

HITACHI INVERTER

HITACHI
Inspire the Next

SJ700N SERIES

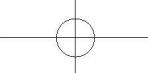
Easy control with powerful performance
Humanization design and environmental compatible

THE
NEW

Powerful Inverter



SJ700N

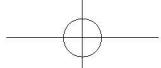


進化

Easy control!
Powerful performance!

- High Starting Torque
- Easy Operation
- Advanced Performance





【Powerful】

High Starting Torque

- High starting torque of 200% or more at 0.3HZ.
- Smooth operation with simple adjustment.

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【Saving】

Cost Effective

- Built-in EMC Filter up.
- Integrated brake unit.
- Saving installation space and total cost of the system.

【Easy】

Ten Years of Lifespan

Easier Maintenance

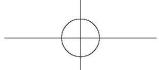
- High quality components with lifetime warning functions. The inverter can be easily maintained or replaced.

【Environmental】

- Varnish coating on internal PCB and nickel-plated treatment of the circuit copper bus-bar meet environmental standards.

Powerful Inverter SJ700N

2



EASY AND POWERFUL

Promoted Performance

applied for models lower than 132kW

1 PM motor control

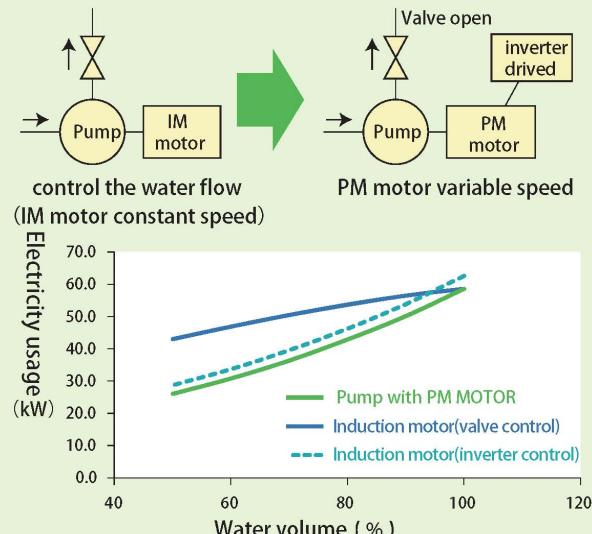
PM and IM motor compatible, which largely reduces the cost of stocks. Better energy saving performance when applied with synchronous motor.

Newly developed auto tuning function features more widely applications, which can easily detect the parameters of models from different brands.

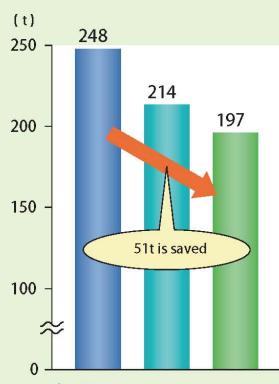


ENERGY SAVING BY USING PM MOTOR

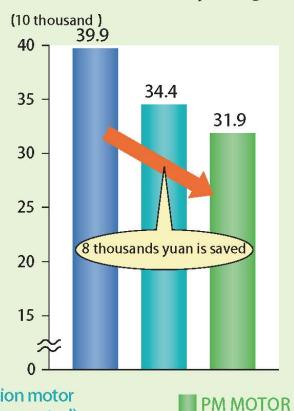
ENERGY SAVING of THE PUMP



Annual release of CO₂



Annual electricity usage

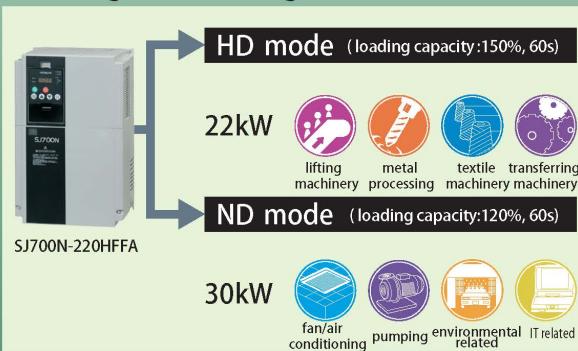


[Conditions]

- HOV centrifugal pump 55kW, high efficient PM motor and full closed external fan type IM motor.
- Annual operation time 8000 hours (100% flow,2000 hours, 70% flow,6000 hours)
- Electricity fee: 1yuan/kWh, CO₂ release volume: 0.53kg CO₂/kWh

2 Double rated

Heavy load and normal load compatible, which automatically choose the proper inverter according to the loading characteristics



3 RS485 (Modbus-RTU) communication speed is promoted by 6 times

- Communication speed maximum 115.2kbps
- EEPROM writing function is added
- Broadcasting function is added
- Command range is increased from 8 bytes to 32 bytes

4 EzSQ processing speed is promoted by 5 times

More quickly feedback to meet different applications

- Processing speed: 1 command/2ms → 5 commands/2ms
- EEPROM writing command, real-time clock command are added
- Data stored at power off

ENVIRONMENTAL FRIENDLY

5 LCD operator (optional)

- LCD screen which displays five lines of data
- Two kinds of background color which exchanges according to the state of the inverter
- 4 groups of user data can be stored(or 1 group of parameter + EzSQ program)
- Internal real time clock
- 10 kinds of languages



6 More functions are added

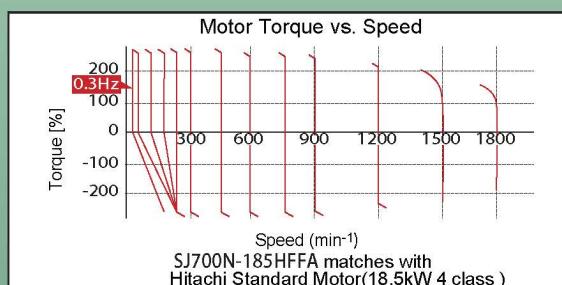
- Output phase loss detection
- Initial screen selection
- Automatically back to the Initial screen
- Data written selection
- Operating mode monitoring
- Increased methods for initiation

Powerful Operation

Starting Torque of 200% or More at 0.3Hz

Hitachi specialized technology of Sensorless Vector Control and Auto Tuning contributes to a high starting torque of 200% or more at 0.3Hz.

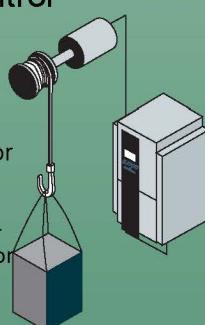
- Much easier to set up the parameters
- Widely used in cranes, lifts, extruders and ect which need high torque to start at low speed



Hitachi Exclusive 0Hz Domain Sensorless Vector Control

The exclusive 0Hz domain sensorless vector control technology makes it possible to develop 150% torque at 0Hz speed reference, which is ideal for lifts that require high torque to start.

* Under the condition that the inverter is one frame size larger than the motor



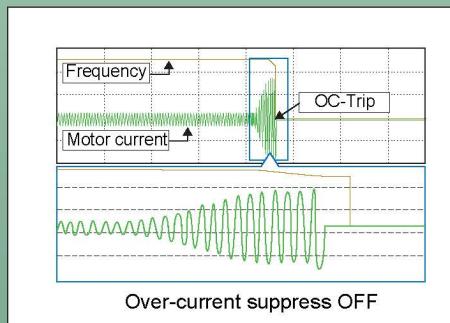
Trip Suppression

Over Current&Voltage Suppress Function

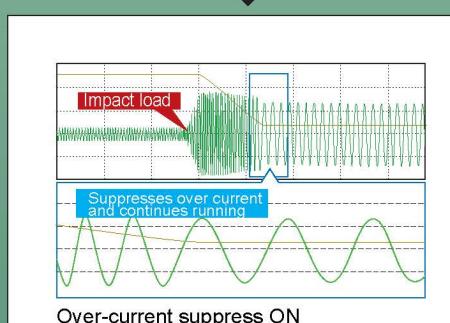
Higher internal calculation speed* improves current control performance. Over-current and over-voltage suppress functions avoid inverter trip during acceleration and deceleration.

Even at sudden acceleration or with impact load, the inverter keeps operating and reduces trip times.

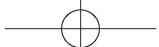
*Three times faster than previous models



Over-current suppress OFF



Over-current suppress ON

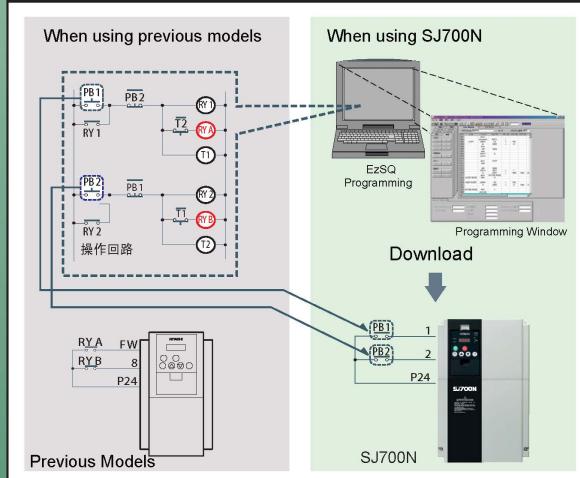


Programming Function 【EzSQ】

Inverter Control by Built-in Programming Function

EzSQ operation allows users to develop certain functions which previous models don't have. And significant cost will be saved by simplifying and eliminating external hardware. The password protection is incorporated to prevent proprietary program data from loss or unauthorized modification.

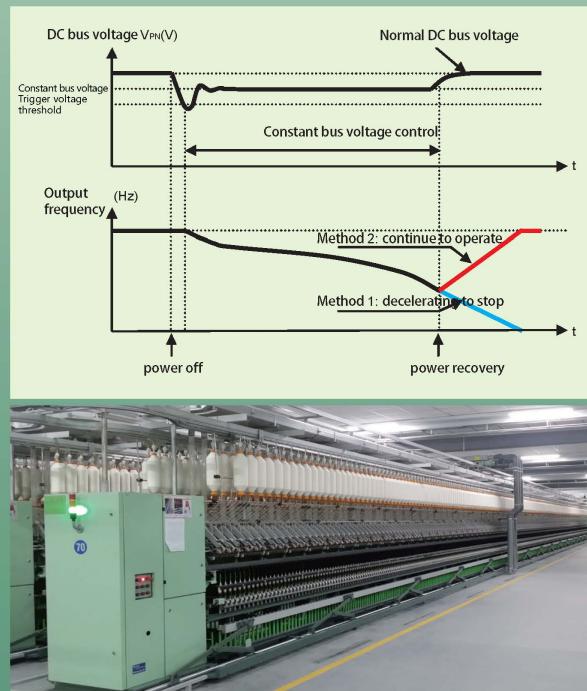
Examples of Application - Relay Unit Control Sequence
The inverter is controlled by EzSQ programming instead of by external relay unit



Decelerating Stops at Power off

Decelerating to stop at power off and restoring to operate during power recovery

The inverter will decelerate until stop by keep the voltage of the main circuit DC section at a constant value when external power supply is turned off. This function is ideal for textile and rolling machinery which have a strict requirement for constant pulling force.

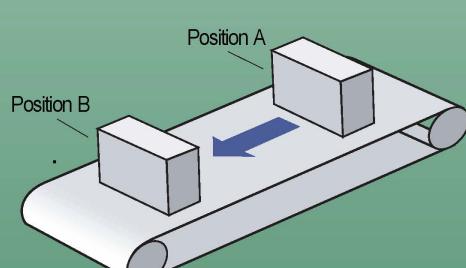


Position Control

Absolute Position Control Function

The SJ700N, with optional feedback board of SJ-FB installed, together with a general purpose motor can perform position control. For application such as position control of conveyor, performance can be achieved at a lower cost. Based on the four motion parameters (position command, speed command, acceleration time and deceleration time), the SJ700N will move an object from original position A to target position B.

After the movement, the inverter keeps servo lock status.



Rich Kinds of Components

EMC Filter Integrated to Reduce Noise

EMC filter and 0 phase reactor are applied which effectively reduced the radiation noise. The inverter meets the EN61800-3 2nd-Environment

The leakage current will be increased with the EMC filter on, so please use proper sensitivity current for residual current circuit breaker

Leakage Current of EMC Filter(EMC Filter ON/OFF)

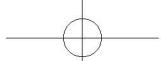
Value of 3 phase Δ connection and 1 phase ground connection
Input power supplier(400v class: 480v/60Hz)

	400V class	
	18.5~37kW	45~55kW
EMC filter on	56mA	56mA
EMC filter off	0.2mA	0.2mA

The leakage current of EMC on 75~132kW models is very low, so there is no switch on and off.
(Leakage current: 0.2mA)

BRD Circuit

Inserted BRD is extended to be applied in 22kW models, which is more cost and space reduction compared with external braking controller.



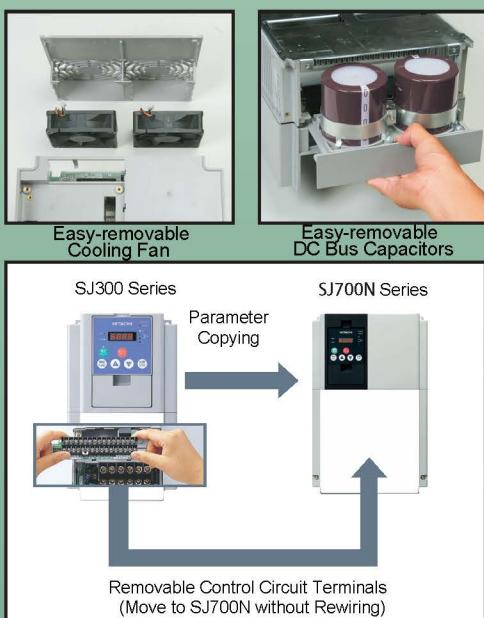
Easy Maintenance

Easy-removable Construction for Maintenance

Endured parts like cooling fans and DC bus capacitors can be quickly replaced on site, which greatly reduces the maintenance time.

Like SJ300 series, the control circuit terminals can be taken off and replaced easily without wiring change.

The parameter of SJ300 can be read and then copied into SJ700N, which greatly saves the operating time.



Durable Components with Longer Lifespan

Components with Long Lifespan

SJ700N is composed of endured components with designed lifespan of 10 years*. Besides, it features cooling fans with ON/OFF switch, which largely extends the inverters lifespan.

* Under average annual temperature of 40°C (at atmosphere of oil free, dust free, mist free and corrosive gases free). The designed lifetime is estimated but not guaranteed.

Lifetime Warning Function

SJ700N sends predictive warnings when the temperature of DC bus capacitor goes up or the cooling fans get aged. It monitors the motor's temperature and alarms to avoid an inverter trip caused by aged components.

Easy Operation

User Selection of Displayed Parameters

Data Comparison Function

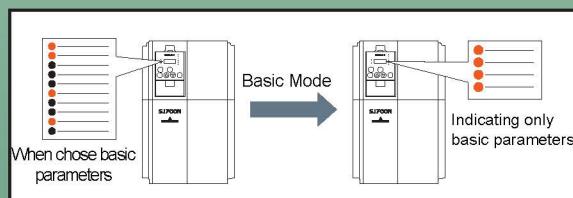
- Allows display of parameters changed from default. Quickly check the correction of parameters and eliminate errors.

User Selection Function

- The display of operator panel can be controlled. Up to 12 user defined parameters U001~U012 can be displayed.

Basic Mode (Default)

- Basic display mode for commonly used parameters.



※ Please refer to page 13 for available parameters for basic mode.

Other Functions

- The direct input of function code is possible rather than scrolling through the list.
- Holding down the function key for 3 seconds, users can change the display to output frequency monitor (d001) mode from any menu location.

Network Compatibility

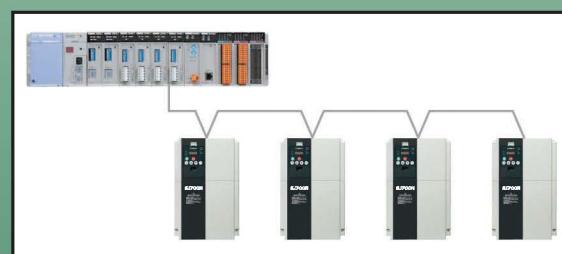
Improving Network Connection

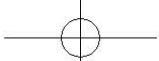
SJ700N is incorporated with Standard RS-485 Modbus-port. It can be connected to open network by optional board such as DeviceNet, PROFIBUS-DP,CC-LINK and so on.

