

SH1 s

Be a next standard!



SH1



Powerful and A

SH1 series , setting the new global standard

1. A High Performance drive for the most demanding

A variety of motors (IM/PM) can be adjustable to drive.
The most stable operation ever.

2. Easy access to all the functionality

Innovative performance and characteristics for dedicated pursuit of user friendliness

3. Versatility through multi mode operation, to meet your specific application needs

SH1 meet a wide range of needs by achieving variety of functions necessary for drive systems.

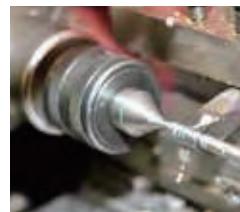
Corresponds to variety of applications.



Crane



Winder &
re-winder



Machine
Tools



Injection
molding



Conveyors

CONTENTS



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Textile



Engineering



Fan



Pump

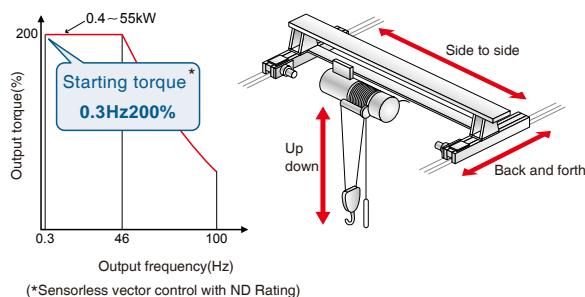
A High Performance drive for the most demanding of applications

"Smooth operation" in critical and demanding applications, such as vertical lift

New

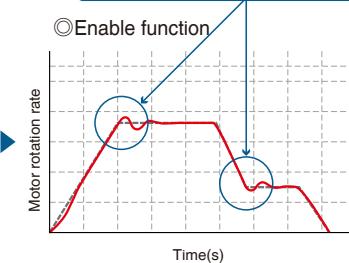
version UP

High starting torque at low speed range while in control of heavy loads. (ND rating).
[Sensor less vector control(SLV)]
[OHZ sensor less vector control]



Decreasing overshoot and undershoot contributes to smooth and stabilized operation with reduced load shock.
[Gain mapping Function]

Reduction of swinging load, leading to better operational control and productivity.



Cog-less motor operation for crane, lift, transport, etc.

Trip-less operation for better productivity.

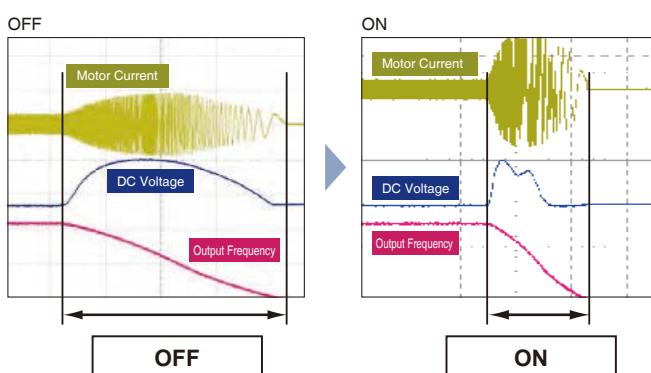


Reduce trips on acceleration and deceleration

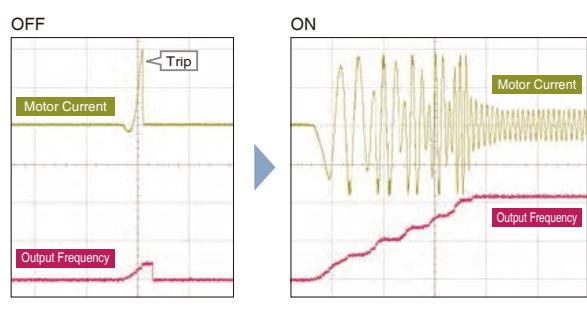
version UP

Automatic speed adjustment manages ideal acceleration / deceleration speed to reduce the trip possibility from over current, over voltage, and impact load.

Over magnetize function



Over-current suppress function



*Turn off this function for lifting equipment.

*Image of the output frequency and output current.

version UP

Improvement or added item.

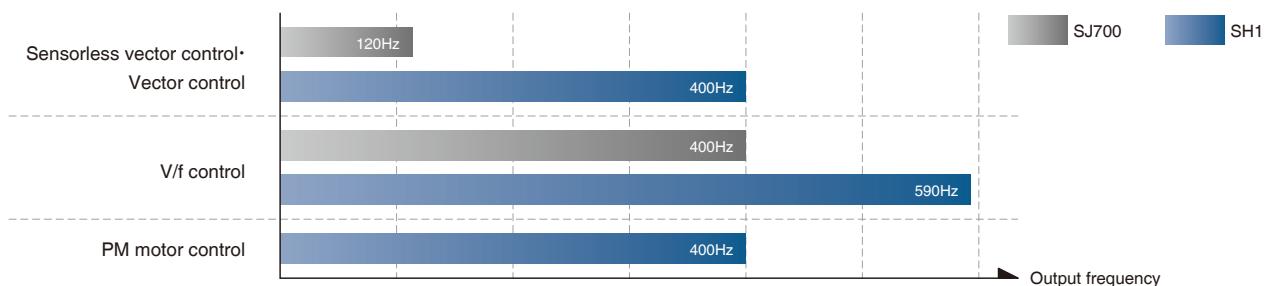
EzSQEzSQ application case.
refer to P17-18 for details.**PM motor**

PM motor specific function.

