13	Selection of electronic thermal characteristic 00-Reduced torque 01-Constant torque	01	
b213	Selection of electronic thermal characteristic (2. setting)	01	
b 21	Selection of overload limit operation mode 00-NO 01-Accel & constant speed 02-Constant speed	01	
b 22	Level of overload limit setting	Rated current times 1.25	
b 23	Rate of deceleration at overload restriction	1.0	
b 31	Selection of software lock mode 00-Terminal, no change 01-Terminal, frequency change 02-Keypad, no change 03-Keypad, frequency change	01	
b 81	Analog meter adjustment	80	
b 82	Start frequency adjustment	0.5	
b 83	Carrier frequency setting (kHz)	5.0	
b 84	Initialization will 00-Clear trip history 01-Restore data & parameters to factory settings	00	
b 85	Selection of initialized data	-FE:01 -EU:02	
b 86	Frequency converted value setting	1.0	
b 87	STOP key active in terminal mode 00-YES 01-NO	00	
b 88	Selection of operation when FRS signal is cancelled 00-Restart at 0 Hz 01-Restart at motor speed	00	
b 89	Selection of contents of remote display 01-Frequency 02-Current 03-Direction 04-PID feedback 05-Input terminal status 06-Output terminal status 07-Scaled frequency	01	
b 90	Rate of use (in %) of the regenerative braking resistor during 100 seconds (00= braking resistor not active)	00	
b 91	Deceleration mode selection when using the STOP key 00-Deceleration stop 01-Free run stop (FRS)	00	
b 92	Fan ON/OFF selection 00-Fan is always on 01-Fan is only on if the inverter/motor is running	00	

Display	Function	Standard Setting	Set Value
C 01	Function of input terminal 1 00-FW (Forward run) 01-RV (Reverse run) 02-CF1 (Multispeed 1) 03-Multispeed 2 04-Multispd. 3 05-Multispd. 4 06-JG (Jogging) 07-DB (Ext. DC braking) 08-SET (use 2. setting) 09-2CH (2. stage accel/decel) 11-FRS (Free run mode) 12-EXT (Extern. trip) 13-USP-function 15-SFT (Software lock) 16-AT (Analog input type) 18-RS (Reset) 19-PTC (only for terminal 5) 27-UP (remote control acceleration) 28-DWN (remote control deceleration)	00	
C 02	Function of input terminal 2 (See *C 01*)	01	
C 03	Function of input terminal 3 (See *C 01*)	-FE:02 -EU:16	
C 04	Function of input terminal 4 (See *C 01*)	-FE:03 -EU:13	
C 05	Function of input terminal 5 (See *C 01*)	-FE:18 -EU:09	
C 06	Function of input terminal 6 (See *C 01*)	-FE:09 -EU:18	
C 11 – C 16	Polarity input of terminal 1-6 00-Normally open 01-Normally closed	00 / *C 14* only: -FE:00 -EU:01	
C 21	Function of output terminal 11 00-RUN-signal 01-FA1 (frequency constant) 02-FA2 (Frequency at set point) 03-OL (Overload) 04-OD (PID deviating) 05-AL (Alarm)	01	
C 22	Function of output terminal 12 (See *C 21*)	00	
C 23	Function of FM terminal 00-Analog frequency 01-Analog current 02-Digital frequency	00	
C 24	Function of alarm terminal (See *C 21*)	05	
C 31	Polarity of terminal 11 00-Normally open 01-Normally closed	01	
C 32	Polarity of terminal 12 (See *C 31*)	01	
C 33	Polarity of terminal AL0/AL1 00-Normally open 01-Normally closed	01	
C 41	Level of overload signal setting	Rated current	
C 42	Arrival frequency setting for acceleration	0.0	
C 43	Arrival frequency setting for deceleration	0.0	
C 44	Level of PID deviation signal setting	3.0	
C 81	Frequency command adjustment (terminal O)		
C 82	Frequency command adjustment (terminal OI)		
C 91 – C 95	For further use, do not change.	-	-