* DeviceNet is the registered trademark of Open DeviceNet Vender Association, Inc

* PROFIBUS-DP is the registered trademark of PROFIBUS Nutzer

* CC-LINK is the trademark of CLPA





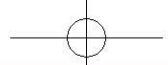
Standard Specifications

● 3 phase 400V class model (ambient temperature 50°C)

Model(SJ700N- □□□□ HFFA)		185	220	300	370	450	550	750	900	1100	1320								
Protective structure		IP20						IP00											
Max. applicable motor capability (4P, kW (HP))	ND	22	30	37	45	55	75	90	110	132	160								
	HD	18.5	22	30	37	45	55	75	90	110	132								
Rated output	400V	ND	29.7	39.4	48.4	58.8	72.7	93.5	110.8	135	159.3								
		HD	26.3	33.2	40.1	51.9	62.3	76.2	103.2	121.9	150.3								
	480V	ND	35.7	47.3	58.1	70.6	87.2	112.2	133	162.1	191.2								
		HD	31.5	39.9	48.2	62.3	74.8	91.4	123.8	146.3	180.4								
Rated output current(V)	Rated output current(V)	ND	43	57	70	85	105	135	160	195	230								
		HD	38	48	58	75	91	112	149	176	217								
	Loading capacity	ND	120%/60s, 150%/5s					120%/60s, 150%/5s											
Rated input	Rated output voltage		150%/60s, 200%/3s																
	Rated input voltage		3 phase (3 wire) 380~480 V (corresponding to the input voltage)																
	SLV	ND	150% @ 0.5Hz					120% @ 0.5Hz											
Starting torque	0-SLV	HD	200% @ 0.3Hz					180% @ 0.3Hz											
		ND	-					-											
	PM-SLV(*1)	ND	150% @ 0Hz (connecting to lower capacity motors)					130% @ 0Hz (connecting to lower capacity motors)											
RS485 communication speed		50% @ rated rotational speed 10%																	
Carrier frequency range		ND	maximum 115.2kbps					0.5~8kHz											
Braking	Braking unit		Internal BRD circuit (no braking resistor)		optional														
	Value of minimum connectable resistance (Ω)		24	20	-														
Vibration		5.9m/s ² (0.6G), 10 ~ 55Hz		2.94m/s ² (0.3G), 10 ~ 55Hz															
EMC filter		internal																	
0 phase reactor		internal																	
DC reactor		-																	
Ambient temperature		optional (external)																	
Weight (Kg)		14	14	22	30	30	30	55	55	70	70								

(*1): PM motor is corresponded with specially designed models

Model(SJ700N- □□□□ HFA)		1600	1850	2200	2600	3150		
Protective structure		IP00						
Application(4P, kW (HP))	HD	160	185	220	260	315		
Rated capacity	400V	218	256	304	332	416		
	480V	262	308	365	398	499		
Rated output current	HD	304	370	440	480	600		
Loading capacity	HD	150%/60s, 200%/3s						
Rated output voltage	150%/60s, 180%/0.5s							
Rated input	Rated input voltage		3 phase(3 wire) 380 ~ 480V (corresponding to the input voltage)					
Starting torque	SLV	HD	180% @ 0.3Hz	150% @ 0.3Hz				
	0-SLV	HD	130% @ 0Hz	100% @ 0Hz (connected to lower capacity motor)				
RS485 communication speed		Maximum 19.2kbps						
Carrier frequency range		HD	0.5~3kHz					
Braking	Braking unit		Optional					
	Value of minimum connectable resistance (Ω)		-					
Vibration		1.96m/s ² (0.2G), 10 ~ 55Hz						
EMC filter		-						
0 phase reactor		-						
DC reactor		Optional (external)						
Ambient temperature		-10°C ~ 50°C (derating according to the carrier frequency)						
Weight(Kg)		72	140	145	160	210		



● Model Name Indication

SJ700N - 185 H F F A

Series
Applicable Motor Capacity
185 : 18.5kW
3150 : 315kW

Input Power Source
3 phase 400Vclass

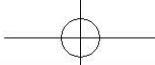
LED Digital Operator

Temperature
A : max50°C

EMC filter
F: internal
Delete: no

Product specification

Motor(kW) 3 phase AC 380V,4P	ND mode		HD mode	
	Model	Rated output current	Model	Rated output current
18.5			SJ700N-185HFFA	38A
22	SJ700N-185HFFA	43A	SJ700N-220HFFA	48A
30	SJ700N-220HFFA	57A	SJ700N-300HFFA	58A
37	SJ700N-300HFFA	70A	SJ700N-370HFFA	75A
45	SJ700N-370HFFA	85A	SJ700N-450HFFA	91A
55	SJ700N-450HFFA	105A	SJ700N-550HFFA	112A
75	SJ700N-550HFFA	135A	SJ700N-750HFFA	149A
90	SJ700N-750HFFA	160A	SJ700N-900HFFA	176A
110	SJ700N-900HFFA	195A	SJ700N-1100HFFA	217A
132	SJ700N-1100HFFA	230A	SJ700N-1320HFFA	260A
160	SJ700N-1320HFFA	290A	SJ700N-1600HFA	304A
185			SJ700N-1850HFA	370A
220			SJ700N-2200HFA	440A
260			SJ700N-2600HFA	480A
315			SJ700N-3150HFA	600A
Overload capacity	120%/60s		150%/60s	
Application	fan,pump,aircondition,conveyer		rolling,lifting,compressor,metal machinery,punching, textile, construction machinery, wood working machinery	
Ambient temperature	-10°C~50°C(derating according to carrier frequency)			



Powerful Inverter SJ700N

● General specifications

Item		Specifications
Control	Control mode	Sine-wave PWM control
	Output freq range(note1)	0.1~400.0Hz
	Frequency accuracy	Digital command: maximum frequency $\pm 0.01\%$ Analog command : $\pm 0.2\%(25 \pm 10^\circ C)$
	Frequency resolution	Digital setting: 0.01Hz Analog setting: max freq /4000(O terminal: 12 bits/0~+10V , O2 terminal: 12 bits-10~+10V)
	Voltage/frequency characteristics	V/f characteristic variable with the base frequency set between 30 to 400Hz, constant- or reduced-torque V/f control, sensorless vector control, 0Hz-range sensorless vector control, vector control(use option SJ-FB).
	Rotational speed variation	$\pm 0.5\%$ (sensorless vector control)
	Acc/dec time	0.01~3600sec(in liner or curved pattern) (S, U,reverse -U, EL-S))
	DC braking	Triggered at motor start-up when the motor freq exceeds the freq set by inverter command or by an externally input command
	Standard operator	Setting with Δ / ∇ keys
	External signal (note 4)	O input : DC0~+10V (input impedance 10k Ω) O2 input : DC-10~+10V (input impedance 10k Ω) OI input : 4~20mA (input impedance 100 Ω) Pulse string : 0.1~50.0kHz (5V wire input : SJ-FB is needed)
Frequency setting command	External port	Setting via RS485 communication(Hitachi protocol/Modbus-RTU optional)
	Standard operator	Input via RUN/STOP key(forward and reverse command switch)
	External signal	Forward/reverse 1a/1b switchable, 3 wire input, servo ON signal, pre excitation signal(SLV, 0HzSLV,V2 mode enabled)
	External port	Setting via RS485 communication(Hitachi protocol/ Modbus-RTU optional)
	Terminals	8 open collector terminals, 24V connector
	Function	01(RV: reverse),02(CF1: multispeed 1 setting),03(CF2: multispeed 2 setting),04(CF3: multispeed 3 setting), 05(CF4: multispeed 4 setting), 06(JG: jogging),07(DB: external DC braking),08(SET: second motor control), 09(2CH: 2-stage acc/dec), 11(FRS: free run stop), 12(EXT: external trip), 13(USP: unattended start protection), 14(CS: commercial power supply switch), 15(SFT: software lock), 16(AT: analog input switch), 17(SET3: third motor control), 18(RS: reset), 20(STA: starting by 3 wire input), 21(STP: stopping by 3 wire input), 22(F/R: forward/reverse switching by 3-wire input), 23(PID: PID enable/disable), 24(PIDC: PID integration reset), 26(CAS: cont rol gain switching), 27(UP: acc by remote control), 28(DWN: dec by remote control), 29(UDC: date clearance by remote control), 31(OPE: forcible operation), 32(SF1: multispeed bit 1), 33(SF2: multispeed bit 2), 34(multispeed bit 3), 35(multispeed bit 4), 36(multispeed bit 5), 37(SF6: multispeed bit 6), 38(multispeed bit 7), 39(OLR: overload restriction selection), 40(TL: torque restriction enabled/disabled), 41(TRQ1: torque limit 1), 42(TRQ2: torque limit 2), 43(PPI: PPI switch), 44(BOK: braking confirmation), 45(ORT: orientation), 46(LAC: LAD cancellation), 47(PCLR: clearance of position deviation), 48(STAT: pulse train input permission), 50(ADD: trigger for frequency addition [A145]), 51(F-TM: forcible-terminal operation), 52(ATR: permission of torque command input), 53(KHC: cumulative power clearance), 54(SON:servo-on), 55(FOC: pre-excitation), 56(MI1: general-purpose input 1), 57(MI2: general-purpose input 2), 58(MI3: general-purpose input 3), 59(MI4: general-purpose input 4), 60(MI5: general-purpose input 5), 61(MI6: general-purpose input 6), 62(MI7: general-purpose input 7), 63(MI8: general-purpose input 8), 64(EMC: emergency stop signal), 65(AHD: analog command holding), 66(CP1: multistage position settings selection 1), 67(CP2: multistage position settings selection 2), 68(CP3: multistage position settings selection 3), 69(ORL:Zero-return limit function), 70(ORG: Zero-return trigger function), 71(FOT: forward drive stop), 72(ROT: reverse drive stop), 73(SPD: speed / position switching), 74(PCNT: pulse counter), 75(PCC: pulse counter clear), no (NO: no assignment)
	Thermistor input terminal	1 terminal(positive temperature coefficient/negative temperature coefficient switchable for resistor)
	Emergency stop input terminal	Not forcibly cut the output via CPU
Input signal	Terminals	5 open collector terminals (24Vdc 50mA max) 1 relay(1C contact) terminal
	Function	00(RUN:Running),01(FA1:constant-speed reached),02(FA2: set frequency overreached),03(OL:overload notice advance signal),04(OD:output deviation for PID),05(AL:alarm signal),06(FA3: set frequency reached),07(OTQ:over-torque),08(IP:instantaneous power failure),09(UV:under voltage),10(TRQ:torque limited),11(RNT:Operation time over),12(ONT: plug-in time over),13(THM:thermal alarm signal),19(BRK:brake release),20(BER:Braking error),21(ZS:0Hz detection signal),22(DSE:speed deviation maximum), 23(POK:positioning completed), 24(FA4: Set frequency overreached 2), 25(FA5: set frequency reached 2), 26(OL2:overload notice advance signal 2),27(ODC:analog O disconnection detection), 28(OIDC: analog OI disconnection detection),29(O2DC: analog O2 disconnection detection),31(FB-V:PID feedback comparison), 32(NDc:communication disconnection detection),33(LOG1:logical operation result 1), 34(LOG2: logical operation result 2), 35(LOG3:logical operation result 3), 36(LOG4: logical operation result 4), 37(LOG5:logical operation result 5), 38(LOG6:logical operation result 6), 39(WAC:capacitor life warning),40(WAF:cooling-fan speed drop),41(FR:starting contact signal),42(OHF:heat sink overheat warning),43(MO1: general output 1), 44(MO2: general output 2), 45(MO3: general output 3),46(MO4: general output 4),47(MO5: general output 5),48(MO6: general output 8),49((LOC:low-current indication signal), 55(WCO1:window comparison function OI),56(WCO2>window comparison function O2)
	Intelligent input	When specify alarm mode by C062, intelligent output terminal 11-13 or 11-14 will be forcibly assigned to AC0-AC2 or AC0-AC3(AVn: alarm code output)
Output signal	Other Function	AM terminal(0~10Vdc:output resolution 10 bits)AMI terminal(4~20mA: output resolution 10 bits)FM terminal(pulse train output), output frequency, output current, output torque, output voltage, input voltage, thermal load ratio, LAD frequency, digital output frequency: only FM, motor moisture, heat temperature, digital output current: only FM, output torque with symbol: only AM
	Monitoring output	Output frequency ,output current, output voltage, out torque, ID feedback, operation direction, intelligent input status, intelligent output terminal status, input voltage, accumulative RUN time, accumulative power ON time, trip display, alarm display, motor moisture, heat temperature, program counter, accumulative voltage, active rotation number, actual frequency, torque command, torque bias, life diagnose, program code, position command, current position, DC bus voltage, BED load ratio, thermal load ratio
	Operator monitoring display	V/f free setting (7breakpoints), frequency upper/lower limit, jump center frequency, manual torque boost level/breakpoint, auto torque boost level, energy saving operation, analog meter adjustment, gain adjustment, acceleration/deceleration according to characteristic curve, overcurrent suppress, thermal protection free setting, external start/end(frequency/rate), restart after instantaneous power failure, restart at instantaneous current input, PID control function, analog input operation, automatically deceleration at power off, overvoltage suppression at deceleration, auto tuning function (online , offline, for 10 P motor), EzSQ programming.
Function		Overcurrent, overload, BRD overload, overvoltage, EEPROM error, undervoltage, CT error, CPU error, external trip, USP, grounding error, overvoltage input, instantaneous power failure, temperature error, gate array communication error, input phase absent, IGBT error, thermistor resistor error, emergency power off, low speed overload, program operation error, program operation command error, program runs nested error
Ambient environment	Storage temperature / humidity(note2)	-20~65°C (short time for transport/20~90%RH(no condensation allowed)
Application	Altitude under 1,000m, indoor (environment without corrosive gases and dust) (Note 5)	
Option	Internal option	Feedback board(vector control with sensor), digital input board(4 bits BCD, 16 bits binary) DeviceNet PANEL, LonWorks panel, PROFIBUS panel
	Others	Braking resistor, AC reactor, DC reactor, noise filter, operator cables, harmonic-wave suppressor unit ,LCR filter, analog operation panel, controllers for applications regenerative braking unit, controllers for various applications

Note1:When the motor is operating at frequency over 50/60Hz, please pre-acknowledge maximum allowable rotation number of the inverter.

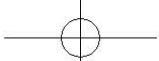
Note2:The storage temperature refers to the temperature during transport.

Note3:The insulation distance is in line with CE standard

Note4: The frequency command will equal the maximum frequency at 9.8V for input voltage DC0~10V,or at 19.6mA for input current 4~20mA.If this characteristic is not satisfactory for your application,contact your sales representative.

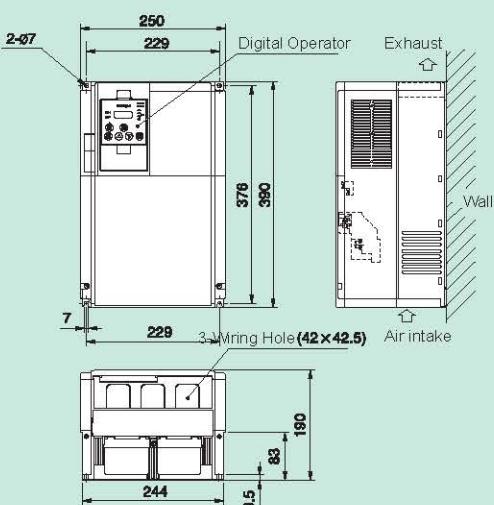
Note5: The density of air decreases by 1% whenever rising by 100m when the altitude exceeds 1000m,

Please inquire about using in the high ground of 2500m or more.

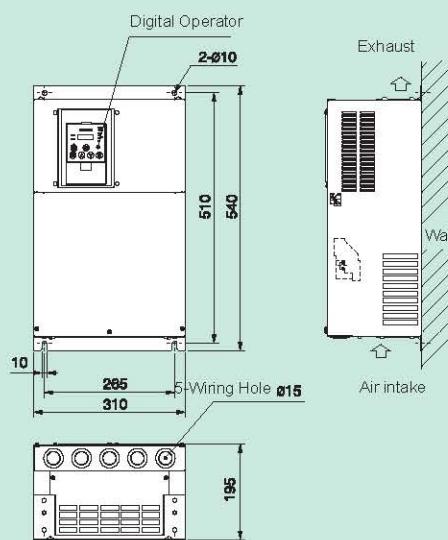


Dimensions

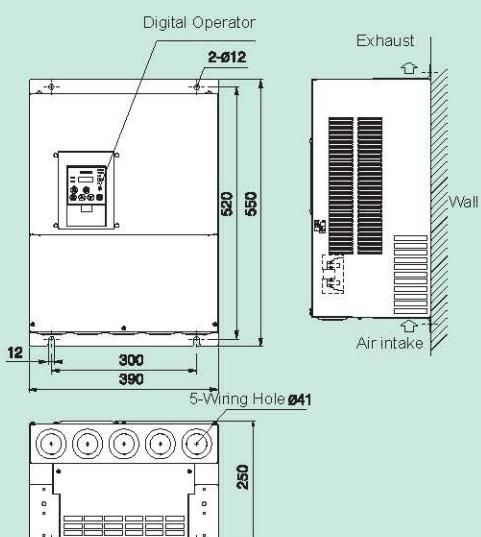
• SJ700N-185, 220HFFA



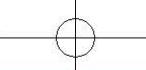
• SJ700N-300HFFA



• SJ700N-370, 450, 550HFFA

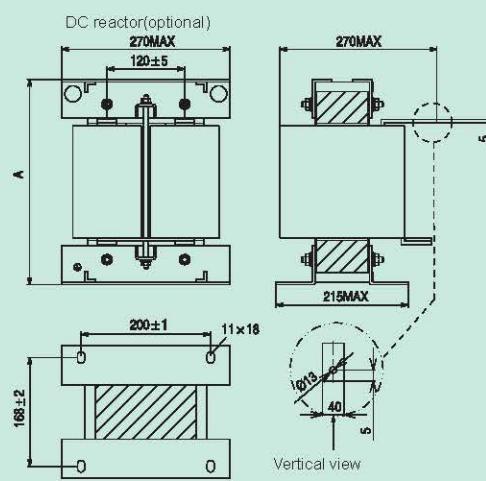
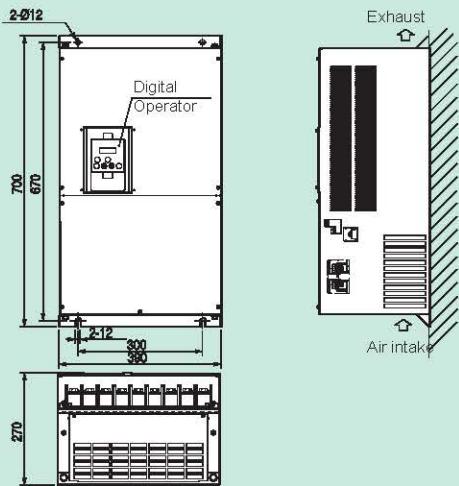


[Unit : mm]



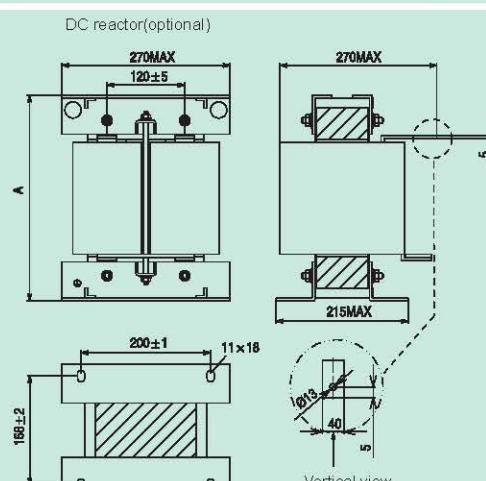
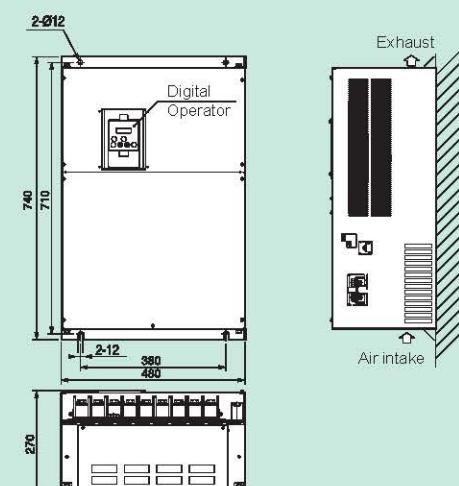
Powerful Inverter SJ700N