"High speed rotation" for non-traditional applications

version UP**PM motor**

590Hz at the maximum operation is available for precise metal processing. For PM motor, also up to 400Hz. (actual output frequency depends on motor)



For metal tooling

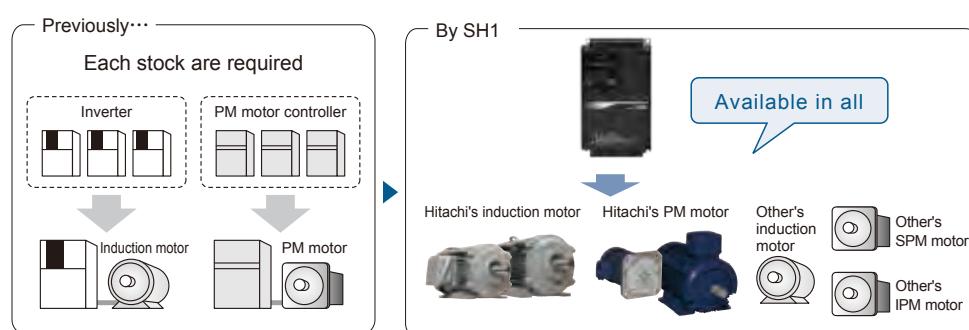
High speed rotation contributes the high quality of metal processing.



Save on spare control costs

New Feature

Our multi-mode inverter can control both your induction motor, or permanent magnet AC motor. All while offering programmable current limit to protect from demagnetization of the PM motor.



Optimize performance. [Auto-tuning function]

Complicated tuning procedures are avoided through the use of our auto-tuning function to optimize motor performance.

For long time operation (fan, pumps)

Significant energy savings can be obtained in comparison to an induction motor, even in 24 hours 365 days operation.



A High Performance drive for the most demanding of applications

Complicated PID process control

New Feature
version UP

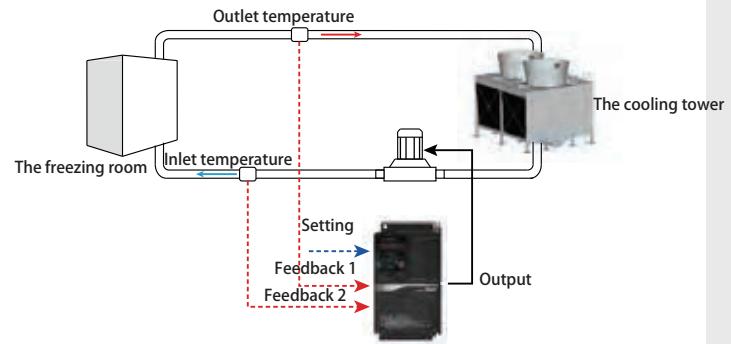
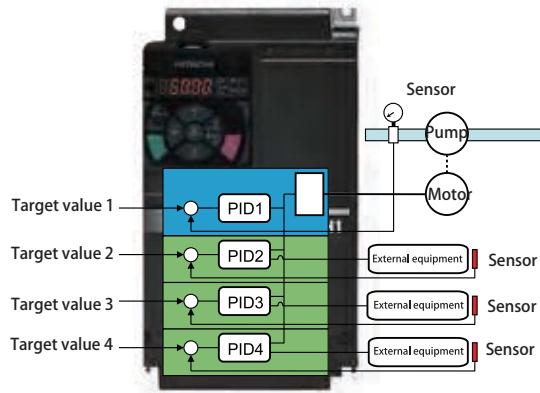
4-path independent PID control is introduced to achieve complex process control

- 4 path PID can be switched to use through the terminal
- When the motor control is not required, it can be freely used as the external PID controller. No additional PID controller is needed to save cost and space
- PID cascade control can be performed

- PID velocity stack
- PID target value and feedback value calculation
- Pressure boost dormancy/wake
- PID soft start

Central air-conditioning cooling water thermostatic difference control

The feedback value calculation function easily achieves the thermostatic difference of water through the inlet and outlet of central air-conditioner.



Highly accurate position control

version UP

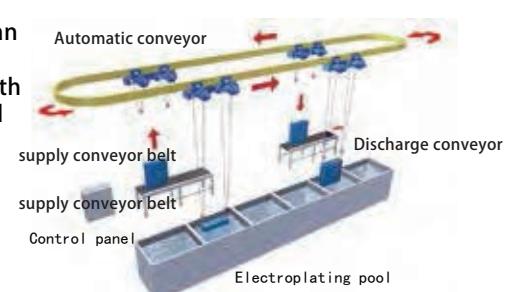
Optimized absolute position control function which achieves accurate operation

The inverter, operated together with encoder-equipped general motor, can realize highly accurate absolute position control.

When applied in a conveyor, accurate position control can be achieved with low cost. Based on the four motion parameters (position command, speed command, acceleration command, deceleration command), the inverter moves an object from original position A to target position B, and after that it keeps the servo lock status.

- Position memory at power off
- Preset of position parameter
- Position learn function
- 16 digit position control

Automatic conveyor winch system



Forcible operation at emergency

New Feature

The inverter will forcibly operate the fan and water pump when fire disaster happens in tunnels, mines or buildings, which will fully ensure the safety of life and property.

When the function is activated, it will enter forcible operation mode according to preset direction and speed. It will restart after inverter trip. Once the inverter fails to work, it will switch to bypass operation.

