HITACHI

VARIABLE FREQUENCY DRIVE

J300 series

SENSORLESS VECTOR CONTROL

Dual Rating

Quiet, powerful and intelligent

Quiet, powerful and intelligent... the high-performance and dual rating inverter J300 Series.

To answer the present needs for higher and more sophisticated performance from the inverter, Hitachi has newly developed the "J300 Series". It features sensorless vector control which allows full use of the inherent power of a motor efficiently and powerfully and an auto tuning function capable of easily realizing powerful operation. Fuzzy logic has been applied for the first time in the industry. The intelligent inverter takes into account the characteristics of both the motor and the system. It provides a higher performance while widening the inverter world.

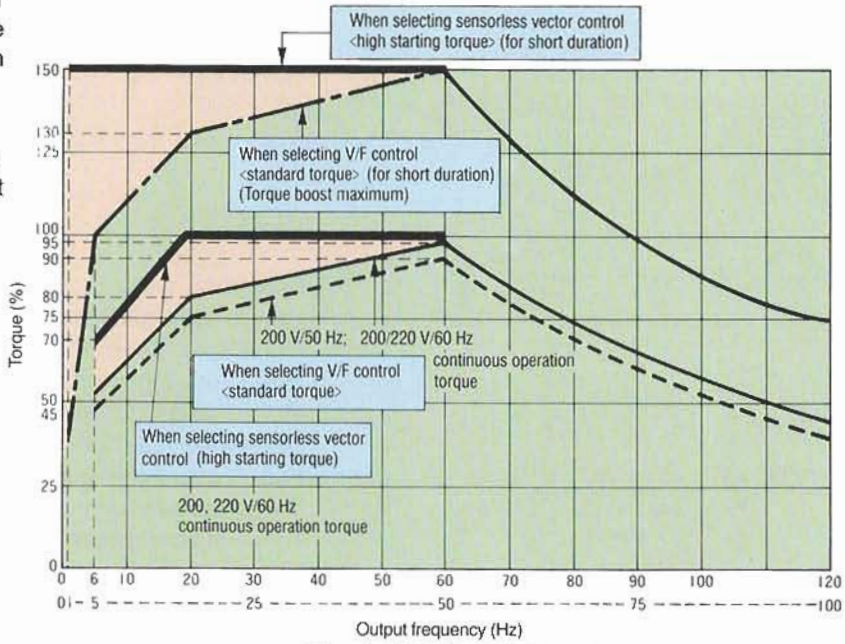
CONTENTS

J300
IGBT Inverter

Precise torque regulation using sensorless vector control!

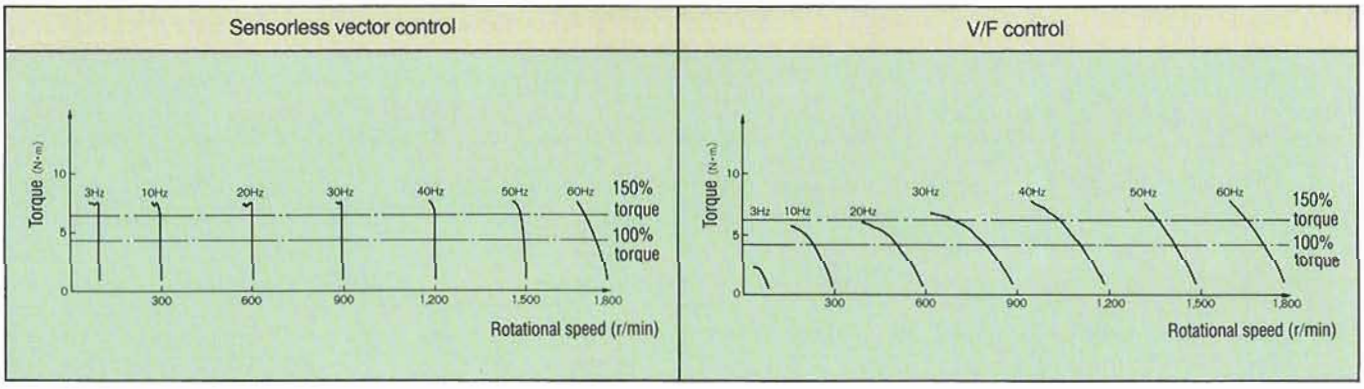
The torque calculation software (sensorless vector control) developed by Hitachi ensures accurate torque control throughout the entire frequency range, even with general purpose motors.

- High starting torque of 150% or more at 1 Hz
- 100% continuous operating torque within a 3:1 speed range (20 to 60 Hz/16 to 50 Hz) without motor derating
- Speed regulation ratio as small as ±1%



*Example: J300-055LF with Hitachi 5.5 kW 4 pole, totally enclosed type motor.

■ Example of rotational speed-torque characteristic

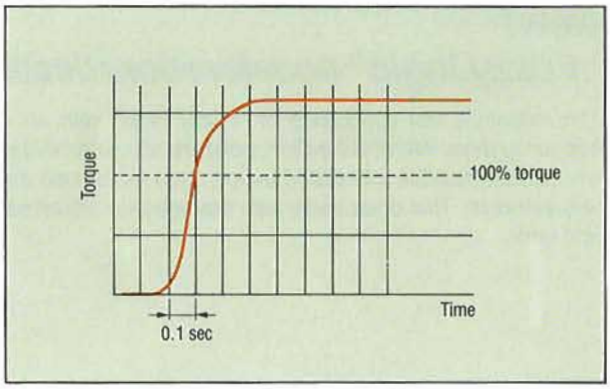


Quick response owing to built-in DSP and high-speed microcomputer!*

The J300 owes its unparalleled response speed to a unique system architecture utilizing a high-speed microcomputer and built-in DSP (digital signal processor). The improved response speed characteristic is effective in preventing "slip-down" in lifting equipment applications.

- Torque response speed: Approx. 0.1 sec achieved

*DSP: Digital Signal Processor

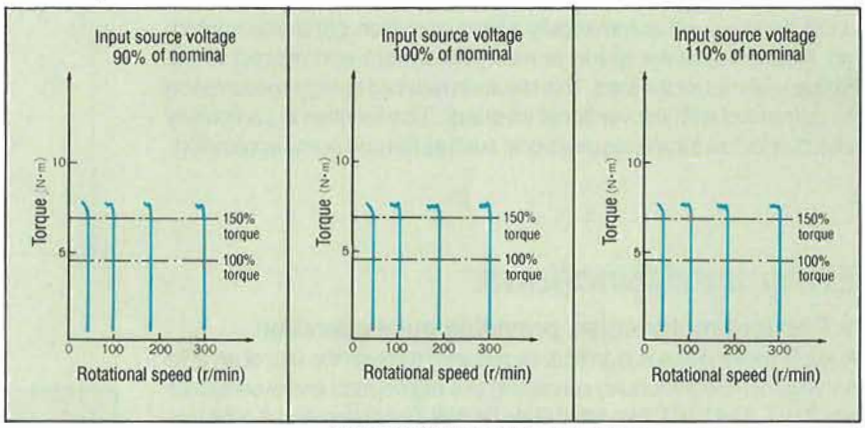


*Response speed differs according to the motor capacity used.

AVR function ensures high starting torque!

Even when the line voltage to the inverter has dropped, a high starting torque can be maintained thanks to the AVR (Automatic Voltage Regulator) function.

■ Example of measured data

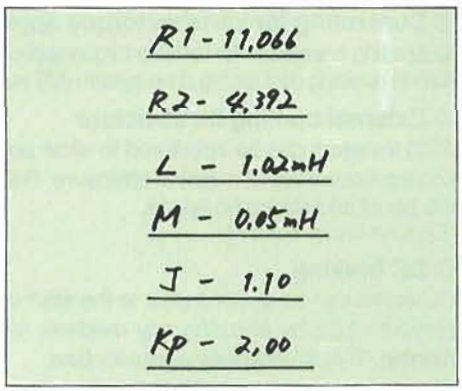


*Example: J300-055LF with Hitachi 5.5 kW 4 pole, totally enclosed type motor.
Measured data may vary with the motor to be coupled and other conditions.

Motor constant auto tuning function incorporated for easier commissioning. [Patent pending]

The J300's auto tuning mode simplifies commissioning by automating the procedure to match the inverter and motor constant. Thus, powerful operation is achievable more efficiently and easily.

(Note) The motor constants of Hitachi standard motor have been factory-set. Auto tuning may fail to provide a satisfactory accuracy for some special motors, in which case actual motor constants can be programmed.

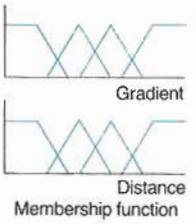


J300
IGBT Inverter

New!
"Fuzzy logic" acceleration/deceleration function. [Patent pending]

The industry's first application of "Fuzzy logic" with an adjustable frequency drive. With this function, optimum acceleration/deceleration time is automatically calculated based upon motor load and braking requirements. This does away with the need for adjustment by trial and error.

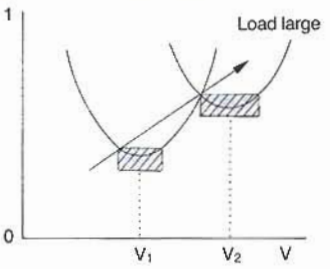
*May not operate effectively if the load inertia is excessive.



Sets the acceleration/deceleration factor and speed according to the fuzzy rule from the distance up to the overload limit or other limits and startup gradient of current and voltage.

Reduced energy consumption...
Function for automatic maximum energy saving operation.

J300 inverters will automatically select operation parameters which will enable the motor to run at minimum current with respect to the torque required for the load. This results in reduced energy consumption as compared with conventional inverters. This function is particularly effective for low torque requirements such as fan and pump application.



On an induction motor, the current is minimized at a certain voltage as illustrated, provided the load is constant. When the current is minimum, the wattage is minimum. Automatically searches that voltage.

Enhanced functions.

● Reduces motor noise, providing quiet operation

Audible motor noise is significantly reduced through the use of an IPM (Intelligent Power Module) consisting of a high-speed micro-computer and IGBT. The IGBT (Insulated Gate Bipolar Transistor) circuit operates at a high carrier frequency which reduces the motor noise associated with conventional inverters.

● Dual rating for variable torque applications

Dual rating is available for variable torque applications such as pumps and fans to realizing cost saving drive system (US version, European version).

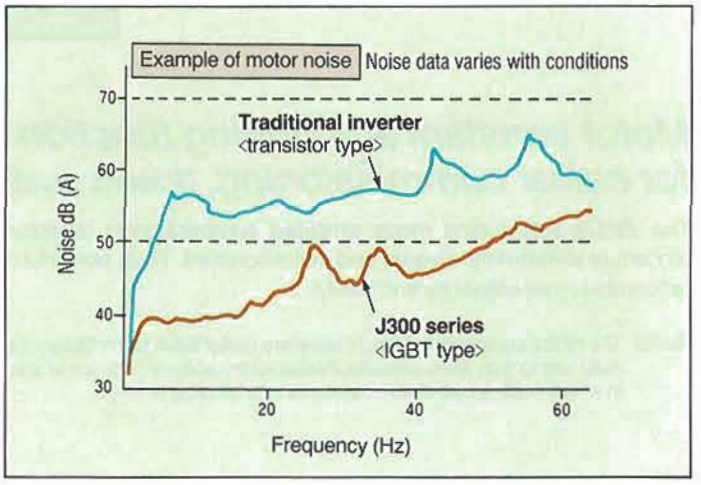
● External cooling fin structure

J300 inverters can be structured to allow positioning of the heat sink cooling fins outside of a control enclosure. This is helpful for downsizing the panel and saving on space.

*Optional fixture required.

● DC braking

DC brake can be applied prior to the start cycle of the inverter. This prevents trips by ensuring any machine rotation is stopped before running. This is especially useful for fans.



● Description of type

J300-055HF□

- Series name
- Applicable motor rating
  - (ex.)
  - 055 : 5.5kW, 7.5HP
  - 075 : 7.5kW, 10HP
  - :
  - 2200 : 220kW, 300HP
- L: Low voltage, three-phase
  H: High voltage, three-phase
- Version number
  - U: US version for U.S.A., Canada, etc.
  - Note: Japanese version
  - E: European version for Europe, Australia, Singapore, etc.

● Model configuration

Applicable motor capacity(kW/HP)	5.5/7.5	7.5/10	11/15	15/20	22/30	30/40	37/50	45/60	55/75	75/100	90/120	110/150	132/200	160/250	220/300
200-220V 200-230V (3phase) [US Version, Japanese version]	J300-055LF	J300-075LF	J300-110LF	J300-150LF	J300-220LF	J300-300LF	J300-370LF	J300-450LF	J300-550LF						
380-415V 400-460V (3phase) [European version US Version, Japanese version]	J300-055HF	J300-075HF	J300-110HF	J300-150HF	J300-220HF	J300-300HF	J300-370HF	J300-450HF	J300-550HF	J300-750HF	J300-900HF	J300-1100HF	J300-1320HF	J300-1600HF	J300-2200HF

E151758 LR78867

(UL / CSA listed: for US version)

Application PC boards for specific drive solutions [option]

The J300 series has a number of application PC boards that can be directly plugged into the main frame of the inverter. These boards provide an immediate functional upgrading as shown below.

PC board name	Application/purpose	Key specification
PID control board	Process control such as constant pressure control	Proportional, integral and differential control
Analog input/output board	Analog input, analog monitor	0 to ±10V DC input (10 bits) 0 to +10V DC output (8 bits)
Communication board	Computer linkage	RS485 general-purpose communication
Feedback board	Positioning, ASR control	Speed reference (0 to ±10V DC) Torque limit (0 to ±10V DC) Linear speed/current output (0 to + 10V DC)
Digital interface board	Interface with PLC Interface with NC machine	Binary (12 bits), BCD (3 digits)
Relay output board	Interface with external circuit	Relay output of run, arrival and load signals, etc.

How to use digital operator

Names and functions of each part

Monitor section (LED indication)

Indicates frequency, motor current, motor speed and alarm contents.

Power lamp

For control circuit.

Function selector key

Transfers from code status to data status or returns to command status upon storing data.

Up and down keys

Select codes or modify data.
- Pressing a key scrolls code Nos. at a command status.
- Modifies data at a data status.

Run key

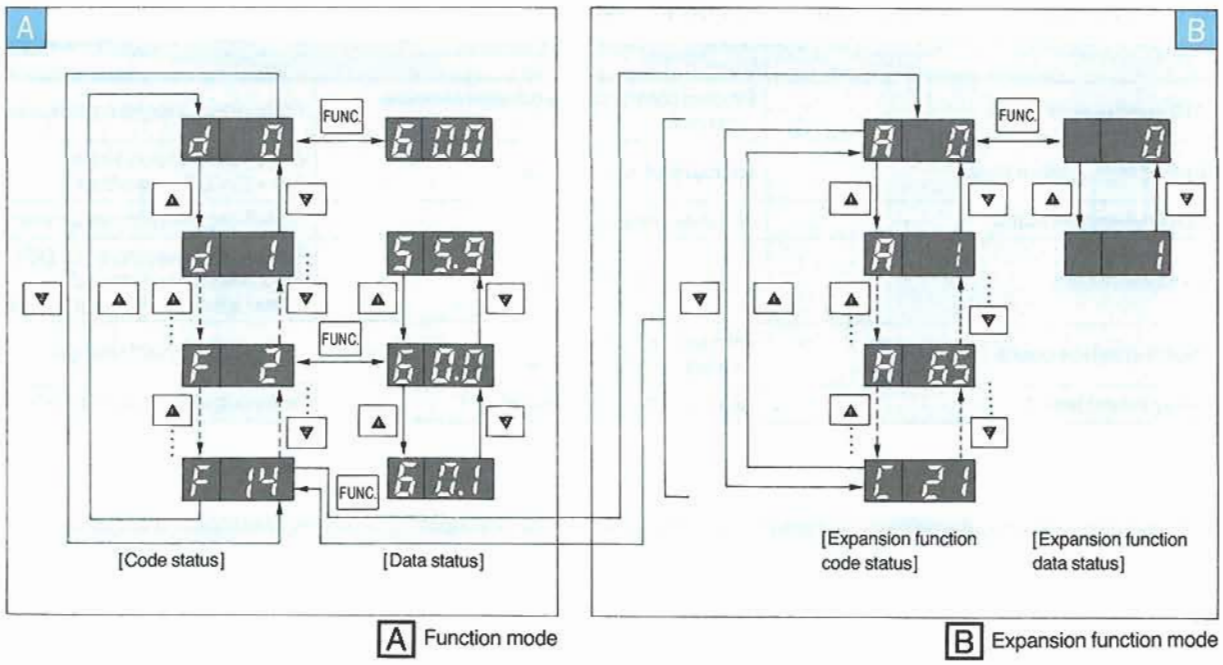
Starts operation.
(Invalid when selecting terminal run.)

Stop/Reset key

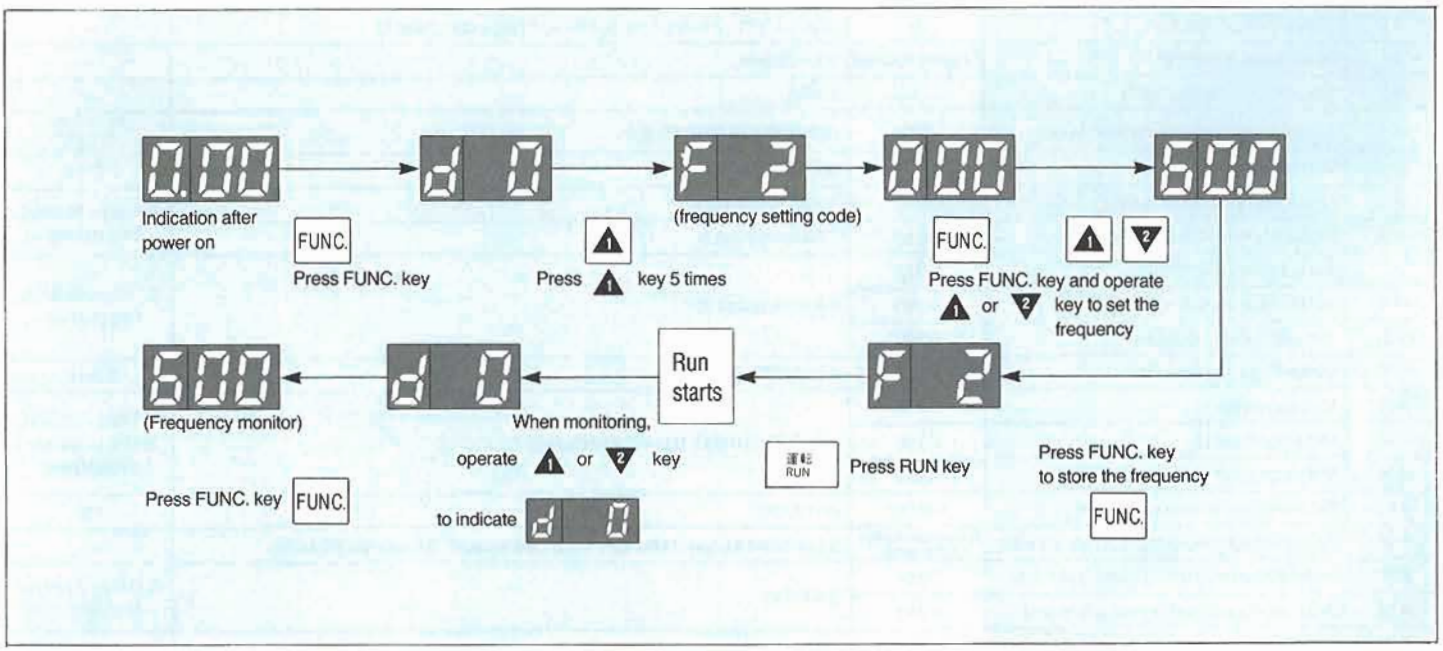
Stops the run or resets the alarm.
(Valid regardless of whether operator or terminal is selected.)

Description on screen indication

- The inverter displays the last indication by power on or, if power is off at the data indication in the function mode, a relevant code (F2 ~ F14).
- Indicates data (some data cannot be modified) while running in any of function modes or expansion function modes.



Operation procedure (for starting run upon setting frequency for example)



Monitor and function list I (when operating digital operator)

●Monitor mode and function mode

Command No.	Function name	Initial set value	Settable range (monitor range)	Setting unit
d 0	Output frequency monitor	—	0.00-9.99/10.0-99.9/100-400 (Hz)	—
d 1	Motor run monitor	—	0.00-9.99/10.0-99.9/100-600 (×100r/min) (Note 1)	—
d 2	Output current monitor	—	0.0-99.9/100-999 (A)	—
d 10	Alarm monitor	—	—	—
d 11	Alarm record trace	—	—	—
F 2	Output frequency setting*	0.00 (Hz)	0.00-9.99/10.0-99.9/100-400 (Hz) (Note 2)	0.01 Hz (~9.99 Hz) 0.1 Hz (~99.9 Hz) 1 Hz (100 Hz ~)
F 4	Motor run direction setting	F (forward)	F (forward) / r (reverse)	—
F 5	V/F pattern setting	02	00-05 (code) Initial set value: European version: 00 Other version : 02	—
F 6	Accelerating time setting*	30.0 (sec)	0.01-9.99/10.0-99.9/100-999 (sec) (Note 3)	0.01 sec (~ 9.99 sec) 0.1 sec (~ 99.9 sec) 1 sec (100 sec ~)
F 7	Decelerating time setting*	30.0 (sec)	0.01-9.99/10.0-99.9/100-999 (sec) (Note 3)	
F 8	Manual torque boost adjustment*	31	00-99 (code)	—
F 9	Digital operator and terminal setting mode switchover	00	00 ~ 03 (standard) / 00 ~ 15 (code) (Note 4)	—
F 10	Analog meter adjustment*	72	00-100 (code)	—
F 11	Motor reception voltage setting	200/400V (Note 5)	200/215/220/230, 380/400/440/460 V (Note 6)	—
F 14	Expansion function command selection	A0	A0-A65/C 0-C21 (Note 7)	—

*Settable while running

Notes
1. Not indicated in actual rotation but in terms of the number of rotations/100.
2. Settable up to 120 Hz in standard. The remote operator is required when the frequency is set beyond 120 Hz.
3. The remote operator is required to set 1,000 sec or more. The inverter is operated at set time although the digital operator indicates [ ].
4. 00-03 (4 types) in standard. 00-15 (16 types) when application circuit board is optionally installed.
5. Initial set value: European version : 380 V
   US version : 230 V/460 V
   Japanese version : 200 V/400 V
6. Selectable out of 200, 215, 220 and 230 V or 380, 400, 440 and 460 V.
7. Cannot set but can monitor each function set value while running.