Display	Function	Standard Setting	Set Value
H 01	Autotuning mode: 00-Autotuning off 01-Autotuning on 02-Autotuning/static	00	
H 02	Motor data: 00-Standard Hitachi 01-Auto	00	
H202	Motor data (2. setting)		
H 03	Motor capacity	*Depending on model*	
H203	Motor capacity (2. setting)		
H 04	Number of motor poles	4	
H204	Number of motor poles (2. setting)		
H 05	Motor constant Kp	20	
H205	Motor constant Kp (2. setting)		
H 06	Motor stabilization constant	100	
H206	Motor stabilization constant. (2. setting)		
H 20	Motor constant R1	*Depending on model*	
H220	Motor constant R1 (2. setting)		
H 21	Motor constant R2		
H221	Motor constant R2 (2. setting)		
H 22	Motor constant L		
H222	Motor constant L (2. setting)		
H 23	Motor constant Io		
H223	Motor constant Io (2. setting)		
H 24	Motor constant J		
H224	Motor constant J (2. setting)		
H 30	Motor constant R1 Autotuning		These parameters must not be changed!
H230	Motor constant R1 Autotuning (2. setting)		
H 31	Motor constant R2 Autotuning		
H231	Motor constant R2 Autotuning (2. setting)		
H 32	Motor constant L Autotuning		
H232	Motor constant L Autotuning (2. setting)		
H 33	Motor constant Io Autotuning		
H233	Motor constant Io Autotuning (2. setting)		
H 34	Motor constant J Autotuning		
H234	Motor constant J Autotuning (2. setting)		

HITACHI INVERTER

SJ100 SERIES

QUICK REFERENCE GUIDE (Part 2/2)

Single phase input 200V class
Three phase input 200V class
Three phase input 400V class

CE-EMC Installation

This instruction describes the electromagnetically compatible setup of your drive system.

1. **As an enduser you must ensure that the HF impedance between frequency inverter, filter and ground is as small as possible.**
   - See to it that the connections are metallic and have the largest possible areas (zink-plated mounting plates)
2. **Conductor loops act like antennas, especially when they encompass large areas. Consequently:**
   - Avoid unnecessary conductor loops
   - Avoid parallel arrangement of „clean“ and interference-prone conductors
3. **Lay the motor cable and all analog and digital contol lines shielded.**
   - You should allow the effective shield area of these lines to remain as large as possible; i.e., do not move the shield further away than absolutely necessary.
   - With compact systems, if for example the frequency inverter is communicating with the steering unit, in the same control cabinet connected at the same PE-potential, the screen of control lines should be put on, on both sides with PE. With branch systems, if for example the communicating steering unit is not in the same control cabinet and there is a distance between the systems, we recommend to put on the screen of control lines only on the side of the frequency inverter. If it is possible, direct in the cable entry section of the steering unit. The screen of Motor cabels always must be put on, on both sides with PE.
   - The large area contact between shield and PE-potential you can realise with a metal PG screw connection or a metallic mounting clip.
   - Use only copper mesh cable (CY) with 85% coverage
   - The shielding should not be interrupted at any point in the cable. If the use of reactors, contactors, terminals or safety switches in the motor output is necessary, the unshielded section should be kept as small as possible.
   - Some motors have a rubber gasket between terminal box and motor housing. Very often, the terminal boxes, and particularly the threads for the metal PG screw connections, are painted. Make sure there is always a good metallic connection between the shielding of the motor cable, the metal PG screw connection, the terminal box and the motor housing, and carefully remove this paint if necessary.
4. **Very frequently, interference is coupled in through installation cables. This influence you can minimize:**
   - Lay interfering cables separately, a minimum of 0.25 m from cables susceptible to interference.A particularly critical point is laying cables parallel over larger distances. If two cables intersect, the interference is smallest if they intersect at an angle of 90°. Cables susceptible to interference should therefore only intersect motor cables, intermediate circuit cables, or the wiring of a rheostat at right angles and never be laid parallel to them over larger distances.
5. **The distance between an interference source and an interference sink (interference-threatened device) essentially determines the effects of the emitted interference on the interference sink.**
   - You should use only interference-free devices and maintain a minimum distance of 0.25 m from the drive.
6. **Safety measures**
   - Ensure that the protective conductor terminal (PE) of the filter is properly connected with the protective conductor terminal of the frequency inverter. An HF ground connection via metal contact between the housings of the filter and the frequency inverter, or solely via cable shield, is not permitted as protective conductor connection. The filter must be solidly and permanently connected with the ground potential so as to preclude the danger of electric shock upon touching the filter if a fault occurs. You can achieve this by:
     - connecting it with a grounding conductor of at least 10 mm^2;
     - connecting a second grounding conductor, connected with a separate grounding terminal, parallel to the protective conductor (The cross section of each single protective conductor terminal must be designed for the required nominal load)