Accessibility

Easy access to all the functionality

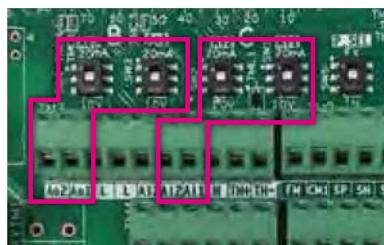
Various convenient features.

Control circuit terminal designed for easy wiring

New Feature

0/10V and 4 to 20mA inputs and as well as output are easily selected via DIP switch.

- 2 analog inputs (3inputs in total).
- 2 analog outputs.



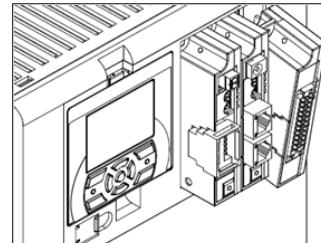
Modbus communication is standard. 2 communication terminals provided for Modbus communication as standard.

Daisy chain wiring of RS-485 is easy.



Easy customize with "Slot-in" option cassette

3 option slots

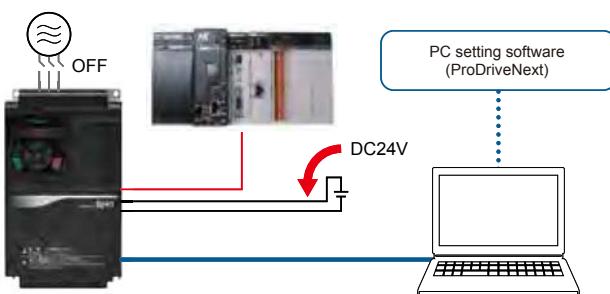


Programming ease through the use of 24 VDC to power up inverter CPU memory

New Feature

Normal power supply (R0, T0) to CPU. Also possible to utilize an external 24VDC control power supply.

Parameter setting is also possible with the main power is turned off. Thus saving time and effort.



Easy customize by PC configuration software

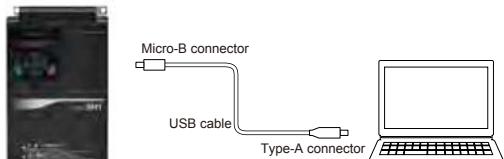
version UP

PC setting software.

Using the PC configuration software (ProDriveNext), parameter setting, monitor, and diagnosis can be easily achieved.

Easy customization to your own inverter.

Specific behavior can be easily programmed into the inverter by BASIC like program.

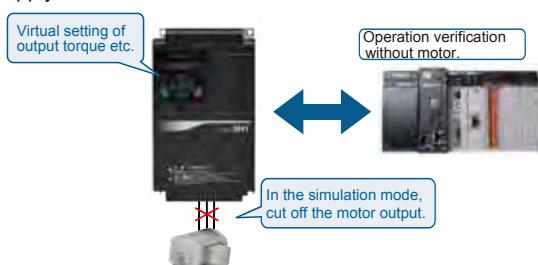


Control Simulation Logic operation without direct motor output

New Feature

The simulation mode makes it easier to verify connection with the system control equipment.

In the simulation mode, only the motor output is shut off while all inverter functions are enabled. The simulation mode can also be active by using an external 24VDC power supply.



Quick diagnose during failure

New Feature

The SH1 automatically stores internal data in retentive memory.

Users can upload the data to a PC for review and diagnosis of issue.



Accessibility

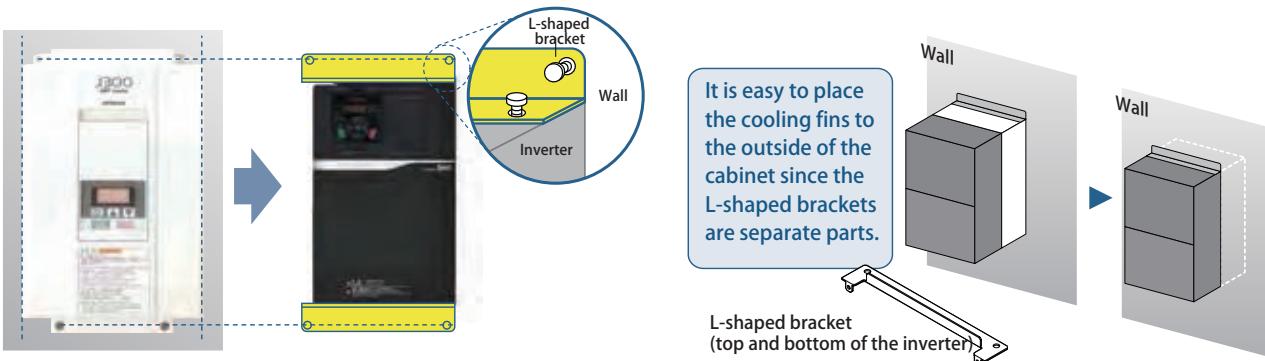
Easy access to all the functionality

Various convenient features.

Direct field replacement, when needed

New Feature

Panel mounting portion is supplied as separate part. (SH1-00175-H or more)
Even if its body size is different, it is possible to correspond in flexible ways.