• SJ700N-750, 900HFFA



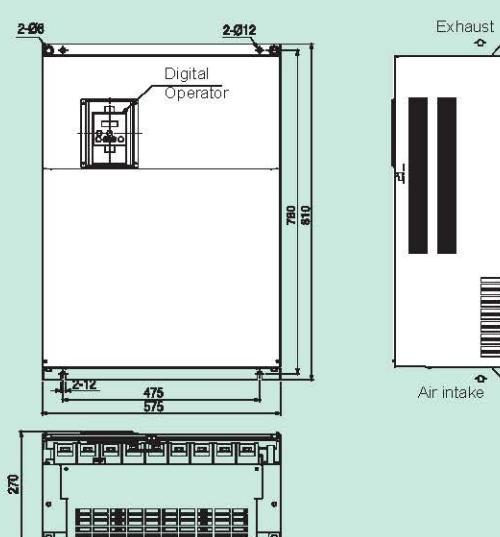
Model	Dimension(mm)		Applicable Capacity(kw)
	Amax		
DCL-H-75-H	310		75
DCL-H-90-H	340		90

• SJ700N-1100, 1320HFFA

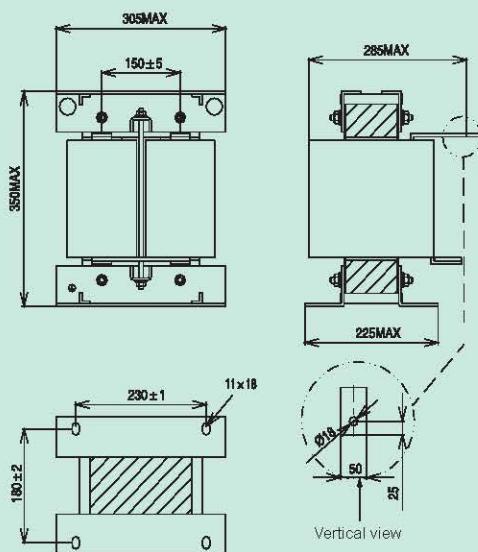


	Amax		
DCL-H-110-H	370		110
DCL-H-132-H	400		132

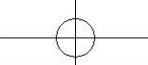
• SJ700N-1600HFA



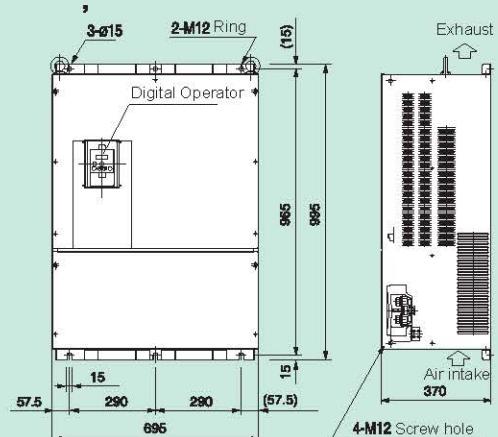
DC reactor(optional) : DCL-H-160-H



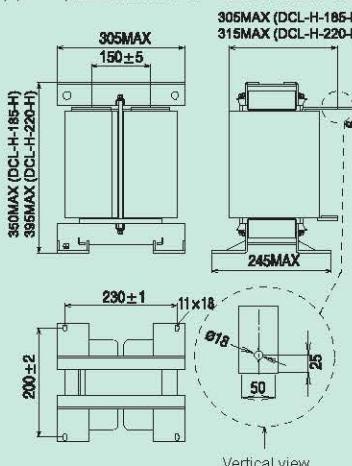
[Unit : mm]



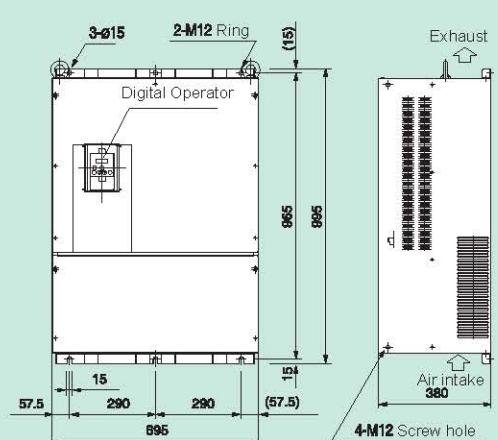
• SJ700N-1850, 2200HFA



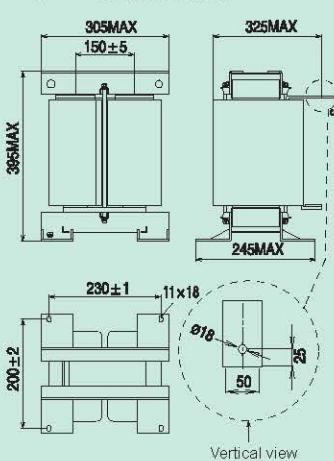
DC reactor(optional) : DCL-H-185-H DCL-H-220-H



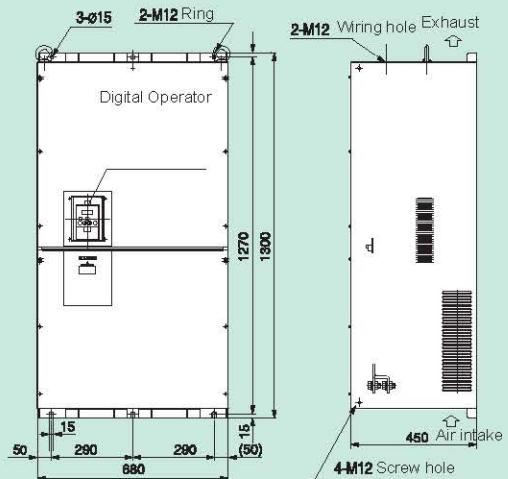
SJ700N-2600HFA



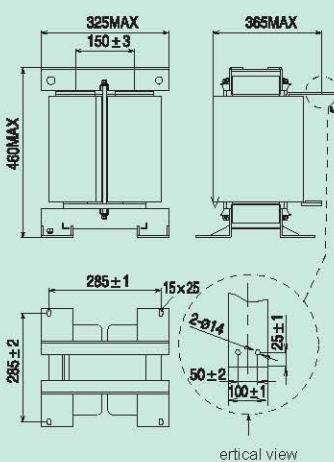
DC reactor(optional) : DCL-H-260-H



• SJ700N-3150HFA



DC reactor(optional) : DCL-H-315-H



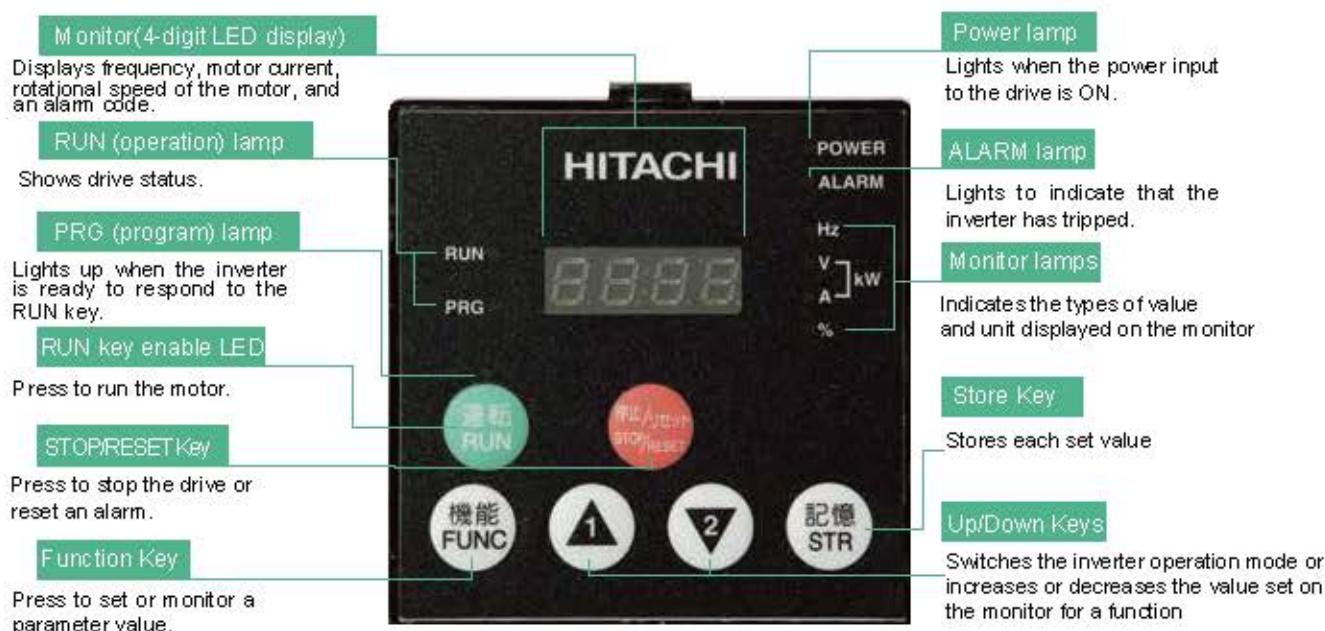
[Unit : mm]



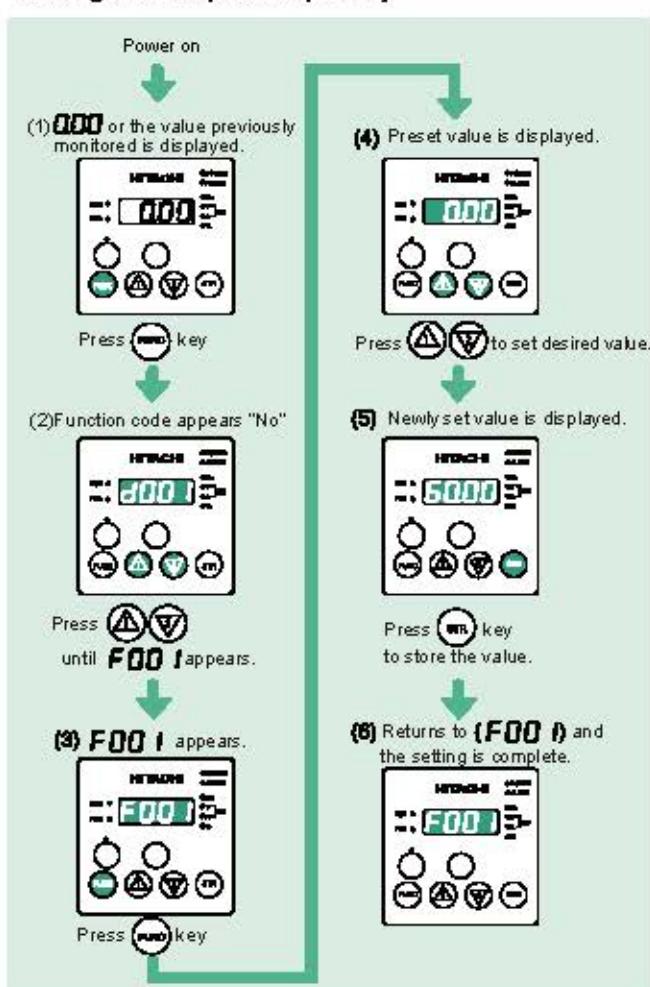
Operation

SJ700N Series can be easily operated with the digital operator provided as standard. It can also be operated by a LCD operator WOP (optional) with remote control function and copy function.

• Instructions

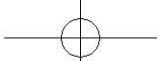


Setting the output frequency



● The default setting is basic display for 160~315kW models
To display all parameters, specify "00" for "b037"

No.	Display Code	Items
1	d001~104	Monitor display
2	F001	Output frequency setting
3	F002	Acceleration (1) time setting
4	F003	Deceleration (1) time setting
5	F004	Operation direction setting
6	A001	Frequency source setting
7	A002	Run command source setting
8	A003	Base frequency setting
9	A004	Maximum frequency setting
10	A005	[AT] selection
11	A020	Multi-speed frequency setting
12	A021	Multi-speed 1 setting
13	A022	Multi-speed 2 setting
14	A023	Multi-speed 3 setting
15	A044	1st control method
16	A045	Vf gain setting
17	A085	Operation mode selection
18	b001	Selection of restart mode
19	b002	Allowable under-voltage power failure time
20	b008	Selection of retry after tripping
21	b011	Retry wait time after trip
22	b037	Function code display restriction
23	b083	Carrier frequency setting
24	b084	Initialization mode selection
25	b130	Ovenvoltage suppression function enabled
26	b131	Ovenvoltage suppression level
27	C021	Setting of intelligent output terminal 11
28	C022	Setting of intelligent output terminal 12
29	C036	Alarm relay active state



Function List

The operator displays the content of d001. If you want to display other parameters under default set, please change the setting of b038.
To enable the parameters to be changed while the inverter is operating, specify "10" for the software lock mode selection (b031).
The grey parts displays the default values of 160~350kW models under basic mode. To enable the display of all parameter, specify "00" full display for the function code display restriction (b037).

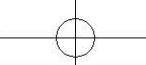
● Monitoring Mode

Code	Function name	Monitored data or setting	Default	Setting during operation (allowed or not)	Change during operation (allowed or not)
Monitoring	d001	Output frequency monitoring 0.00~99.99/100.0~400.0 (Hz)	-	<input checked="" type="radio"/>	(*1)
	d002	Output current monitoring 0.0~999.9/1000~9999(A)	-	-	-
	d003	Rotation direction monitoring F (forward rotation)/ o (stopped)/ r (reverse rotation)	-	-	-
	d004	Process variable (PV), PID feedback monitoring 0.00~99.99/100.0~999.9/1000~9999, 1000~9999(10000~99990)/100~1999(10000~99900)	-	-	-
	d005	Intelligent input terminal status 	-	-	-
	d006	Intelligent output terminal status 	-	-	-
	d007	Scaled output frequency monitoring 0.00~99.99/100.0~999.9/1000~9999/1000~3996(10000~39960)	-	<input checked="" type="radio"/>	(*2)
	d008	Actual-frequency monitoring -400.~~-100.~/-99.9~0.00~99.99/100.0~400.0(Hz)	-	-	-
	d009	Torque command monitoring 18.5~160kW: -200.~+200.(%) / 185~315kW: 0.~+200.(%)	-	-	-
	d010	Torque bias monitoring -200.~+200.(%)	-	-	-
	d012	Torque monitoring -200.~+200.(%)	-	-	-
	d013	Output voltage monitoring 0.0~600.0(V)	-	-	-
	d014	Power monitoring 0.0~999.9(kW)	-	-	-
	d015	Cumulative power monitoring 0.0~999.9/1000~9999./1000~9999(10000~99990)/ 100~999(100000~99900)	-	-	-
	d016	Cumulative operation RUN time monitoring 0.~9999/1000 ~ 9999(10000 ~ 99990)/ 100~999(100000~99900)(hr)	-	-	-
	d017	Cumulative power-on time monitoring 0.~9999/1000~9999(10000~99990)/ 100~999(100000~99900)(hr)	-	-	-
	d018	Heatsink temperature monitoring -20.~200.0(°C)	-	-	-
	d019	Motortemperature monitoring -20.~200.0(°C)	-	-	-
	d022	Life-check monitoring 	-	-	-
	d023	Program counter 0~1023	-	-	-
	d024	Program number monitoring 0000~9999	-	-	-
	d025	User monitor 0 -2147483647~2147483647 (upper 4 digits including "-"))	-	-	-
	d026	User monitor 1 -2147483647~2147483647 (upper 4 digits including "-"))	-	-	-
	d027	User monitor 2 -2147483647~2147483647 (upper 4 digits including "-"))	-	-	-
	d028	Pulse counter 0~2147483647(upper 4 digits)	-	-	-
	d029	Position setting monitor -1073741823~1073741823 (upper 4 digits including "-"))	-	-	-
	d030	Position feedback monitor -1073741823~1073741823 (upper 4 digits including "-"))	-	-	-
	d031(*3)	Time lock monitoring Enabled when connected with WOP	-	-	-
	d060(*3)	Inverter mode monitoring I-C(IM motor HD mode) / I-V(IM motor ND mode)	-	-	-
	d080	Trip Counter 0.~9999./1000~6553(10000~65530)(times)	-	-	-
	d081 ~ d086	Trip monitoring 1 ~ Trip monitoring 6 Factor, frequency (Hz), current (A), voltage across P-N (V), running time (hours), power-on time (hours)	-	-	-
	d090	Programming error monitoring Warning code	-	-	-
	d102	DC voltage monitoring 0.0~999.9	-	-	-
	d103	BRD load factor monitoring 0.0~100.0(%)	-	-	-
	d104	Electronic thermal overload monitoring 0.0~100.0(%)	-	-	-

(*1):18.5~132kW models allowed, over 132kW models not allowed

(*2):185~315kW models not allowed

(*3): This code is only applied to 18.5~132kW models



● Function Mode

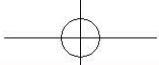
Code	Function name	Monitored data or setting	Default	Setting during operation (allowed or not)	Change during operation (allowed or not)
Setting	F001 Output frequency setting	"start frequency" to "maximum frequency"(or maximum frequency , 2nd/3rd motors)(Hz) 0.0~100.0(when PID function is enabled)	0.00	○	○
	F002 Acceleration (1) time setting	0.01~99.99/100.0~999.9/1000.~3600.(s)	30.00	○	○
	F202 Acceleration(1)time setting,2nd motor	0.01~99.99/100.0~999.9/1000.~3600.(s)	30.00	○	○
	F302 Acceleration(1)time setting,3rd motor	0.01~99.99/100.0~999.9/1000.~3600.(s)	30.00	○	○
	F003 Deceleration (1) time setting	0.01~99.99/100.0~999.9/1000.~3600.(s)	30.00	○	○
	F203 Deceleration time setting,2nd motor	0.01~99.99/100.0~999.9/1000.~3600.(s)	30.00	○	○
	F303 Deceleration timesetting,3rd motor	0.01~99.99/100.0~999.9/1000.~3600.(s)	30.00	○	○
	F004 Keypad Run key routing	00(forward rotation)/01(reverse rotation)	00	×	×