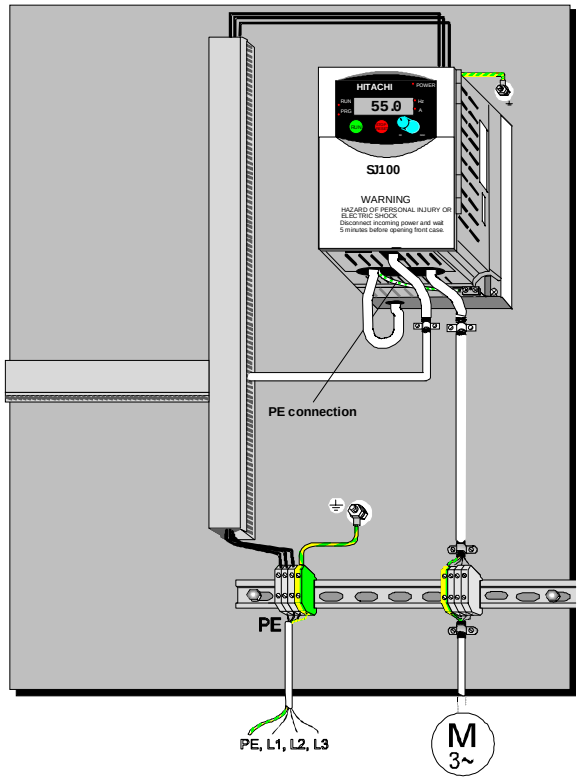
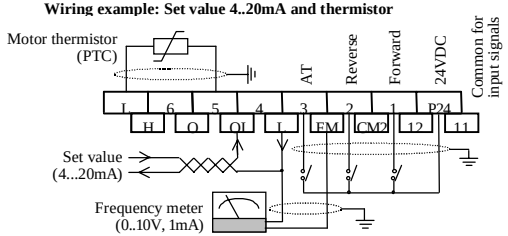


Figure: Hitachi frequency inverter with footprint filter

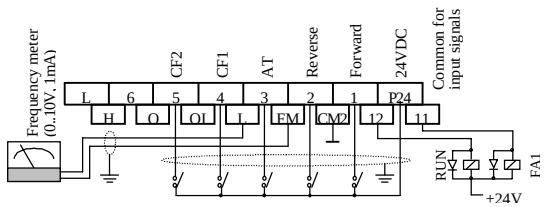
Wiring example: Set value 4..20mA and thermistor



A 01 = 01 (Frequency set value on input O or OI) *A 02* = 01 (Start signal on FW/RV)
F 02 = 10 (acceleration time 10 sec.) *F 03* = 10 (deceleration time 10 sec.)
C 01 = 00 (FW: Start forward run via input 1)
C 02 = 01 (RV: Start reverse run via input 2)
C 03 = 16 (AT: Use current input 4-20mA for set value) *C 05* = 19 (PTC on input 5)

The inverter can now be started via input 1 (forward run) or input 2 (reverse run). If the inputs RV and FW are both closed, the inverter is stopped. If input AT is configured as normally open contact and is closed, current input on OI is used for set value.