● Expansion function mode

Command No.	Function name	Initial set value	Settable range (monitor range)	Setting unit
A0	Control method selection	0	0 (VC), 1 (VP1), 2 (VP2), 3 (VP3), 4 (SLV), 5 (V2) (code) (Note 1)	—
A1	Motor capacity selection	(Depends on model)	3.7 ~ 75 (kw)	—
A2	Motor pole number selection	4	2/4/6/8	—
A3	Speed control response constant setting	2.00	0.00-9.99/10.0-99.9/100-655	0.01 (~ 9.99) 0.1 (~ 99.9) 1 (100 ~)
A4	Start frequency adjustment	0.50 (Hz)	0.10-9.99 (Hz)	0.01 Hz
A5	Frequency upper limiter setting	0 (Hz)	0-400 (Hz) (Note 2)	0.1 Hz (~ 99.9 Hz) 1 Hz (100 Hz ~)
A6	Frequency lower limiter setting	0 (Hz)	0-400 (Hz) (Note 2)	
A7	Jump frequency setting 1	0 (Hz)	0-400 (Hz) (Note 2)	0.1 Hz (~ 99.9 Hz) 1 Hz (100 Hz ~)
A8	Jump frequency setting 2	0 (Hz)		
A9	Jump frequency setting 3	0 (Hz)		
A10	Carrier frequency selection	16.0 (kHz) (Note 3)	2.0-16.0 (kHz)	0.1 kHz
A12	Multistage speed 1	0 (Hz)	0.00-9.99/10.0-99.9/100-400 (Hz) (Note 2)	0.01 Hz (~ 9.99 Hz) 0.1 Hz (~ 99.9 Hz) 1 Hz (100 Hz ~)
A13	Multistage speed 2	0 (Hz)		
A14	Multistage speed 3	0 (Hz)		
A23	Electronic thermal level adjustment	100 (%)	20-120 (%)	1 %
A24	Electronic thermal level characteristic selection	0: European version 1: Other version	0 (constant torque (Note 4)), 1 (reduced torque), 2(freely set (Note 5))	—
A26	External frequency setting start adjustment	0 (Hz)	0-400 (Hz)	0.1 Hz (~ 99.9 Hz) 1 Hz (100 Hz ~)
A27	External frequency setting end adjustment	0 (Hz)		
A34	Restart after instantaneous power failure	0	0-3 (code)	—
A38	Regenerative braking use time (ratio) setting	1.5 (%)	0.0-100 (%)	0.1 %
A39	Frequency arrival signal at acceleration setting	0 (Hz)	0-400 (Hz) (Note 2)	0.1 Hz (~ 99.9 Hz) 1 Hz (100 Hz ~)
A40	Frequency arrival signal at deceleration setting	0 (Hz)		
A44	Monitor signal selection	0	0-3 (code)	—
A48	Analog input characteristic selection	1	0 (0 ~ 5 V DC), 1 (0 ~ 10 V DC) (code)	—
A49	Frequency arrival signal output method selection	0	0-2 (code)	—
A54	Soft switch (changeover of auto tuning, etc.)	00	00-03 (select auto tuning function)	—
A59	Operation mode (standard, fuzzy, low-energy) selection	0	0 (standard), 1 (automatic energy saving), 2 (fuzzy acceleration/deceleration)	—
A61	Jogging frequency setting	1.00	0-9.99 (Hz)	0.01 Hz
A62	Base frequency setting	60	30-400 (Hz) (Note 2)	1 Hz
A63	Maximum frequency setting	60		
A65	Data batch selection	0	0-18 (code)	—
C0	Intelligent input terminal function setting 1	18 (RS)	Input terminal function list (see below)	
C1	Intelligent input terminal function setting 2	16 (AT)		
C2	Intelligent input terminal function setting 3	5 (JG)		
C3	Intelligent input terminal function setting 4	11 (FRS)		
C4	Intelligent input terminal function setting 5	9 (CH1)		
C5	Intelligent input terminal function setting 6	13 (USP): US version 2 (CF2): Other version		
C6	Intelligent input terminal function setting 7	1 (CF1)		
C7	Intelligent input terminal function setting 8	0 (REV)		
C10	Intelligent output terminal function setting 1	0 (FA1)	0: FA1 (frequency arrival signal) 1: RUN (running signal) 2: OTQ (overtorque signal) (Note 6)	
C11	Intelligent output terminal function setting 2	1 (RUN)		
C20	Input terminal a/b contact changeover	00: Japanese version 08: Other version	00-DF (code). All input terminals are initially set as "a" contact.	—
C21	Output terminal a/b contact changeover	04	00-07 (code). Alarm terminal is initially set as "b" contact. All other output terminals are initially set as "a" contact.	—

Input terminal function list

Set value	Abbreviation	Function name
0	REV	Reverse
1	CF1	Multistage speed 1
2	CF2	Multistage speed 2
3	CF3	Multistage speed 3
5	JG	Jogging
6	DB	External DC braking
7	STN	Initial set
8	SET	2nd control function
9	CH1	2 stage acceleration/deceleration

Set value	Abbreviation	Function name
11	FRS	Free run
12	EXT	External trip
13	USP	USP function
14	CS	Change to/from commercial source
15	SFT	Terminal soft-lock
16	AT	Analog input voltage/current change
18	RS	Reset
19	PR1	Process inching 1
20	PR2	Process inching 2

Set value	Abbreviation	Function name
21	PR3	Process inching 3
22	PR4	Process inching 4
23	PR5	Process inching 5
24	PR6	Process inching 6
25	PR7	Process inching 7
26	PR8	Process inching 8
27	UP	Remote control function. Acceleration
28	DWN	Remote control function. Deceleration

Notes

1. VC: V/F control constant torque.
   VP1: V/F control reduced torque (1.5th power).
   VP2: V/F control reduced torque (1.7th power).
   VP3: V/F control reduced torque (2.0th power).
   SLV: Sensorless vector control.
   V2: Vector control with sensor (feedback board required).
2. Before setting to 120 Hz or more, the maximum frequency must be changed by the remote operator.
3. Initial set value depends on the model. Max. carrier frequency goes down according to the inverter capacity (6 to 16 kHz).
4. Electronic thermal level is automatically changed when selecting VP1 to VP3.
5. Settable by remote operator. (See p. 24)
6. The torque for over-torque signal is settable by the remote operator (initial set value is 100%). Use the over-torque signal during sensorless vector control only.

How to use high-performance remote operator

J300 Series includes high-performance remote operator/copy unit (HOP/HRW) capable of setting calls upon hierarchical arrangement of functions (option). The copy unit has a copy function and stores data of the inverter and copies it to other inverters.

Names and functions of each part

[Indicating section]
- Indicates monitor and function display on a liquid crystal screen of 17 characters × 5 lines.

[Forward, reverse and stop keys]
- Deliver run commands to the inverter.

[Monitor and function selector keys]
- Select the monitor mode or function mode.

[Numeric keys]
- Change the parameters.

[Store key]
- Stores data set by the numeric keys.

[Read and copy keys] **(for HRW)**

(Read)
- Reads the inverter data to the operator.

(Copy)
- Transfers to another inverter the data of inverter read by pressing the "READ" key.

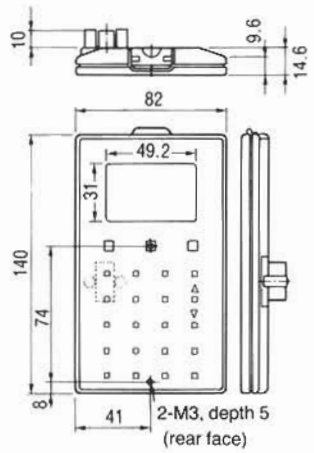
[△ and ▽ keys]
- Move the cursor.

Note: The selector keys move the cursor and scroll the screen. Use the unmeric keys for changing set values.

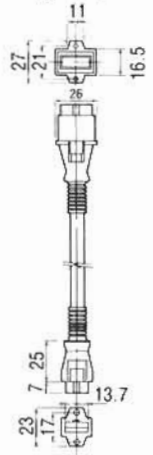
[Return key]
- Returns to the setting screen of preceding hierarchical grade.

[Selector key]
- Transfers to the next hierarchical grade screen of setting item following the cursor provided that item has the next hierarchical grade screen.

Remote operator/copy unit (HOP/HRW)



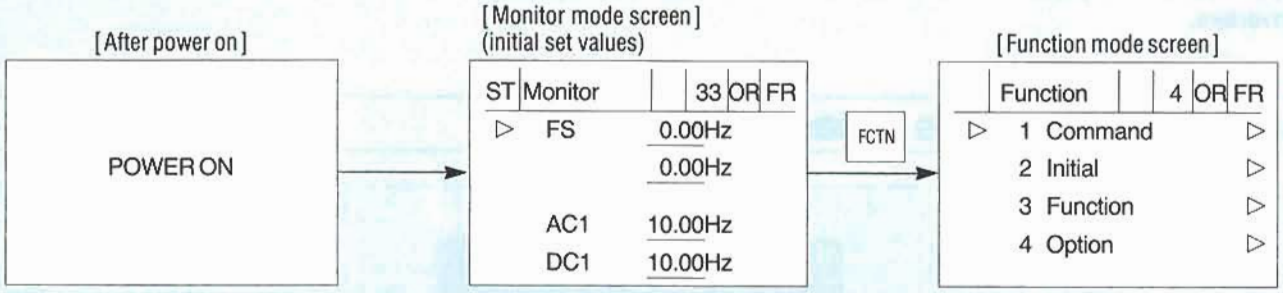
Cable for connecting J300 with digital operator or HOP/HRW



ICJ-1 cable of 1 m long
ICJ-3 cable of 3 m long

Description on screen indication

HOP/HRW has monitor mode and function mode.



- Power on develops the monitor mode screen automatically.
- Power off and on when other than the above initial set values are indicated develops the last indication before power off.

Screen configuration

①Run status/screen hierarchy

Operation mode	Status	Indication			
Monitor screen	Run status	When stopped ST	When troubled TR	When forward FR	When reverse RR
Function screen	Screen hierarchy	1st grade	2nd grade	3rd grade	4th grade

④How to command run

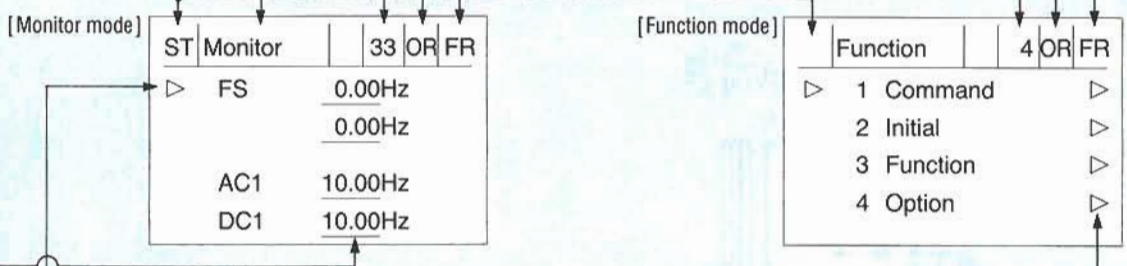
Operation mode	Indication	
Monitor mode, function mode	Remote operator OR	Terminal OT
	Optional circuit board 1 01	Optional circuit board 2 02

⑤How to command frequency

Operation mode	Indication	
Monitor mode, function mode	Remote operator FR	Terminal FT
	Optional circuit board 1 F1	Optional circuit board 2 F2

②Title...indicates currently displayed mode or grade name

③Total number of items... indicates total number of items in hierarchy or mode name displayed currently



⑥Item selector cursor...to change frequency or other set values, move cursor to the line modified by pressing △ or ▽ key and operate numeric keys (0-9). Press STOR key after the change.

⑦Set value changeable mark...underlined set values are changeable.

⑧Next grade mark...indicates there is another grade. To indicate the next grade, move cursor to the item having the next grade mark by pressing △ or ▽ key then press SEL key. To return to last grade indication, press RETN key.

Monitor and function list II

(when operating high performance remote operator/copy unit <HOP/HRW>)

● Monitor mode

Order	Monitor name	Run command	Screen indication (initial set value)	Set value changeable by HOP/HRW	Settable range	Setting unit	Remarks	Can be monitored by digital operator
1	Output frequency setting Output frequency indication	Operator	FS 0.00Hz / 0.00Hz	○	0~400Hz	0.01Hz		○
	Multistage speed setting Frequency indication Output frequency indication (Indicated provided the terminal is (ON))	Terminal	S1 0.00Hz / 0.00Hz ~ S7 0.00Hz / 0.00Hz	○	0~400Hz	0.01Hz	To set in the monitor mode, turn on the relevant multistage speed terminal.	○ (Same as output frequency indication)
	Process inching setting Frequency indication Output frequency indication (Selected in function mode)	Terminal	P1 0.00Hz / 0.00Hz ~ P7 0.00Hz / 0.00Hz	○			Set in the function mode.	○ (Same as output frequency indication)
	Terminal setting frequency indication Output frequency indication	Terminal	TM 0.00Hz / 0.00Hz	—				
	Jogging setting frequency indication Output frequency indication	[Operator terminal option]	JG 1.00Hz / 0.00Hz	○	—	—	Set the jogging frequency in No. 10.	○ (Same as output frequency indication)
	OP 1 setting frequency indication Output frequency indication	Option 1	O1 0.00Hz / 0.00Hz	—	0~400Hz	0.01Hz	Set in the function mode provided the application circuit board is installed.	○ (Same as output frequency indication)
	OP 2 setting frequency indication Output frequency indication	Option 2	O2 0.00Hz / 0.00Hz	—				
2	Accelerating time setting	Operator	AC1 10.00s	○	0.01~999 sec	0.01 sec		○
	2 stage accelerating time setting	Terminal	AC2 10.00s	○	0.01~999 sec	0.01 sec	Set in the function mode.	○
3	Decelerating time setting	Operator	DC1 10.00s	○	0.01~999 sec	0.01 sec		○
	2 stage decelerating time setting	Terminal	DC2 10.00s	○	0.01~999 sec	0.01 sec	Set in the function mode.	○
4	Number of motor poles setting The number of motor rotation indication	[Operator Terminal Option]	RPM 4P / 0RPM	○	2/4/6/8	—		×
5	Frequency conversion value setting Frequency conversion value output indication		/Hz 1.0 / 0.00	○	0~99.9/Hz	0.1Hz		×
6	Output current indication		Im 0.0A / 0.0%	—	—	0.1A / 0.1%		△ (% indication impossible)
7	Torque monitor indication		Torque 0%	—	—	—		×
8	Manual torque boost adjustment		T-Boost 31	○	0~99 (code)	1 (code)		○
9	Output voltage gain adjustment		V-Gain 100%	○	20~150%	1%		×
10	Jogging frequency setting		Jogging 1.00Hz	○	0~9.99	0.01Hz		○
11	Analog meter adjustment		ADJ 72	○	0~100	1 (code)		○
12	Terminal input status indication		TERM LLLLLLLLL	—	—	—		×
13	Alarm indication		WARN #	—	—	—	• Performs alarm history trace indication. • Can trace back to last 3 times for alarm cause, alarm frequency, alarm current, P-N voltage and accumulated running days at alarm. • Can trace only when alarm has occurred. Indicates only alarm cause, current and P-N voltage	△ (Alarm cause, alarm current and P-N voltage at alarm can be indicated)
14	Alarm cause 1		ERR1 #					
15	Alarm frequency 1		ERR1 0.0Hz					
16	Alarm current 1		ERR1 0.0A					
17	P-N voltage 1 at alarm		ERR1 0.0V					
18	Accumulated running days 1 at alarm		ERR1 R 0Y 0D					
19	Accumulated number of alarms		ERR COUNT 0					

○: Possible △: Partly possible ×: Impossible

● Function mode

Settable range in [ ] or ( )

Order	1st grade <Function name> Indication	2nd grade <Function name> Indication (initial set value)	3rd grade <Function name> Indication (initial set value)	4th grade <Function name> Indication (initial set value)	Setting unit	Remarks	DOP/ DRW function No.	Settable by digital operator
1	<Command method> 1 Command	<Select how to command run> 1 F-SET 0: TRM [0-3]			1 (code)	0: Operator 1: Terminal 2: Application circuit board 1 3: Application circuit board 2	Monitor mode	○
		<Select how to command frequency> 2 F/R 0: TRM [0-3]						
		<Select how to command parameter> 3 PARM 0: REM [0-2]				0: Operator 1,2: Application circuit boards 1, 2	F-09	×
2	<Initial setting> 2 Initial	<Preset data program by application> 1 USES 0 (0-18)			1 (code)	—	F-38	○
		<Clear trip history> 2 TCNT 0: CNT [0-1]				0: Continue to count trips 1: Clear trip count	F-38	×
		<Select debug mode> 3 DEBG 0: OFF [0-1]				0: Mode OFF 1: Debug mode	F-38	×
		<Set the digital operator turning direction> 4 DOPE 0: FWD [0-1]				0: Forward 1: Reverse	F-38	○
3	<Set the function> 3 Function	<V/F characteristics> 1 Control	<Set V/F> 1 V/F	<Set the base frequency> 1 F-BASE 60Hz (30-400)	1Hz	—	F-00	○
				<Set the maximum frequency> 2 F-MAX 60Hz (30-400)			F-01	○
				<Adjust start frequency> 3 Fmin 0.50Hz (0.10-9.99)	0.01Hz	—	F-02	○
			(Note 1)	<Set the receiving voltage> 4 A-AC 0: 200V [0-8]	1 (code)	200, 215, 220, 230V 380, 400, 440, 460V	F-03	○
				<Select AVR function when decelerating> 5 A-DEC 1: ON [0-1]	1 (code)	0: OFF 1: ON	F-03	×
				<Select control mode> 6 MODE 0: VC [0-5]	1 (code)	VC, VP1, VP2 VP3, SLV, V2	F-04	○
			<Set the motor data> 2 Motor	<Select auto tuning function> 1 AUTO 0: NOR [0-1]	1 (code)	0: Auto tuning invalid 1: Auto tuning valid	F-05	○
				<Select motor data> 2 DATA 0: NOR [0-1]		0: Hitachi standard motor data 1: Auto tuning data		○
			(Note 2)	<Select motor capacity> 3 K □: □.□ kw [0-21]		3.7~75kw (corresponds to code). Initial set value depends on model.		○
				<Select number of motor poles> 4 P 1: 4P [0-3]		2, 4, 6, 8P		○
				<Set the primary resistor R1> 5 R1 11.066 (0.000-65.535)	0.001Ω	—		×
				<Set the secondary resistor R2> 6 R2 4.392 (0.000-65.535)		—		
				<Set l1 + l2> 7 L 1.02mH (0.00-65535)	0.01mH	—		
				<Set the combined inductance> 8 M 0.05mH (0.00-65535)		—		
				<Set the inertia J> 9 J 1.10 (0.00-655.35)	0.01kgm²	—		
				<Set ASR Kp> a Kp 2.00 (0.00-655.35)	—	Valid when feedback board is installed		○
				<Set ASR Ti> b Ti 100ms (0-65535)	1ms			×
				<Set ASR proportional run Kp> c Kpp 1.00 (0.00-655.35)	—			

Notes 1. Select 0-3 (200-230V) or 4-7 (380-460V). Do not use code 8.
2. The initial set value depends on the model. Carrying out auto tuning sets 5-9 automatically.

Order	1st grade <Function name> Indication	2nd grade <Function name> Indication (initial set value)	3rd grade <Function name> Indication (initial set value)	4th grade <Function name> Indication (initial set value)	Setting unit	Remarks	DOP/DRW function No.	Settable by digital operator
3	<Function setting> 3 Function	<V/F characteristics> 1 Control	<Set the carrier frequency> 3 Carrier	<Set the carrier frequency> 1 CARRY 16.0kHz (2.0-16.0)	0.1kHz	—	F-36	○
		<Set the acceleration/deceleration> 2 Acc/Dec	<Set the acceleration condition> 1 Accel	<Set the accelerating time 1> 1 A1 10.00s (0.01-3000.00)	0.01 sec	Invalid at fuzzy acceleration/deceleration run	F-06	○
				<Set the 2stage accelerating time> 2 A2 5.00s (0.01-3000.00)		Valid when using input terminal CH 1		
				<Set the curve pattern> 3 LINE 0: L [0-3]	1 (code)	L (straight line), S (S curve), U (U curve), RU (reversed U curve)		×
				<Set the curve constant> 4 GAIN 2 (1-10)	1 (code)	—		
			<Set the deceleration condition> 2 Decel	<Set the decelerating time 1> 1 D1 10.00s (0.01-3000.00)	0.01 sec	Invalid at fuzzy acceleration/deceleration run	F-07	○
				<Set the decelerating time 2> 2 D2 5.00s (0.01-3000.00)		Valid when using input terminal CH 1		
				<Set the curve pattern> 3 LINE 0: L [0-3]	1 (code)	L (straight line), S (S curve), U (U curve), RU (reversed U curve)		×
				<Set the curve constant> 4 GAIN 2 (1-10)	1 (code)	—		
		<Set the running condition> 3 Run	<Adjust frequency stop condition> 1 Freq	<Adjust acceleration/deceleration stop frequency> 1 F1 0.0Hz (0.0-400.0)	0.1Hz	Set the frequency or time to temporarily stop	F-08	×
				<Adjust acceleration/deceleration stop time> 2 TIME 0.0s (0.0-60.0)	0.1 sec			
			<Set the run pattern> 2 Pattern	<Select multistage speed/process inching> 1 KIND 0: SPD [0-1]	1 (code)	SPD: Multistage speed run PRC: Process inching run	F-10	×
				<Set the run mode> 2 MODE 0: NOR [0-2]	1 (code)	NOR: Normal run OEN: Automatic energy-saving run GOD: Fuzzy acceleration/deceleration run		○
			<Set the multistage speed> 3 SPD	<Set the speed 1-7> 1 S1 0.00Hz (0.00-400.00)	0.01Hz	Valid when using input terminal (CF 1-3)	F-11	○
				2 S2 0.00Hz (0.00-400.00)				
				3 ≀ 6				
				7 S7 0.00Hz (0.00-400.00)				
			※<Set the process inching 1> 4 PRC1	<Set the process speed 1> 1 F 0.00 (0.00-400.00)	0.01Hz		F-12	×
				<Terminal 1> 2 TM 0: OFF [0-1]	—	How to set the frequency ON: Input through terminal OFF: Set value for process inching speed		
				<Set the process time 1> 3 TIME 0.0s (0.0-3000.0)	0.1 sec			
				<Set the acceleration/deceleration 1> 4 A/D 0S1F [0-4]	1 (code)	S1F: Speed 1 forward, S1R: Speed 1 reverse S2F: Speed 2 forward, S2R: Speed 2 reverse		
				<Change the input terminal 1> 5 TERM 0: NOR [0-8]	1 (code)	NOR (no input terminal) PR1~PR8		
				<Set the process transfer 1> 6 NEXT 1 (0-8)	1 (code)	Set the order of process inching		
			※<Set the process inching2-8> 5 PRC2-6 PRC8	Set the process speed ~ process transfer. Same as PRC 1 above.	—	—	F-13 ≀ F-19	×
		<Set the braking condition> 4 Braking	<Set the DC braking condition> 1 DCB	<Select DC braking> 1 SW 0: OFF [0-1]	—	ON: DC braking valid OFF: DC braking invalid	F-20	×

※ Process inching function is available for US version and Japanese version.