● A Group

Code	Function name	Monitored data or setting	Default	Setting during operation	Change during operation
Basic setting Analog input and others	A001 Frequency source setting	00 (keypad potentiometer) (*1), 01 (control circuit terminal block), 02 (digital operator), 03 (RS485), 04 (option 1), 05 (option 2), 06 (pulse-string input), 07 (easy sequence), 10 (operation function result)	01	×	×
	A002 Run command source setting	01(control circuit terminal block), 02(digital operator), 03(RS485), 04(option 1), 05(option 2)	01	×	×
	A003 Base frequency setting	30.0 to "maximum frequency" (Hz)	50.0	×	×
	A203 Basefrequency setting, 2nd motor	30.0 to "maximum frequency, 2nd motor" (Hz)	50.0	×	×
	A303 Basefrequency setting, 3rd motor	30.0 to "maximum frequency, 3rd motor" (Hz)	50.0	×	×
	A004 Maximum frequency setting	30.~400.(Hz)	50.0	×	×
	A204 Maxfrequency setting, 2nd motor	30.~400.(Hz)	50.0	×	×
	A304 Max frequency setting, 3rd motor	30.~400.(Hz)	50.0	×	×
	A005 [AT] selection	00(switching between O and O1 terminals), 01(switching between O and O2 terminals), 02(switching between O terminal and keypad potentiometer)(*1), 03(switching between O1 terminal and keypad potentiometer)(*1), 04(switching between O2 and keypad potentiometer)(*1)	00	×	×
	A006 [O2] selection	00(single), 01(auxiliary frequency input via O and O1 terminals)(nonreversible), 02(auxiliary frequency input via O and O1 terminals)(reversible), 03(disabling O2terminal)	03	×	×
Multispeed operation and jogging	A011 O start frequency	0.00~99.99/100.0~400.0	0.00	×	○
	A012 O end frequency	0.00~99.99/100.0~400.0	0.00	×	○
	A013 O start voltage	0. to "[O]-[L] input active range end voltage" (%)	0.	×	○
	A014 O end voltage	"[O]-[L] input active range start voltage" to 100. (%)	100.	×	○
	A015 O start frequency selection	00 (external start frequency), 01 (0 Hz)	01	×	○
	A016 External freq filter time const.	1. to 30. or 31. (500 ms filter ±0.1 Hz with hysteresis)	31	×	○
	A017 Easy sequence function selection	00 (disabling), 01 (enabling)	00	×	×
	A019 Multispeed operation selection	00 (binary: 16 speeds selectable with 4 terminals), 01 (bit: 8 speeds selectable with 7 terminals)	00	×	×
	A020 Multi speed freq setting	0.0 or "start frequency" to "maximum frequency" (Hz)	0.00	○	○
	A220 Multi speed freq setting, 2nd motor	0.0 or "start frequency" to "maximum frequency, 2nd motor" (Hz)	0.00	○	○
V/f Characteristic	A320 Multi speed freq setting, 3rd motor	0.0 or "start frequency" to "maximum frequency, 3rd motor" (Hz)	0.00	○	○
	A021 ~ A035 Multispeed1-15 setting	0.0 or "start frequency" to "n-th maximum frequency" (Hz)	0.00	○	○
	A038 Jog frequency setting	"Start frequency" to 9.99 (Hz)	1.00	○	○
	A039 Jog stop mode	00(free-running after jogging stops [disabled during operation]), 01(deceleration and stop after jogging stops [disabled during operation]), 02(DC braking after jogging stops [disabled during operation]), 03(free-running after jogging stops [enabled during operation]), 04(deceleration and stop after jogging stops [enabled during operation]), 05(DC braking after jogging stops [enabled during operation])	00	×	○
	A041 Torque boost method selection	00(Manual torque boost) / 01(Automatic torque boost)	00	×	×
	A241 Torque boost method selection 2nd motor	00(Manual torque boost) / 01(Automatic torque boost)	00	×	×
	A042 Manual torque boost value	0.0~20.0(%)	1.0	○	○
	A242 Manual torque boost value 2nd motor	0.0~20.0(%)	1.0	○	○
	A342 Manual torque boost value 3rd motor	0.0~20.0(%)	1.0	○	○
	A043 Manual torque boost frequency adjustment	0.0~50.0(%)	5.0	○	○
DC Braking	A243 Manual torque boost freq adjustment, 2nd motor	0.0~50.0(%)	5.0	○	○
	A343 Manual torque boost freq adjustment, 3rd motor	0.0~50.0(%)	5.0	○	○
	A044 V/F characteristic curve selection, 1st motor	00 (VC), 01 (VP), 02 (free V/f), 03 (sensorless vector control), (*2)04 (0Hz-range sensorless vector), (*2)05 (vector with sensor)	00	×	×
	A244 V/F characteristic curve selection, 2nd motor	00 (VC), 01 (VP), 02 (free V/f), 03 (sensorless vector control), (*1)04 (0Hz-range sensorless vector)	00	×	×
	A344 V/F characteristic curve selection, 3rd motor	00(VC)/01(VP)	00	×	×
	A045 V/f gain setting	20.~100. (%)	100.	○	○
	A046 Voltage compensation gain setting for automatic torque boost, 1st motor	0.~255.	100.	○	○
A246 Voltage compensation gain setting for automatic torque boost, 2nd motor	A047 Slippage compensation gain setting for automatic torque boost, 1st motor	0.~255.	100.	○	○
	A247 Slippage compensation gain setting for automatic torque boost, 2nd motor	0.~255.	100.	○	○
	A051 DC braking enable	00 (disabling), 01 (enabling), 02 (set frequency only)	00	×	○
	A052 DC braking frequency setting	0.00~99.99/100.0~400.0(Hz)	0.50	×	○
	A053 DC braking wait time	0.0~5.0(s)	0.0	×	○

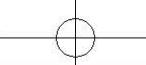
(*1) This setting is valid only when the OPE-SR is connected.

(*2) ND mode is not allowed.



Code		Function name	Monitored data or setting	Default	Setting during operation	Change during operation
DC braking	A054	DC braking force during deceleration (*1)	(18.5~132kW) HD mode: 0.~100.(%) <0.~80(%)> / ND mode: 0.~70.(%) <0.~50(%)> (160~315kW) 0.~35(%)	0.	x	○
	A055	DC braking time for deceleration	0.0~60.0(s)	0.0	x	○
	A056	DC braking/edge or level detection for [DB] input	00 (edge operation), 01 (level operation)	01	x	○
	A057	DC braking force for starting	(18.5~132kW) HD mode: 0.~100.(%) <0.~80(%)> / ND mode: 0.~70.(%) <0.~50(%)> (160~315kW) 0.~35(%)	0.	x	○
	A058	DC braking time for starting	0.0~60.0(s)	0.0	x	○
Frequency Upper/Lower Limit and Jump Frequency	A059	DC braking carrier frequency setting	(18.5~132kW) HD mode: 0.5~15.0(kHz) <0.5~10.0(kHz)> / ND mode: 0.5~12.0(kHz) <0.5~8.0(kHz)> (160~315kW) 0.5~3.0(kHz)	185~132kW HD5.0~30> ND3.0~160kW3.0 185~315kW2.1	x	x
	A061	Frequency upper limit setting	0.00 or "1st minimum frequency limit" to "maximum frequency" (Hz)	0.00	x	○
	A261	Frequency upper limit setting, 2nd motor	0.00 or "2nd minimum frequency limit" to "maximum frequency, 2nd motor" (Hz)	0.00	x	○
	A062	Frequency lower limit setting	0.00 or "start frequency" to "maximum frequency limit" (Hz)	0.00	x	○
	A262	Frequency lower limit setting, 2nd motor	0.00 or "start frequency" to "maximum frequency, 2nd motor limit" (Hz)	0.00	x	○
	A063	Jump(center) frequency setting 1	0.00~99.99/100.0~400.0(Hz)	0.00	x	○
	A064	Jump(hysteresis) frequency width setting 1	0.00~10.00(Hz)	0.50	x	○
	A065	Jump(center) frequency setting 2	0.00~99.99/100.0~400.0(Hz)	0.00	x	○
	A066	Jump(hysteresis) frequency width setting 2	0.00~10.00(Hz)	0.50	x	○
	A067	Jump(center) frequency setting 3	0.00~99.99/100.0~400.0(Hz)	0.00	x	○
PID Control	A068	Jump(hysteresis) frequency width setting 3	0.00~10.00(Hz)	0.50	x	○
	A069	Acceleration stop freq setting	0.00~99.99/100.0~400.0(Hz)	0.00	x	○
	A070	Acceleration stop time freq setting	0.0~60.0(s)	0.0	x	○
	A071	PID Function Enable	00 (disabling), 01 (enabling), 02 (enabling inverted-data output)	00	x	○
	A072	PID proportional gain	0.2~5.0	1.0	○	○
	A073	PID integral time constant	0.0~999.9/1000.~3600.(s)	1.0	○	○
	A074	PID derivative gain	0.00~99.99/100.0(s)	0.00	○	○
	A075	PV scale conversion	0.01~99.99	1.00	x	○
	A076	PV source setting	00 (input via OI), 01 (input via O), 02 (external communication), 03 (pulse-string frequency input), 10 (operation result output)	00	x	○
	A077	Output of inverted PID deviation	00(OFF)/01(ON)	00	x	○
AVR	A078	PID variation range	0.0~100.0(%)	0.0	x	○
	A079	PID feed forward selection	00 (disabled), 01 (O input), 02 (OI input), 03 (O2 input)	00	x	○
Operation Mode and acceleration/deceleration function	A081	AVR function select	00 (always on), 01 (always off), 02 (off during	00	x	x
	A082	AVR voltage select	380/400/415/440/460/480(V)	400	x	x
	A085	Operation mode selection	00 (normal operation), 01 (energy-saving operation), 02 (fuzzy operation)	00	x	x
	A086	Energy saving mode tuning	0.0~100.0	50.0	○	○
	A092	Acceleration (2) time setting		15.00	○	○
	A292	Acceleration (2) time setting, 2nd motor	0.01~99.99/100.0~999.9/1000.~3600.(s)	15.00	○	○
	A392	Acceleration (2) time setting, 3rd motor		15.00	○	○
	A093	Deceleration (2) time setting, 2nd motor	0.01~99.99/100.0~999.9/1000.~3600.(s)	15.00	○	○
	A293	Deceleration (2) time setting, 3rd motor		15.00	○	○
	A393	Select method to switch to Acc2/Dec2 profile		15.00	○	○
External frequency adjustment	A094	Select method to switch to Acc2/Dec2 profile	00 (switching by 2CH terminal), 01 (switching by setting), 02 (switching only when rotation is reversed)	00	x	x
	A294	Select method to switch to Acc2/Dec2, 2nd motor		00	x	x
	A095	Acc1 to Acc2 frequency transition point	0.00~99.99/100.0~400.0(Hz)	0.00	x	x
	A295	Acc1 to Acc2 frequency transition point, 2nd motor		0.00	x	x
	A096	Dec1 to Dec2 freq transition point	0.00~99.99/100.0~400.0(Hz)	0.00	x	x
	A296	Dec1 to Dec2 frequency transition point, 2nd motor		0.00	x	x
	A097	Acceleration curve selection	00 (linear), 01 (S curve), 02 (U curve), 03 (inverted-U curve), 04 (EL-S curve)	00	x	x
	A098	Deceleration curve setting		00	x	x
	A101	[OI]-[L] input active range start freq	0.00~99.99/100.0~400.0(Hz)	0.00	x	○
	A102	[OI]-[L] input active range end freq	0.00~99.99/100.0~400.0(Hz)	0.00	x	○
Operation target freq acc dec	A103	[OI]-[L] input active range start current	0. to "OI"-[L] input active range end current" (%)	20.	x	○
	A104	[OI]-[L] input active range end current	"OI"-[L] input active range start current" to 100. (%)	100.	x	○
	A105	[OI]-[L] input start frequency enable	00 (external start frequency), 01 (0 Hz)	00	x	○
	A111	[O2]-[L] input active range start freq	-400.~100.-/-99.9~0.00~99.99/100.0~400.0(Hz)	0.00	x	○
	A112	[O2]-[L] input active range end freq	-400.~100.-/-99.9~0.00~99.99/100.0~400.0(Hz)	0.00	x	○
	A113	[O2]-[L] input active range start voltage	-100. to 02 end-frequency rate (%)	-100.	x	○
	A114	[O2]-[L] input active range end voltage	"02 start-frequency rate" to 100. (%)	100.	x	○
	A131	Acceleration curve constants setting		2	x	○
	A132	Deceleration curve constants setting	01 (smallest swelling) to 10 (largest swelling)	2	x	○
	A141	Operation target frequency selection 1	00 (digital operator), 01 (keypad potentiometer), 02 (input via O), 03 (input via OI), 04 (external communication), 05 (option 1), 06 (option 2), 07 (pulse-string frequency input)	02	x	○
Acc dec	A142	Operation target frequency selection 2		03	x	○
	A143	Operator selection	00 (addition: A141+A142), 01 (subtraction: A141-A142), 02 (multiplication: A141×A142)	00	x	○
	A145	Frequency to be added	0.00~99.99/100.0~400.0(Hz)	0.00	x	○
	A146	Sign of the freq to be added	00 (frequency command + A145), 01 (frequency command - A145)	00	x	○
	A150	EL-S-curve acceleration ratio 1	0.~50. (%)	25.	x	x
	A151	EL-S-curve acceleration ratio 2		25.	x	x
	A152	EL-S-curve deceleration ratio 1	0.~50. (%)	25.	x	x
Acc dec	A153	EL-S-curve deceleration ratio 2		25.	x	x

(*1) <> for 75~132kW



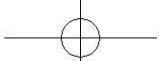
● B Group

Code	Function name	Monitored data or setting	Default	Setting during operation	Change during operation
Restart after instantaneous power failure or tripping	b001 Selection of restart mode	00(tripping),01(starting with 0Hz),02(starting with matching frequency),03(tripping after deceleration and stopping with matching frequency),04(restarting with active matching freq)	00	×	○
	b002 Allowable under-voltage power failure time	0.3~25.0(s)	1.0	×	○
	b003 Retry wait time before motor restart	0.3~100.0(s)	(18.5~160kW) 1.0 (185~315kW) 5.0	×	○
	b004 Instantaneous power failure/under-voltage trip alarm enable	00(disabling),01(enabling),02(disabling during stopping and decelerating to stop)	00	×	○
	b005 Number of restarts on power failure/under-voltage trip events	00(16 times),01(unlimited)	00	×	○
	b006 Phase loss detection enable	00(disabling),01(enabling)			
	b007 Restart frequency threshold	0.00~99.99/100.0~400.0(Hz)	0.00	×	○
	b008 Selection of retry after tripping	00(tripping),01(starting with 0Hz),02(starting with matching frequency),03(tripping after deceleration and stopping with matching frequency),04(restarting with active matching frequency)	00	×	○
	b009 Selection of retry after undervoltage	00(16 times),01(unlimited)	00	×	○
	b010 Selection of retry count after overvoltage or overcurrent	1~3times	3	×	○
Electronic thermal function	b011 Retry wait time after tripping	0.3~100.0(s)	(18.5~160kW) 1.0 (185~315kW) 5.0	×	○
	b012 Electronic thermal setting (calculated within the inverter from current output)	0.20x"rated current" to 1.00x"rated current"(A)	Rated current	×	○
	b012 Electronic thermal setting (calculated within the inverter from current output), 2nd motor		Rated current	×	○
	b012 Electronic thermal setting (calculated within the inverter from current output), 3rd motor		Rated current	×	○
	b013 Electronic thermal characteristic		01	×	○
	b013 Electronic thermal characteristic, 2nd motor		01	×	○
	b013 Electronic thermal characteristic, 3rd motor		01	×	○
	b015 Free setting, electronic thermal frequency(1)	0.~400.Hz	0.	×	○
	b016 Free setting, electronic thermal current(1)	0.0 to rated current(A)	0.0	×	○
	b017 Free setting, electronic thermal frequency(2)	0.~400.Hz	0.	×	○
Overload restriction and overcurrent restraint	b018 Free setting, electronic thermal current(2)	0.0 to rated current(A)	0.0	×	○
	b019 Free setting, electronic thermal frequency(3)	0.~400.Hz	0.	×	○
	b020 Free setting, electronic thermal current(3)	0.0 to rated current(A)	0.0	×	○
	b021 Overload restriction operation mode	00(disabling),01(enabling during acceleration and deceleration),02(enabling during constant speed),03(enabling during acceleration and deceleration(increasing the speed during regeneration))	01	×	○
	b022 Overload restriction setting	(185~132kW)HD mode:0.2~2.0*rated current<0.2~1.8*rated current>(*1) / ND mode: 0.2~1.5*rated current (160kW)0.2~2.0*rated current(185~315kW)0.2~1.8*rated current	185~132kW ND:rated current*15 160~315kW: rated current*12	×	○
	b023 Deceleration rate at overload restriction	0.10~30.00(s)	1.00	×	○
	b024 Overload restriction operation mode (2)	00(disabling),01(enabling during acceleration and deceleration),02(enabling during constant speed),03(enabling during acceleration and deceleration(increasing the speed during regeneration))	01	×	○
	b025 Overload restriction setting (2)	(185~132kW)HD mode:0.2~2.0*rated current<0.2~1.8*rated current>/ ND mode: 0.2~1.5*rated current (160kW)0.2~2.0*rated current(185~315kW)0.2~1.8*rated current	185~132kW ND:rated current*15 160~315kW: rated current*12	×	○
	b026 Deceleration rate at overload restriction (2)	0.10~30.00(s)	1.00	×	○
	b027 Overcurrent suppression enable	00(disabling),01(enabling)	01	×	○
Software lock	b028 Active frequency matching, scan start frequency	(185~132kW)HD mode:0.2~2.0*rated current<0.2~1.8*rated current>/ ND mode: 0.2~1.5*rated current (160kW)0.2~2.0*rated current(185~315kW)0.2~1.8*rated current	Rated current	×	○
	b029 Active frequency matching, scan-time constant	0.10~30.00(s)	0.50	×	○
	b030 Active frequency matching, restart frequency select	00(frequency at the last shutdown),01(maximum frequency),02(set frequency)	00	×	○
Others	b031 Software lock mode selection	00(disabling change of data other than "b031" when SFT is on), 01(disabling change of data other than "b031" and frequency settings when SFT is on), 02(disabling change of data other than "b031"), 03(disabling change of data other than "b031" and frequency settings), 10(enabling data changes during operation)	01	×	○
	b034 Run/power-on warning time	0.~9999.(0~99990)/1000~6553(10000~655300)(hr)	0.	×	○
	b035 Rotational direction restriction	00(enabling both forward and reverse rotations),01(enabling only forward rotation), 02(enabling only reverse rotation)	00	×	×
	b036 Reduced voltage start selection	0(minimum reduced voltage start time) to 255(maximum reduced voltage start time)	6	×	○
	b037 Function code display restriction	00(full display),01(function-specific display),02(user setting), 03(data comparison display),04(basic display)	18.5~132kW 00 160~315kW 04	×	○
Torque limitation	b038 Initial-screen selection	(18.5~132kW) 00(the display when last press the STR key)/001~060(d001~d060)/201(F001)(*2) Other models: 00(the display when last press the STR key)/01(d001)/02(d002)/03(d003)/ 04(d007)/05(F001)	18.5~132kW 001 160~315kW 01	×	○
	b039 Automatic user-parameter setting function enable	00(disabling),01(enabling)	00	×	○
	b040 Torque limit selection	00(quadrant-specific setting),01(swapping by terminal), 02(analog input),03(option 1),04(option 2)	00	×	○
	b041 Torque limit(1)(forward-driving in 4-quadrant mode)	(18.5~132kW) HD mode: 0.~200.(%) / no <0.~150.(%) / no > / ND mode: 0.~150.(%) / no (160kW) 0.~200.(%) / no (185~315kW) 0.~180.(%) / no	18.5~132kW HD mode: 150. ND mode 120. 160~315kW 150.	×	○
	b042 Torque limit(2)(reverse-regenerating in 4-quadrant mode)		×	○	
	b043 Torque limit(3)(reverse-driving in 4-quadrant mode)		×	○	
	b044 Torque limit(4)(forward-regenerating in 4-quadrant mode)		×	○	
Load mode	b045 Torque limit LADSTOP enable	00(disabling),01(enabling)	00	×	○
	b046 Reverse Run protection enable	00(disabling),01(enabling)	00	×	○
(*3)	b049 Load mode selection	00(HD: heavy load) / 01(ND: standard load)	00	×	×