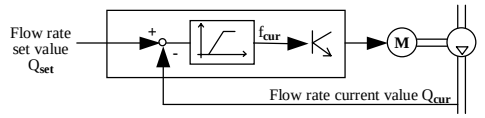
Wiring example: Fixed set values; FA1 output and RUN output



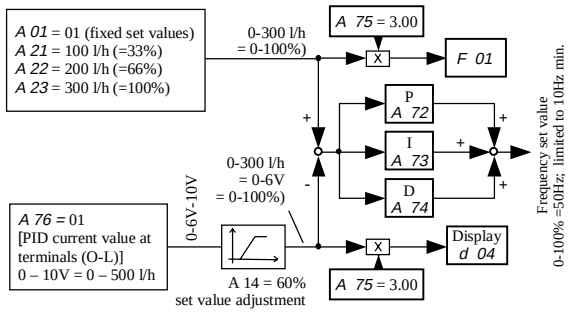
Parameters for functions *A 01*, *A 02*, *F 02*, *F 03*, *C 01*, *C 02*, and *C 03* are set exactly the same as in the example above. Additionally, *C 04* is set to 02 (CF1) and *C 05* is set to 03 (CF2). Fixed frequency set values are set via functions *A 21*, *A 22*, and *A 23* using parameters 0 to 360 (= frequency 0 to 360Hz). The inverter can now be started via input 1 (FW) or input 2 (RV). If the inputs RV and FW are both closed, the inverter is stopped. If none of the digital inputs CF1 or CF2 is closed, frequency set value can be set using analog inputs O/OI.

Application example: Flow control

A flow control circuit is to be realized using the SJ100 inverter built in PID control.



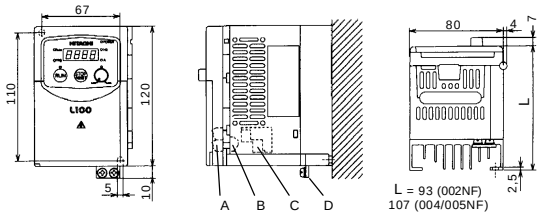
Set value is given in fixed intervals: 100, 200, 300l/h. The current value is input by a sensor (0-500l/h = 0-10V). When the difference is greater than 20% a warning is output. The frequency must not fall below 10 Hz. The set value and current value are displayed as flow rate in l/h (300l/h = 100% = 50Hz maximum frequency).



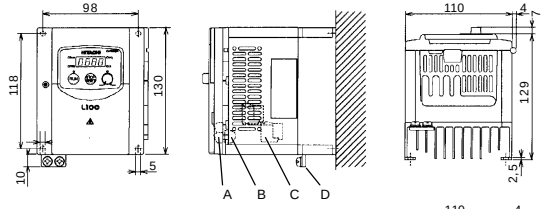
In order to display the correct value, *A 75* is set to 3.00 so that a set value of 100% corresponds to a flow rate of 300l/h. In order to match the current value input (0-500l/h) to the set value input (0-300l/h) the current value must be adjusted with parameters *A 11* to *A 14*, i.e. *A 14* must be set to 60% so that 300l/h process value corresponds to 100% current value.

External dimensions and terminal positions

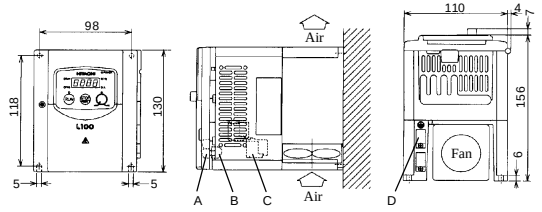
SJ100- 002 NFE/NFU 004 NFE/NFU 005 NFE



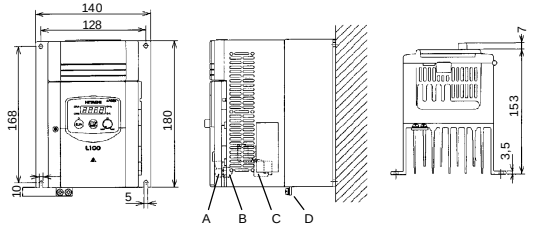
SJ100- 004 HFE/HFU 007 NFE/NFU 011 NFE



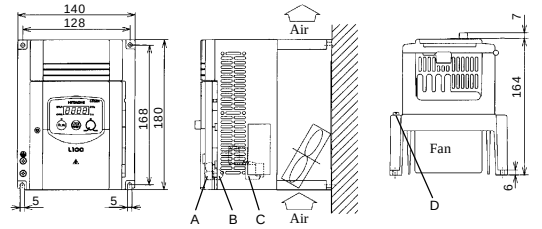
SJ100- 007 HFE/HFU (*without fan*) 015 HFE/HFU 022 HFE/HFU