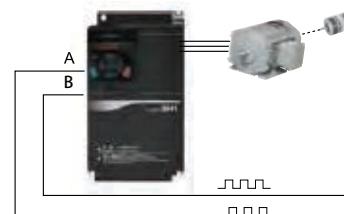


High speed pulse train input

New Feature

The inverter is equipped with 2 way high speed pulse train input port (maximum 32 kpps)

Not only used as input of pulse train, but also as input port of feedback signal
When operating together with encoder-equipped general motor, the inverter
can achieve highly accurate speed control, torque control and position control,
which largely reduce the cost of the system.



Cooling fan and the main circuit capacitor is
designed for 10 years life.

(Note: The ambient temperature is 40 °C (annual average).
Without corrosive gas, flammable gas, oil mist and dust.)
The above design life is a calculated value, not a guaranteed value.
Output current at the calculation is 80% of the rated current of the inverter.

Monitor lifetime prediction functions.

Electrolytic capacitor of control circuit
(internal estimation calculation).

Cooling fan.

Environment compatibility

version UP

Independent cooling structure

The cooling structure is separated from electric structure, which prevents from dust, oil and other bad working environment, so as to ensure sustainable operation.

Promoted treatment of inner coating

Nickel-plated treatment of the cooper bus-bar enhances the compatibility to corrosive gas and oil mist.

Built-in noise filters corresponding to the European EMC Directive. (IEC61800-3 2nd Environment Category C3)



Since complies with the RoHS, Environmental considerations also sufficient.

EMC directive:EN 61800-3:2004/
A1:2012 LVD:EN 61800-5-1:2007

EzSQ

EzSQ (programming function for customization)

version
UP

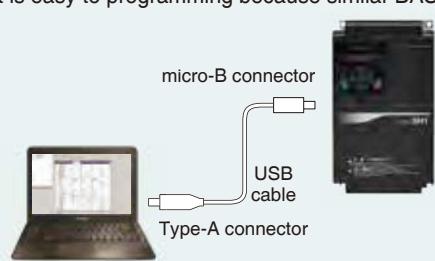
Line	ラベル	ニーモニック	パラメータ1	パラメータ2	パラメータ3	パラメータ4	パラメータ5
7	case		1				
8	call	RUN_FW					
9	case	2					
10	call	RUN_RV					
11	case	3					
12	call	WAIT_RUN					
13	case else						
14	call	STOP					
15	end select						
16	goto	LOOP					
17							
18	sub	STOP					
19	UBw=	Xw	and	3			
20	if	UBw	◇	2	then	LBLO	
21	FW=	1					
22	timer set	TD(0)	U(00)				
23	U(31)=			1			
24	LBLO	end sub					
25							

The program is easy to create with available condition branches and timer settings.

Hitachi's EzSQ makes it possible to achieve a level of control that cannot be realized by a general purpose inverter. Providing a unique solution and added value through cost savings and improved performance.

Simultaneous execution task in SH1 extended to 5tasks/2ms

The program is created on a PC setting software (ProDriveNext).
It is easy to programming because similar BASIC!



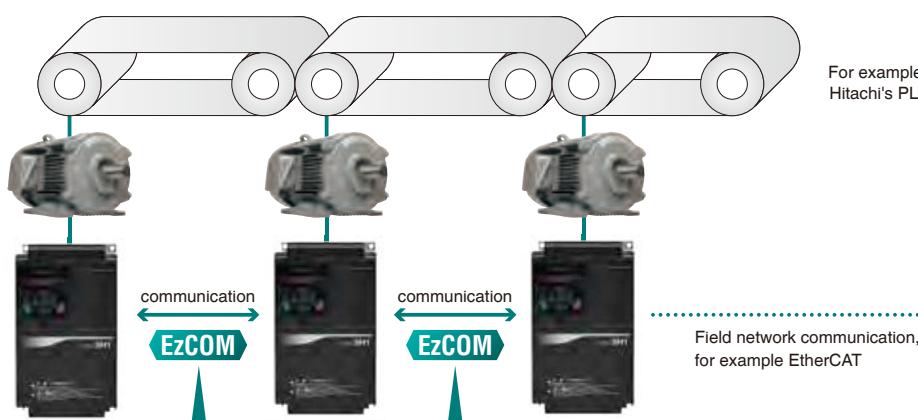
EzCOM

Inverter-to-Inverter communication

version
UP

SH1 makes it possible to have Inverter-to-Inverter communication without a PLC or PC. [EzCOM function]

It is easy to build a small coarsely synchronized system using multiple inverters. Since SH1 can use both of EzCOM and external communication option cassette, you can create a system that does not require complicated control components. (The maximum number of EzCOM units is 8 inverters)



For example,
Hitachi's PLC



Field network communication,
for example EtherCAT

Available together,
EzCOM communication
and field network
communication options.

By simple wiring and easy parameter settings, the synchronous operation can be achieved without the host controller (Resulting in cost and wiring savings).

Flexibility

Versatility through multi mode operation, to meet your specific application needs.

SH1 meet a wide range of needs by achieving variety of functions

"Save space and save cost" by multi rating function!(specially used)

version
UP
PM
motor

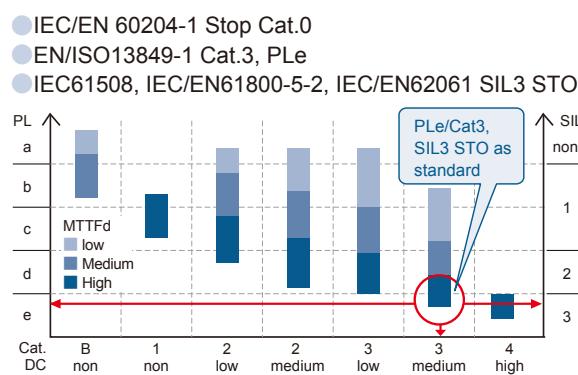
Triple-rated for Induction motor for various applications is selectable. Dual-rated for PM motor control.
Multiple rating helps to save space and cost.