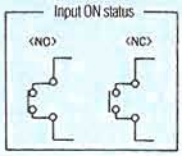
Order	1st grade <Function name> Indication	2nd grade <Function name> Indication (initial set value)	3rd grade <Function name> Indication (initial set value)	4th grade <Function name> Indication (initial set value)	Setting unit	Remarks	DOP/ DRW function No.	Settable by digital operator
3	<Set the function> 3 Function	<Set the braking condition> 4 Braking	<Select DC braking> 1 DCB	<Select DC braking type> 2 KIND 1: LVL [0-1]	—	EDG: Edge motion (Valid when using external DC braking) LVL: Level motion	F-20	×
				<Adjust DC braking frequency> 3 F 0.5Hz (0.0-400.0)	0.1Hz	Set the frequency to start DC braking		
				<Adjust DC braking force (at start)> 4 V-STA 0 (0-20)	1 (code)	Set the DC braking force at start		
				<Adjust DC braking force (at stop)> 5 V-STP 0 (0-20)	1 (code)	Set the DC braking force at stop		
				<Adjust DC braking time (at start)> 6 T-STA 0.0s (0.0-600.0)	0.1 sec	Set the DC braking time at start		
				<Adjust DC braking time (at stop)> 7 T-STP 0.0s (0.0-600.0)	0.1 sec	Set the DC control time at stop		
				<Adjust DC braking output turn-off time> 8 STOP-T 0.00s (0.00-5.00)	0.01 sec	Set the free run time for executing DC braking after output frequency has dropped to DC braking frequency		
			<Adjust regenerative braking> 2 BRD	<Adjust regenerative braking duty rate> 1 %ED 1.5% (0.0-100.0)	0.1%	Set the allowable duty rate for braking resistance for 100 seconds	F-21	○
		<Set the protection> 5 Protect	<Set the electronic thermal> 1 EThermal	<Set the electronic thermal characteristics> 1 CHAR 1: SUB [0-2]	1 (code)	SUB: Reduced torque characteristics CRT: Constant torque characteristics FRE: Free characteristics	F-23	○
				<Adjust electronic thermal level> 2 LEVEL 100% (20-120)	1%	—		
				<Set the characteristics free setting current 1> 3 A1 0.0A (0-6553.5)	0.1A	—		×
				<Set the characteristics free setting frequency 1> 4 F1 0.0Hz (0-400)	0.1Hz	—		
				<Set the characteristics free setting current 2> 5 A2 0.0A (0-6553.5)	0.1A	—		
				<Set the characteristics free setting frequency 2> 6 F2 0.0Hz (0-400)	0.1Hz	—		
				<Set the characteristics free setting current 3> 7 A3 0.0A (0-6553.5)	0.1A	—		
				<Set the characteristics free setting frequency 3> 8 F3 0.0Hz (0-400)	0.1Hz	—		
			<Select overload limit> 2 OLoad	<Fuzzy overload limit> 1 FUZZY 0: NOR [0-1]	—	Use NOR as it is	F-24	×
				<Adjust overload limit level> 2 LEVEL 125% [50-150]	1%	At sensorless vector control, overload limit and torque limit detect the overload		
				<Set the overload limit constant> 3 CONST 1.0 (0.3-30.0)	0.1	—		
				<Overload limit valid when accelerating> 4 ACC 0: OFF [0-1]	—	Valid when accelerating. (Retain ON.)		
			<Set the frequency jump, limiter> 3 Freq.	<Set the lower frequency limiter> 1 LIML 0.0Hz (0.0-400.0)	0.1Hz	Invalid if set at 0.0	F-26	○
				<Set the upper frequency limiter> 2 LIMH 0.0Hz (0.0-400.0)				
				<Set the jump frequency 1> 3 F1 0.0Hz (0.0-400.0)	0.1Hz	Invalid if set at 0.0	F-27	○
				<Set the jump frequency 2> 4 F2 0.0Hz (0.0-400.0)				
				<Set the jump frequency 3> 5 F3 0.0Hz (0.0-400.0)				

Order	1st grade <Function name> Indication	2nd grade <Function name> Indication (initial set value)	3rd grade <Function name> Indication (initial set value)	4th grade <Function name> Indication (initial set value)	Setting unit	Remarks	DOP/ DRW function No.	Settable by digital operator
3	<Set the function> 3 Function	<Set the protection> 5 Protect	<Set the frequency jump, limiter> 3 Freq.	<Set the jump frequency range> 6 WIDTH 0.5Hz (0.0-9.9)	0.1Hz	Set the range of frequency to jump.	F-27	×
			<Adjust instantaneous power failure> 4 IPS	<Adjust allowable instantaneous power failure time> 1 TIME 1.0s (0.3-3.0)	0.1 sec	Set the time allowable from instantaneous power failure to recovery.	F-22	×
				<Adjust the time to wait for turning on> 2 WAIT 1.0s (0.3-100.0)		Set the time to wait for restart after power recovery.		
				<Select restart after instantaneous power failure> 3 POWER 0: ALM [0-3]	1 (code)	ALM: Alarm output, ZST: Start at 0Hz after retry FTP: Stop run after matching frequency when retrying RST: Restart after matching frequency when retrying		○
				<Select undervoltage trip at stop> 4 TRIP 1: OFF [0-1]	—	0: Trip at instantaneous power failure 1: Do not trip at instantaneous power failure		×
			<Select other functions> 5 Others	<Change the maximum frequency> 1 MAXF 0: 120Hz [0-1]	—	0: 120 Hz max. 1: 400 Hz. max.	F-30	×
				<Select soft-lock> 2 SLOCK 1: MD1 [0-3]	1 (code)	HD0, MD1: Terminal soft-lock MD2, MD3: Soft-lock } (Note 3)	F-25	×
				<Select STOP key at terminal run> 3 STOP 1: ON [0-1]	—	0: OFF (STOP key invalid) 1: ON (STOP key valid)	F-28	×
				<Select running direction> 4 F/R 2: FRE [0-2]	—	FWD: Forward REV: Reverse FRE: Forward and reverse	F-29	×
				<Select reverse run prevention> 5 PREV 0: OFF [0-1]		0: OFF (Reverse run preventive function invalid) 1: ON (Reverse run preventive function valid)		
		<Set the terminal> 6 Terminal	<Adjust analog input command> 1 Analog	<Analog input voltage> 1 V 1: 10 [0-1]	—	0: 0~5V 1: 0~10V	F-31	○
				<External frequency start> 2 EXS 0.0Hz (0.0-400.0)	0.1Hz	Frequency to start external input at		
				<External frequency end> 3 EXE 0.0Hz (0.0-400.0)	0.1Hz	Frequency at which external input is maximum		
				<External frequency start rate> 4 EX%S 0% (0-100)	1%	—		×
				<External frequency end rate> 5 EX%E 100% (0-100)	1%	—		
			<Set the signal output> 2 Signal	<Change the arrival signal output pattern> 1 PTN 0 CST [0-2]		CST: Output when arriving at constant frequency PAT: Output beyond set frequency ANT: Output only set frequency	F-32	○
				<Speed arrival signal rate at acceleration> 2 ACC 0.0Hz (0.0-400.0)	0.1Hz	—		
				<Speed arrival signal rate at deceleration> 3 DEC 0.0Hz (0.0-400.0)				
				<Overtorque signal (set the power running)> 4 V 100% (0-250)	0.1%	Rate with respect to rated torque of applied motor (Note 4)	F-33	×
				<Overtorque signal (set the regeneration)> 5 R 100% (0-250)				
			<Set the terminal> 3 Terminal	<Set the input terminal 1> 1 I-1 18: RS [0-28]			F-34	○
				<Set the input terminal 2> 2 I-2 16: AT [0-28]				
				<Set the input terminal 3> 3 I-3 5: JG [0-28]				
				<Set the input terminal 4> 4 I-4 11: FRS [0-28]				
				<Set the input terminal 5> 5 I-5 9: CH1 [0-28]				

Set value	Abbreviation	Function name
0	REV	Reverse
1	CF1	Multistage speed 1
2	CF2	Multistage speed 2
3	CF3	Multistage speed 3
5	JG	Jogging
6	DB	External DC braking
7	STN	Initial set value
8	SET	2nd control function
9	CH1	2 stage acceleration/deceleration
11	FRS	Free run
12	EXT	External trip
13	USP	USP function
14	CS	Change to/from commercial source
15	SFT	Terminal soft-lock
16	AT	Change the analog input voltage/current
18	RS	Reset
19	PR1	Process inching 1

Notes 3. In case of MD 0, turning on the input terminal (SFT) locks all function data. In case of MD2, setting (storing) locks all function data. You cannot modify the data so long as it is locked. You can set the output frequency for MD 0 in case of MD 1 or for MD 2 in case of MD 3.

4. Rate with respect to the rated torque of the applicable motor model. Pay attention when using the inverter at overrating. The rated torque will automatically be changed if the number of poles of Hitachi general-purpose motor has been modified.

Order	1st grade <Function name> Indication	2nd grade <Function name> Indication (initial set value)	3rd grade <Function name> Indication (initial set value)	4th grade <Function name> Indication (initial set value)	Setting unit	Remarks	DOP/ DRW function No.	Settable by digital operator
3	<Set the function> 3 Function	<Set the terminal> 6 Terminal	<Set the terminal> 3 Terminal	<Set the input terminal 6> 6 I-6 2: CF2 [0-28]	See table	See table	F-34	○
				<Set the input terminal 7> 7 I-7 1: CF1 [0-28]				
				<Set the input terminal 8> 8 I-8 0: REV [0-28]				
				<Change the input terminal 1 NO/NC> 9 I-OC1 0: NO [0-1]	—	Set the input terminal NO: Operate when closed NC: Operate when open 	F-34	○
				<Change the input terminal 2 NO/NC> a I-OC2 0: NO [0-1]				
				<Change the input terminal 3 NO/NC> b I-OC3 0: NO [0-1]				
				<Change the input terminal 4 NO/NC> c I-OC4 0: NO [0-1]				
				<Set the output terminal 1> d O-1 0: FA1 [0-2]	See table	See table	F-35	○
				<Set the output terminal 2> e O-2 1: RUN [0-2]				
				<Change the alarm signal NO/NC> f O-OCA 1: NC [0-1]	—	Set the output terminal NO/NC NO: Close when operating NC: Open when operating		
				<Change the output terminal 1 NO/NC> g O-OC1 0: NO [0-1]				
				<Change the output terminal 2 NO/NC> h O-OC2 0: NO [0-1]				
			<Change the terminal monitor> 4 Monitor	<Change the monitor signal type> 1 SEL 0: A-F [0-3]	A-F/A/T D-F	A-F: Analog frequency monitor T: Torque monitor A: Current monitor D-F: Digital frequency monitor	F-37	○
4	<Option (Note 5)> 4 Option	<Select inverter operation at OP 1 error> 1 Op Error	<Select inverter operation at OP 1 error> 1 OP1 1: STP [0-1]		—	STP: Stop at error RUN: Continue to run in spite of error	F-47	×
			<Select inverter operation at OP 2 error> 2 OP2 1: STP [0-1]					
		<Set the feedback> 2 Select	<Set the encoder pulse count> 1 ENC-P 1024pls (1-65535)		1 pulse	—	F-39	×
			<Select control mode> 2 MODE 0: ASR [0-2]		—	0: ASR 1: APR 2: ATR		
		<Set the orientation> 3 Orient	<Change the stop position> 1 POS 0: IN [0-1]		—	0: IN 1: OUT	F-40	×
			<Set the stop position> 2 P 0pls (0-65535)		1 pulse	—		
			<Set the speed> 3 FC 5.0Hz (0.0-400.0)		0.1Hz	—		
			<Set the direction> 4 TURN 0: FWD [0-1]		—	0: FWD (forward) 1: REV (reverse)		
			<Set the completion range> 5 LIMIT 5pls (0-65535)		1 pulse	—		
			<Set the completion delay time> 6 TW 0.0ms (0.0-65.5)		0.1m sec	—		
		<Initial setting of electronic gear> 4 Position	<Select electronic gear set position> 1 EGRP 0 FB [0-1]		—	0: FB 1: RET	F-41	
			<Set the numerator of electronic gear ratio> 2 EGR-N 1 (1-65535)		1	—		

Set value	Abbreviation	Function name
20	PR2	Process inching 2
21	PR3	Process inching 3
22	PR4	Process inching 4
23	PR5	Process inching 5
24	PR6	Process inching 6
25	PR7	Process inching 7
26	PR8	Process inching 8
27	UP	Remote control function. Acceleration
28	DWN	Remote control function. Deceleration.

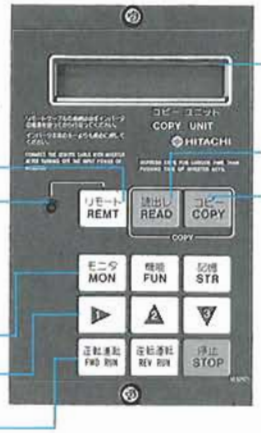
Set value	Abbreviation	Function name
0	FA1	Frequency arrival signal
1	RUN	Running signal
2	OTQ	Overtorque signal

Note 5. Valid when application circuit boards are installed.

Order	1st grade <Function name> Indication	2nd grade <Function name> Indication (initial set value)	3rd grade <Function name> Indication (initial set value)	4th grade <Function name> Indication (initial set value)	Setting unit	Remarks	DOP/ DRW function No.	Settable by digital operator
4	<Option> 4 Option	<Initial setting of electronic gear> 4 Position	<Set the denominator of electronic gear> 3 EGR-D 1 (1-65535)		1	—	F-41	×
			<Set the feed-forward gain> 4 FFWG 0.00 (0.00-655.35)		0.01	—		
			<Set the position loop gain> 5 G 0.50rad (0.00-100.00)		0.01 rad	—		
		<Set the torque control> 5 Torque	<Change the torque control setting> 1 LIMIT 0: IN [0-1]		—	0: IN 1: OUT	F-42	×
			<Set the forward torque limit> 2 FWD 150% (0-150)		1%	—		
			<Set the reverse torque limit> 3 REV 150% (0-150)		1%	—		
		<Set PID control> 6 PID	<Change the target input method> 1 I-SEL 0: IN [0-1]			0: IN 1: OUT	F-43	×
			<Select feedback> 2 F-SEL 0: AC [0-1]			0: AC 1: DC		
			<PID target> 3 LVL 0.00% (0.00-200.00)		0.01%	—		
			<Adjust P gain> 4 P 1.0 (0.2-5.0)		0.1	—		
			<Adjust I gain> 5 I 1.0s (0.5-15.0)		0.1 sec	—		
			<Adjust D gain> 6 D 10.0 (0.0-100.0)		0.1	—		
		<Set the digital I/O> 7 Digital	<Select input terminal> 1 IN 0: MD0 [0-9]		1 (code)	0~9: MD0~MD9	F-44	×
			<Select output terminal> 2 OUT 0: MD0 [0-9]					
			<Electronic thermal warning level> 3 THMLVL 80% (0-100)		1%	—		
		<Set the analog I/O> 8 Analog	<Select input terminal> 1 IN 0: MD0 [0-9]		1 (code)	0~9: MD0~MD9	F-45	×
			<Select output terminal> 2 OUT 0: MD0 [0-9]					
		<Set the communication function> 9 Com.	<Select data transmission speed> 1 BAUD 1: 600bps [0-5]		1 (code)	300, 600, 1200 2400, 4800, 9600bps	F-46	×
			<Select station number> 2 NUMBER 1 (1-64)		1 (code)	1~64 stations		
			<Select bit length> 3 LENGTH 0: 8 [0-1]		—	0: 8 bit 1: 7 bit		
			<Select parity> 4 PAR-1 1: ON [0-1]		—	0: ON 1: OFF		
			<Select even/odd parity> 5 PAR-2 0: EVN [0-1]		—	0: EVN (even) 1: ODD (odd)		
			<Select stop bit length> 6 STOPBIT 0: 2 [0-1]		—	0: 2 bit 1: 1 bit		
			<Select test mode> 7 TEST 0: OFF [0-1]		—	0: OFF 1: ON		

Monitor and function list III (when operating remote operator/copy unit (DOP/DRW))

●Names of each part



<Example: DRW>

●Monitor mode

Indication order	Monitor name
1	Frequency setting and output frequency
	Set the multistage speed
	Set the jogging frequency
	Set the expanded multistage speed frequency
	Set the process inching frequency
2	Set the accelerating time
3	Set the decelerating time
4	Frequency command
5	Run command
6	Motor pole number setting and rotation number monitor
7	Frequency conversion value setting and converted value monitor
8	Current monitor
9	Torque monitor
10	Adjust manual torque boost
11	Adjust the output voltage gain
12	Adjust jogging frequency
13	Adjust analog meter
14	Terminal input status monitor
15	Warning monitor
16	Alarm display
	Trip monitor
17	Total alarm count monitor
18	Alarm history monitor

●Function mode

Indication order	Function No.	Function name	
1	F-00	Set the base frequency	
2	F-01	Set the maximum frequency	
3	F-02	Adjust start frequency	
4	F-03	Set the motor receiving voltage	
		Select AVR function at deceleration	
5	F-04	Set the control method	
6	F-05	Set the auto tuning	
		Select motor data	
		Set the motor capacity	
		Set the number of motor poles	
		Set the motor constants (R1, R2, L, M, J, Kp, Ti, Kpp)	
7	F-06 Accel-erating time	Set the accelerating time	
		Set the 2 stage accelerating time	
		Select the curve pattern at acceleration	
		Select acceleration/deceleration curve constants	
8	F-07 Decel-erating time	Set the decelerating time	
		Set the 2 stage decelerating time	
		Select the curve pattern at deceleration	
		Select acceleration/deceleration curve constants	
9	F-08	Set the frequency to stop acceleration at	
		Set the time to stop acceleration at	
10	F-09	Select how to command parameters	
11	F-10 Run mode	Select multistage speed/process inching	
		Select run mode	
12	F-11	Set multistage speed (1-7 stage)	
13	F-12	Set the process inching 1-8 (Set the speed, frequency terminal input, time, acceleration/ deceleration, input terminal, etc.)	Available for US version and Japanese version
14	F-13		
15	F-14		
16	F-15		
17	F-16		
18	F-17		
19	F-18		
20	F-19		
21	F-20	Select DC braking (type, braking force, time, frequency, etc.)	
22	F-21	Set the regenerative braking motion	
23	F-22 Restart after instantaneous power failure	Set the allowable instantaneous power failure time	
		Adjust time to wait to turn on after recovery from instantaneous power failure	
		Select restart after instantaneous power failure	
		Select trip at instantaneous power failure or undervoltage at stop	
24	F-23	Set the electronic thermal (characteristics, level, etc.)	

Indication order	Function No.	Function name
25	F-24 Overload limit	Select fuzzy overload limit
		Set the overload limit level
		Set the overload limit constant
		Select overload limit at acceleration valid
26	F-25	Select soft-lock
27	F-26	Set the lower frequency limiter
		Set the upper frequency limiter
28	F-27	Set the jump frequencies 1-3
29	F-28	Select STOP key at terminal run valid
30	F-29	Select running direction
		Select reverse prevention
31	F-30	Select maximum frequency
32	F-31 External analog frequency command	Select analog input voltage
		Set the external frequency start
		Set the external frequency end
		Set the external frequency start setting rate
		Set the external frequency end setting rate
33	F-32 Frequency arrival output signal	Select arrival signal output pattern
		Set the arrival frequency rate at acceleration
		Set the arrival frequency rate at deceleration
34	F-33 Over-torque signal	Set the over-torque signal rate (at power running)
		Set the over-torque signal rate (at regeneration)
35	F-34	Set the intelligent input terminals 1-8 and change the NO/NC contacts
36	F-35	Set the intelligent output terminals 11 and 12 and change the NO/NC contacts
37	F-36	Set the carrier frequency
38	F-37	Select monitor signal
39	F-38 Initial setting	Preset data program by applications
		Clear the trip history count
		Select debug mode indication
		Select digital operator turning direction
40	F-39	Initially set the application circuit board
41	F-40	Initially set the orientation
42	F-41	Initially set the electronic gear
43	F-42	Initially set the torque limit
44	F-43	Initially set PID control
45	F-44	Initially set the digital I/O
46	F-45	Initially set the analog I/O
47	F-46	Set the communication protocol
48	F-47	Set the application circuit board error

Note: 1. For settable ranges and units, refer to the instruction manual.
* F-39-47 are valid when application circuit boards (option) are installed.