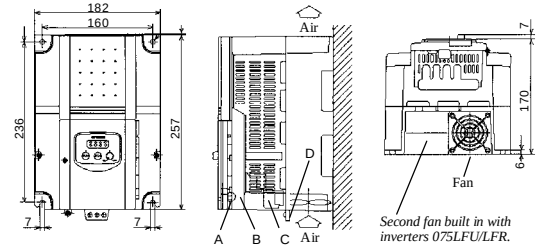
SJ100- 015 NFE/NFU



SJ100- 022 NFE/NFU 030 HFE 037 LFU 040 HFE/HFU



SJ100- 055 LFU/LFR 055 HFE/HFU/HFR 075 HFE/HFU/HFR 075 LFU/LFR



Second fan built in with inverters 075LFU/LFR.

Legend:

A Control terminals B Alarm terminals
C Main terminals D Grounding terminal (All dimensions are in millimeters)

Technical Specifications Inverter SJ100- (200V Series)		002 NFE	004 NFE	005 NFE	007 NFE	011 NFE	015 NFE	022 NFE		055 LFR	075 LFR
		002 NFU	004 NFU		007 NFU		015 NFU	022 NFU	037 LFU	055 LFU	075 LFU
Protective structure (*Note 1*)		IP20									
Overvoltage category		III									
Maximum motor size (4P) in kW (*Note 2*)		0.2	0.4	0.55	0.75	1.1	1.5	2.2	3.7	5.5	7.5
Maximum capacity in kVA	230V	0.6	1.0	1.1	1.5	1.9	3.1	4.3	6.9	9.1	12.2
	240V	0.6	1.0	1.2	1.6	2.0	3.3	4.5	7.2	9.1	12.2
Input supply phase		Single / Three phase							Three phase		
Rated input voltage		200VAC -10% ~ 240VAC +5% 50/60Hz +/-5%									
Rated output voltage (*Note 3*)		Three phase 200 ~ 240VAC (Corresponds to input voltage)									
Rated input current in A Single phase (Three phase)		3.5 (2.0)	5.8 (3.4)	6.7 (3.9)	9.0 (5.2)	11.2 (6.5)	17.5 (10.0)	24.0 (14.0)	- (22.0)	-	-
Rated output current in A (*Note 4a*)		1.4	2.6	3.0	4.0	5.0	8.0	11.0	17.5	24.0	32.0
Output frequency range		0.5 ~ 360 Hz (*Note 5*)									
Frequency accuracy (at 25°C +/-10°C)		Digital command: +/-0.01% of maximum frequency Analog command: +/-0.1% of maximum frequency									
Frequency setting resolution		Digital setting: 0.1 Hz Analog setting: max. frequency / 1000									
Voltage/frequency characterist.		Constant, reduced or high starting (SLV) torque (*Note 8*)									
Overload current capacity		150% during 60 seconds (once per 10 minutes)									
Acceleration/deceleration time		0.1 ~ 3000 s in selectable linear and non-linear mode (second acceleration/deceleration usable)									
Starting torque (using SLV)		> 200%							> 180%		
Braking torque	Dynam. braking, feedback to capacitor (*Note 6*)?	approx. 100%				approx. 70%	approx. 20%		approx. 30%		
	External braking resistor	approx. 150%					approx. 100%		approx. 80%		
	DC injection braking	Braking is on at the minimum frequency or less (minimum frequency, braking time and braking force can be set)									
Inputs	Frequency setting: Dig. operator	Settings using keys ▲ ▼ or potentiometer									