Rating	VLD(Very Light Load)	LD(Light Load)	ND(Normal Load)
Induction motor	←	→	
PM motor		←	→
Applications	Fan·Pump	Metal tooling·Conveyer	Crane·Mixer
Overload current rating	110% 60sec, 120% 3sec	120% 60sec, 150% 3sec	150% 60sec, 200% 3sec
Example 400V/18.5kW Max rated output current	47.0A 	43.0A 	39.0A 

Certified "functional safety" international standard(specially models)

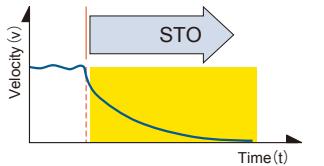
Certified functional safety. (Certification in process)

Third party certified electrical safety,
In compliance to IEC61508, IEC/EN61800-5-2 SIL3 STO,
available as standard.

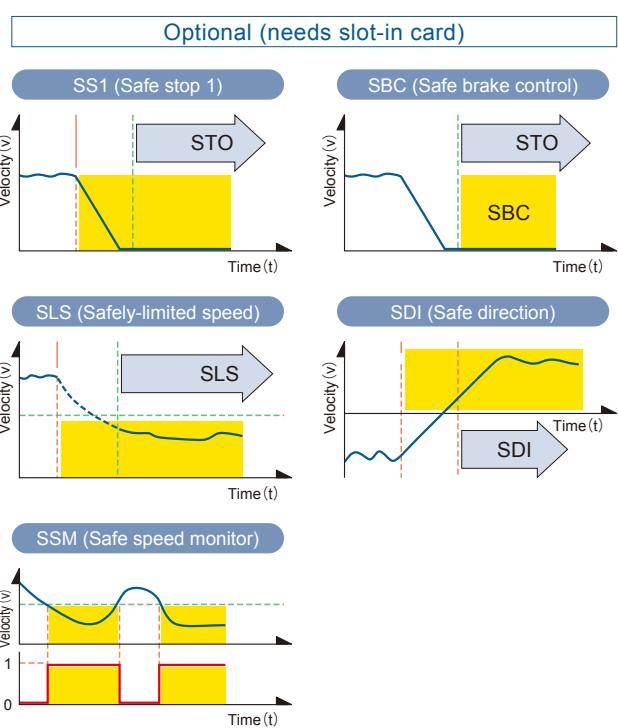


Standard (without option cassette)

STO (Safe torque off)



SS1, SLS and others are available with slot-in option cassette. (In design phase)



version
UP

IoT applied

Remote control of industrial equipment, OA system information sharing, general management of different information facilities.



RS-485 communication terminal

Modbus-RTU, The maximum baud rate is 115.2kbps.

(Modbus is the registered trademark of Modicon Inc. EtherCAT is the registered trademark and patented technology approved by Beckhoff Automation GmbH. Other corporation name and product name is the trademark and registered trademark of related companies and organizations)

Intuitive,easy-to-use LED operator is standard

version
UP

Operation Panel



Braking circuit is built-in. Further "Space and Cost saving"

version
UP

The regenerative braking circuit is built-in, therefore a separate regenerative braking unit (BRD) is not necessary. Saving space and cost.

Applicable models
0.75 to 55kW
(45kW and 55kW is the order)



PC setting Software

Hitachi's ProDriveNext Software

Easy configuration, such as start/stop and fault diagnosis.

ProDriveNext(PC setting software)

ProDriveNext supports various functions.

Easy Setup & Easy data management.
Parameter comparison is also enhanced.



Easy connection via USB

Ethernet is also available (optional)

Type-A connector
Micro-B connector
USB cable

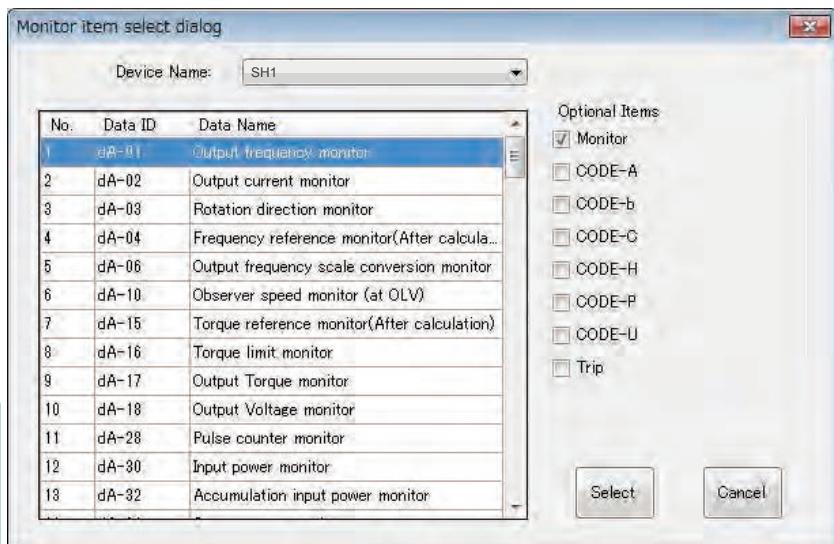


Monitor Function.