(*1) for 75~132kW.

(*2) only when the inverter is connected to OPE-SR, the set for "201" and "000" is the same.

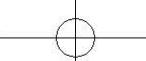
(*3) this code is only for SJ700N-185~1320HFFA models.



Code	Function name	Monitored data or setting	Default	Setting during operation	Change during operation
Non-stop operation at momentary power failure	b050 Controller deceleration and stop on power loss	00(disabling), 01(nonstop deceleration to stop), 02(DC voltage constant control, with resume), 03(without resume)	00	x	x
	b051 DC bus voltage trigger level during power loss	0.0~999.9/1000.(V)	440.0	x	x
	b052 Over-voltage threshold during power loss	0.0~999.9/1000.(V)	720.0	x	x
	b053 Deceleration time setting during power loss	0.01~99.99/100.0~999.9/1000.~3600.(s)	1.00	x	x
	b054 Initial output frequency decrease during power loss	0.00~10.00(Hz)	0.00	x	x
	b055 Proportional gain setting for nonstop operation at power loss	0.00~2.55	0.20	o	o
	b056 Integral time setting for nonstop operation at power loss	0.000~9.999/10.00~65.53(s)	0.100	o	o
Window comparator	b060 Maximum-limit level of window comparatorsO	0.~100.(lower limit: b061 + b062 × 2) (%)	100.	o	o
	b061 Minimum-limit level of window comparatorsO	0.~100.(upper limit: b060 - b062×2) (%)	0.	o	o
	b062 Hysteresis width of window comparatorsO	0.~10.(upper limit:(b061 - b061)/2) (%)	0.	o	o
	b063 Maximum-limit level of window comparatorsOI	0.~100.(lower limit: b064 + b065 × 2) (%)	100.	o	o
	b064 Minimum-limit level of window comparatorsOI	0.~100.(upper limit: b063 - b065×2) (%)	0.	o	o
	b065 Hysteresis width of window comparatorsOI	0.~10.(upper limit:(b063 - b064)/2) (%)	0.	o	o
	b066 Maximum-limit level of window comparatorsOI	-100.~100. (lower limit:b067 + b068 × 2) (%)	100.	o	o
	b067 Minimum-limit level of window comparatorsO/OI/O2	-100.~100. (upper limit: b066 - b068×2) (%)	-100.	o	o
	b068 Hysteresis width of window comparatorsO/OI/O2	0.~10.(upper limit:(b066 - b067)/2) (%)	0.	o	o
	b070 Operation level at Odisconnection	0.~100 ./no(ignore)	no	x	o
	b071 Operation level at Oldisconnection	0.~100 ./no(ignore)	no	x	o
	b072 Operation level at O2 disconnection	-100.~100 ./no(ignore)	no	x	o
Others	b078 Cumulative input power data clearance	Clearance by setting "01" and pressing the STR key	00	o	o
	b079 Cumulative input power display gain setting	1.~1000.	1.	o	o
	b082 Start frequency adjustment	0.10~9.99(Hz)	0.50	x	o
	b083 Carrier frequency setting	(18.5~132kW) HD mode: 0.5~15.0(kHz) <0.5~10.0(kHz) > / ND mode: 0.5~12.0(kHz) <0.5~8.0(kHz) > (160~315kW) 0.5~3.0(kHz)	18.5~132kW HD mode: 0.5~3.0 > ND mode: 0.5~3.0 > 160~315kW 2.1	x	x
	b084 Initialization mode (parameters or trip history)	00(initializing disabled) / 01(clearing the trip history) (*1) / 02(initializing the data) / 03(initializing the data + initializing the data) / 04(initializing the data + initializing the data + EzSQ initializing)		x	x
	b085 Country code for initialization	00(JAPAN) / 01(CHINA,EU) / 02(SOUTH AMERICA)	01	x	x
	b086 Freq scaling conversion factor	0.1~99.0	1.0	o	o
	b087 STOP(RESET)key enable	00(enabling), 01(disabling), 02(disabling only the function to stop)	00	x	o
	b088 Restart mode after FRS	00(starting with 0 Hz), 01(starting with matching frequency), 02(starting with active matching frequency)	00	x	o
	b089 Automatic carrier freq reduction	00: invalid, 01: valid	00	x	x
	b090 Dynamic braking usage ratio	0.0~100.0(%)	0.0	x	o
	b091 Stop mode selection	00(deceleration until stop), 01(free-run stop)	00	x	o
	b092 Cooling fan control	00(always operating the fan), 01(operating the fan only during inverter operation <including 5 minutes after power-on and power-off>), 00(disabling), 01(enabling <disabling while the motor is stopped>)	00	x	o
	b095 Dynamic braking control	00(disabling also while the motor is stopped)	00	x	o
	b096 BRD activation level	660~760(V)	720	x	o
	b098 Thermistor for thermal protection control	00(disabling the thermistor), 01(enabling the thermistor with PTC), 02(enabling the thermistor with NTC)	00	x	o
	b099 Thermal protection level setting	0.0~9999.(Ω)	3000.	x	o
Free setting of V/f characteristic	b100 Free-setting V/f frequency (1)	0. to "free-setting V/f frequency (2)"(Hz)	0.	x	x
	b101 Free-setting V/f voltage (1)	0.0~800.0(V)	0.0	x	x
	b102 Free-setting V/f frequency (2)	0. to "free-setting V/f frequency (3)"(Hz)	0.	x	x
	b103 Free-setting V/f voltage (2)	0.0~800.0(V)	0.0	x	x
	b104 Free-setting V/f frequency (3)	0. to "free-setting V/f frequency (4)"(Hz)	0.	x	x
	b105 Free-setting V/f voltage (3)	0.0~800.0(V)	0.0	x	x
	b106 Free-setting V/f frequency (4)	0. to "free-setting V/f frequency (5)"(Hz)	0.	x	x
	b107 Free-setting V/f voltage (4)	0.0~800.0(V)	0.0	x	x
	b108 Free-setting V/f frequency (5)	0. to "free-setting V/f frequency (6)"(Hz)	0.	x	x
	b109 Free-setting V/f voltage (5)	0.0~800.0(V)	0.0	x	x
	b110 Free-setting V/f frequency (6)	0. to "free-setting V/f frequency (7)"(Hz)	0.	x	x
	b111 Free-setting V/f voltage (6)	0.0~800.0(V)	0.0	x	x
	b112 Free-setting V/f frequency (7)	0.~400.(Hz)	0.	x	x
	b113 Free-setting V/f voltage (7)	0.0~800.0(V)	0.0	x	x
Braking control	b120 Brake Control Enable	00(disabling), 01(enabling)	00	x	o
	b121 Brake Wait Time for Release		0.00	x	o
	b122 Brake Wait Time for Acceleration	0.00~5.00(s)	0.00	x	o
	b123 Brake Wait Time for Stopping		0.00	x	o
	b124 Brake Wait Time for Confirmation		0.00	x	o
	b125 Brake Release Frequency Setting	0.00~9.99/100.0~400.0(Hz)	0.00	x	o
	b126 Brake Release Current Setting	(18.5~55kW) 0.00~2.00* rated current/(75~315kW) 0.00~1.80* rated current	Rated current	x	o
Overvoltage suppression	b127 Braking frequency	0.00~99.99/100.0~400.0(Hz)	0.00	x	o
	b130 Overvoltage suppression enable	00(disabling the restraint), 01(controlled dec), 02(enabling acc)	00	x	o
	b131 Overvoltage suppression level	400V class: 660~780(V)	760	x	o
	b132 overvoltage suppression time constant	0.10~30.00(s)	1.00	x	o
	b133 Overvoltage suppression proportional gain	0.00~2.55	0.50	o	o
	b134 Overvoltage suppression Integral time	0.000~9.999/10.00~65.53(s)	0.060	o	o
	b141 Output phase absent detection	00(invalid) / 01(valid)	00	x	o
Others*2)	b142 Output phase absent detection sensitivity	1.~100(%)	10.	o	o
	b164 Initial screen auto change	00(invalid) / 01(valid)	00	o	o
	b166 Data read/write	00(R/W allowed)/01(R/W not allowed)	00	x	o
	b180 Initialization	00(invalid) / 01(valid)	00	x	x

(*1):<> for 75~132kW

(*2): this code is only for SJ700N-185~1320HFFA models



● C Group

Code	Function name	Monitored data or setting	Default	Setting during operation	Change during operation
Intelligent input terminals	C001 Terminal [1] function	01(RV: Reverse RUN)/02~05(CF1~CF4: Multispeed 1~4 setting)/06(JG: Jogging)/07(DB: external DC braking)/08(SET: Set 2nd motor data)/09(2CH: 2-stage acceleration/deceleration)/11(FRS: free-run stop)/12(EXT: external trip)/13(USP: unattended start protection)/14(CS: commercial power source enable)/15(SFT: software lock)/16(AT: analog input voltage/current select)/17(SET3: 3rd motor control)/18(RS: reset)/20(STA: starting by 3-wire input)/21(STP: stopping by 3-wire input)/22(F/R: forward/reverse switching by 3-wire input)/23(PID: PID disable/enable)/24(PIDC: PID reset)/26(CAS: control gain setting)/27(UP: remote control UP function)/28(DWN: remote control DOWN function)/29(UDC: remote control data clearing)/31(OPE: forcible operation)/32~38(SF1~SF7: multispeed bit 1~7)/39(OLR: overload restriction selection)/40(TL: torque limit enable/disable)/41(TRQ1: torque limit selection bit 1)/42(TRQ2: torque limit selection bit 2)/43(PPI/PPI mode selection)/44(BOK: mode selection)/45(ORT: orientation)/46(LAC: LAD cancellation)/47(PCLR: clearance of position deviation)/48(STAT: pulse train position command input enable)/50(ADD: trigger for frequency addition [A145])/51(F-TM: forcible terminal operation)/52(ATR: permission of torque command input)/53(KHC: cumulative power clearance)/54(SON: servo-on)/55(FOC: forcing)/56~63(MI1~MI8: general-purpose input 1~8)/64(EMR: emergency stop signal)/65(AHD: analog command holding)/66(CP1: multistage position settings selection 1)/67(CP2: multistage position settings selection 2)/68(CP3: multistage position settings selection 3)/69(OLR: Zero-return limit function)/70(ORG: Zero-return trigger function)/71(ROT: forward drive stop)/72(ROT: reverse drive stop)/73(SPD: speed/position switching)/74(PCN: pulse counter)/75(PCC: pulse counter clear)/82(PRG: EzSQ program operation terminal)(★)/no(NO: assignment)	18 (*1)	×	○
	C002 Terminal [2] function		16	×	○
	C003 Terminal [3] function		06 (*1)	×	○
	C004 Terminal [4] function		11	×	○
	C005 Terminal [5] function		09	×	○
	C006 Terminal [6] function		03	×	○
	C007 Terminal [7] function		02	×	○
	C008 Terminal [8] function		01	×	○
Intelligent output terminals	C011 Terminal [1]~[8] active state	00(NO)/01(NC)	00	×	○
	C018 Terminal [FW] active state a/b(NO/NC)	00(NO)/01(NC)	00	×	○
	C021 Terminal [11] function	00(RUN: running)/01(FA1: constant-speed reached)/02(FA2: set frequency overreached)/03(OL: overload notice advance signal)/04(OD: output deviation for PID control)/05(AL: alarm signal)/06(FA3: set frequency reached)/07(OTQ: over-torque)/08(PI: instantaneous power failure)/09(UV: under voltage)/10(TRO: torque limited)/11(RNT: operation time over)/12(ONT: plug-in time over)/13(THM: thermal alarm signal)/19(BRK: brake release)/20(BER: braking error)/21(ZS: 0 Hz detection signal)/22(DSE: speed deviation maximum)/23(POK: positioning completed)/24(FA4: set frequency overreached 2)/25(FA5: set frequency reached 2)/26(OL2: overload notice advance signal 2)/27(ODC: Analog O disconnection detection)/28(OIDC: Analog O1 disconnection detection)/29(O2DC: Analog O2 disconnection detection)/31(FBV: PID feedback comparison)/32(NDC: communication line disconnection)/33~38(LOG1~LOG6: logical operation result 1~6)/39(WAC: capacitor life warning)/40(WAF: cooling-fan speed drop)/41(FR: starting contact signal)/42(OHF: heat sink overheat warning)/43(LOC: low-current indication signal)/44~49(MO1~MO6: general-purpose output 1~6)/50(RDY: inverter ready)/51(FWR: forward rotation)/52(RVR: reverse rotation)/53(MA: major failure)/54(WCO: window comparator O)/55(WCO1: window comparator O1)/56(WCO2: window comparator O2)/When alarm code output is selected for "C062", functions "AC0" to "AC2" or "AC0" to "AC3" [ACnalarm code output] are forcibly assigned to intelligent output terminals 11 to 13 or 11 to 14, respectively)	01	×	(*2)
	C022 Terminal [12] function		00	×	(*2)
	C023 Terminal [13] function		03	×	(*2)
	C024 Terminal [14] function		07	×	(*2)
	C025 Terminal [15] function		40	×	(*2)
	C026 Alarm relay terminal function		05	×	(*2)
Analog monitoring	C027 [FM] signal selection	00(output frequency), 01(output current), 02(output torque), 03(digital output frequency), 04(output voltage), 05(input power), 06(electronic thermal overload), 07(LAD frequency), 08(digital current monitoring), 09(motor temperature), 10(heat sink temperature), 12(general-purpose output YA0)	00	×	(*2)
	C028 [AM] signal selection	00(output frequency), 01(output current), 02(output torque), 04(output voltage), 05(input power), 06(electronic thermal overload), 07(LAD frequency), 09(motor temperature), 10(heat sink temperature), 11(output torque [signed value]), 13(general-purpose output YA1)	00	×	(*2)
	C029 [AMI] signal selection	00(output frequency), 01(output current), 02(output torque), 04(output voltage), 05(input power), 06(electronic thermal overload), 07(LAD frequency), 09(motor temperature), 10(heat sink temperature), 14(general-purpose output YA2)	00	×	(*2)
	C030 Digital current monitor reference value	(18.5~132kW) 0.20~1.50* rated current / (160~315kW) 0.20~2.00* rated current	Rated current	○	○
Intelligent output terminals	C031~C035 Terminal [11]~[15] active state a/b(NO/NC)	00(NO)/01(NC)	00	×	(*2)
			00	×	(*2)
			00	×	(*2)
			00	×	(*2)
	C036 Alarm relay active state	00(NO)/01(NC)	01	×	(*2)
Levels and output terminal status	C038 Low-current indication signal output mode selection	00(output during acceleration/deceleration and constant-speed operation), 01(output only during constant-speed operation)	01	×	○
	C039 Low-current indication signal detection level	(18.5~132kW) HD mode: 0.0~2.0% rated current <0.0~1.8% rated current> / ND mode: 0.0~1.5% rated current (160kW) 0.0~2.0% rated current (185~315kW) 0.0~1.8% rated current	Rated current	○	○
	C040 Overload signal output mode	00(output during acceleration/deceleration and constant-speed operation), 01(output only during constant-speed operation)	01	×	○
	C041 Overload level setting	(18.5~132kW) HD mode: 0.0~2.0% rated current <0.0~1.8% rated current> / ND mode: 0.0~1.5% rated current (160kW) 0.0~2.0% rated current (185~315kW) 0.0~1.8% rated current	Rated current	○	○
	C042 Frequency arrival setting for acceleration	0.00~99.99/100.0~400.0(Hz)	0.00	×	○
	C043 Frequency arrival setting for deceleration	0.00~99.99/100.0~400.0(Hz)	0.00	×	○
	C044 PID deviation level setting	0.0~100.0(%)	3.0	×	○
	C045 Frequency arrival setting for acceleration (2)	0.00~99.99/100.0~400.0(Hz)	0.00	×	○
	C046 Frequency arrival setting for deceleration (2)	0.00~99.99/100.0~400.0(Hz)	0.00	×	○
	C052 Maximum PID feedback data	0.0~100.0(%)	100.0	×	○
	C053 Minimum PID feedback data	0.0~100.0(%)	0.0	×	○
	C055 Over-torque (forward-driving) level setting		100.	×	○
	C056 Over-torque (reverse regenerating) level setting	(18.5~132kW) HD mode: 0~200(%) / no <0~180(%) / no> / ND mode: 0~150(%) / no (160kW) 0~200(%) / no (185~315kW) 0~180(%) / no	100.	×	○
	C057 Over-torque (reverse driving) level setting		100.	×	○
	C058 Over-torque (forward regenerating) level setting		100.	×	○
	C061 Electronic thermal warning level setting	0.~100.(%)	80.	×	○
	C062 Alarm code output	00(invalid)/ 01(3 bits)/ 02(4 bits)	00	×	○
	C063 Zero speed detection level	0.00~99.99/100.0(Hz)	0.00	×	○
	C064 Heat sink overheat warning level	0.~200.(°C)	120.	×	○

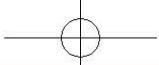
(*1) emergency stop enabled (when SW1=ON, C001 is specified as (RS). C003 is forcibly set as 64(EMR)(64 can not be set freely)).