Function and setting methods

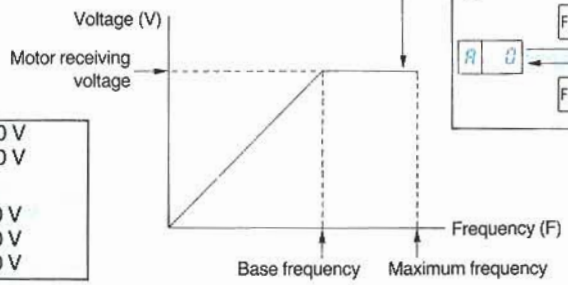
□□ : When operating by digital operator, (F-□□) : When operating by DOP/DRW

●Setting V/F pattern (setting order for ① ~ ③ is at random) (set the Function, V/F at HOP/HRW operation)

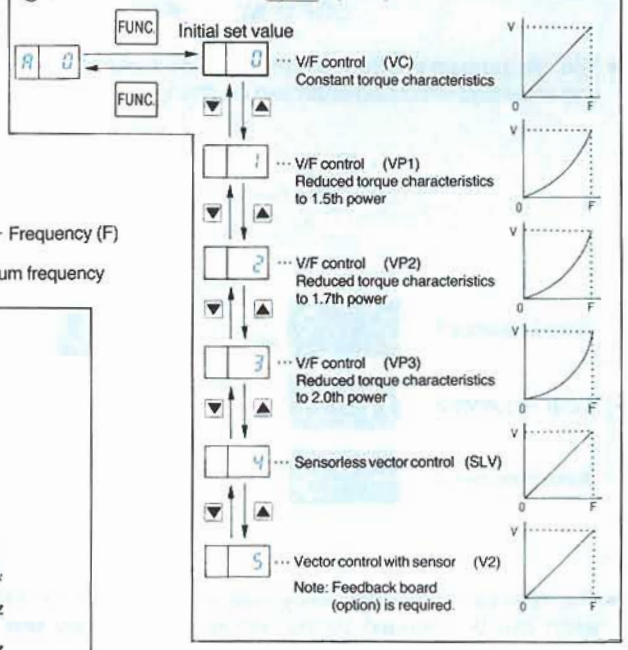
① Set the motor receiving voltage. (□□, F-03)

200/215/220/230 V.
Initial setting: [US version 230 V / Japanese version 200 V]

380/400/440/460 V.
Initial setting: [European version 380 V / US version 460 V / Japanese version 400 V]

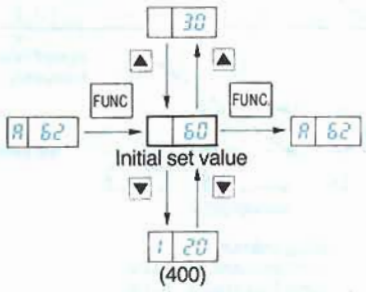


② Set the control method. A 0 (F-04)

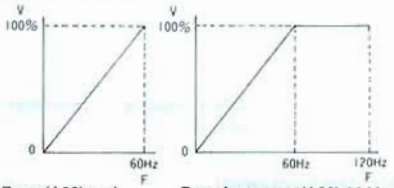


③ Set the base frequency (A62, F-00) and maximum frequency (A63, F-01).

Setting method

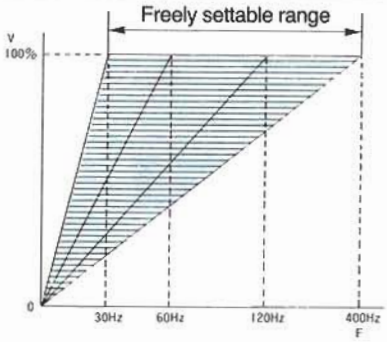


Setting example



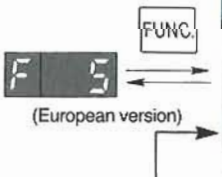
Base (A62) and maximum (A63) frequencies 60 Hz

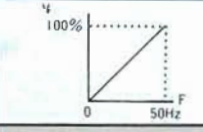
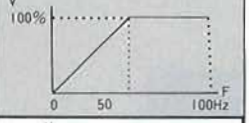
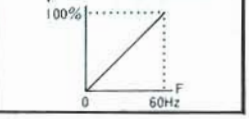
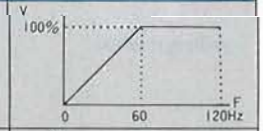
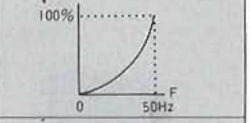
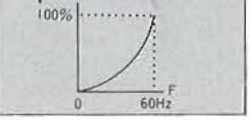
Base frequency (A62) 60 Hz
Maximum frequency (A63) 120 Hz



Notes
1. If the setting is base frequency > maximum frequency, it is forcibly changed to base frequency = maximum frequency when starting the run.
2. If the employed base frequency is beyond 60 Hz, a special motor must be used instead of a general purpose motor. Therefore, the maximum applicable motor is different. Generally speaking, if the indication in kW is the same, the inverter capacity must be increased.
3. If the employed base frequency and maximum frequency are beyond 120 Hz, modify the frequencies by the remote operator (DOP, DRW, HOP, HRW).

The digital operator can set V/F pattern, base frequency and maximum frequency at a time.



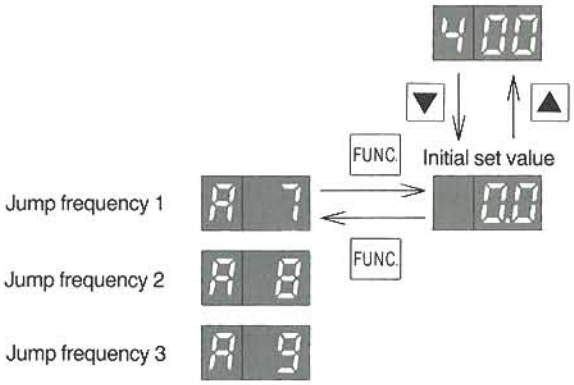
Code	Control method	Base frequency	Maximum frequency	V/F pattern
00	VC (constant torque)	50 Hz	50 Hz	
01	VC (constant torque)	50 Hz	120 Hz	
02	VC (constant torque)	60 Hz	60 Hz	
03	VC (constant torque)	60 Hz	120 Hz	
04	VP1 (reduced torque to 1.5th power)	50 Hz	50 Hz	
05	VP1 (reduced torque to 1.5th power	60 Hz	60 Hz	

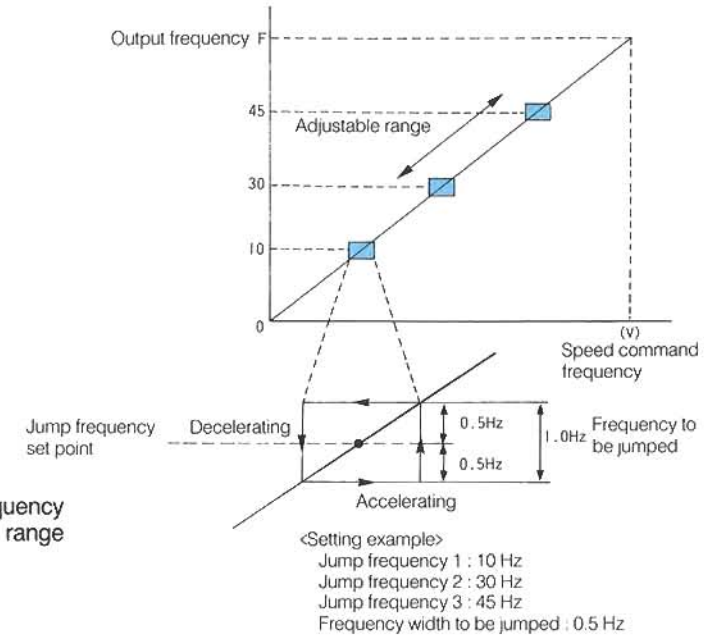
Notes
1. □□□ appears on digital operator if any setting changed by the remote operator does not conform any longer to the data in the table above.
2. □□□ appears on digital operator when running with sensorless vector control.
3. Use a corresponding remote operator when it is desired to set any patterns other than given in the above table.

Frequency jump

Digital operator : A 7 A 8 A 9
HOP/HRW : Function "Set the frequency jump"
DOP/DRW : F-27

- You can jump up to 3 frequencies to avoid a resonance with the load. The setting order and executing order can be changed.





<Setting example>
Jump frequency 1 : 10 Hz
Jump frequency 2 : 30 Hz
Jump frequency 3 : 45 Hz
Frequency width to be jumped : 0.5 Hz

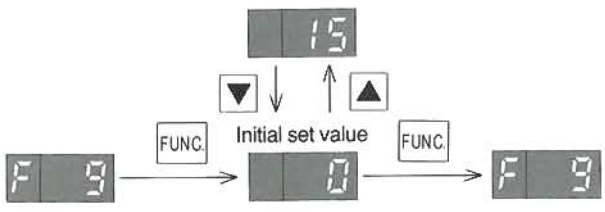
- The initial set value of frequency width to be jumped is ±0.5 Hz. The frequency width can be changed by the remote operator/copy unit. (Settable range 0~9.9 Hz.)

Changing the run command and frequency command setting mode

Digital operator : F 9
HOP/HRW : Command
DOP/DRW : Monitor mode

- Sets the run command and frequency command destination.
- The run command and frequency command destination can be set optionally for each of terminal, operator, option 1 and option 2. Select relevant set values.
- Codes 04~15 are valid when the application circuit board (option) is installed.

Setting method



Initial set values →

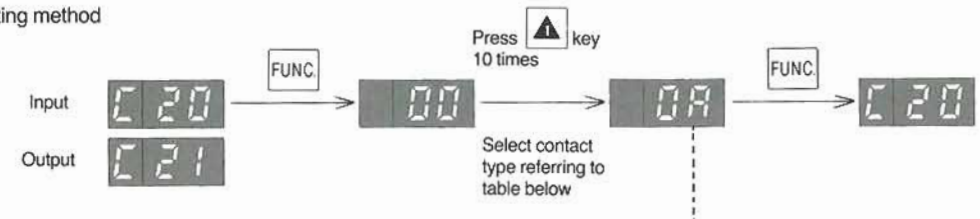
Set value	Run command destination	Frequency command destination
00	Operator	Operator
01	Operator	Terminal
02	Terminal	Operator
03	Terminal	Terminal
04	Operator	Option 1
05	Option 1	Operator
06	Option 1	Option 1
07	Operator	Option 2
08	Option 2	Operator
09	Option 2	Option 2
10	Terminal	Option 1
11	Option 1	Terminal
12	Terminal	Option 2
13	Option 2	Terminal
14	Option 1	Option 2
15	Option 2	Option 1

Setting the input terminal and output terminal NO/NC contacts

Digital operator : C 20 C 21
HOP/HRW : Function "Set the terminals"
DOP/DRW : F-34

- Intelligent input terminals 1~4, intelligent output terminals and alarm output terminals can be changed distinctly to NO or NC contacts. Input relevant set values.

Setting method



Example of set value

Input terminal

Initial set value: 00

Set MSD to 0

Set value	F	E	d	C	b	A	9	8	7	6	5	4	3	2	1	0
Input terminal No. 4	b	b	b	b	b	b	b	b	a	a	a	a	a	a	a	a
Input terminal No. 3	b	b	b	b	a	a	a	a	b	b	b	b	a	a	a	a
Input terminal No. 2	b	b	a	a	b	b	a	a	b	b	a	a	b	b	a	a
Input terminal No. 1	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a

Initial set value

Output terminal

Initial set value: 04

Set MSD to 0

Set value	7	6	5	4	3	2	1	0
Output terminal No. 11	b	a	b	a	b	a	b	a
Output terminal No. 12	b	b	a	a	b	b	a	a
Output terminal No. Alarm	b	b	b	b	a	a	a	a

a: NO contact (OFF when open)
b: NC contact (ON when open)

Auto tuning function

Digital operator : A 54
HOP/HRW : Function "Select auto tuning function"
DOP/DRW : F-05

- Automatically sets the motor constants necessary for sensorless vector control. Note that the constants for Hitachi standard motor are already set.

<Auto tuning method>

Check the motor specifications and settings
- Before the auto tuning, make sure whether or not:
  ①Base frequency (invalid if set at 0 Hz)
  ②Motor capacity
  ③Number of motor poles
  are correctly set.

Auto tuning mode ON
- (Digital operator A 54
  HOP/HRW Function "AUTO"
  DOP/DRW F-05)

Run command ON

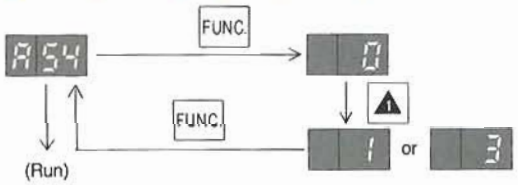
(Automatic run)
- Operates the motor for 60~120 seconds in the order of:
  ①Excite by AC (motor does not run)
  ②Excite by DC (motor does not run)
  ③Accelerate to 80% of base frequency, decelerate and stop
  ④Accelerate to 40% of base frequency, decelerate and stop

End/stop the measurement

(Stand by)

Make sure the load connected to the motor is normal in the above run.

[When operating digital operator]



- Indicate A 54 and set the data (01, 03) for starting the auto tuning setting.

Data set value	Select motor data for sensorless vector. Hitachi standard/auto.	Auto tuning measurement start/end.
03	Auto tuning data	Start
02	Auto tuning data	End
01	Hitachi standard data	Start
00	Hitachi standard data	End

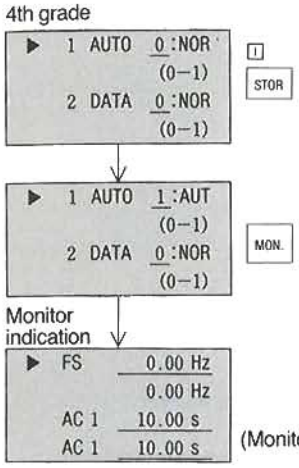
Initial set values

- The auto tuning measurement changes to "End" automatically when the measuring motion ends (to 02 or 00 when set at 03 or 01, respectively).

[When operating high-performance remote operator/ copy unit (HOP/HRW)]

- Select the 1st grade (Function, 2nd grade (Control) and 3rd grade (Motor).

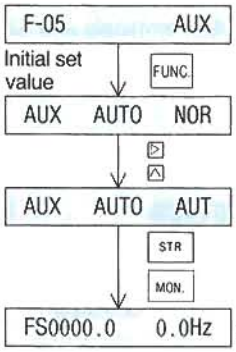
4th grade



(Monitor screen)

- On the 4th grade, change the contents of (1 Auto) from 0: NOR to 1: AUT. After changing the data, press STOR key.
- Press the MON key to select the monitor mode and press the FWD RUN or REV RUN key. The machine will execute auto tuning.
- After the tuning, the setting changes from 1 to 0.

[When operating remote operator/copy unit (DOP/DRW)]



(Monitor screen)

On F-05, indicate the motor constant setting. Develop AUX AUTO screen and select "AUT".

Auto tuning

NOR...turns off setting and ends the auto tuning.

AUT ...starts the auto tuning measurement.

After setting the data, pressing FWD RUN or REV RUN key carries out the auto tuning measuring motion.

<Indication at end of auto tuning>

- The following indication for normal tuning appears when the auto tuning has ended properly. Pressing any key resumes the last screen. When abnormal, the following indication for abnormal tuning appears and the measurement stops.

	Digital operator	HOP/HRW	DOP/DRW
Normal tuning		OK Function 3 OR FR	Tuning END
Abnormal tuning		NG Function 3 OR FR	Tuning NG

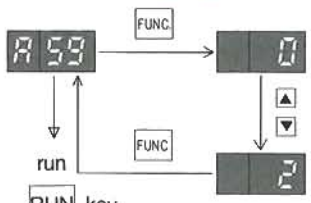
- The motor constants can be modified or set distinctly (provided the remote operator/copy unit is used).
- Auto tuned data or Hitachi standard motor data can be used selectively.
- Either of forward and reverse run directions for auto tuning motion can be designated.

Fuzzy acceleration/deceleration run

Digital operator : A 59
HOP/HRW : Function "Set the run mode"
DOP/DRW : F-10

The fuzzy acceleration/deceleration function provides acceleration/deceleration characteristics making full use of the inverter capacity to dispense with troublesome setting of accelerating/decelerating time. The accelerating time is the time of acceleration by the current intensity designated at the overload control level.

[When operating digital operator]

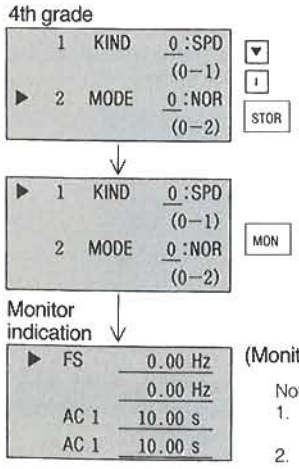


- In A-59 Select run mode, select 02 .
  Select run mode
  0...normal run (initial set value)
  1...energy-saving run
  2...fuzzy acceleration/deceleration run
- After setting the data, starting the run carries out an optimum acceleration/deceleration run.

[When operating high-performance remote operator/copy unit]

- Select the 1st grade (Function), 2nd grade (RUN) and 3rd grade (Pattern).

4th grade



(Monitor screen)

On the 4th grade, change the contents of "2 MODE" from 0: NOR to 2: GOD. After changing the data, press the STOR key.

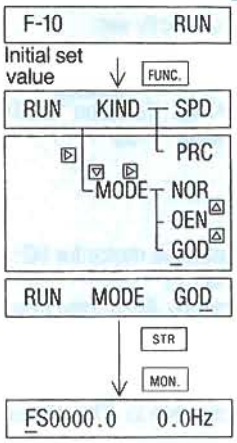
0: NOR...normal run (initial set value)

1: OEN..energy-saving run

2: GOD...fuzzy acceleration/deceleration run

Press the MON key to select the monitor mode and start the run. The machine will execute a fuzzy acceleraiton/deceleration run.

[When operating remote operator/copy unit]



(Monitor screen)

Indicate F-10 Select run mode. After indicating the RUN MODE screen, select "GOD".

Select run mode

0: NOR...normal run (initial set value)

1: OEN..energy-saving run

2: GOD...fuzzy acceleration/deceleration run

Set the data and start the run. The machine will carry out the optimum acceleration/deceleration run.

* At the fuzzy acceleration/deceleration run, the acceleration/deceleration indication in the monitor mode is invalid (Setting is possible. Indication is invalid but, at normal run, is valid.)

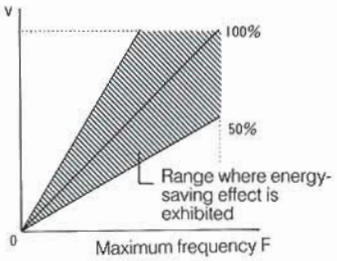
Notes

1. Not suited for a machine for which the accelerating/decelerating time must be constant. The accelerating/decelerating time depends on the load and inertia.
2. May trip if the machine inertia is beyond 20 times that on the motor shaft. The fuzzy acceleration/deceleration setting is valid at V/F control. The sensorless vector control provides a normal run. May trip if acceleration/deceleration is repeated frequently (cycle 2 sec or smaller).

Automatic energy-saving run

Digital operator : A53
HOP/HRW : Function "Set the run mode"
DOP/DRW : F-10

- At V/F control run, automatically sets the output voltage according to the load, thereby suppressing useless power. Useful for fan, pump or other loads of reduced torque characteristics.
- The function is a comparatively slow control. Therefore, the motor may stall if impact load or other abrupt load variations have occurred.



<Setting method>
(see fuzzy acceleration/deceleration run)
[Digital operator]
In A53 run mode, select 01.
[High-performance remote operator/copy unit]
On the 4th grade (MOD), change to (1: DEN).
[Remote operator/copy unit]
After selecting F-10 Run mode, select "OEN" on the RUN MODE screen.

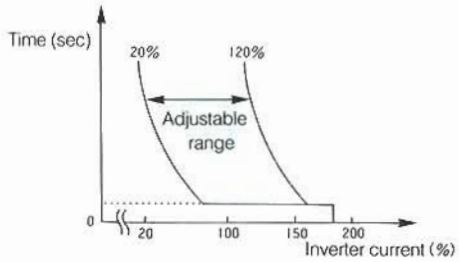
Selecting and adjusting electronic thermal characteristics and levels

Digital operator : A23, A24
HOP/HRW : Function
"Set the electronic thermal"
DOP/DRW : F-23

HOP/HRW : Function

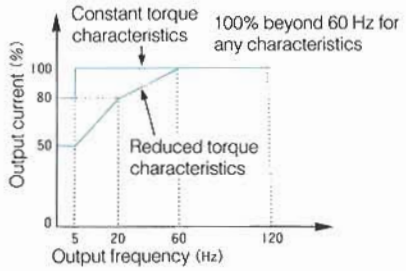
- You can select and adjust the electronic thermal characteristics and levels.

Adjusting electronic thermal level



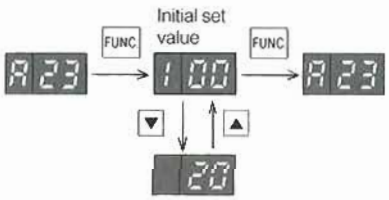
$$\text{Adjusting level} = \frac{\text{rated current of motor}}{\text{rated current of inverter}} \times 100\,(\%)$$

Selecting electronic thermal characteristics

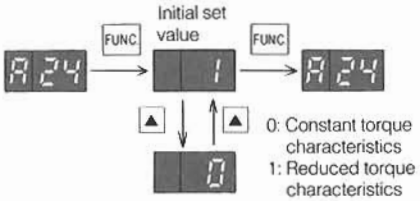


<Setting method> [Digital operator]

Electronic thermal level



Electronic thermal characteristics



[High-performance remote operator/copy unit]

Select the 1st grade (Function), 2nd grade (Protect) and 3rd grade (E thermal).

1 CHAR	1 : SUB	[0-2]
2 LEVEL	100%	(20-120)

On the 4th grade, select and adjust "1 CHAR" (electronic thermal characteristics) and "2 LEVEL" (electronic thermal level).

0: CRT Constant torque characteristics
1: SUB Reduced torque characteristics
2: FRE Free characteristics

[Remote operator/copy unit (DUP/DRW)]

Select F-23 (electronic thermal switch).

F-23	E-THM

(Electric thermal characteristics) FUNC.

E-THM	CHAR	SUB

CRT
SUB
FRE

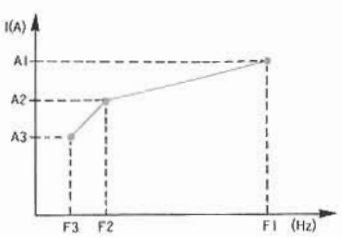
(Electronic thermal level)

E-THM	LEVEL	100%

20 ~ 120%

You can select the free electronic thermal characteristics upon setting the frequency and current (provided remote operator is used).

- Set the electronic thermal characteristics to "3: FRE or CHAR FRE" and then set the frequencies (F1 ~ F3) and currents (A1 ~ A3).
- When the electronic thermal characteristics are free characteristics, ignore the constant torque characteristics and reduced torque characteristics.



Simplified sequence function (process inching function)

<Available for US version and Japanese version>

The automatic run is made by the inverter only. You can set the frequency and process time (timer setting) for up to 8 processes. You can change the process item or process sequence through the terminal.
[This function is selectable when operating the remote operator/copy unit (HOP/HRW, DOP/DRW)].