All display parameters can be monitored.

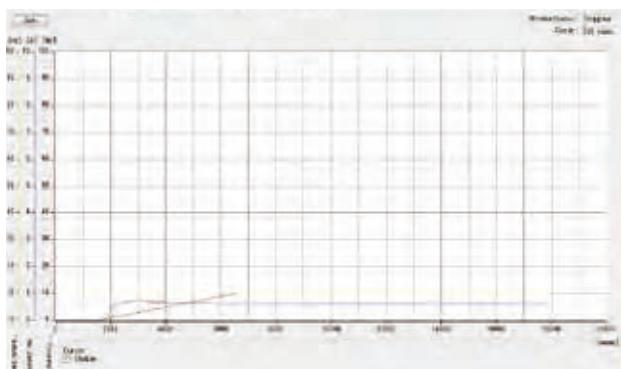


Monitor display format can be uniquely customized by selecting the required items, and can be displayed in a tabular or graphical format.



Device Name	Data ID	Data Name	Process value	Unit
SH1	dA-01	Output frequency monitor	18	Hz
SH1	dA-02	Output current monitor	1.39	A
SH1	dA-03	Rotation direction monitor	Forward RUN	
SH1	dA-04	Frequency reference monitor(After calculat...)	18	Hz
SH1	dA-05	Output frequency scale conversion monit...	18	
SH1	dA-10	Observer speed monitor (at OLV)	0	%
SH1	dA-15	Torque reference monitor(After calculation)	0	N
SH1	dA-16	Torque limit monitor	0	N
SH1	dA-17	Output Torque monitor	0	N
SH1	dA-18	Output Voltage monitor	48	V
SH1	dA-28	Pulse counter monitor	0	aW
SH1	dA-30	Input power monitor	0	aW
SH1	dA-32	Accumulation input power monitor	0	aW

[Table type monitor]



[Graph type monitor]

Parameter Setting.

Changes made by keyboard input.

Changed parameters highlighted "PINK" which indicates that it needs to be download to the device.

Device Status(SJ-P1) Parameter setting(SJ-P1) Monitor(SJ-P1)						
Device Name SJ-P1						
Compare						
Data ID	Data Name	Setting value	Current value	Unit	Default value	Range
AA101	Main speed input source select	01(Setting by para.)	01(Setting by para.)		01(Setting by para.)	
AA102	Sub frequency input source sele...	00(Disable)	00(Disable)		00(Disable)	
AA104	Sub speed setting, 1st-motor	0.00	0.00	Hz	0.00	0.00 ~ 500.00
AA105	Calculation symbol selection for...	00(Disable)	00(Disable)		00(Disable)	
AA108	Add frequency setting, 1st-motor	0.00	0.00	Hz	0.00	-100.00 ~ 500.00
AA111	Run-command input source sele...	02(RUN key on Key)	02(RUN key on Key)		02(RUN key on Key)	
AA112	RUN-Hkey Direction of Keypad, 1...	00(Foward)	00(Foward)		00(Foward)	
AA113	STOP-key enable of RUN-Hkey...	01(Enable)	01(Enable)		01(Enable)	
AA114	RUN-direction restriction, 1st-m...	00(Disable)	00(Disable)		00(Disable)	
AA115	STOP mode selection, 1st-motor	00(Deceleration unit)	00(Deceleration unit)		00(Deceleration unit)	
AA201	Main speed input source select	01(Setting by para.)	01(Setting by para.)		01(Setting by para.)	
AA202	Sub speed input source sele...	00(Disable)	00(Disable)		00(Disable)	
AA204	Sub speed setting, 2nd-motor	0.00	0.00	Hz	0.00	0.00 ~ 500.00
AA205	Calculation symbol selection for...	00(Disable)	00(Disable)		00(Disable)	
AA208	Add frequency setting, 2nd-motor	0.00	0.00	Hz	0.00	-100.00 ~ 500.00
AA211	Run-command input source sele...	02(RUN key on Key)	02(RUN key on Key)		02(RUN key on Key)	
AA214	STOP-mode selection, 2nd-motor	00(Disable)	00(Disable)		00(Disable)	

[Parameter setting display]

Extensive parameter comparison function.

Parameter management is supported by comparison functions below.

[Setting value] - [Current value],

[Setting value] - [Default value]

[Setting value] - [File value]