In addition, when SW1 is set from ON→OFF, C003 is specified as no allocation.

(*2) 18.5~132kW is not allowed, other models is allowed.

<> for 75~132kW.

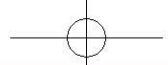
★ : only for SJ700N-185~1320HFFA models.



Code	Function name	Monitored data or setting	Default	Setting during operation	Change during operation
Communication function	C071 Communication speed selection	02(loopback test)/03(2400bps)/04(4800bps)/05(9600bps)/06(19.2kbps)/07(38.4kbps)/08(57.6kbps)/09(76.8kbps)/10(115.2kbps)★	04	×	○
	C072 Node allocation	(18.5~132kW) 1~247 / (160~315kW) 1~32.	1.	×	○
	C073 Communication data length selection	7(7 bits)/8(8bits)	7	×	○
	C074 Communication parity selection	00(no parity), 01(even parity), 02(odd parity)	00	×	○
	C075 Communication stop bit selection	1(1 bit), 2(2 bits)	1	×	○
	C076 Selection of the operation after communication error	00(tripping), 01(tripping after decelerating and stopping the motor), 02(ignore errors), 03(stopping the motor after free-running), 04(decelerating and stopping the motor)	02	×	○
	C077 Communication timeout limit before tripping	0.00(invalid)/0.01~99.99(s)	0.00	×	○
	C078 Communication wait time	0~1000.(ms)	0.	×	○
	C079 Communication mode selection	00(ASCII)/01(Modbus-RTU)	00	×	○
Adjustment	C081 [O] input span calibration	0~9999./1000~6553(10000~65535)	Factory set	○	○
	C082 [OI] input span calibration		Factory set	○	○
	C083 [O2] input span calibration		Factory set	○	○
	C085 Thermistor input tuning	0.0~999.9/1000.	Factory set	○	○
Others	C091 Debug mode enable	(Do not change this parameter, which is intended for factory adjustment.)	00	×	×
	C101 Up/Down memory mode selection	00(not storing the frequency data), 01(storing the frequency data)	00	×	○
	C102 Reset mode selection	00(resetting the trip when RS is on), 01(resetting the trip when RS is off), 02(enabling resetting only upon tripping [resetting when RS is on])	00	○	○
Meter adjustment	C103 Restart mode after reset	00(starting with 0 Hz), 01(starting with matching frequency), 02(restarting with active matching frequency)	00	×	○
	C105 FM gain adjustment	50.~200.(%)	100.	○	○
	C106 AM gain adjustment		100.	○	○
	C107 AMI gain adjustment		100.	○	○
	C109 AMI gain adjustment	0.~100.(%)	0.	○	○
	C110 AMI bias adjustment		20.	○	○
	C111 Overload setting (2)	(18.5~132kW) HD mode: 0.0~2.0*rated current<0.0~1.8*rated current>/ND mode: 0.0~1.5*rated current (160kW) 0.0~2.0*rated current(185~315kW) 0.0~1.8*rated current	Rated current	○	○
	C121 [O] input zero calibration	0~9999./1000~6553(10000~65530)	Factory set	○	○
	C122 [OI] input zero calibration		Factory set	○	○
	C123 [O2] input zero calibration		Factory set	○	○
Output terminal delay	C130 Output 11 on-delay time	0.0~100.0(s)	0.0	×	○
	C131 Output 11 off-delay time		0.0	×	○
	C132 Output 12 on-delay time	0.0~100.0(s)	0.0	×	○
	C133 Output 12 off-delay time		0.0	×	○
	C134 Output 13 on-delay time	0.0~100.0(s)	0.0	×	○
	C135 Output 13 off-delay time		0.0	×	○
	C136 Output 14 on-delay time	0.0~100.0(s)	0.0	×	○
	C137 Output 14 off-delay time		0.0	×	○
	C138 Output 15 on-delay time	0.0~100.0(s)	0.0	×	○
	C139 Output 15 off-delay time		0.0	×	○
	C140 Output RY on-delay time	0.0~100.0(s)	0.0	×	○
	C141 Output RY off-delay time		0.0	×	○
	C142 Logical output signal 1 selection 1	Same as the settings of C021 to C026 (except those of LOG1 to LOG6)	00	×	○
	C143 Logical output signal 1 selection 2		00	×	○
Logical output terminal operation function	C144 Logical output signal 1 operator selection	00(AND) / 01(OR) / 02(XOR)	00	×	○
	C145 Logical output signal 2 selection 1	Same as the settings of C021 to C026 (except those of LOG1 to LOG6)	00	×	○
	C146 Logical output signal 2 selection 2		00	×	○
	C147 Logical output signal 2 operator selection	00(AND) / 01(OR) / 02(XOR)	00	×	○
	C148 Logical output signal 3 selection 1	Same as the settings of C021 to C026 (except those of LOG1 to LOG6)	00	×	○
	C149 Logical output signal 3 selection 2		00	×	○
	C150 Logical output signal 4 selection 1	00(AND) / 01(OR) / 02(XOR)	00	×	○
	C151 Logical output signal 4 selection 2	Same as the settings of C021 to C026 (except those of LOG1 to LOG6)	00	×	○
	C152 Logical output signal 4 selection 2		00	×	○
	C153 Logical output signal 4 operator selection	00(AND) / 01(OR) / 02(XOR)	00	×	○
	C154 Logical output signal 5 selection 1	Same as the settings of C021 to C026 (except those of LOG1 to LOG6)	00	×	○
	C155 Logical output signal 5 selection 2		00	×	○
	C156 Logical output signal 5 operator selection	00(AND) / 01(OR) / 02(XOR)	00	×	○
	C157 Logical output signal 6 selection 1	Same as the settings of C021 to C026 (except those of LOG1 to LOG6)	00	×	○
	C158 Logical output signal 6 selection 2		00	×	○
	C159 Logical output signal 6 operator selection	00(AND) / 01(OR) / 02(XOR)	00	×	○
Input terminal response	C160 Input terminal response time setting 1	0.~200. (×2ms)	1.	×	○
	C161 Input terminal response time setting 2	0.~200. (×2ms)	1.	×	○
	C162 Input terminal response time setting 3	0.~200. (×2ms)	1.	×	○
	C163 Input terminal response time setting 4	0.~200. (×2ms)	1.	×	○
	C164 Input terminal response time setting 5	0.~200. (×2ms)	1.	×	○
	C165 Input terminal response time setting 6	0.~200. (×2ms)	1.	×	○
	C166 Input terminal response time setting 7 AAA	0.~200. (×2ms)	1.	×	○
	C167 Input terminal response time setting 8	0.~200. (×2ms)	1.	×	○
	C168 Input terminal response time setting 9	0.~200. (×2ms)	1.	×	○
	C169 Multistage speed/position determination time	0.~200. (×10ms)	0.	×	○

<> For 75~132kW.

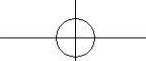
★ : only for SJ700N-185~1320HFFA models.



● H Group

Code	Function Name	Monitored data or setting	Default	Setting during operation	Change during operation
H001	Auto-tuning setting	00(disabling auto-tuning), 01 (auto-tuning without rotation), 02 (auto-tuning with rotation)	00	×	×
H002	Motor data selection, 1st motor	00 (Hitachi standard data), 01 (auto-tuned data), 02 (auto-tuned data [with online auto-tuning function])	00	×	×
H202	Motor data selection, 2nd motor		00	×	×
H003	Motor capacity, 1st motor	(18.5~160kW) 0.20~160.(kW) / (185~315kW) 11.0~400.(kW)	Factory set	×	×
H203	Motor capacity, 2nd motor		Factory set	×	×
H004	Motor poles setting, 1st motor	2, 4, 6, 8, 10 (poles)	4.	×	×
H204	Motor poles setting, 2nd motor		4.	×	×
H005	Motor speed constant, 1st motor	0.001~9.999 / 10.00~80.00 (10.000~80.000)	1.590	○	○
H205	Motor speed constant, 2nd motor		1.590	○	○
H006	Motor stabilization constant, 1st motor		100.	○	○
H206	Motor stabilization constant, 2nd motor	0.~255.	100.	○	○
H306	Motor stabilization constant, 3rd motor		100.	○	○
H020	Motor contant R1, 1st motor		Factory set	×	×
H220	Motor constant R1, 2nd motor	(18.5~160kW) : 0.001 ~ 9.999/10.00~65.53(Ω) (185~315kW) : 0.1 ~999.9/1000.~6553.(mΩ)	Factory set	×	×
H021	Motor constant R2, 1st motor		Factory set	×	×
H221	Motor constant R2, 2nd motor		Factory set	×	×
H022	Motor constant L ₁ , 1st motor	(18.5~160kW) : 0.01 ~99.99/100.0~655.3(mH) (185~315kW) : 0.001 ~9.999/10.00~65.53(mH)	Factory set	×	×
H222	Motor constant L ₁ , 2nd motor		Factory set	×	×
H023	Motor constant I ₀	(18.5~160kW) : 0.01 ~99.99/100.0~655.3(A) (185~315kW) : 0.01 ~0.35*rated current(A)	Factory set	×	×
H223	Motor constant I ₀ , 2nd motor		Factory set	×	×
H024	Motor constant J	0.001~9.999/10.00~99.99/ 100.0~999.9/1000.~9999.(kgm ²)	Factory set	×	×
H224	Motor constant 2nd motor		Factory set	×	×
H030	Auto constant R1, 1st motor		Factory set	×	×
H230	Auto constant R1, 2nd motor	(18.5~160kW) : 0.001~9.999/10.00~65.53(Ω) (185~315kW) : 0.1 ~999.9/1000.~6553.(mΩ)	Factory set	×	×
H031	Auto constant R2, 1st motor		Factory set	×	×
H231	Auto constant R2, 2nd motor		Factory set	×	×
H032	Auto constant L ₁ , 1st motor	(18.5~160kW) : 0.01 ~99.99/100.0~655.3(mH) (185~315kW) : 0.001 ~9.999/10.00~65.53(mH)	Factory set	×	×
H232	Auto constant L ₁ , 2nd motor		Factory set	×	×
H033	Auto constant I ₀ , 1st motor	(18.5~160kW) : 0.01 ~99.99/100.0~655.3(A) (185~315kW) : 0.01 ~0.35*rated current(A)	Factory set	×	×
H233	Auto constant I ₀ , 2nd motor		Factory set	×	×
H034	Auto constant J, 1st motor	0.001~9.999/10.00~99.99/ 100.0~999.9/1000.~9999.(kgm ²)	Factory set	×	×
H234	Auto constant J, 2nd motor		Factory set	×	×
H050	PI proportional gain for 1st motor	0.0~999.9/1000.	100.0	○	○
H250	PI proportional gain for 2nd motor		100.0	○	○
H051	PI integral gain for 1st motor	0.0~999.9/1000.	100.0	○	○
H251	PI integral gain for 2nd motor		100.0	○	○
H052	P proportional gain setting for 1st motor	0.01~10.00	1.00	○	○
H252	P proportional gain setting for 2nd motor		1.00	○	○
H060	ZeroSLV limit for 1st motor	0.0~100.0	100.0	○	○
H260	ZeroSLV limit for 2nd motor		100.0	○	○
H061	ZeroSLV starting boost current for 1st motor		50.0	○	○
H261	ZeroSLV starting boost current for 2nd motor	0.~50.(%)	50.0	○	○
H070	Terminal selection PI proportional gain setting	0.0~999.9/1000.	100.0	○	○
H071	Terminal selection PI integral gain setting	0.0~999.9/1000.	100.0	○	○
H072	Terminal selection P proportional gain setting	0.00~10.00	1.00	○	○
H073	Gain switching time	0.~9999.(ms)	100.0	○	○

<> for 75~132kW.



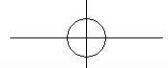
● P Group

Code	Function name	Monitored data or setting	Default	Setting during operation	Change during operation
Output terminal operation functions	P001 Operation mode on expansion card 1 error	00 (tripping), 01 (continuing operation)	00	X	○
	P002 Operation mode on expansion card 2 error	00 (tripping), 01 (continuing operation)	00	X	○
	P011 Encoder pulse per revolution (PPR) setting	128.~9999./1000~6553(10000~65535)(pulses)	1024.	X	×
	P012 Control pulse setting	00 (ASR), 01 (APR), 02 (APR2), 03 (HAPR)	00	X	×
	P013 Pulse train mode setting	00 (mode 0), 01 (mode 1), 02 (mode 2)	00	X	×
	P014 Home search stop position setting	0.~4095.	0.	X	○
	P015 Home search speed setting	"start frequency" to "maximum frequency" (up to 120.0) (Hz)	5.00	X	○
	P016 Home search speed setting	00 (forward), 01 (reverse)	00	X	(*)1
	P017 Home search completion range setting	0.~9999./1000(10000)(pulses)	5.	X	○
	P018 Home search completion delay time setting	0.00~9.99(s)	0.00	X	○
	P019 Electronic gear set position selection	00 (feedback side), 01 (commanding side)	00	X	○
	P020 Electronic gear ratio numerator setting	1.~9999.	1.	○	○
	P021 Electronic gear ratio denominator setting	1.~9999.	1.	○	○
	P022 Feed-forward gain setting	0.00~99.99/100.0~655.3	0.00	(*)1	○
	P023 Position loop gain setting	0.00~99.99/100.0	0.50	(*)1	○
	P024 Position loop gain setting	-204(-2048).~-999.~2048.	0.	○	○
	P025 Temperature compensation thermistor enable	00 (no compensation), 01 (compensation)	00	X	○
	P026 Over-speed error detection level setting	0.0~150.0 (%)	135.0	X	○
	P027 Speed deviation error detection level setting	0.00~99.99/100.0~120.0(Hz)	7.50	X	○
	P028 Numerator of motor gear ratio	(18.5~132kW / 185~315kW) : 1.~9999. (160kW) : 0.~9999.		1.	X
	P029 Denominator of motor gear ratio				○
	P031 Accel/decel time input selection	00 (digital operator), 01 (option 1), 02 (option 2), 03 (easy sequence)	00	X	×
	P032 Positioning command input selection	00 (digital operator), 01 (option 1), 02 (option 2)	00	X	○
	P033 Torque command input selection	00 (O terminal), 01 (OI terminal), 02 (O2 terminal), 03 (digital operator)	00	X	×
	P034 Torque command setting	(18.5~160kW 0.~200.(%) <0.~180.(%)> / (185~315kW) 0.~180.(%)	0.	○	○
	P035 Polarity selection at the torque command input via O2 terminal	00 (as indicated by the sign), 01 (depending on the operation direction)	00	X	×
	P036 Torque bias mode	00 (disabling the mode), 01 (digital operator), 02 (input via O2 terminal)	00	X	×
	P037 Torque bias value	(18.5~160kW) -200.~+200.(%) <-180.~+180.(%)> (185~315kW) -180.~+180.(%)	0.	○	○
	P038 Torque bias polarity selection	00 (as indicated by the sign), 01 (depending on the operation direction)	00	X	×
	P039 Speed limit for torque-controlled operation (forward rotation)	0.00 to "maximum frequency" (Hz)	0.00	○	○
	P040 Speed limit for torque-controlled operation (reverse rotation)	0.00 to "maximum frequency" (Hz)	0.00	○	○
	P044 DeviceNet command watchdog timer	0.00~99.99(s)	1.00	X	×
	P045 Inverter action on DeviceNet command error	00 (tripping), 01 (tripping after decelerating and stopping the motor), 02 (ignoring errors), 03 (stopping the motor after free-running), 04 (decelerating and stopping the motor)	01	X	×
	P046 Input instance number	20/21/100	21	X	×
	P047 Output instance number	70/71/101	71	X	×
	P048 Inverter action on DeviceNet idle mode	00 (tripping), 01 (tripping after decelerating and stopping the motor), 02 (ignoring errors), 03 (stopping the motor after free-running), 04 (decelerating and stopping the motor)	01	X	×
	P049 DeviceNet motor poles setting for RPM	0/2/4/6/8/10/12/14/16/18/20/22/24/26/28/30/32/34/36/38	0	X	×
	P055 Pulse-string frequency scale	1.0~50.0(kHz)	25.0	X	○
	P056 Time constant of pulse-string frequency filter	0.01~2.00(s)	0.10	X	○
	P057 Pulse-string frequency bias	-100.~+100.(%)	0.	X	○
	P058 Pulse-string frequency limit	0.~100.(%)	100.	X	○
Absolute position control	P060 ~ P067 Multistage position setting 0~7	Position setting range reverse side ~ forward side (upper 4 digits including -)	0	○	○
	P068 Zero-return mode selection	00(Low)/ 01(Hi1)/ 02(Hi2)	00	○	○
	P069 Zero-return direction selection	00 (FW) / 01 (RV)	00	○	○
	P070 Low-speed zero-return frequency	0.00~10.00(Hz)	0.00	○	○
	P071 High-speed zero-return frequency	(18.5~160kW) 0.00~99.99/100.0~Maximum frequency setting, 1st motor(Hz) (185~315kW) 0.00~Maximum frequency setting, 1st motor(Hz)	0.00	○	○
EZQ programming	P072 Position range specification (forward)	0~268435455(when P012=02) 0~1073741823(when P012=03)(upper 4 digits)	2684 (268435455)	○	○
	P073 Position range specification (reverse)	-268435455~0(when P012=02) -1073741823~0(when P012=03) (upper including 4 digits)	-268 (-268435455)	○	○
	P074 Teaching selection	00(X00)/ 01(X01)/ 02(X02)/ 03(X03)/ 04(X04)/ 05(X05)/ 06(X06)/ 07(X07)	00	○	○
	P100 ~ P131 Easy sequence user parameter U(00)~U(31)	0.~9999./1000~6553(10000~65535)	0.	○	○

(*1) 18.5~132kW not allowed, other models allowed.
<> for 75~132kW.