■ Setting contents

[When operating HOP/HRW]

<3rd grade>	<4th grade>		
4. PRC1	1 F	0.00Hz	(0.00-400.0)
≀			
b. PRC8	2 TM	0:OFF	[0-1]
	3 TIME	0.0s	(0.0-3000.0)
	4 A/D	0:S1F	[0-4]
	5 TERM	0:NOR	[0-8]
	6 NEXT	1	(0-8)

[When operating DOP/DRW]

<Function No.>	<Indication>		
F-12	PRC1 F	0000.00Hz	
≀			
F-19	PRC1 TF	OFF	
	PRC1 T	0000.0s	
	PRC1 A/D	S1F	
	PRC1 TERM	NOR	
	PRC1 NEXT	1	

① Set the frequency of each process

② Designate the frequency setting method for each process.
(ON : Set from terminal input
OFF: Set the frequency in ①)

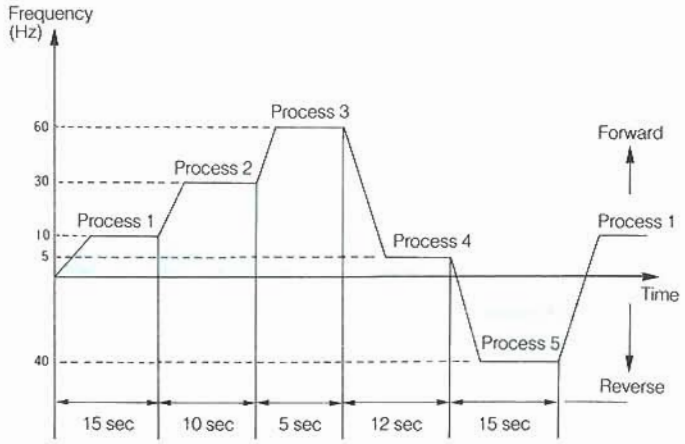
③ Set the execution time for each process.
(Executed only for terminal input in ⑤ if set to 0.0 sec.)

④ Set the acceleration/deceleration and rotating direction of each process..
(S1F: 1-stage speed forward, S1R: 1-stage speed reverse, FRS: Free run, S2F: 2-stage speed forward, S2R: 2-stage speed reverse)

⑤ Set the input terminal of each process.
(NOR: No input from terminal)

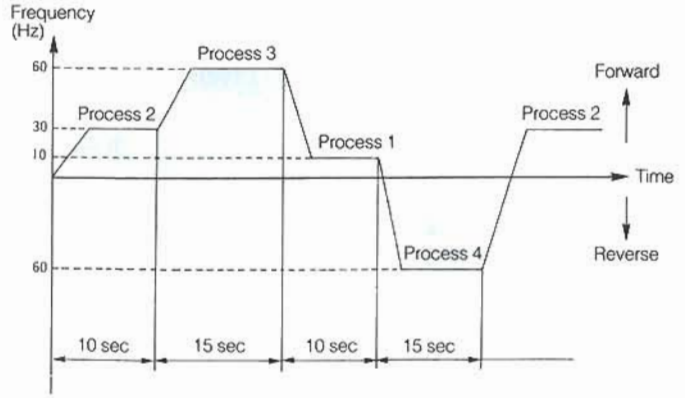
⑥ Designate the sequence of each process.
(Used to interchange the process steps.)

■ Setting example 1



Process	Frequency	Rotating direction	Frequency setting method	Process time	Acceleration/ deceleration	Process change terminal	Process order
1	10	Forward	(OFF)	15	S1F	NOR	1
2	30	Forward	(OFF)	10	S1F	NOR	2
3	60	Forward	(OFF)	5	S2F	NOR	3
4	5	Forward	(OFF)	12	S1F	NOR	4
5	40	Reverse	(OFF)	15	S2R	NOR	5
6	0	—	—	0	—	—	
7	0	—	—	0	—	—	—
8	0	—	—	0	—	—	—

■ Setting example 2



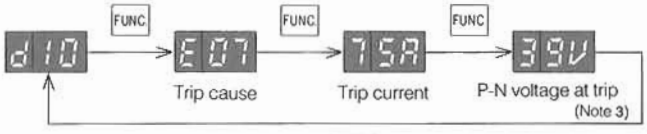
Process	Frequency	Rotating direction	Frequency setting method	Process time	Acceleration/ deceleration	Process change terminal	Process order
1	10	Forward	(OFF)	10	S1F	NOR	3
2	30	Forward	(OFF)	10	S2F	NOR	1
3	60	Forward	(OFF)	15	S1F	NOR	2
4	60	Reverse	(OFF)	15	S2R	NOR	4
5	0	—	—	0	—		—
6	0	—	—	0	—		—
7	0	—	—	0	—		—
8	0	—	—	0	—		—

Protective functions

Name	Description		Digital operator indication	Remote operator/copy unit indication ERR1 ****
Overcurrent protection (Note 1)	Detects a current by AC CT between the power module and output terminals (U, V, W). If the motor is locked or abruptly decelerated, a large current would flow to the inverter, thereby causing troubles. The AC CT thus detects a current greater than specified and cuts off the output. The current is also detected in the power module. (See E31, E32, E33 and E34 below.)	At constant speed	E01	OC. Drive
		At deceleration	E02	OC. Decel
		At acceleration	E03	OC. Accel
		At stop	E04	Over. c
Overload protection (Note 1)	The electronic thermal incorporated in the inverter supervises the inverter output current and, if the motor has overloaded, cuts off the inverter output.		E05	Over. L
Braking resistor overload protection	If the duty rating for the regenerative braking resistor has been exceeded, an overvoltage is detected by stopping BRD (regenerative braking unit) operation and the inverter output is turned off.		E06	OL. BRD
Overvoltage protection	If, when the regenerative energy from the motor or the receiving voltage is high, the converter voltage has risen higher than specified, the protective circuit is actuated and turns off the inverter output.		E07	Over. V
EEPROM error	Turns off the output if EEPROM in the inverter has gone abnormal on account of external noise, excessive temperature rise, etc.		E08	EEPROM
Undervoltage protection	If the inverter receiving voltage drops, the control circuit would not function properly, the motor would overheat and the torque would reduce. Turns off the output if the receiving voltage has dropped to 150-160 V (low voltage) or 300-420 V (high voltage).		E09	Under. V
CT error	Turns off the output if CT in the inverter has become abnormal.		E10	CT
CPU error	Turns off the inverter if the incorporated CPU has operated erratically or gone abnormal.		E11	CPU
External trip	If any external device or equipment has become abnormal, the inverter fetches that signal and turns off the output (provided external trip function is selected).		E12	EXTERNAL
USP error	Error indication when power has been turned on while the inverter is running (provided USP function is selected).		E13	USP
Ground fault protection	Detects grounding between the inverter output section and motor when turning on power, thereby protecting the inverter.		E14	GND. Flt.
Overvoltage receiving protection	Turns off the output upon detecting the received voltage is higher than specified 5 seconds after turning on. Detects a level above F11 motor receiving voltage setting. If a voltage beyond 280 V or 560 V has been input, it exceeds the rated value of employed parts whereby they could not be protected and might break.		E15	OV. SRC
Instantaneous power failure	Turns off the output if power failure has lasted beyond 15 msec. If the power failure time is long, the error signal will be reset. If restart is selected, the machine will restart when a run command remains.		E16	Inst. P-F
Option connecting section error (Note 2)	For when option connecting section (connector, etc.) has malfunctioned.	Option 1	E17	NG. OP1
		Option 2	E18	NG. OP2
Optional circuit board error (Note 2)	Error message delivered from optional circuit board itself.	Option 1	E19	OP1
		Option 2	E20	OP2
Waiting on account of undervoltage	Waiting with the output turned off because the inverter receiving voltage has dropped.		E23	UV. WAIT
Phase loss protection	Turns off the output if a phase loss has been detected on the inverter power receiving side (R,S,T) or (L1,L2,L3).		E24	PH. Fail
Power module protection	Actuated by the detector incorporated in the power module. If the inverter output is short-circuited or the motor is locked, a large current would flow to the inverter, thereby causing troubles. Turns off the output if the current in the power module or temperature of main semiconductors has become higher than specified.	At constant speed	E31	PM. Drive
		At deceleration	E32	PM. Decel
		At acceleration	E33	PM. Accel
		At stop	E34	PM. ERR

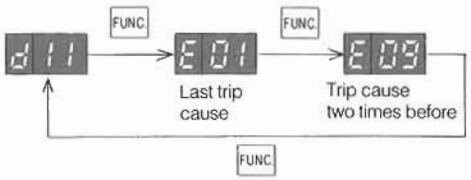
Notes
1. Press the reset key 10 seconds after the alarm has occurred.
2. Valid when the application circuit board (option) is installed.

Alarm monitor method (□_ _ appears in case of no trip)



Note 3: The example for P-N voltage on the left indicates 390-399 V.

Alarm history monitor method (□_ _ appears in case of no trip)



Terminal arrangement

Main circuit terminal

• 055~550LFU/055~150HFU

G (PE)	R (L1)	S (L2)	T (L3)	RB (RB)	P (+)	N (−)	U (T1)	V (T2)	W (T3)	G (PE)

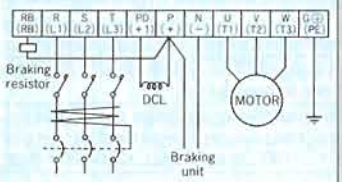
RB : 055,075LFU/HFU only

Internal short circuit bar

• 220~2200HFU

G (PE)	R (L1)	S (L2)	T (L3)	PD (+1)	P (+)	N (−)	U (T1)	V (T2)	W (T3)	G (PE)

Terminal symbol	Terminal name	Function
R,S,T (L1),(L2),(L3)	Main power input connection	Connect the input power
U,V,W (T1),(T2),(T3)	Inverter output connection	Connect the motor
P,RB (+),(RB)	External braking resistor connection	Connect the braking resistor(option)
P,N (+),(−)	External braking unit connection	Connect the braking unit(option)
P,PD (+),(+1)	External choke coil connection	Connect a choke coil(DCL) for harmonics current reduction
G (RE)	Ground	Carry out grounding to avoid electric shock and reduce noise



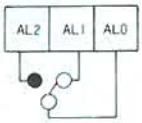
W=terminal width

Terminal dimensions

Model	055~075LF 055~075HF		110~150LF 110~370HF		220~370LF 450~550HF		450~550LF		750,900HF		1100HF		1320~2200HF	
	Terminal thread dia.	Terminal width	Terminal thread dia.	Terminal width	Terminal thread dia.	Terminal width	Terminal thread dia.	Terminal width	Terminal thread dia.	Terminal width	Terminal thread dia.	Terminal width	Terminal thread dia.	Terminal width
Main circuit	M5	13mm	M6	17.5mm	M8	23mm	M10	35mm	M10	35mm	M10	40mm	M16	51mm
Control circuit	M3	6.2mm	M3	6.2mm	M3	6.2mm	M3	6.2mm	M3	6.2mm	M3	6.2mm	M3	6.2mm

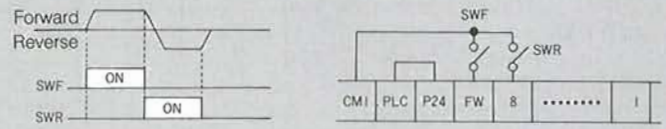
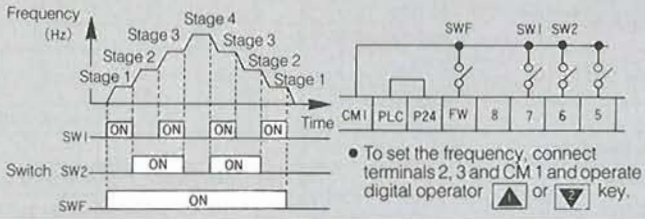
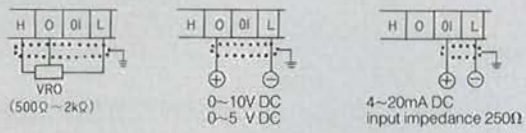
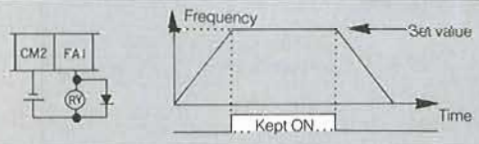
Control circuit section

FM	CM1	PLC	P24	FW	8	7	6	5	4	3	2	1	H	O	OI	L	CM2	12	11		AL2	AL1	AL0

	Terminal symbol	Terminal name	Initial set value of intelligent terminal		Remarks
Input and monitor signal terminal	FM	Frequency monitor	—		Contact input Closed: ON Open: OFF Minimum ON time: 20 msec or more
	CM1	Common terminal for contact input terminal and frequency monitor terminal			
	PLC	Common terminal for programmable controller (PLC) or other external power			
	P24	Internal power for frequency monitor or intelligent input terminal			
	FW	Forward run command			
	8	Intelligent input terminal 8	REV	Reverse run command	
	7	Intelligent input terminal 7	CF1	1st multistage speed command	
	6	Intelligent input terminal 6	CF2*	2nd multistage speed command	
	5	Intelligent input terminal 5	CH1	2 stage acceleration/ deceleration command	
	4	Intelligent input terminal 4	FRS	Free run stop command	
	3	Intelligent input terminal 3	JG	Jogging	
	2	Intelligent input terminal 2	A-T	Select current input	
	1	Intelligent input terminal 1	RS	Reset	
Frequency analog command input	H	Frequency command power	—		10V DC
	O	Frequency command input (voltage command)	—		0~10V DC (standard), 0~5V DC, input impedance 30kΩ
	OI	Frequency command input (current command)	—		4~20mA DC, input impedance 250Ω
	L	Common terminal for frequency analog command input	—		
Output signal	CM2	Common terminal for intelligent output terminal	—		
	12	Intelligent output terminal 12	RUN	Running signal	27V DC 50mAmax.
	11	Intelligent output terminal 11	FA1	Frequency arrival signal	
Alarm output contact	AL2	 AL0-AL1 closed when normal. AL0-AL2 closed when abnormal or when power is turned off (AL0-AL1 normally open is available (expansion function C21). Contact rating 250V AC 2.5A (resistive load) 0.2A (cosø = 0.4) 30V DC 3.0A (resistive load) 0.7A (cosø = 0.4) [Minimum 100V AC 10mA 5V DC 100mA]			
	AL1				
	AL0				

* USP (Unattended start protection) for US version.

Functions of control circuit terminals

Terminal symbol	Terminal name	Description
FM	Monitor terminal	Analog: Output frequency, current, torque. Digital: Output frequency.
CM1	Common terminal 1	Common terminal for FW terminal, intelligent input terminal and monitor terminal
PLC	Internal interface common	Common terminal for external power supply for programmable controller
P24	Input signal power	Internal power supply 24V DC for contact input terminal or frequency monitor terminal
FW	Forward run/stop terminal	
1 ~ 8 REV	Reverse run/stop terminal	
CF1	Multistage speed command	 • To set the frequency, connect terminals 2, 3 and CM 1 and operate digital operator ▲ or ▼ key.
CF2		
CF3		
JG	Jogging	Jogging run signal
DB	External DC braking	DC braking input signal
STN	Initial set value	Initial set value (factory set) input
SET	2nd control function	Modifies at a time the base and maximum frequencies, control method, motor constants, accelerating/decelerating time, torque boost adjustment, electronic thermal setting, etc.
CH1	2-stage acceleration/deceleration	Closing the contact modifies accelerating/decelerating time
FRS	Free run stop	Inverter stops and motor stops after free run (valid when contact is closed)
EXT	External trip	External trip input signal (valid when contact is closed)
USP	Unattended start protection	Avoids restart when turned on at RUN status (valid when contact is closed)
CS	Change to/from commercial power	Input signal for changing to/from commercial power from/to inverter drive
SFT	Terminal soft-lock	Turning on terminal locks set data
AT	Select current input	Changes analog input voltage/current
RS	Reset	Resets alarm signal
UP	Remote control function, acceleration	Closing the contact accelerates (valid when frequency command destination is operator)
DWN	Remote control function, deceleration	Closing the contact decelerates (valid when frequency command destination is operator)
H	Power terminal for frequency command	· Initial set value of external command is voltage signal of 0-10V DC. For inputting 0-5V DC, the operator must make the change.  * Maximum frequency is commanded at 4.8V for voltage command input of 0-5V DC, at 9.6V for 0-10V DC or at 19.2mA for current command input of 4-20mA. Contact us for other characteristics.
O	Terminal for frequency command (voltage command)	
OI	Terminal for frequency command (current command)	
L	Common terminal for frequency command	
CM2	Common terminal	Monitor terminal for intelligent output terminal
11 · 12 FA1	Frequency arrival signal	Allows the operator to output an arrival signal at an arbitrary frequency.  Open collector output 27V DC 50mA
RUN	Running signal	Transistor output ON during run
OTQ	Over-torque signal	Transistor output ON beyond set torque (Initial set value is 100% torque. To modify from initial set value, operate the remote operator. Use it only for sensorless vector control.)
AL0	Alarm terminal	AL0-AL1 closed when normal. AL0-AL2 closed when abnormal or when power is turned off. Contact rating 250V AC 2.5A (resistive load) 0.2A (cosø = 0.4) 30V DC 3.0A (resistive load) 0.7A (cosø = 0.4) (Minimum 100V AC 10mA 5V DC 100mA)
AL1		
AL2		

Standard specifications

Item				200-220V/200-230V 3phase								
Model name (type)				J300-055LF	J300-075LF	J300-110LF	J300-150LF	J300-220LF	J300-300LF	J300-370LF	J300-450LF	J300-550LF
Enclosure				IP20 excluding cooling fan				IP00				
Applicable motor rating (4P, max. kW/HP)*1	Constant torque			5.5/7.5	7.5/10	11/15	15/20	22/30	30/40	37/50	45/60	55/75
	Variable torque*2			7.5/10	11/15	15/20	22/30	30/40	37/50	45/60	55/75	75/100
Continuous output (kVA)	Constant torque		200V	8.3	11	16	22	33	42	50	63	76
			230V	10	13	18	25	38	48	58	73	88
	Variable torque		200V	9	12	18	25	37	47	56	71	86
			230V	11	14	21	29	43	54	65	82	99
Rated AC input power supply				3-phase (3-wire) 200 to 220/200 to 230V ± 10%, 50/60 Hz ±5%								
Rated output voltage*3				3-phase 200 to 30V (corresponding to reception voltage)								
Rated output current (A)	Constant torque			24	32	46	64	95	121	145	182	220
	Variable torque (US version)			27	36	52	72	107	136	163	205	248
Carrier frequency (kHz)	Constant torque			16	16	16	16	12	10	10	6	6
	Variable torque (US version)			16	16	16	16	12	10	10	6	6
Control system				Sine-wave pulse width modulation(PWM)control								
Output frequency range*4				0.1 ~ 400Hz								
Frequency accuracy				With reference to maximum frequency, ±0.01% in digital setting and ±0.1% in analog setting (25 ± 10°C)								
Frequency resolution				Digital setting: 0.01 Hz/60 Hz, analog setting: maximum frequency/1000								
Voltage/frequency characteristic				V/F optionally variable, V/F control (constant torque, reduced torque), sensorless vector control								
Overload current rating				150%, 1 minute (VC, SLV), 115%, 30 sec (VP1 to VP3)								
Accelerating/decelerating time				0.01 to 3,000 sec. (optionally settable in straight line or curve, and each acceleration and deceleration independently settable), second acceleration/deceleration rate settable								
Starting torque*5				150% or more (at 1 Hz)								
Average braking torque	Dynamic braking (short duration)*6			Approx. 20 to 10% at capacitor feedback (Types 055/075LF incorporate Dynamic braking circuit, and other types (from 110LF onward) employ separate installation of braking unit.)								
	DC braking			Operates at below minimum frequency at start or deceleration, or in response to external input signal (minimum frequency, operating frequency, time and brake force all adjustable)								
Input signal	Frequency setting	Digital operator		Setting by △ ▽								
		External signal		Variable resistor of 500 Ω to 2 kΩ, 2W, 0 to 5V, 0 to 10V DC<nominal> (input impedance 30 kΩ), 4 to 20 mA <nominal> (input impedance 250 Ω)								
	Forward/reverse run and stop	Digital operator		Run/stop (forward or reverse run selected by command)								
		External signal		Forward run/stop (1a contact) [reverse run specifiable at terminal assignment (1a/1b selectable)]								
	Intelligent input terminal			REV (reverse run command), FRS (free run stop command), CF1 to 3 (multistage speed setting), USP (unattended start protection setting), JG (jogging command), CH1 (2-stage acceleration/deceleration command), DB (external dynamic brake command), RS (reset input), STN (initial setting), CS (commercial source changeover), SFT (soft lock), AT (current input selection), SET (2nd setting selection), EXT (external trip), UP (remote control, acceleration), DOWN (remote control, deceleration)								
Output signal	Intelligent output terminal			FA1 (frequency arrival signal), RUN (running signal), OTQ (overtorque signal)								
	Frequency monitor			Analog meter (0 to 10V DC, 1 mA full scale) digital frequency signal, analog current monitor or analog torque monitor selectable by remote operator								
Alarm output contact				ON at inverter alarm (1C contact output)								
Other functions				AVR function, process inching, data batch setting, V/F characteristic changeover, curved acceleration/deceleration, upper and lower limiters, 8-stage speed, fine adjustment of start frequency, carrier frequency change (2 to 16 kHz), frequency jump, electronic thermal level adjustment, fuzzy acceleration/deceleration, auto tuning, gain and bias setting, retry function, trip history monitor (up to 3 trips storable in memory), etc.								
Protective function				Overcurrent, overvoltage, undervoltage, electronic thermal, abnormal temperature, ground fault current at start*7, overload limit, overvoltage supply, braking resistor overload, etc.								
General specifications	Ambient temperature/humidity	Constant torque		−10 to 50°C (14 to 122°F) / 20 to 90% RH (non-condensing)								
		Variable torque		−10 to 40°C (14 to 104°F) / 20 to 90% RH (non-condensing)								
	Vibration			5.9m/s²(0.6G) 10~55Hz				2m/s²(0.2G) 10~55Hz				
	Installation site			Altitude 1,000 m or lower, indoor (excessive corrosive gas and dust unallowable)								
	Coating color			Munsell 9.1Y7.4/0.6 semi-gloss, cooling fins in base color of aluminum								
Option				A variety of application PC boards (PID control, communication, digital I/F, relay output, high resolution, etc.), remote operator, copy unit, cable of each operator, braking resistor, power factor improvement reactor, noise filter for inverter, fixture for positioning fins outside cubicle, etc.								
Approx. mass (kg/lbs)				7.5/10.5	7.5/16.5	13/29	13/29	21/46	37/82	37/82	51/113	51/113

<Notes>

*1 Applicable motors indicate Hitachi standard three-phase motors. When using other motors, the rated current of motor (at 50 Hz) must not exceed the rated output current of inverter.