	Frequency setting: External signals	0-10VDC (input impedance 10k Ohm) 4-20mA (input impedance 250 Ohm) Potentiometer 1k-2k Ohm, 1W (055 ~ 075LFU/LFR: 2W)									
	Forward / Reverse run (Start/Stop): Dig. operator	Via keys RUN (for start) and STOP/RESET (for stop) (Default setting: forward run)									
	Forward / Reverse run (Start/Stop): Ext. signals	Intelligent input terminals configurable as FW and RV									
	Intelligent input terminals programmable as	FW: Forward run start/stop CF1–CF4: Multistage speed AT: Analog current input selection FRS: Free run stop USP: USP function SFT: Software lock DB: Ext. DB input UP: Acceleration (Remote) RV: Reverse run start/stop JG: Jogging command 2CH: 2.Accel./decel. time EXT: External trip RS: Reset PTC: Thermal protection SET: 2. setting active DWN: Decelerat. (Remote)									
Outputs	Intelligent output terminals programmable as	FA1/FA2: Frequency arrival signal RUN: Motor running signal OD: Deviation signal at PID control OL: Overload signal AL: Alarm signal									
	Frequency and current monitoring	Connection of external analog meter (0-10VDC, max. 1mA) for frequency or current; connection of external digital frequency meter									
Fault alarm contact		On when the inverter trips (1c contact). Alternatively usable as intelligent output terminal									
Other functions		Autotuning, Automatic voltage regulation, retry; analog gain/vias adjustment, frequency jump, upper/lower limiter, output frequency display, trip history monitoring, carrier frequency setting, PID control, automatic torque boost, USP function, 2. Setting function, ON/OFF control of cooling fan, and many more									
Protection functions		Overcurrent, overvoltage, undervoltage, electronic thermal, temperature abnormality, ground fault, overload, CT error, BRD error									
Environmental	Ambient temperature	-10 ~ 50°C (*Note 7*)									
	Storage temperature and humidity	-25 ~ 70°C (during short term transportation period only) 20 ~ 90% RH (no dew condensation)									
	Vibration	Max. 5.9m/s² (=0.6g) at 10-55Hz									
	Installation location	1000m or less altitude indoors (IP54 or equivalent)									
External color		Grey									
Options		Remote operator, copy unit, cable for digital operator, reactor for improving power factor, noise filter, OPE-J									
Overall weight (approx.)		0.7	0.8		1.3		2.3	2.8	5.5	5.7	