● U Group

Code	Function name	Monitored data or setting	Default	Setting during operation	Change during operation
Parameter for users	U001 ~ U012	User-selected function 1~12 no/d001~P131	no	○	○



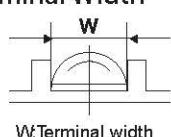
Terminals

(1) Main Circuit Terminals

● Terminal Description

Terminal Symbol	Terminal Name	Functions
R(L1),S(L2),T(L3)	Main power supply input terminals	Control power supply input terminals
U(T1),V(T2),W(T3)	Inverter output terminals	Connecting the motor
PD(+1),P(+)	DC reactor connection terminals	Connecting DC reactor(optional)
P(+),RB(RB)	External braking resistor connection terminals	Connecting braking resistor(optional)
P(+),N(-)	External braking unit connection terminals	Connecting braking resistor(optional)
⊕(G)	Ground connection terminal	Connecting the ground(avoiding electric shock, eliminating noise)
Ro(Ro),To(To)	Control power supply input terminals	Connecting the control power supply

● Screw Diameter and Terminal Width



Model	Screw diameter	Ground Screw diameter	Terminal width (mm)
185~300HFFA	M6	M6	23
370~550HFFA	M8	M8	29
750~900HFFA	M10	M8	29
1100~1320HFFA	M10	M8	40
1600HFA	M10	M8	36.5
1850HFA	M16	M12	51
2200HFA	M16	M12	51
2600HFA	M12	M12	51
3150HFA	M16	M12	51
ROTO terminals (All models)	M4		9

(*1) When connected with bare wire instead of crimping terminal, please use the angle washer provided in the product package.

● Terminal Arrangement

·185~220HFFA		·1600HFA	
·300~370HFFA		·1850~2200HFA	
·450~550HFFA		·2600HFA	
·750~1320HFFA		·3150HFA	



(2) Control Circuit Terminals

● Terminal Description

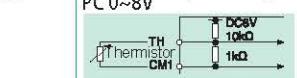
	Symbol	Name	Explanation of Terminals	Characteristics
Analog	Power Supply	L	Common Terminal for Analog Power Source	—
		H	Power Source for Frequency Setting	DC 10V, 20mA max
	Frequency Setting	O	Frequency Command Terminal(Voltage)	Maximum frequency is attained at DC 10V in DC 0-10V range. Set the voltage at
		O2	Frequency Command Extra Terminal(Voltage)	O2 signal is added to the frequency command of O or O1 in DC 0-±10V range. By changing configuration, frequency command can be input also at O2 terminal.
	Output Monitor	O1	Frequency Command Terminal (Current)	Maximum frequency is attained at DC 20mA in DC 4-20mA range. When the intelligent terminal configured as AT is on, O1 signal is enabled.
		AM	Analog Output Monitor (Voltage)	Selection of one function from: Output frequency, output current, torque, output voltage, input power, electronic thermal load ratio, and LAD frequency, motor temperature, heat sink temperature, common output terminals.
		AMI	Analog Output Monitor (Current)	DC0-10V, 2mA max.
	Monitor Output	FM	Digital Monitor (Voltage)	DC4-20mA, 250Ω max.
		P24	Power Terminal for Interface	[DC0-10V output (PWM output)] Selection of one function from: Output frequency, output current, torque, output voltage, input power, electronic thermal load ratio, and LAD frequency, motor temperature, heat sink temperature, common output terminals. [Digital pulse output (Pulse voltage DC 0/10V)] Outputs the value of output frequency as digital pulse (duty 50%)
Digital(contact)	Power Supply	CM1	Common Power Terminalfor Interface	Internal power supply for input terminals. In the case of source type logic, common terminal for contact input terminals.
		FW	Forward Command Input	Common terminal for P24, TH, and FM. In the case of sink type logic, common terminal for contact input terminals. Do not ground.
	Run Functions	1~8	Intelligent Input Terminals	The motor runs forward when FW terminal is ON, and stops when FW is OFF.
		PLC	Common Terminal for Intelligent Input Terminals	Assign 8 functions to terminals. Terminal 1 and 3 is for urgent stop,
	Status	11~15	Intelligent Output Terminals	[Input ON condition] Voltage between each terminal and PLC: DC 18V min. [Input OFF condition] Voltage between each terminal and PLC: DC 3V max. Input impedance between each terminal and PLC: 4.7Ω
		CM2	Common Terminal for Intelligent Output Terminals	Select sink or source logic with the short-circuit bar on the control terminals. Sink logic: Short P24 to PLC / Source logic: Short CM1 to PLC. When applying external power source, remove the short-circuit bar and connect PLC terminal to the external device.
	Analog Input	Open Collector	11~15	Assign 5 functions to open collector outputs. When the alarm code is selected at C062, terminal 11-13 or 11-14 are reserved for error codes of inverter trip. (Refer to the standard specifications for the functions.) Both sink and source logic are always applicable between each terminal and CM1.
		TH	Thermistor Input Terminals	Decrease in voltage between each terminal and CM2: 4V max. during ON
	Digital	Sensor	CM2	Common terminal for intelligent output terminal 11-15.
		State/ Alarm	AL0 AL1 AL2	Allowable maximum voltage: DC 27V Allowable maximum current: 50mA

● Terminal Arrangement

H	O2	AM	FM	TH	FW	8	CM1	5	3	1	14	13	11	AL1
L	O	OI	AM1	P24	PLC	CM1	7	6	4	2	15	CM2	12	AL0 AL2

Screw diameter M3

Terminal Width 6.4mm





Protective Function

Error Codes

Name	Description	Display on digital operator	Display on WOP
Over-current protection	The inverter output was short-circuited, or the motor shaft is locked or has a heavy load. These conditions cause excessive current for the inverter, so the inverter output is turned off.	Constant speed	E01.□
		During dec	E02.□
		During acc	E03.□
		Others	E04.□
Overload protection(*1)	When a motor overload is detected by the electronic thermal function, the inverter trips and turns off its output.	E05.□	Over.L
Braking resistor overload protection	When the regenerative braking resistor exceeds the usage time allowance or an over-voltage caused by the stop of the BRD function is detected, the inverter trips and turns off its output.	E06.□	OL.BRD
Over-voltage protection	When the DC bus voltage exceeds a threshold, due to regenerative energy from the motor, the inverter trips and turns off its output.	E07.□	Over.V
EEPROM error(*2)(*3)	When the built-in EEPROM memory has problems due to noise or excessive temperature, the inverter trips and turns off its output.	E08.□	EEPROM
Under-voltage error	A decrease of internal DC bus voltage below a threshold results in a control circuit fault. This condition can also generate excessive motor heat or cause low torque. The inverter trips and turns off its output.	E09.□	Under.V
CT(Current transformer) error	If a strong source of electrical interference is close to the inverter or abnormal operations occur in the built-in CT, the inverter trips and turns off its output.	E10.□	CT
CPU error	When a malfunction in the built-in CPU occurs, the inverter trips and turns off its output.	E11.□	CPU
External trip	When a signal to an input terminal configured as EX has occurred, the inverter trips and turns off its output.	E12.□	EXTERNAL
USP error	An error occurs when power is cycled while the inverter is in RUN mode if the Unattended Start Protection (USP) is enabled. The inverter trips and does not go into RUN mode until the error is cleared.	E13.□	USP
Ground fault	The inverter is protected by the detection of ground faults between the inverter output and the motor during power-up tests. This feature protects the inverter only.	E14.□	GND.Fit
Input over-voltage protection	When the input voltage is higher than the specified value, it is detected 60 seconds after power-up and the inverter trips and turns off its output.	E15.□	OV.SRC
Instantaneous power failure	When power is cut for more than 15ms, the inverter trips and turns off its output. If power failure continues, the error will be cleared. The inverter restarts if it is in RUN mode when power is cycled.	E16.□	Inst.P-F
Temperature error due to low cooling fan speed	The inverter will display the error code shown on the right if the lowering of cooling-fan speed is detected at the occurrence of the temperature error described below.	E20.□	OH.stFAN
Inverter thermal trip	When the inverter internal temperature is higher than the specified value, the thermal sensor in the inverter module detects the higher temperature of the power devices and trips, turning off the inverter output.	E21.□	OH.fin
Gate array error	Communication error has occurred between CPU and gate array.	E23.□	GA.COM
Input phase loss detection	Specify phase loss selection b006 as 01, trip will occur to avoid inverter damage. When phase loss time continues for over 1 second, the inverter trips.	E24.□	PH.fail
Main circuit error (*3)	The inverter will trip if the gate array cannot confirm the on/off state of IGBT because of a malfunction due to noise or damage to the main circuit element.	E25.□	Main.Cir
Cooling-fan speed drop signal	If the rotation speed of the internal cooling fan decreases so that the cooling effect decreases, inverter outputs turn OFF for protection.	E29.□	Fan.Slow
IGBT error	When an instantaneous over-current has occurred, the inverter trips and turns off its output to protect main circuit element.	E30.□	IGBT
Output phase loss protection(*5)	Specify output phase loss selection b141 as 01, trip will occur to avoid inverter damage. Detecting with output frequency range within 5~100HZ.	E34.□	PH.fail
Thermistor error	When the thermistor inside the motor detects temperature higher than the specified value, the inverter trips and turns off its output.	E35.□	TH
Braking error	The inverter turns off its output when it can not detect whether the braking is ON or OFF within waiting time set at b024 after it has released the brake. (When braking is enabled at b120)	E36.□	BRAKE
Emergency stop(*4)	If the EMR signal (on three terminals) is turned on when the slide switch (SW1) on the logic board is set to ON, the inverter hardware will shut off the inverter output and display the error code shown on the right.	E37.□	EMR
Low-speed over-load protection	If overload occurs during the motor operation at a very low speed at 0.2 Hz or less, the electronic thermal protection circuit in the inverter will detect the overload and shut off the inverter output. (2nd electronic thermal control) (Note that a high frequency may be recorded as the error history data.)	E38.□	OL-LowSP
Modbus communication error	If timeout occurs because of offline disconnection during the communication in Modbus-RTU mode, the inverter will display the error code shown on the right. (The inverter will trip according to the setting of C076.)	E41.□	NET.ERR
User trip 0~9	Error will be displayed in case of trip	E50.□~E59.□	PRG-0~PRG-9
Option error 1	Refer to the manual instructions	E60.□~E69.□	OP1-0~OP1-9
Option error 2	Refer to the manual instructions	E70.□~E79.□	OP2-0~OP2-9
Easy sequence function Error	Error indications by protective functions with the easy sequence function used	E43.□ E44.□ E45.□	PRG.CMD PRG.NST PRG.ERR1

(*1): Reset operation is acceptable 10 seconds after the trip.

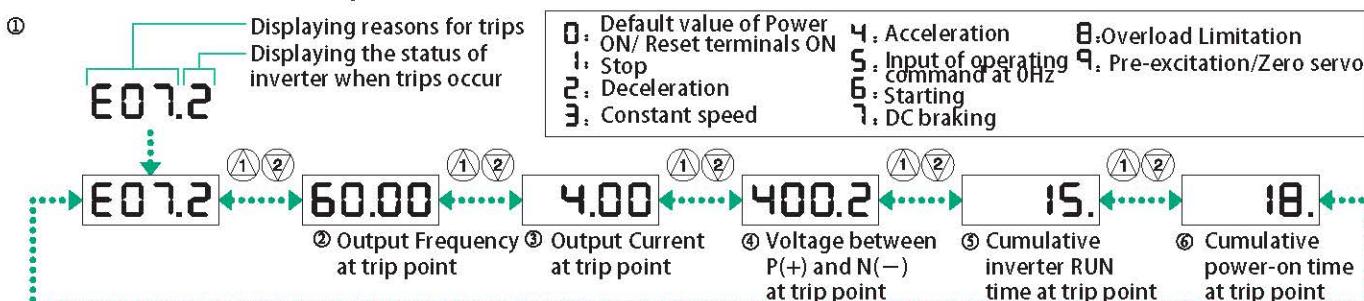
(*2): Check the parameters when EEPROM error E08 occurs. If EEPROM errors reoccur after power on, please reset the parameters after default.

(*3): The inverter will not accept reset commands input via the RS terminal or entered by the STOP/RESET key. Therefore, turn off the inverter power.

(*4): The inverter will not accept the reset command entered from the digital operator. Therefore, reset the inverter by turning on the RS terminal.

(*5): This protection function is only for SJ700N-185~1320HFFA.

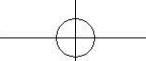
Method to Monitor Trips



Note: This is the status during an inverter trip, not the actual status of the motor.

Eg: Under PID control command or analog signal(voltage/current) input frequency command, the motor is operating at constant speed, but the inverter displays imperceptible acceleration/deceleration because of the fluctuation of analog signals.

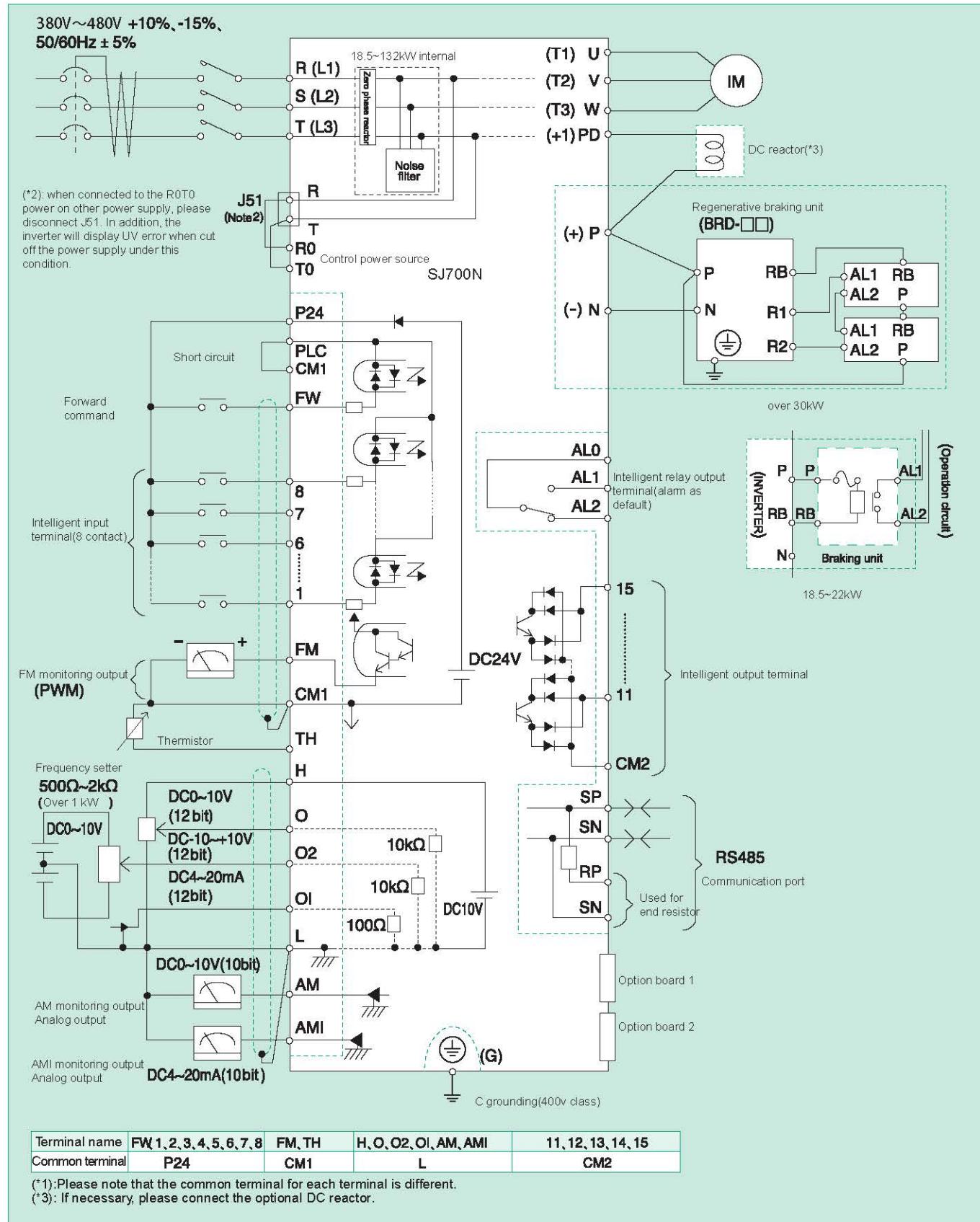
Under such circumstance, the actual status of the motor displayed on the operator is different from the status displayed during an inverter trip.