*2 Applicable motor rating at variable torque is valid with the condition that output current does not exceed the ratings at variable torque.

*3 A maximum output voltage drops in response to a fall in line voltage.

*4 For motor operation beyond 50/60 Hz, consult with motor manufacturer.

*5 At the rated voltage when using a Hitachi standard 3-phase, 4-pole motor. (When selecting high starting torque flux vector control)

*6 Braking torque at capacitor feedback represents average deceleration torque when a motor alone has decelerated in the shortest time period (has stopped from operation at 50/60 Hz). It does not stand for continuous deceleration torque. Also, the average deceleration torque varies with motor loss. The torque value is reduced during operation beyond 50/60 Hz. Remember that no braking resistor is incorporated in the inverter. When a large regeneration torque is needed, therefore, the optional braking resistor should be used.

*7 An internal ground fault protection circuit is applied to prevent damage to the inverter and is not intended for safeguarding personnel. It is therefore recommended to install an external ground fault detection device on the input power circuit.

Item				380-415V/400-460V 3phase														
Model name (type)				J300-055HF	J300-075HF	J300-110HF	J300-150HF	J300-220HF	J300-300HF	J300-370HF	J300-450HF	J300-550HF	J300-750HF	J300-900HF	J300-1100HF	J300-1320HF	J300-1600HF	J300-2200HFU
Enclosure				IP20 excluding cooling fan				IP00										
Applicable motor rating (4P, max. kW/HP)*1	Constant torque			5.5/7.5	7.5/10	11/15	15/20	22/30	30/40	37/50	45/60	55/75	75/100	90/120	110/150	132/200	160/250	220/300
	Variable torque*2			7.5/10	11/15	15/20	22/30	30/40	37/50	45/60	55/75	75/100	90/120	110/150	132/200	160/250	220/300	260/350
Continuous output (kVA)	Constant torque		380V	8.6	10.5	15	21	32	38	49	59	72	82	103	118	158	207	250
			400V	9.0	11	16	22	33	40	52	62	76	86	108	125	166	218	263
			460V	10.4	12.7	18	25	38	46	60	72	88	99	124	191	191	251	303
	Variable torque		380V	9.6	11.8	17	24	36	43	55	66	82	103	118	158	199	250	286
			400V	10.1	12.5	18	25	37	45	58	70	86	108	118	166	209	263	301
			460V	11.6	14.3	21	29	43	52	67	80	99	124	143	191	241	303	347
Rated AC input power supply				3-phase (3-wire) 380 to 415/400 to 460V±10%, 50/60Hz±5%														
Rated output voltage*3				3-phase 380 to 460V (corresponding to reception voltage)														
Rated output current(A)	Constant torque			13	16	23	32	48	58	75	90	110	124	156	180	240	315	380
	Variable torque(US version)			14.6	18	26	36	54	65	84	101	124	156	180	240	302	380	435
Carrier frequency(kHz)*4	Constant torque			16	16	16	16	12	10	10	6	6	3	3	3	2	2	2
	Variable torque(US version)			16	16	16	16	12	10	10	6	6	2	2	2	2	2	2
Control system				Sine-wave pulse widlth modulation (PWM) control														
Output frequency range*5				0.1~400Hz														
Frequency accuracy				With reference to maximum frequency, ±0.01% in digital setting and ±0.1% in analog setting(25±10°C)														
Frequency resolution				Digital setting : 0.01Hz/60Hz, analog setting : maximum frequency/1000														
Voltage/frequency characteristic				V/F optionally variable, V/F control (constant torque, reduced torque), sensorless vector control														
Overload current rating				150%, 1 minute (VC,SLV), 115%, 30 sec(VP1 to VP3) (1320HF~ : 150%, 1min(VC, SLV), 119~130%, 1min(VP1 to VP3))														
Accelerating/decelerating time				0.01 to 3,000 sec.(optionally settable in straight line or curve, and each acceleration and deceleration independently settable), second acceleration/deceleration rate settable														
Starting torque*6				150% or more (at 1 Hz)														
Average braking torque	Dynamic braking (short duration)*7	European version (055/075HF)		Approx.60 to 50%(Types 055/075HF incorporate resistor for Dynamic braking)														
		Other models		Approx.20 to 10% at capacitor feedback(Types 055/075HF incorporate regenerative braking circuit, and other types(from 110HF onward) employ separate installation of regenerative braking unit.)														
	DC braking			Operates at below minimum frequency at start or deceleration,or in response to external input signal (minimum frequency, operating frequency, time and brake force all adjustable)														
Input signal	Frequency setting	Digital operator		Setting by △ ▽														
		External signal		Variable resistor of 500Ω to 2kΩ, 2W, 0 to 5V, 0 to 10V DC<nominal>(input impedance 30 kΩ), 4 to 20 mA<nominal>(input impedance 250 Ω)														
	Forward/reverse run and stop	Digital operator		Run/stop(forward or reverse run selected by command)														
		External signal		Forward run/stop (1a contact) [reverse run specifiable at terminal assignment (1a/1b selectable)]														
	Intelligent input terminal			REV(reverse run command), FRS(free run stop command), CF1 to 3(multistage speed setting), USP(unattended start protection setting), JG(jogging command), CH1(2-stage acceleration/deceleration command), DB(external dynamic brake command), RS(reset input), STN(initial setting), CS(commercial source changeover) SFT(soft lock), AT(current input selection), SET(2nd setting selection), EXT(external trip), UP(remote control, acceleration), DOWN(remote control, deceleration)														
Output signal	Intelligent output terminal			FA1(frequency arrival signal), RUN(running signal), OTQ(overtorque signal)														
	Frequency monitor			Analog meter(0 to 10V DC, 1 mA full scale) digital frequency signal, analog current monitor or analog torque monitor selectable by remote operator														
Alarm output contact				ON at inverter alarm(1C contact output)														
Other functions				AVR function, process inching, data batch setting, V/F characteristic changeover, curved acceleration/deceleration, upper and lower limiters, 8-stage speed, fine adjustment of start frequency, carrier frequency change (2 to 16kHz), frequency jump, electronic thermal level adjustment, fuzzy acceleration/deceleration, auto tuning, gain and bias setting, retry function, trip history monitor (up to 3 trips storable in memory), etc.														
Protective function				Overcurrent, overvoltage, undervoltage, electronic thermal level adjustment, abnormal temperature, ground fault current at start*8, overload limit, overvoltage supply, braking resistor overload, etc.														
General specifications	Ambient temperature/humidity	Constant torque		-10 to 50°C(14 to 122°F)/20 to 90% RH(non-condensing)														
		Variable torque		-10 to 40°C(14 to 104°F)/20 to 90% RH(non-condensing)														
	Vibration			5.9m/s²(0.6G) 10~55Hz								2m/s²(0.2G) 10~55Hz						
	Installation site			Altitude 1,000m or lower, indoor(excessive corrosive gas and dust unallowable)														
	Coating color			Munsell 9.1Y7.4/0.6 semi-gloss, cooling fins in base color of aluminum														
Option				A variety of application PC boards(PID control, communication, digital I/F, relay output, high resolution, etc.), remote operator, copy unit, cable of each operator, braking resistor, power factor improvement reactor, noise filter for inverter, fixture for positioning fins outside cubicle, etc.														
Approx. mass (kg/lbs)				7.5/16.5	7.5/16.5	13/29	13/29	21/46	36/79	36/79	46/102	46/102	70/154	70/154	80/176	130	130	130

<Notes>

*1 Applicable motors indicate Hitachi standard three-phase motors. When using other motors, the rated current of motor (at 50 Hz) must not exceed the rated output current of inverter.

*2 Applicable motor rating at variable torque is valid with the condition that output current does not exceed the ratings at variable torque.

*3 A maximum output voltage drops in response to a fall in line voltage.

*4 Carrier frequency is automatically limited when selecting VP1 to VP3 for European version.

*5 For motor operation beyond 50/60 Hz, consult with motor manufacturer.

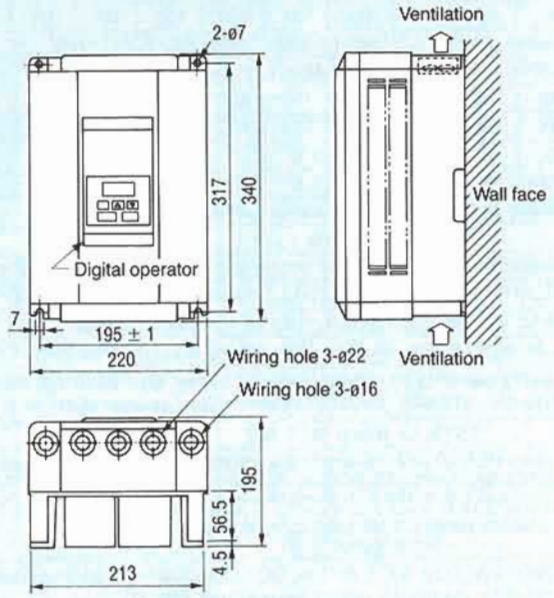
*6 At the rated voltage when using a Hitachi standard 3-phase, 4-pole motor. (When selecting high starting torque flux vector control)

*7 Braking torque at capacitor feedback represents average deceleration torque when a motor alone has decelerated in the shortest time period (has stopped from operation at 50/60 Hz). It does not stand for continuous deceleration torque. Also, the average deceleration torque varies with motor loss. The torque value is reduced during operation beyond 50/60 Hz. Remember that no braking resistor is incorporated in the inverter. When a large regeneration torque is needed, therefore, the optional braking resistor should be used.

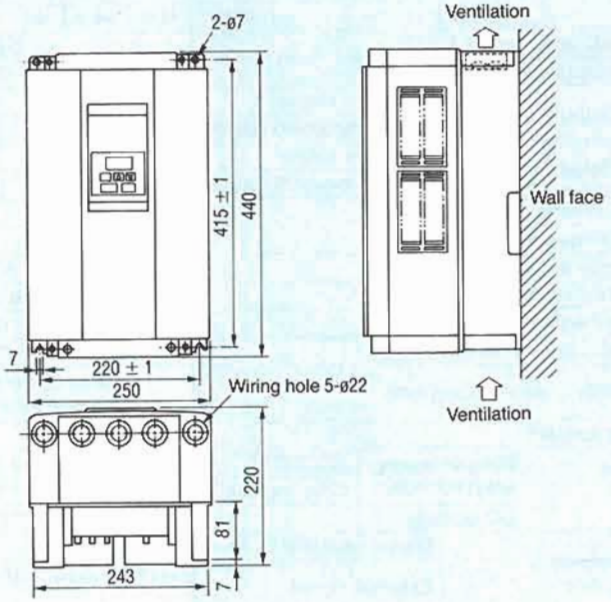
*8 An internal ground fault protection circuit is applied to prevent damage to the inverter and is not intended for safeguarding personnel. It is therefore recommended to install an external ground fault detection device on the input power circuit.

Dimensions

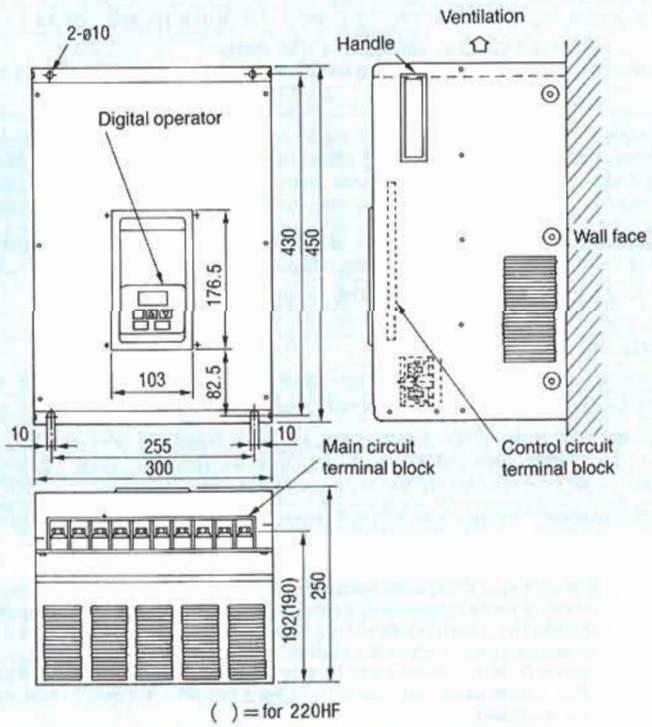
J300-055LF/055HF 075LF/075HF



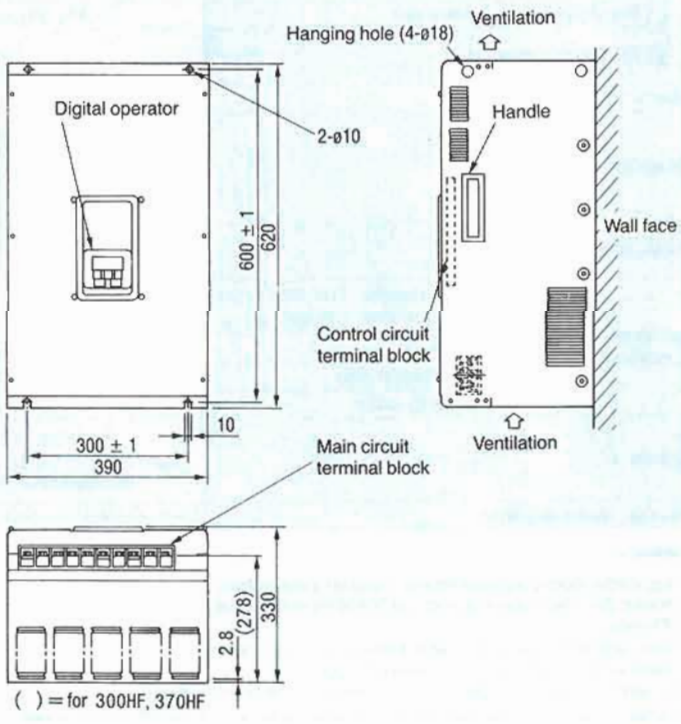
J300-110LF/110HF 150LF/150HF



J300-220LF/220HF

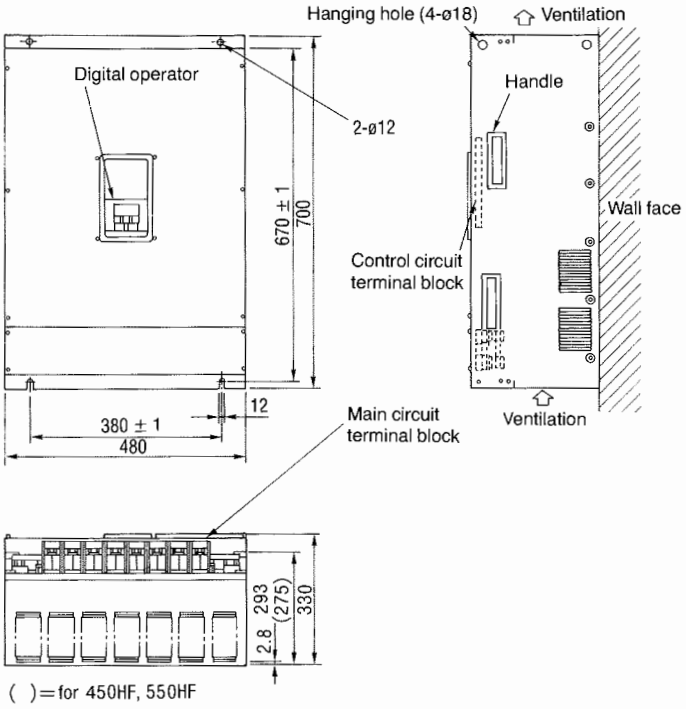


J300-300LF/300HF 370LF/370HF

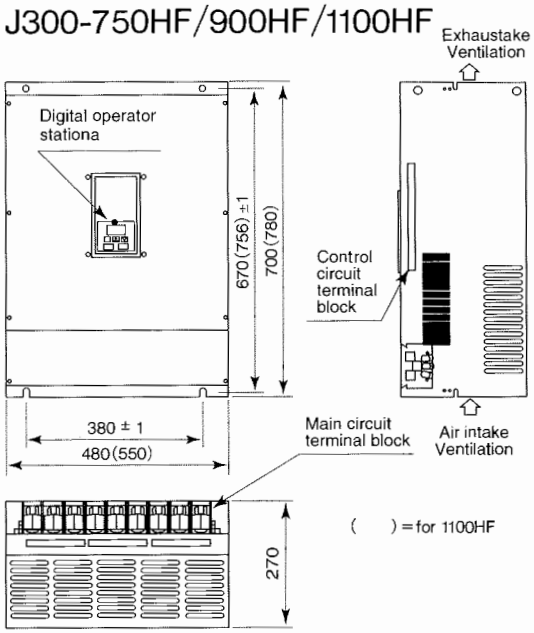


(Unit: mm)

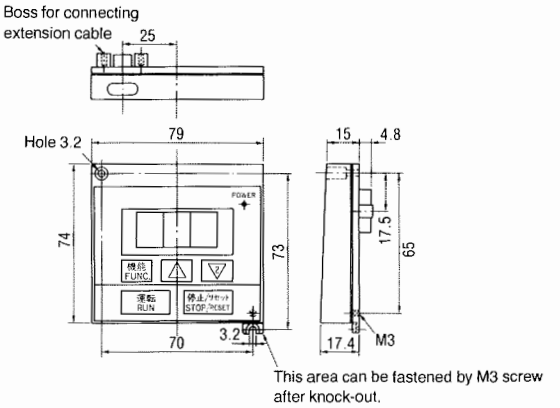
J300-450LF/450HF, 550LF/550HF



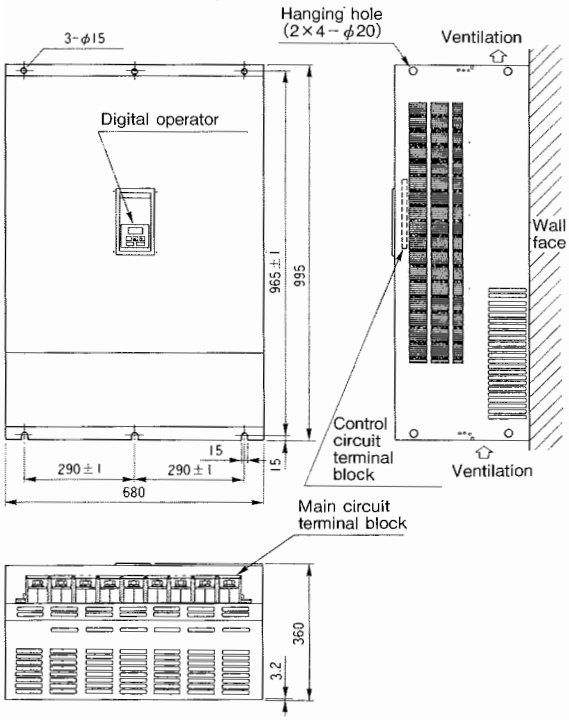
J300-750HF/900HF/1100HF



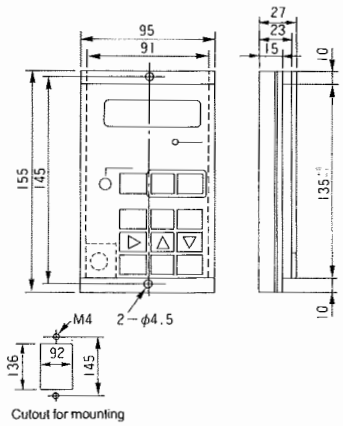
Digital operator



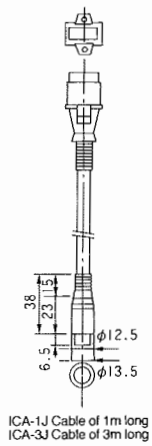
J300-1320HF/1600HF/2200HF



Remote operator/ copy unit (DOP/DRW)



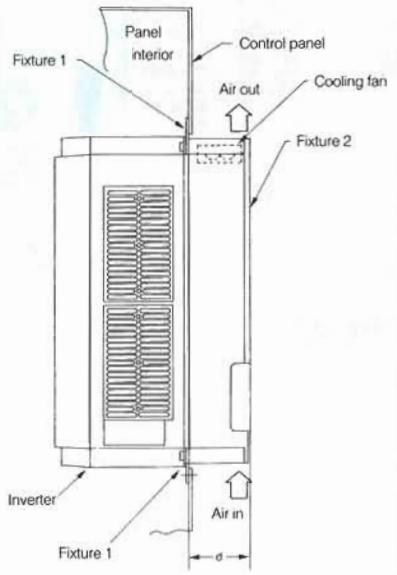
Cable for connecting 300J with DOP/DRW

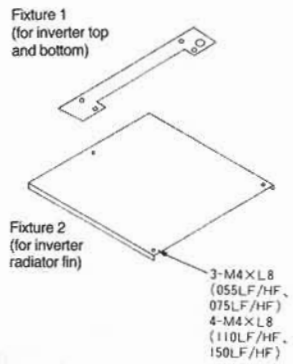


Realize compact control panels (radiator fins arranged externally)

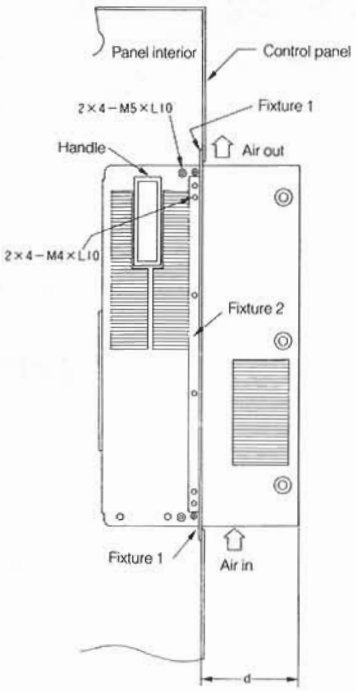
Heat accumulation in the panel can be reduced by arranging the inverter radiator fins outside as illustrated below. This solution is recommended to make the totally-enclosed control panel compact.