Note 1: Protective structure is based upon EN60529. *Note 2*: The applicable motor is a Hitachi standard four-pole motor. When using another motor, make sure that the rated motor current does not exceed the rated inverter current. *Note 3*: The output voltage will decrease if input voltage decreases. *Note 4a*: The initial data setting values of 005N/011N are same as 004N/007N. So be sure to set the values *b 12* and *b 22* of 004N/007N for each motor. (*To be continued on next page*)

Technical Specifications Inverter SJ100- (400V Series)		004 HFE	007 HFE	015 HFE	022 HFE	030 HFE	040 HFE	055 HFE HFR	075 HFE HFR
		004 HFU	007 HFU	015 HFU	022 HFU		040 HFU	055 HFU	075 HFU
Protective structure (*Note 1*)		IP20							
Overvoltage category		III							
Maximum motor size (4P) in kW (*Note 2*)		0.4	0.75	1.5	2.2	3.0	4.0	5.5	7.5
Maximum capacity in kVA	460V	1.1	1.9	2.9	4.2	6.2	6.6	9.9	12.2
Input supply phase		Three Phase							
Rated input voltage		380VAC -10% ~ 460VAC +10% 50/60Hz +/-5%							
Rated output voltage (*Note 3*)		Three Phase 360 ~ 460VAC (Corresponds to input voltage)							
Rated input current in A		2.0	3.3	5.0	7.0	10.0	11.0	16.5	20.0
Rated output current in A (*Note 4b*)		1.5	2.5	3.8	5.5	7.8	8.6	13.0	16.0
Output frequency range		0.5 ~ 360 Hz (*Note 5*)							
Frequency accuracy (at 25°C +/-10°C)		Digital command: +/-0.01% of maximum frequency Analog command: +/-0.1% of maximum frequency							
Frequency setting resolution		Digital setting: 0.1 Hz Analog setting: max. frequency / 1000							
Voltage/frequency characterist.		Constant, reduced or high starting (SLV) torque (*Note 8*)							
Overload current capacity		150% during 60 seconds (once per 10 minutes)							
Acceleration/deceleration time		0.1 ~ 3000 s in selectable linear and non-linear mode (second acceleration/deceleration usable)							
Starting torque (using SLV)		> 200%				> 180%			
Braking torque	Dynam. braking, feedback to capacitor (*Note 6*)	approx. 100%			approx. 70%	approx. 20%		approx. 30%	
	External braking resistor	approx. 150%			approx. 100%			approx. 80%	
	DC injection braking	Braking is on at the minimum frequency or less (minimum frequency, braking time and braking force can be set)							
Inputs	Frequency setting: Dig. operator	Settings using keys ▲ ▼ or potentiometer							
	Frequency setting: External signals	0-10VDC (input impedance 10k Ohm) 4-20mA (input impedance 250 Ohm) Potentiometer 1k-2k Ohm, 1W (055 ~ 075LFU/LFR: 2W)							
	Forward / Reverse run (Start/Stop): Dig. operator	Via keys RUN (for start) and STOP/RESET (for stop) (Default setting: forward run)							
	Forward / Reverse run (Start/Stop): Ext. signals	Intelligent input terminals configurable as FW and RV							
	Intelligent input terminals programmable as	FW: Forward run start/stop CF1–CF4: Multistage speed AT: Analog current input selection FRS: Free run stop USP: USP function SFT: Software lock DB: Ext. DB input UP: Acceleration (Remote) RV: Reverse run start/stop JG: Jogging command 2CH: 2.Accel./decel. time EXT: External trip RS: Reset PTC: Thermal protection SET: 2. setting active DWN: Decelerat. (Remote)							
Outputs	Intelligent output terminals programmable as	FA1/FA2: Frequency arrival signal RUN: Motor running signal OD: Deviation signal at PID control OL: Overload signal AL: Alarm signal							
	Frequency and current monitoring	Connection of external analog meter (0-10VDC, max. 1mA) for frequency or current; connection of external digital frequency meter							
Fault alarm contact		On when the inverter trips (1c contact). Alternatively usable as intelligent output terminal							
Other functions		Autotuning, Automatic voltage regulation, retry; analog gain/vias adjustment, frequency jump, upper/lower limiter, output frequency display, trip history monitoring, carrier frequency setting, PID control, automatic torque boost, USP function, 2. Setting function, ON/OFF control of cooling fan, and many more							
Protection functions		Overcurrent, overvoltage, undervoltage, electronic thermal, temperature abnormality, ground fault, overload, CT error, BRD error							
Environmental	Ambient temperature	-10 ~ 50°C (*Note 7*)							
	Storage temperature and humidity	-25 ~ 70°C (during short term transportation period only) 20 ~ 90% RH (no dew condensation)							
	Vibration	Max. 5.9m/s² (=0.6g) at 10-55Hz							
	Installation location	1000m or less altitude indoors (IP54 or equivalent)							
External color		Grey							
Options		Remote operator, copy unit, cable for digital operator, reactor for improving power factor, noise filter, OPE-J							
Overall weight (approx.)		1.3	1.7		2.8			5.5	5.7

(*Contd. from prev. page*) *Note 4b*: The initial data setting value of 030H is same as 040H. So be sure to set the values *b 12* and *b 22* of 030H for the motor. *Note 5*: Confirm with the motor manufacturer the motors maximum rpm when using a motor running at frequencies higher than 50/60Hz. *Note 6*: Torque will be reduced when the base frequency exceeds 50Hz. *Note 7*: In the range of 40 to 50°C reduce carrier frequency 2kHz and derate output current 80%, and remove the top cover.