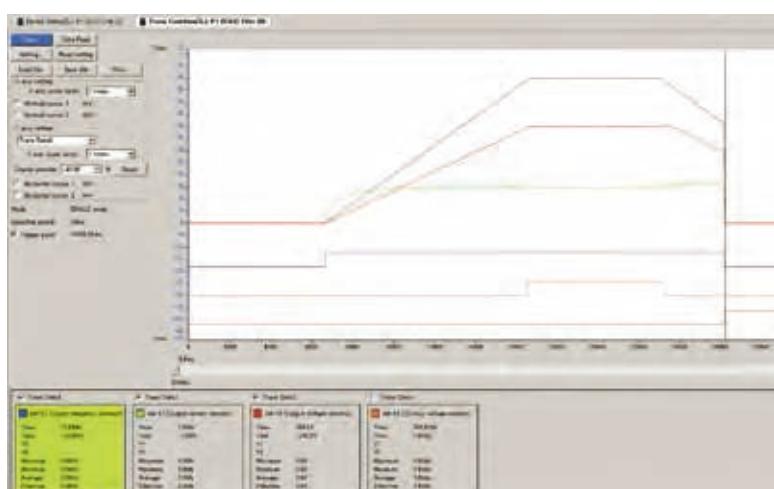
Output			
Device Name(SJ-P1)			
Setting is compared with Default value.			
PA-01 Main speed reference selection	Setting value: 01(0)	Current value: 01(0)	Default value: 01(0)
PA-02 Deceleration time restrict	Setting value: 00(0ms)	Current value: 00(0ms)	Default value: 00(0ms)
AA111 Run-command input source selection, 1st-motor	Setting value: 00(RUN key or keypad)	Current value: 00(RUN key or keypad)	Default value: 00(RUN key or keypad)
AA112 Torque reference input source selection	Setting value: 02(Genkey or Terminal A/D)	Current value: 02(Genkey or Terminal A/D)	Default value: 02(Genkey or Terminal A/D)
AA113 Torque limit input source selection	Setting value: 03(Digital by Terminal A/D)	Current value: 03(Digital by Terminal A/D)	Default value: 03(Digital by Terminal A/D)
DA104 Overload protection 1 mode selection, 1st-motor	Setting value: 01(Enable)	Current value: 01(Enable)	Default value: 01(Enable)
No data mismatch were detected.			

Data Trace function support an failure diagnosis.

By frequency reached, alarm or other signal trigger, the internal data of inverter is stored in real-time in the internal memory*.

Operation adjustment and failure analysis becomes more quickly.

(*This memory data is cleared at power shutdown.)



Hitachi's EzSQ makes it possible to achieve a level of control that cannot be realized by a general purpose inverter. Providing a unique solution and added value through cost savings and improved performance.

Simultaneous execution task in SH1 extended to 5tasks/2ms.
(SJ700 is 1task/2ms.)

Hitachi inverters are used in a wide variety of industries because

Crane, Lift, Automatic warehouse

EzSQ

- Provides smooth drive control even for heavy weights.

Provide stable drive control even for the heavy weights (such as winding of the cranes) by high start-up torque (0.3Hz, 200%).

*Note Hitachi Induction motor 4P (ND load/Sensor-less vector control)



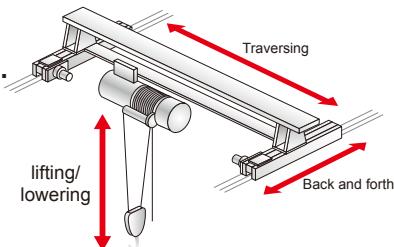
- Reduce the shock such as swing load by multi setting speed response gain.

Gain mapping function provides a vibration reduction and stable operation. It will be also effective in the tact time reduction.



- Space-saving and cost-down by the EzSQ(programming function).

By using EzSQ, it is possible to reduce components by eliminating the host controller for the drive, thus saving-space and cost.



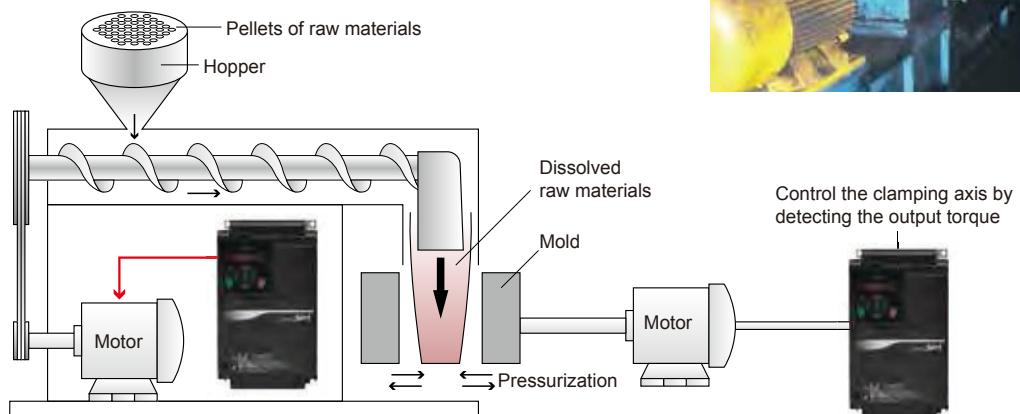
Recommended function

- Sensorless vector control
- Gain mapping function
- EzSQ(programming function)

Injection molding machine

- Torque control can be applied to the injection molding machine.

"Overload warning signal" and "Over torque signal" can apply the operation timing of the injection and mold clamping axis.



Recommended function

- Torque control
- Torque limit function
- Overload signal
- Over torque signal
- Overload restriction function

of its high efficiency and high quality.

Winder

Utilizing Gain Control.

When you allow the speed response gain to be variable by the output frequency band, the drive is more stable.

This is suitable for winder and re-winder applications.



In Winding machine applications highly precise rotation is required.

For closed-Loop application optional feedback board is required.



Recommended function

- Vector control (feedback option board required)
- Gain mapping function
- Torque control

Grinder

EzSQ PM
motor

Miniaturization by utilizing a PM motor.

Hitachi supports PM motor control.



Further support to high-quality machining applications.

Maximum output frequency is 590Hz (induction motor) and 400Hz (PM motor).

EzSQ expands the possibility for a wide variety of simpler applications.