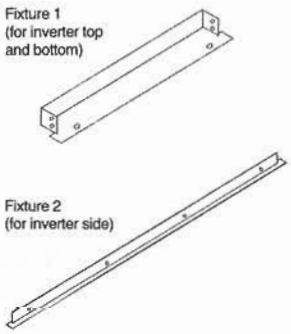
J300-055LF/HF~150LF/HF



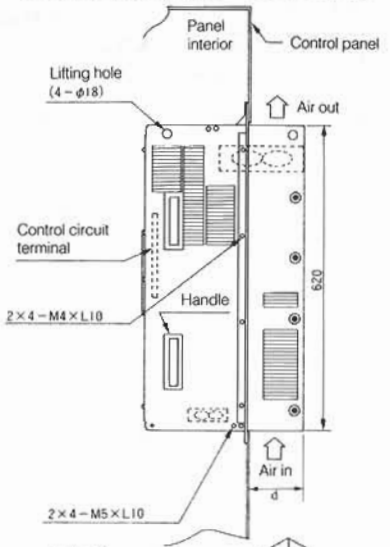


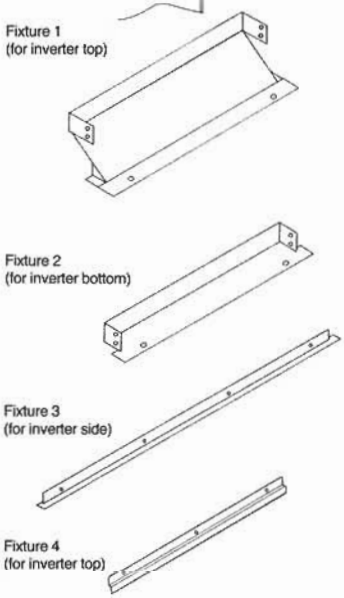
J300-220LF/HF



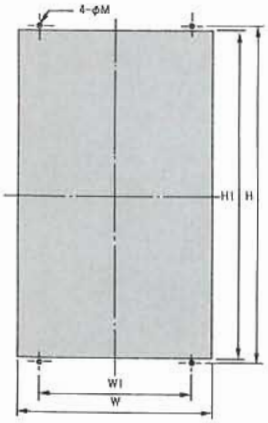


J300-300LF/HF~550LF/HF





Panel cutout



(Unit: mm)

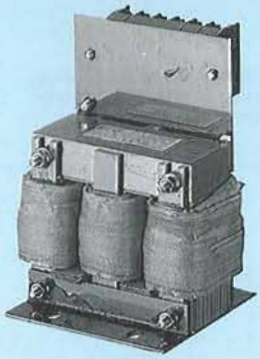
Inverter model	W	W1	H	H1	M	Thread	d
J300-055LF/HF 075LF/HF	214	165	361	345	7	M6	62
J300-110LF/HF 150LF/HF	244	185	461	455	7	M6	82
J300-220LF/HF	305	255	470	455	10	M8	123
J300-300LF/HF 370LF/HF	395	300	672	643	10	M8	119
J300-450LF/HF 550LF/HF	485	380	760	719	12	M10	119
J300-750HF/900HF	485	380	746	710	12	M10	130
J300-1100HF	555	380	826	790	12	M10	162

Options

(Unit: mm)

Name (model)	Dimensions and connections

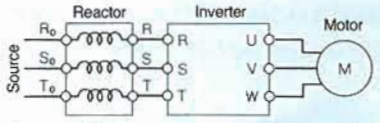
Power harmonics AC reactor for power factor improvement



Model abbreviation

ALI-2.5L

- Input side
- Inverter output capacity (kVA)
- (L: 3 phase low voltage / H: 3 phase high voltage)



Connection ALI-□□□

Dimensions Fig. 1

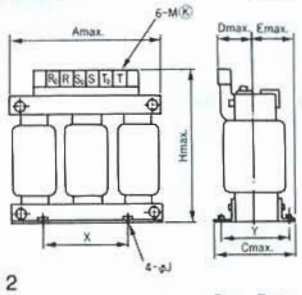
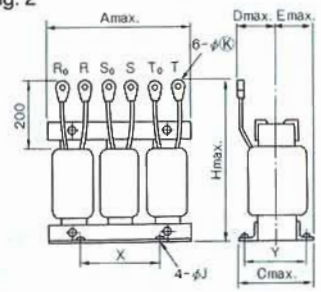


Fig. 2



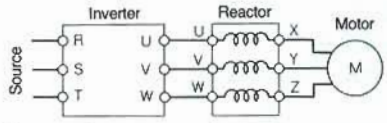
Voltage	Model	Dimension (mm) A	C	H	X	Y	J	(K)	D	E	Weight (kg)	See:	Applicable inverter J300-**
200 to 230 V	ALI-11L	160	103	170	60	80	6	5.3	70	55	6	Fig.2	~075LF
	ALI-22L	180	113	190	90	90	6	8.4	75	55	8.5	Fig.2	~150LF
	ALI-33L	180	113	230	125	90	6	8.4	85	60	10	Fig.2	~220LF
	ALI-50L	260	113	290	100	90	7	8.4	85	60	20	Fig.2	~370LF
	ALI-75L	260	146	290	125	112	7	8.4	110	80	25	Fig.2	~550LF
380 to 400 V	ALI-11H	160	116	170	60	98	6	5	75	55	6.0	Fig.1	~075HF
	ALI-22H	180	103	190	100	80	6	5.3	75	55	8.5	Fig.2	~150HF
	ALI-33H	180	123	230	100	100	6	6.4	85	60	10	Fig.2	~220HF
	ALI-50H	260	113	290	100	90	7	8.4	85	60	20	Fig.2	~370HF
	ALI-75H	260	146	290	125	112	7	8.4	110	80	25	Fig.2	~550HF

AC reactor for reducing vibration

Model abbreviation

ACL-L-0.4

- Connected motor capacity (in kW for 4P)
- Input voltage (L: 3 phase low voltage / H: 3 phase high voltage)



Connection ACL-□-□□□

Dimensions Fig. 1

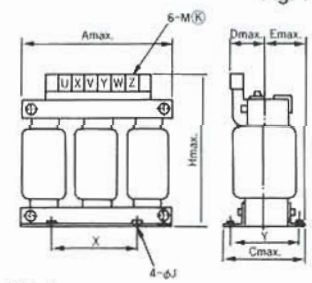
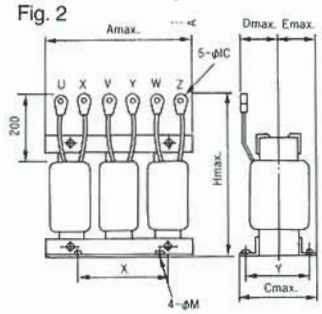


Fig. 2



Voltage	Model	Dimension (mm) A	C	H	X	Y	J	(K)	Weight (kg)	See:
200 to 230 V	ACL-L-5.5	230	115	330	125	90	6	5.3	15	Fig. 2
	ACL-L-7.5	250	130	345	125	112	7	6.7	22	Fig. 2
	ACL-L-11	250	135	360	125	112	7	6.7	24	Fig. 2
	ACL-L-15	*260*	*160*	*385*	*140*	*125*	*7*	*6.7*	*37*	*Fig. 2*
	ACL-L-18.5	280	170	395	140	135	7	8.3	40.5	Fig. 2
	ACL-L-22	280	175	390	140	140	7	8.3	43	Fig. 2
	ACL-L-30	310	190	435	160	150	10	8.3	60	Fig. 2
	ACL-L-37	310	190	445	160	150	10	8.3	62	Fig. 2
	ACL-L-45	310	195	475	160	160	10	8.3	73	Fig. 2
	ACL-L-55	310	205	475	160	180	10	10.3	76	Fig. 2
380 to 400 V	ACL-H-5.5	230	115	220	125	90	6	4	15.5	Fig. 1
	ACL-H-7.5	250	130	235	125	112	7	4	22	Fig. 1
	ACL-H-11	250	135	345	125	112	7	5.3	24	Fig. 2
	ACL-H-15	280	160	380	140	125	7	6.7	37	Fig. 2
	ACL-H-18.5	280	170	390	140	135	7	6.7	40	Fig. 2
	ACL-H-22	280	175	385	140	140	7	6.7	43	Fig. 2
	ACL-H-30	310	190	430	160	150	10	8.3	60	Fig. 2
	ACL-H-37	310	190	445	160	150	10	8.3	62	Fig. 2
	ACL-H-45	310	195	445	160	160	10	8.3	72	Fig. 2
	ACL-H-55	310	205	445	160	180	10	8.3	75	Fig. 2

Note: Select so as not to exceed the rated current of the connected motor.

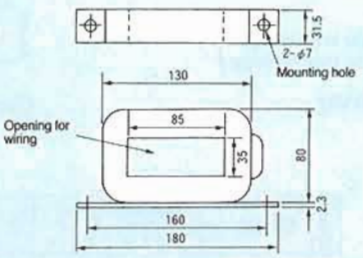
(Unit: mm)

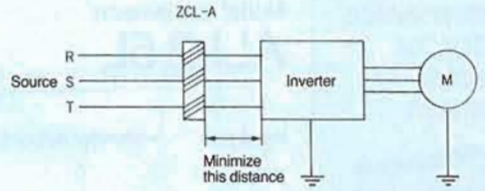
Name (model)	Dimensions and connections

Radio noise filter (zero-phase reactor)

ZCL-A

Dimensions



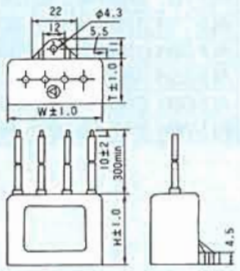


Notes 1. Wind the phases R, S and T in the same direction.
2. Usable in the same way on either of the inverter input and output sides.

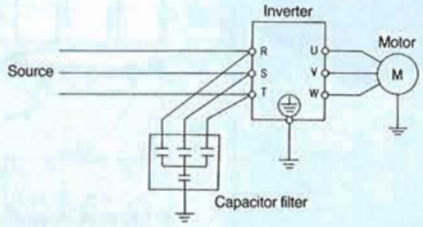
Input side radio noise filter (capacitor filter)

Connect directly to the inverter power terminal to reduce noise emitted from wires.

Dimensions



Connection



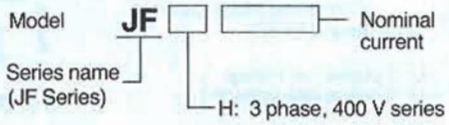
Name	W	H	T	Applicable inverter
CFI-L (250V rating)	48.0	35.0	26.0	low voltage
CFI-H (500V rating)	55.0	47.0	31.0	high voltage

Notes 1. Do not connect the capacitor filter to the output side. Otherwise, the inverter or filter might be troubled.
2. Beware of a leakage current from capacitors and select a leakage breaker. (The leakage current is approximately 22 mA in case of 220 V AC, 60 Hz and delta wiring or approximately 20 mA in case of 440 V, 60 Hz and star wiring.)
3. Fix the capacitors near the inverter so as to minimize the lead length. Never suspend them.

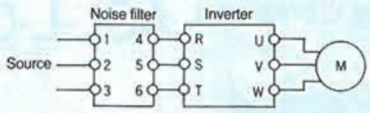
Noise filter for inverter (input side noise filter)

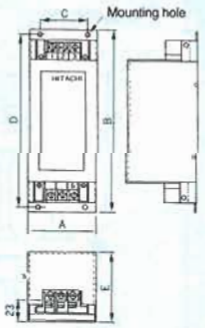
JF-□□

① Model abbreviation



③ Connection





② Dimensions

Name	Dimension						Mounting hole	Terminal			Ground terminal	Applicable model
	A	B	C	D	E	F		Thread	Width(W)	Terminal pitch (P)	Thread	
JF-H20	120	250	75	235	95	17	ø5	M4	9.6	12.0	M4 (hex)	J300-055HF/075HF
JF-H35	150	280	90	260	130	17	ø6	M5	13	15.5	M4 (hex)	J300-110HF/150HF

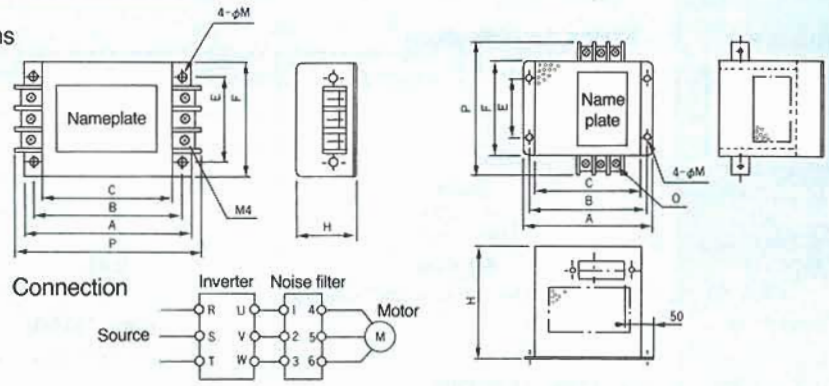
• Please inquire us about other models

(Unit: mm)

Name (model)	Dimensions and connections

Noise filter for inverter
(output side noise filter)

Dimensions

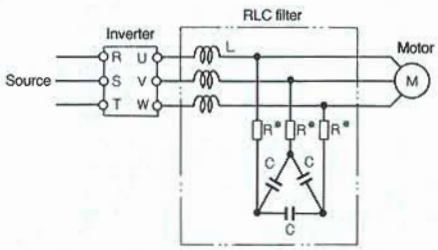


Connection

Model	Source	Rated current (A)	Applicable motor (kW)		Dimension (mm)								See:
			Low voltage	High voltage	A	B	C	E	F	H	M	P	
ACF-C25	3 phase, 3 wires, 500 V AC rated	25	5.5	5.5~11	160	145	130	80	110	120	ø7	156	Fig.2
ACF-C50		50	7.5, 11	15, 22	200	180	160	100	160	150	ø8	212	Fig.2
ACF-C75		75	15	30, 37	220	200	180	100	180	170	ø12	232	Fig.2
ACF-C100		100	22	45	220	200	180	100	180	170	ø12	239	Fig.2
ACF-C150		150	30, 37	55	240	220	200	150	200	170	ø12	259	Fig.2

LCR filter
(output side sine wave filter)

Install between the inverter and motor to improve the inverter output current and voltage waveforms, thereby reducing the motor vibration, noise and noise emitted from wires.



Filter constants (combining L, C, R)

Model	AC reactor L	Capacitor C	Resistor R
J300-055LF	ACL-L-5.5	LPF-H335	Not used
J300-075LF	ACL-L-7.5	LPF-H475	4Ω, 100W
J300-110LF	ACL-L-11	LPF-H685	〃
J300-150LF	ACL-L-15	LPF-H825	〃
J300-220LF	ACL-L-22	LPF-H156	4Ω, 150W
J300-300LF	ACL-L-30	LPF-H186	〃
J300-370LF	*	*	*
J300-450LF	*	*	*
J300-550LF	*	*	*

Model	AC reactor L	Capacitor C	Resistor R
J300-055HF	ACL-H-5.5	LPF-H105	Not used
J300-075HF	ACL-H-7.5	LPF-H225	〃
J300-110HF	ACL-H-11	〃	〃
J300-150HF	ACL-H-15	LPF-H335	4Ω, 100W
J300-220HF	ACL-H-22	LPF-H475	4Ω, 150W
J300-300HF	ACL-H-30	〃	〃
J300-370HF	ACL-H-37	LPF-H685	4Ω, 220W
J300-450HF	ACL-H-45	〃	〃
J300-550HF	ACL-H-55	LPF-H825	4Ω, 270W

Note: LCR filter is composed of reactors L, capacitors C and resistors R as shown in the diagram and table. It is not integrated. Install components in the panel, etc.

* Contact to your nearest Hitachi sales representative.

(Unit: mm)

Name (model)	Dimensions and connections

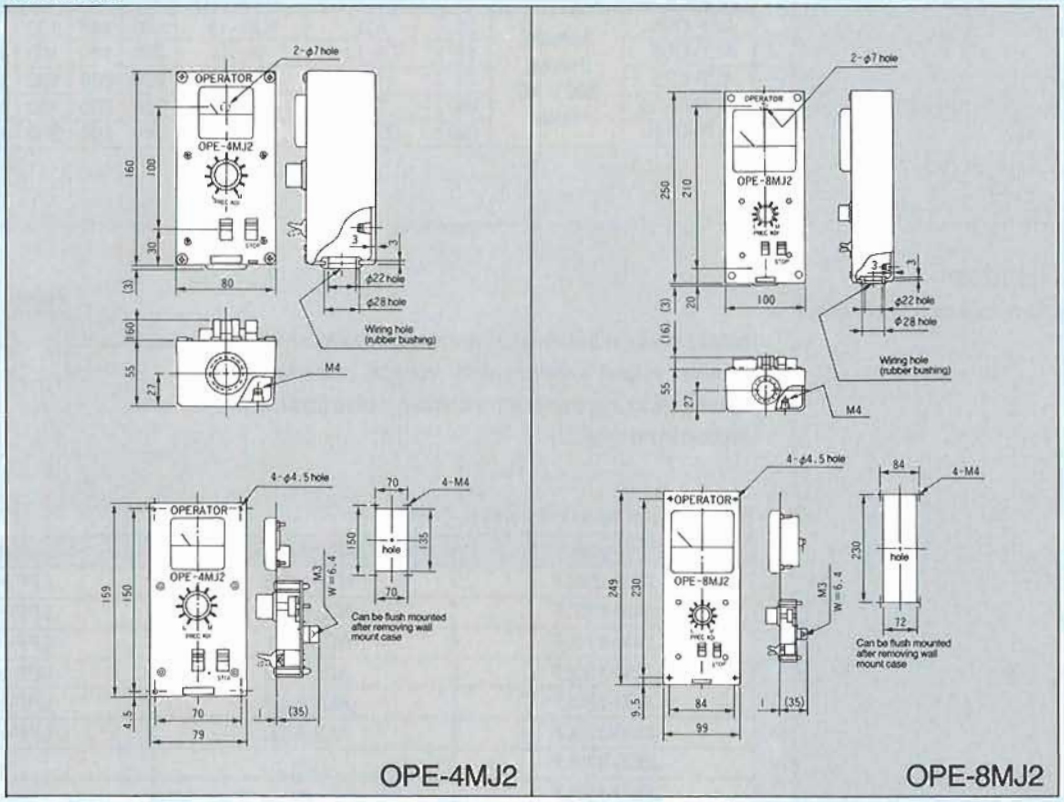
Operation panel
(analog operation panel)

OPE-4MJ2
OPE-8MJ2

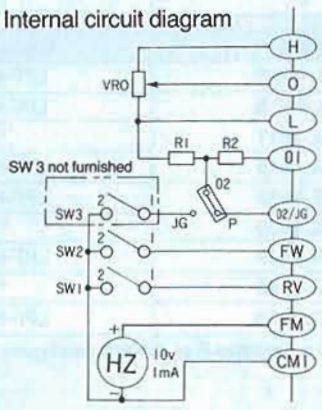
Standard specifications

Model		OPE-4MJ2	OPE-8MJ2
Meter size		43 mm square	80 mm square
Meter indication		0~50/60/100/120Hz	0~50/60/100/120/200/240Hz
Frequency setter		1W, 1kΩ	
Switch (FWD/STOP REV/STOP)		DC 20mV~28V, 0.1mA~0.1A	
Weight (kg)		0.43	0.8
General specifications	Ambient temperature and humidity	−10~50°C/20~90% (RH) non-condensing	
	Vibration	4.9m/s² (0.5G) 10~55Hz, conforming to JISC0911	
	Installation site	Altitude 1,000 m max., indoors, free from corrosive gases or dust	
	Protective structure	IP 20	

Dimensions



Internal circuit diagram



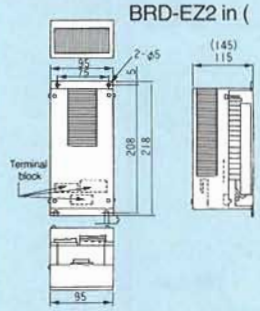
(Unit: mm)

Name (model)	Dimensions and specifications

Regenerative braking unit

Dimensions

BRD-EZ2 in ( )



J300-055LF/HF and 075LF/HF incorporate regenerative braking circuits.

Specifications

Model name	Voltage		Incorporated resistor	Incorporated resistor duty rating	Power consumption	Protective function, etc.
	Source	ON/OFF voltage				
BRD-E2	200~220/ 200~230V 50/50,60Hz	(Note 1) 362.5V/ 355V	120W, 180Ω	• Continuous ON time: 10 sec max. • Allowable run cycle: 1/10 (10 sec ON, 90 sec OFF)	• 0.7 kW instan-teneously • 120 W rated	• Thermal relay operates at fin temperature 100°C • Thermal relay operates at incorporated resistor temperature 200°C
BRD-S2			120W, 20Ω	• Continuous ON time: 0.5 sec max. • Allowable run cycle: 1/50 (0.5 sec ON, 25 sec OFF)	• 6.6 kW instan-teneously • 120 W rated	Relay rating: 240 V AC, 3 A at resistive load or 0.2 A at inductive load. 36 V DC, 2 A at resistive load.
BRD-EZ2	380~415/ 400~460V 50/50, 60 Hz	(Note 1) 725V/710V	(120W 180Ω) × 2 in series	• Continuous ON time: 10 sec max. • Allowable run cycle: 1/10 (10 sec ON, 90 sec OFF)	• 1.5 kW instan-taneously • 240 W rated	Abnormal time • Linked setting function for parallel connection (master-slave action) (Note 2)

Notes 1. An operating voltage setting change (−5%, −10%) function available (by internal DIP switches).
2. An external connection is required.