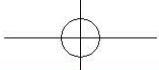


Connecting Diagram

● Standard connection(source logic)

400V class example





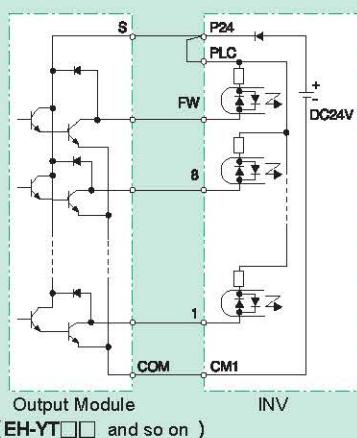
Connection to PLC

Connection to the Module of Hitachi HIDIC-H Series

● Connection to Input Terminals

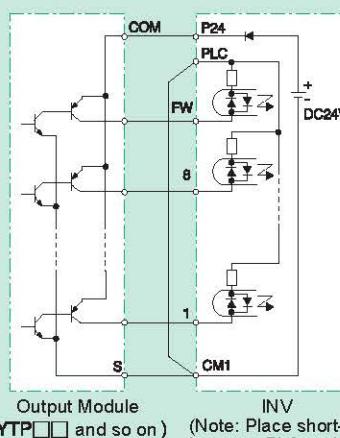
1. Using Internal Power Supply of The Inverter

1) Sink type logic



Output Module
(EH-YT□□ and so on)

2) Source type logic

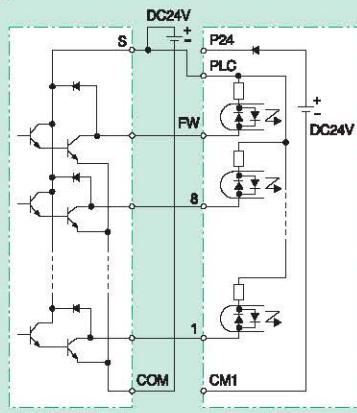


Output Module
(EH-YTP□□ and so on)

(Note: Place short-circuit bar between PLC and CM1 instead of P24 and PLC)

2. Using External Power Supply

1) Sink type logic

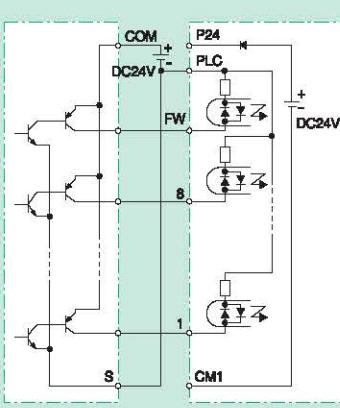


Output Module
(EH-YT□□ and so on)

(Note: Take off the short-circuit bar between PLC and P24)

(Note: Be sure to turn on the inverter after turning on the PLC and its external power source to prevent the parameters in the inverter from being modified.)

2) Source type logic

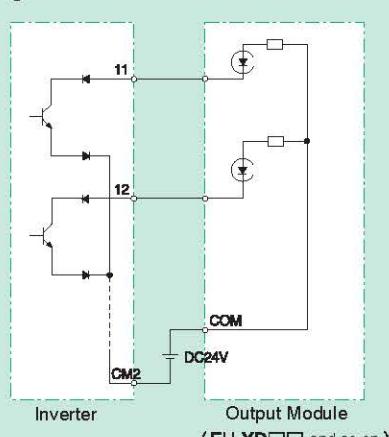


Output Module
(EH-YTP□□ and so on)

(Note: Take off the short-circuit bar between PLC and P24)

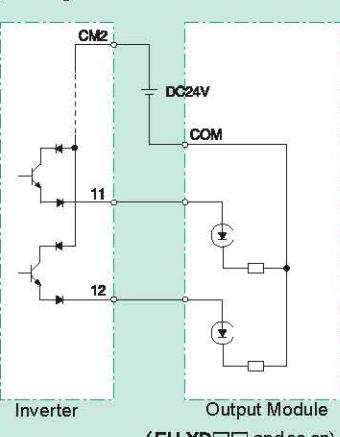
● Connection to Output Terminals

1) Sink type logic

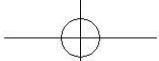


Output Module
(EH-XD□□ and so on)

2) Source type logic

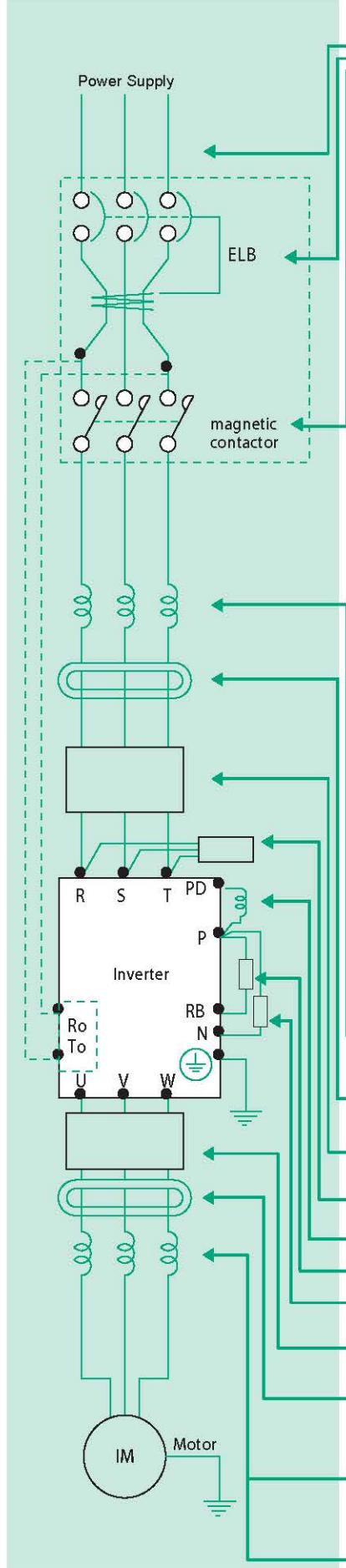


Output Module
(EH-XD□□ and so on)



Wiring and Accessories

● Standard Wiring and Accessories



Note1: The accessories are specially used in Hitachi 4 pole squirrel-cage motor

Note2: Please use the breaker with proper capacity (inverter compatible circuit breaker)

Note3: Be sure to use thick wire cable for power wiring if the distance exceeds 20m (66ft)

Note4: Be sure to use ELB to ensure safety

Note5: It is recommended to use heat resisting insulated wire(75°C)

Note6: AWG R,S,T,U,V,W (100mm²) *2

Note7: The diameter for the wire is designed based on HIV wire(heat resisting 75°C)

Note8: For P terminal wire, please refer to the manual for regenerative braking unit

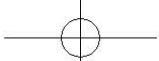
For alarm output contact, please use 0.75mm² wire

Please choose the current sensitivity according to the equivalent value of inverter-power source distance and inverter-motor distance.(④)

④	Current Sensitivity (mA)
100m and below	50
300m and below	100

[When the accessory wire is over 100m, please use CV wire instead. Because the leakage current of the HIV wire is 8 times higher than that of the CV wire. The current sensitivity is as following.(Please use 8 times higher current sensitivity when using HIV wire.)]

Name	Effectiveness				Function
	Radiated Noise	Conducted Noise	Harmonics Noise	Surge Voltage Suppress	
Input side AC reactor (AL1- □□□ 2)		△	○		This is useful in suppressing harmonics induced on the power supply lines, or when the main power voltage imbalance exceeds 3% (and power source capacity is more than 500kVA), or to smooth out line fluctuations. It also improves the power factor.
EMI filter (ZCL- □)	○	△			Reduces the conducted noise on the power supply wiring generated by the inverter. Connect to the inverter input side.
Radio noise filter (NF- □□□)	○	○			Electrical noise interference may occur on nearby equipment such as a radio receiver. This magnetic choke filter helps reduce radiated noise (can also be used on output).
Capacitor filter (CF1- □)	○	△			This capacitor filter reduces radiated noise from the main power wires in the inverter input side.
DC link choke (DCL- □ - □□)			○		Suppresses harmonics generated by the inverter.
Braking resistor					
Regenerating braking unit (BRD- □□□)					This is useful for increasing the inverter's control torque for high duty-cycle (on-off) applications, and improving the decelerating capability.
Output side noise filter (ACF-C □)	○	○		△	Reduces radiated noise from wiring in the inverter output side.
Radio noise filter (Zero Reactor) (ZCL- □□□)	○	△			Electrical noise interference may occur on nearby equipment such as a radio receiver. This magnetic choke filter helps reduce radiated noise (can also be used on input).
Output side AC reactor (ACL- □ 2- □□□)		△			This reactor reduces the vibration in the motor caused by the inverter's switching waveforms, by smoothing the waveforms to approximate commercial power quality. It is also useful when wiring from the inverter to the motor is more than 10m in length, to reduce harmonics.
LCR filter	△	○		○	Sine wave shaping filter for the output side.



For Correct Operation

- Before use, be sure to read through the Instruction Manual to insure proper use of the inverter.
- Note that the inverter requires electrical wiring; a trained specialist should carry out the wiring.
- The inverter in this catalog is designed for general industrial applications. For special applications in fields such as aircraft, outer space, nuclear power, electrical power, transport vehicles, clinics, and underwater equipment, please consult with us in advance.
- For application in a facility where human life is involved or serious losses may occur, make sure to provide safety devices to avoid damages.
- The inverter is intended for use with a three-phase AC motor. For use with a load other than this, please consult with us.

Application to Motors

< Application to general-purpose motors >

Operating frequency	The overspeed endurance of a general-purpose motor is 120% of the rated speed for 2 minutes (JIS C4 004). For operation at higher than 60Hz, it is required to examine the allowable torque of the motor, useful life of bearings, noise, vibration, etc. In this case, be sure to consult the motor manufacturer as the maximum allowable rpm differs depending on the motor capacity, etc.
Torque characteristics	The torque characteristics of driving a general-purpose motor with an inverter differ from those of driving it using commercial power (starting torque decreases in particular). Carefully check the load torque characteristic of a connected machine and the driving torque characteristic of the motor.
Motor loss and temperature increase	An inverter-driven general-purpose motor heats up quickly at lower speeds. Consequently, the continuous torque level (output) will decrease at lower motor speeds. Carefully check the torque characteristics vs speed range requirements.
Noise	When run by an inverter, a general-purpose motor generates noise slightly greater than with commercial power.
Vibration	When run by an inverter at variable speeds, the motor may generate vibration, especially because of (a) unbalance of the rotor including a connected machine, or (b) resonance caused by the natural vibration frequency of a mechanical system. Particularly, be careful of (b) when operating at variable speeds a machine previously fitted with a constant speed motor. Vibration can be minimized by (1) avoiding resonance points using the frequency jump function of the inverter, (2) using a tire-shaped coupling, or (3) placing a rubber shock absorber beneath the motor base.
Power transmission mechanism	Under continued, low-speed operation, oil lubrication can deteriorate in a power transmission mechanism with an oil-type gear box (gear motor) or reducer. Check with the motor manufacturer for the permissible range of continuous speed. To operate at more than 60 Hz, confirm the machine's ability to withstand the centrifugal force generated.

< Application to special motors >

Gear motor	The allowable rotation range of continuous drive varies depending on the lubrication method or motor manufacturer. (Particularly in case of oil lubrication, pay attention to the low frequency range.)
Brake-equipped motor	For use of a brake-equipped motor, be sure to connect the braking power supply from the primary side of the inverter.
Pole-change motor	There are different kinds of pole-change motors (constant output characteristic type, constant torque characteristic type, etc.), with different rated current values. In motor selection, check the maximum allowable current for each motor of a different pole count. At the time of pole changing, be sure to stop the motor. Also see: Application to the 400V-class motor.
Submersible motor	The rated current of a submersible motor is significantly larger than that of the general-purpose motor. In inverter selection, be sure to check the rated current of the motor.
Explosion-proof motor	Inverter drive is not suitable for a safety-enhanced explosion-proof type motor. The inverter should be used in combination with a pressure-proof explosion-proof type of motor.
Synchronous (MS) motor High-speed (HFM) motor	In most cases, the synchronous (MS) motor and the high-speed (HFM) motor are designed and manufactured to meet the specifications suitable for a connected machine. As to proper inverter selection, consult the manufacturer.
Single-phase motor	A single-phase motor is not suitable for variable-speed operation by an inverter drive. Therefore, use a three-phase motor.

< Application to the 400V-class motor >

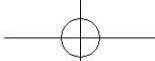
A system applying a voltage-type PWM inverter with IGBT may have surge voltage at the motor terminals resulting from the cable constants including the cable length and the cable laying method. Depending on the surge current magnification, the motor coil insulation may be degraded. In particular, when a 400V-class motor is used, a longer cable is used, and critical loss can occur, take the following countermeasures:

- (1) install the LCR filter between the inverter and the motor
- (2) install the AC reactor between the inverter and the motor
- (3) enhance the insulation of the motor coil.

Notes on Use

< Drive >

Run/Stop	Run or stop of the inverter must be done with the keys on the operator panel or through the control circuit terminal. Do not operate by installing a electromagnetic contactor (Mg) in the main circuit.
Emergency motor stop	When the protective function is operating or the power supply stops, the motor enters the free run stop state. When an emergency stop is required or when the motor should be kept stopped, use of a mechanical brake should be considered.
High-frequency run	A max. 400Hz can be selected on the SJ700N Series. However, a two-pole motor can attain up to approx. 24,000 rpm, which is extremely dangerous. Therefore, carefully make selection and settings by checking the mechanical strength of the motor and connected machines. Consult the motor manufacturer when it is necessary to drive a standard (general-purpose) motor above 60 Hz. A full line of high-speed motors is available from Hitachi.



< 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 gasses, mist of liquid for grinding, or salt. Install the inverter away from direct sunlight in a well-ventilated room that is free of vibration. The inverter can be operated in the ambient temperature range of -10 to 50°C.

< Main Power Supply >

Installation of an AC reactor on the input side	In the following examples involving a general-purpose inverter, a large peak current flows on the main power supply side, and is able to destroy the converter module. Where such situations are foreseen or the connected equipment must be highly reliable, install an AC reactor between the power supply and the inverter. Also, where influence of indirect lightning strike is possible, install a lightning conductor. (A) The unbalance factor of the power supply is 3% or higher. (Note) (B) The power supply capacity is at least 10 times greater than the inverter capacity (the power supply capacity is 500 kVA 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) and (C), it is recommended to install an AC reactor on the main power supply side. Note: Example calculation with $V_{RS} = 205V$, $V_{ST} = 201V$, $V_{TR} = 200V$ V_{RS} : R-S line voltage, V_{ST} : S-T line voltage, V_{TR} : T-R line voltage Unbalance factor of voltage = $\frac{\text{Max. line voltage (min.)} - \text{Mean line voltage}}{\text{Mean line voltage}} \times 100$ $= \frac{V_{RS} - (V_{RS} + V_{ST} + V_{TR})/3}{(V_{RS} + V_{ST} + V_{TR})/3} \times 100 = \frac{205 - 202}{202} \times 100 = 1.5 (\%)$
Using a private power generator	An inverter run by a private power generator may overheat the generator or suffer from a deformed output voltage waveform of the generator. Generally, the 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.

Notes on Peripheral Equipment Selection

Wiring connections		(1) Be sure to connect main power wires with R(L1), S(L2), and T(L3) terminals (input) and motor wires to U(T1), V(T2), and W(T3) terminals (output). (Incorrect connection will cause an immediate failure.) (2) Be sure to provide a grounding connection with the ground terminal ().
Wiring between inverter and motor	Electromagnetic contactor	When an electromagnetic contactor is installed between the inverter and the motor, do not perform on-off switching during running operation.
Installing a circuit breaker		When used with standard applicable output motors (standard three-phase squirrel-cage four-pole motors), the SJ700N series does not need a thermal relay for motor protection due to the internal electronic protective circuit. A thermal relay, however, should be used: <ul style="list-style-type: none">● During continuous running outside a range of 30 to 60 Hz.● For motors exceeding the range of electronic thermal adjustment (rated current).● When several motors are driven by the same inverter; install a thermal relay for each motor.● The RC value of the thermal relay should be more than 1.1 times the rated current of the motor. Where the wiring length is 10 m or more, the thermal relay tends to turn off readily. In this case, provide an AC reactor on the output side or use a current sensor.
Wiring distance		Install a circuit breaker on the main power input side to protect inverter wiring and ensure personal safety. Choose an inverter-compatible circuit breaker. The conventional type may malfunction due to harmonics from the inverter. For more information, consult the circuit breaker manufacturer.
Earth leakage relay		If the earth leakage relay (or earth leakage breaker) is used, it should have a sensitivity level of 15 mA or more (per inverter).
Phase advance capacitor		Do not use a capacitor for power factor improvement between the inverter and the motor because the high frequency components of the inverter output may overheat or damage the capacitor.

High-frequency Noise and Leakage Current

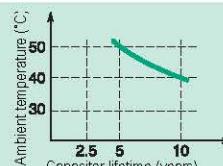
- (1) High-frequency components are included in the input/output of the inverter main circuit, and they may cause interference in a transmitter, radio, or sensor if used near the inverter. The interference can be minimized by attaching noise filters (option) in the inverter circuitry.
(2) The switching action of an inverter causes an increase in leakage current. Be sure to ground the inverter and the motor.

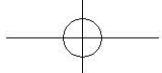
Lifetime of Primary Parts

Because a DC bus capacitor deteriorates as it undergoes internal chemical reaction, it should normally be replaced every 10 years. (10 years is not the guaranteed lifespan but rather, the expected design lifespan.) Be aware, however, that its life expectancy is considerably shorter when the inverter is subjected to such adverse factors as high temperatures or heavy loads exceeding the rated current of the inverter.

JEMA standard is the 10 years at ambient temperature 40°C used in 12 hours daily. (according to the "Instructions for Periodic Inspection of General-Purpose Inverter" (JEMA).)

Also, such moving parts as a cooling fan should be replaced. Maintenance inspection and parts replacement must be performed by only specified trained personnel. Please plan to replace new INV depends on the load, ambient condition in advance.





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