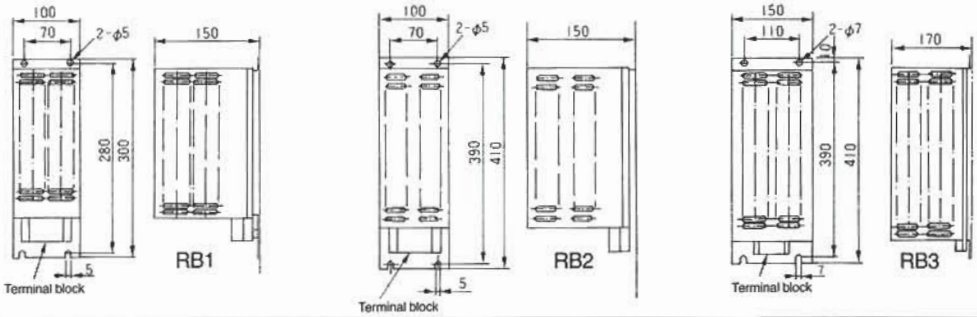
Discharge resistor

RB1
RB2
RB3

Specifications

Model name	Rated capacity	Resistance	Continuous ON time rating	Power consumption	Overheat protection
RB1	400W	50Ω	10 sec max.	• 2.6 kW instantaneously • 400 W rated	Incorporating a thermal relay in the resistor, outputs "Open" (NC contact) signal at an excessive temparature. Contact rating: 240V AC, 3A at resistive load or 0.2A at inductive load. 36V DC, 2A at resistive load.
RB2	600W	35Ω	10 sec max.	• 3.8 kW instantaneously • 600 W rated	
RB3	1,200W	17Ω	10 sec max.	• 7.7 kW instantaneously • 1,200 W rated	

Dimensions



■ Incorporated options

Name	Description

Application circuit board

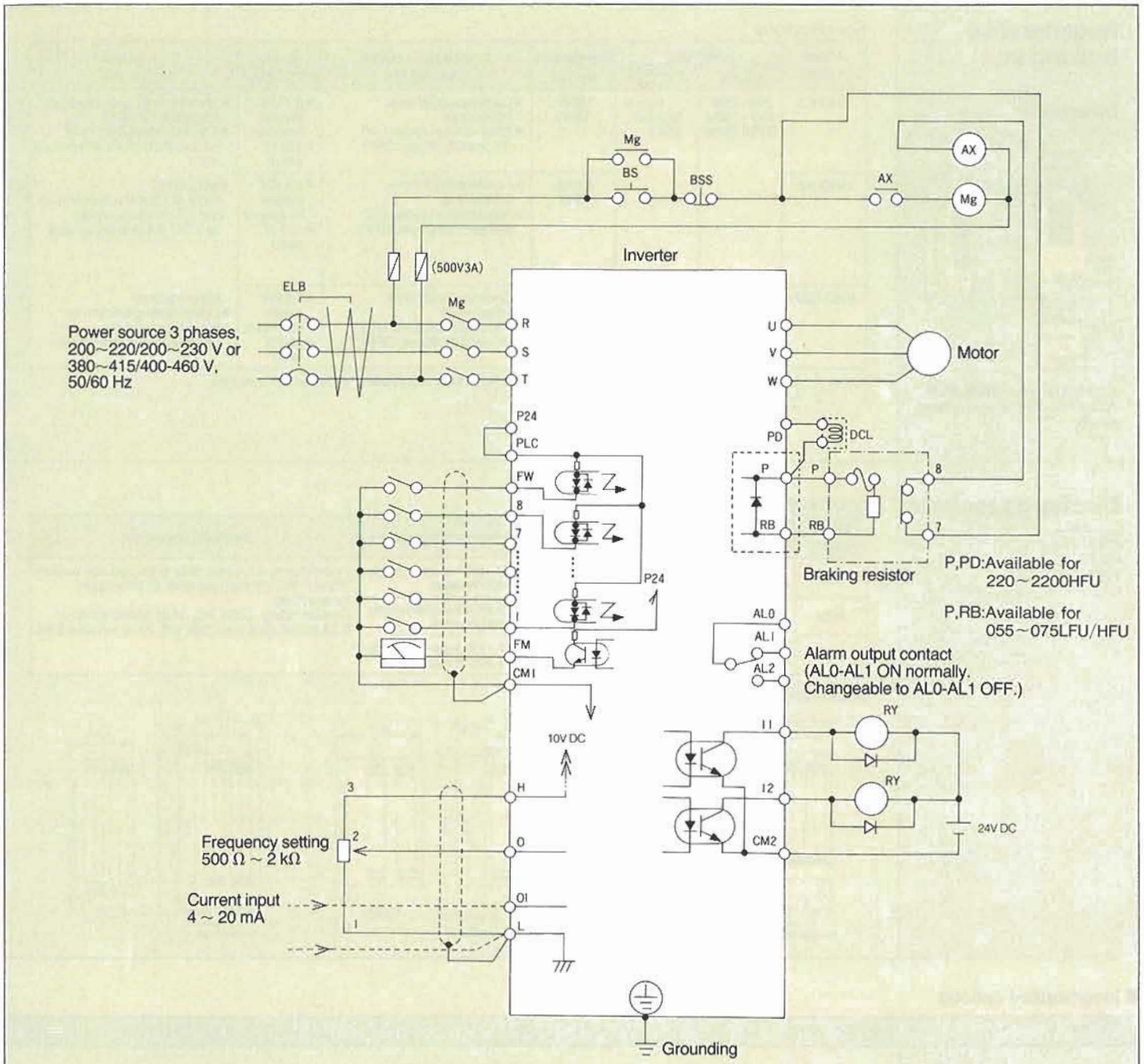
- Installing an application circuit board on the inverter upgrades its accuracy and performance, thereby easily adapting to a particular system.
- Up to 2 application circuit boards can be installed (except J-FB, J-CM).

Board name	Model	Use and purpose	Specification
Feedback board	J-FB	High accuracy run, easy orientation, easy positioning	Vector control with sensor (1024 pulse encoder input)
Communication board	J-CM	Computer link, network compatible	General purpose communication (RS485), etc.
Analog input/output board	J-AG	Analog command, analog feedback	Frequency command (±0~10V), analog monitor output (0~10V)
Digital interface board	J-DG	Interface with programmable controller or NC	Binary (8 bits), BCD, etc.
Relay output board	J-RY	Interface with external circuit	RUN signal and other relay output

* Other application circuit boards are available to match particular use or machine. For further details, contact us.

Connection diagrams

Terminal connections

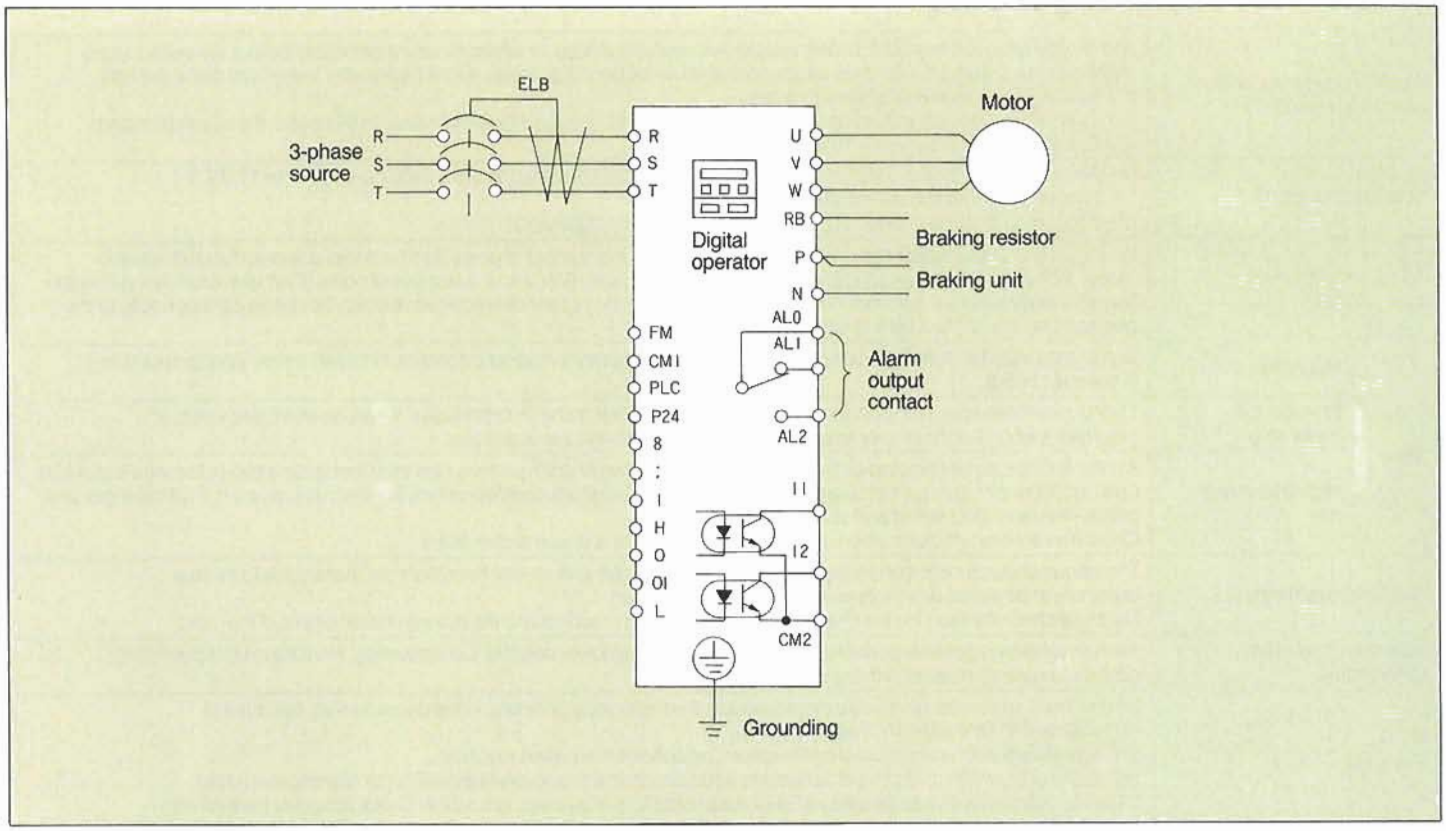


Notes
1. Common of each terminal is different.

Terminal name	FM, PLC, P24, FW, 8~1	H, O, OI	11, 12
Common	CM1	L	CM2

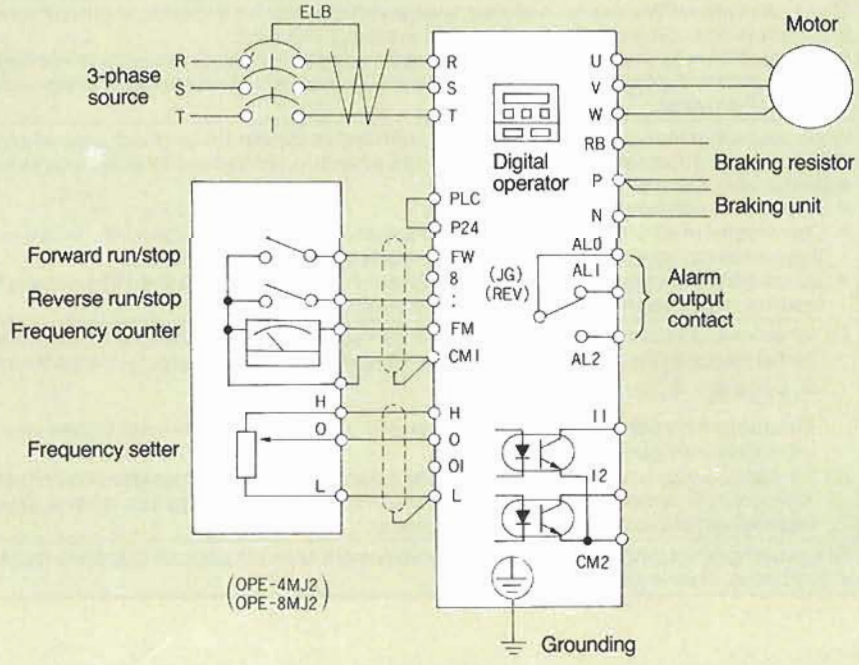
2. The braking resistor has a thermal sensor. If actuated, turn off the inverter or increase the decelerating time.
3. Delivering the run command first and then turning on the main circuit would cause direct start instead of soft start and might trip the circuit and disable rotation of the motor.
4. Do not deliver the run command concurrently with turning on the main circuit.

When operating digital operator (same applies with remote operator or copy unit)



For external command

When frequency and run/stop are external signal (FW, RV terminals). The following represents an operation on the operation panel (OPE-4MJ2, 8MJ2).



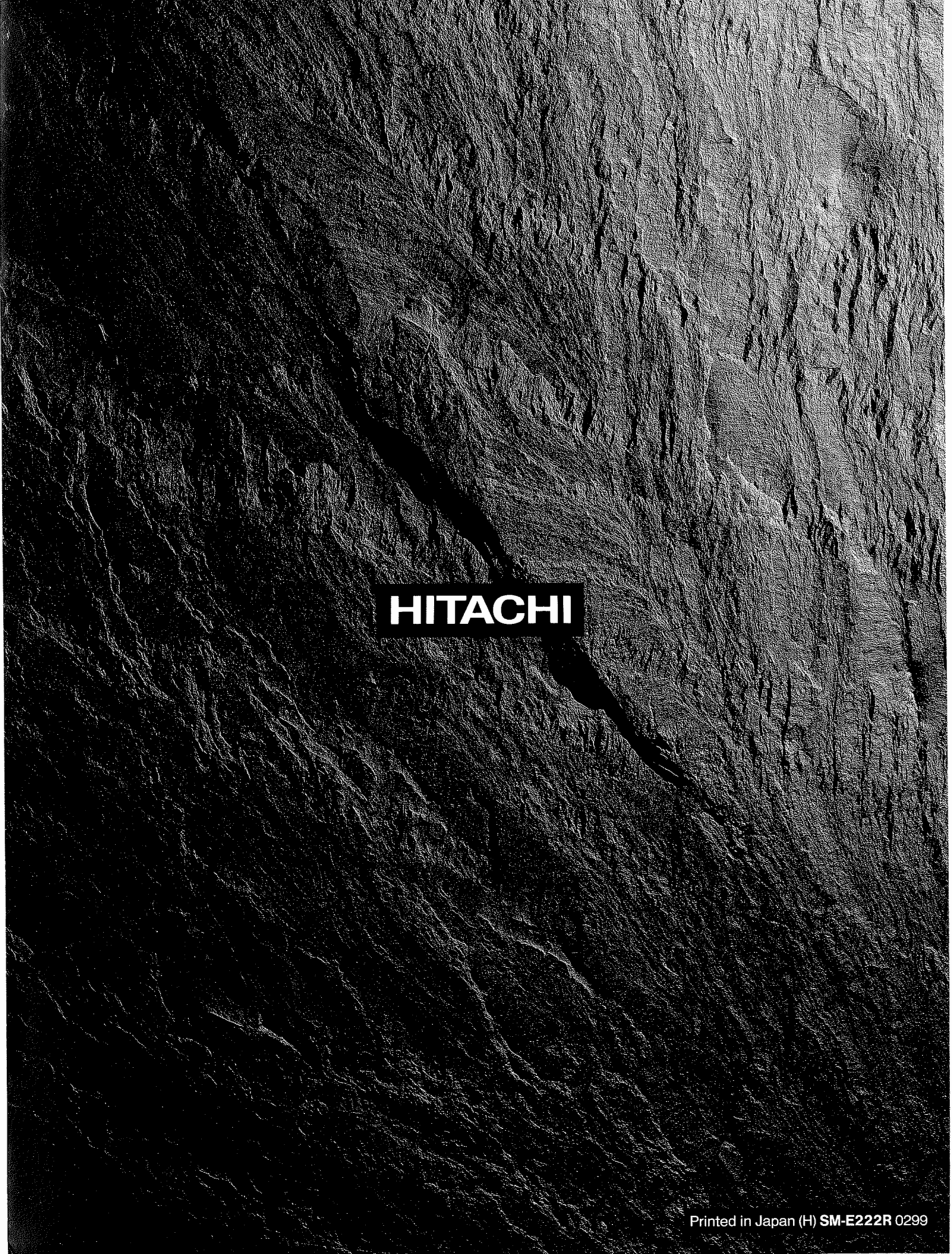
- Determine the frequency command method and run command method for each terminal (digital operator: F 9).

For correct operation

Precautious on planning and use

Installation location and operating environment		Avoid installation in areas of high temperature, excessive humidity, or where moisture can easily collect, as well as areas that are dusty, subject to corrosive gases, mist of liquid for grinding, or salt. Install the inverter away from direct sunlight in a well ventilated room that is free of vibration. To mount the inverter in a control panel, remove the terminal cover and the blind cover. In this case, the recommended ambient temperature range is −10 to 50°C (14 to 122°F).
Wiring connections		(1) Always connect power wires to R, S, T or L1, L2, L3 (input terminals), and the motor to U, V, W, or T1, T2, T3. (Incorrect connection can cause breakdowns) (2) Grounding must be connected to the grounding terminal (⏚mark).
Motor capacity and pole number		On J300 series, max. applicable motor capacity (kW) and the number of poles (four) is set as standard for each inverter model. When using other motors, always set the motor capacity (kW) and the number of poles (P) or use auto turning functio Be particularly careful it is sometimes impossible to achive the proper characteristics when the data is set incorrectly or the inverter is connected to 2 rank smaller capacity motor.
Drive	Run/stop	Run or stop must be done by a control circuit terminal, but not by a magnetic contactor located on the input/output side of the main circuit.
	Emergency motor stop	During protective operation and sudden power stops, the motor shaft rotates freely. When an emergency stop is required or when the motor should be kept stopped, use the mechanical brake.
	High-frequency run	A max. 400Hz can be selected on the J300 series by choosing the V/F pattern. However, because a two-pole motor can attain up to 24,000min^{-1} (rpm), which is extremely dangerous. Therefore, carefully check the mechanical strength of the motor and paired machines and select and set appropriately. Consult motor manufacturer when a general-purpose motor is driven at over 60Hz.
Torque characteristics		The torque characteristics of driving a general-purpose motor with an inverter differ from that of driving it with a commercial power source (note starting torque in particular). Carefully check the load torque characteristic of the paired machine and the driving characteristic of the motor.
Motor loss and rising temperature		An inverter-driven general-purpose motor heats up swiftly at lower speeds. Consequently, the torque level permitting continuous use decreases with lower motor speeds.
Vibration		When run by an inverter at variable motor speeds, the motor may generate vibration, especially because of (a) unbalance of the rotor and paired machine; or (b) sympathetic vibration caused by the natural resonance of a paired machine. Be careful of (b) when operating at variable speeds a machine previously fitted with a constant speed motor. Vibration can be minimized by using a tire-shaped coupling or by placing a rubber shock absorber beneath the motor base.
Power transmission mechanism		Under continued, low-speed operation, oil lubrication can deteriorate in the power transmission mechanism with an oil-type gear box (gear motor) or reducer. Check with the motor manufacturer for the permissible range of continuous revolutions. To operate at more than 60Hz, confirm the machine's ability to withstand the centrifugal force generated.
Wiring between inverter and motor		Install an electromagnetic contactor between the inverter and the motor to prevent on-off switching during operation. With a pole-change motor, always stop the motor before changing windings on the output side of the inverter. On a system where PWM inverter is applied, a surge voltage attributable to cable length (10m or more), cable placing procedure or other cable constants may appear on the motor terminal. Inserting LCR filter between the motor and the inverter, using the inverter driven motor or inserting output AC reactor between the motor and the inverter should be made particularly in the case high voltage class or long cable distance between the motor and the inverter.
Thermal relay		When used with standard applicable output motors (Hitachi's standard three-phase, squirrel-cage, four-pole motors), J300 series, which feature internal electronic thermal protection, do not need a thermal relay for motor protection. A thermal relay, however, should be used when: • Continuously operating at other than 10-60Hz. • Operating the motor in a range where the rated current exceeds the adjustable level of incorporated electronic thermal switch. If an inverter covers several motors, mount thermal relays on respective motors. • RC value of thermal relay must be 1.1 × rated current of motor. If the wiring is long (10m or more), the relay may trip prematurely. In such a case, insert ACL on the output side or use a current sensor.
Parallel operation		(1) When several motors run simultaneously from low frequency to gradually higher frequency, select an inverter so that the sum of the constant motor current (If) are less than the fixed output current of the inverter (I). $If_1 + If_2 + If_3 + \cdots\cdots < / = 1$ Ensure that the starting current is less than the overload capacity of the inverter. Consult your nearest Hitachi representative regarding sequential starts. (2) Sensorless vector control cannot be used. Use the standard starting torque selection (V/F setting). (3) When multiple motors are driven by V/F control and are interchanged in groups for drive, select the closest value of the total capacity of each group for the motor capacity.
Soft start and stop		When starting or stopping a load with a large inertia moment, short soft start/soft stop time may cause the inverter to trip. In such cases, make the start time longer.

Installing a magnetic circuit breaker	Install a magnetic circuit breaker on the power supply side to protect inverter wiring.
Wiring distance	The wiring distance between the inverter and the remote operator (OPE) should be less than 20 meters. To exceed this distance, use CVD-E or RCD-E. Shielding cable should be used on the wiring. Beware of voltage drops on main circuit wires.
Earth leakage relay	If the earth leakage relay (or earth leakage breaker) is used, it should have a sensitivity level of 15mA or more (per inverter).
Phase advance capacitor	Do not use a capacitor for power factor improvement between inverter and motor because the higher harmonics of the inverter output may overheat or damage the capacitor.
Using a private power generator	An inverter run by a private power generator may overheat or suffer a deformed output voltage waveform. Generally, generator capacity should be five times that of the inverter (kVA) in a PWM control system, or six times greater in a PAM control system.
Effects of distributor lines on inverters	In the cases below involving a general-purpose inverter, a large peak current flows on the power supply side, sometimes destroying the converter module. Where such situations are foreseen, or the paired equipment must be highly reliable, install an AC reactor between the power supply and the inverter. (A) The unbalance factor of the power supply is 3% or higher. (B) The power supply capacity is at least 10 times greater than the inverter capacity (and the power supply capacity, 500kVA or more). (C) Abrupt power supply changes are expected. Examples: (1) Several inverters are interconnected with a short bus. (2) A thyristor converter and an inverter are interconnected with a short bus. (3) An installed phase advance capacitor opens and closes. In cases (A), (B) or (C), we recommend installing an AC reactor of 3% (in a voltage drop at rated current) with respect to the supply voltage on the power supply side. Note: Unbalance factor of voltage $= 100 \times \frac{\text{max. deviation voltage}}{\text{mean voltage}}$ For example, where V_{RS} is: the voltage across wires RS V_{ST} is: the voltage across wires ST, and V_{TR} is: the voltage across wires TR, Let V_{RS} be 200, V_{ST} be 203; and V_{TR} be 195V Unbalance factor $= 100 \times \frac{8}{199} = 4.0\%$
Life time of smoothing capacitor	Capacitors deteriorate through their internal chemical reaction and must be replaced after about 5 years normally (provided the yearly average ambient temperature is 30°C and the operation is 12 hours a day). Their life would considerably shorten if the inverter is operated at high temperature or under heavy load.



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