By utilizing the EzSQ program operation functionality, The drive logic (EzSQ) can be developed and edited to optimize the motor operation based on conditional or logical programming to enhance and increase production.

In addition, the programming functionality can reduce cost, function, and panel space as well as some of the logic allocated to the controller and peripheral devices.

e. g. Depend on application desired operation, the logic program (EzSQ) can control many of the operational parameters, such as frequency, overload level, overload signals and others.



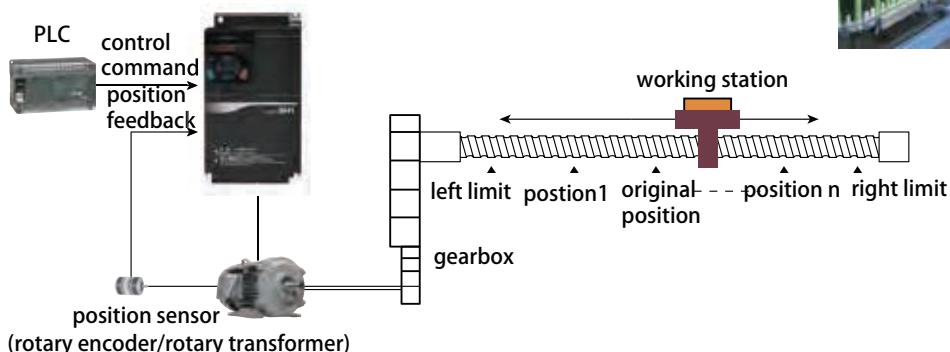
Recommended function

- PM motor drive
- EzSQ(programming function)

The SH1 inverter is applicable in a wide variety of applications.

Positioning control of lifting mechanism and working station

- The inverter together with encoder-equipped motor can perform position control in applications such as lift machinery, metal processing machinery and so on. No additional encoder feedback board is needed to achieve cost competitive system.
- EzSQ program achieves auto-positioning operation.



Recommended function

- Position control
- Return to original position

- Position learning
- EzSQ(programming function)

- Motor gear ratio

Air blower, water pump

- PM motor is used to promote energy saving
- Energy saving mode highly promotes the working efficiency and saves energy
- PID and pressurized sleep/wake help achieve stable and high efficient operation
- EzSQ program makes the whole system simple to operate and largely reduces the cost



Recommended function

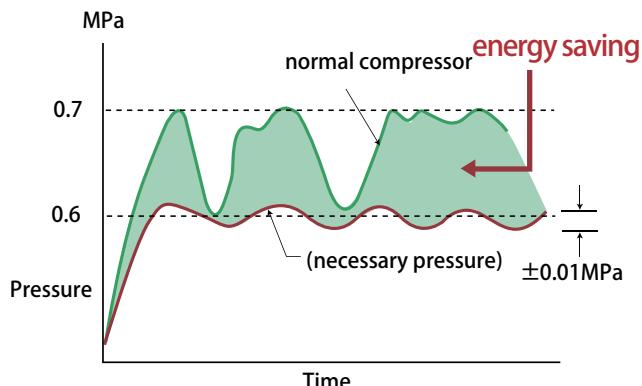
- PM motor drive
- PID control
- Automatic energy-saving function
- EzSQ

such as fan, pump and compressor.

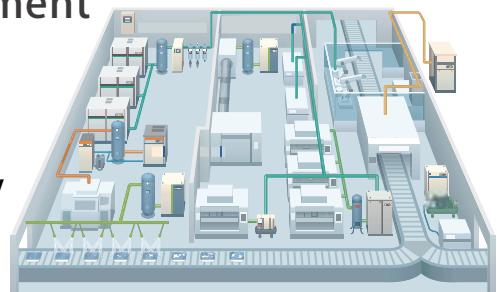
more useful features of each application!

Air compressor in the industrial equipment

- The inverter controlled compressor can realize highly accurate pressure control, which is more stable and energy efficient.
- PM motor is used to further promote energy efficiency



*Hitachi OSP-11~160kW testing curve



Recommended function

● PM motor

● Modbus

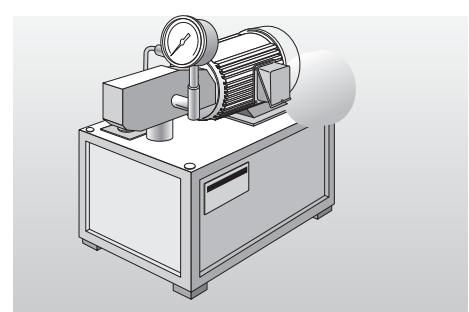
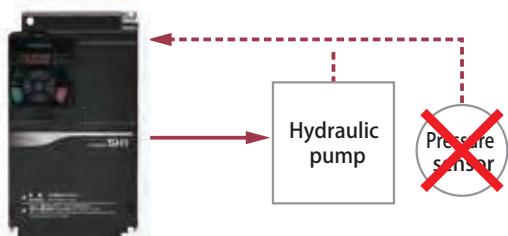
● PID control

Hydraulic pump

EzSQ

- Energy-saving achieved by EzSQ (programming function).

By increasing the rotation speed when pressure is necessary, and reducing the rotational speed during standby, the SJ-P1 will optimize energy consumption. In addition, EzSQ can utilize signals from external sources such as a pressure sensor and/or a relay circuit. Therefore, cost reduction and space saving can be achieved.



□ Example of the results of the hydraulic pump energy-saving test

Inverter operation
EzSQ (programming function)

Example of the results

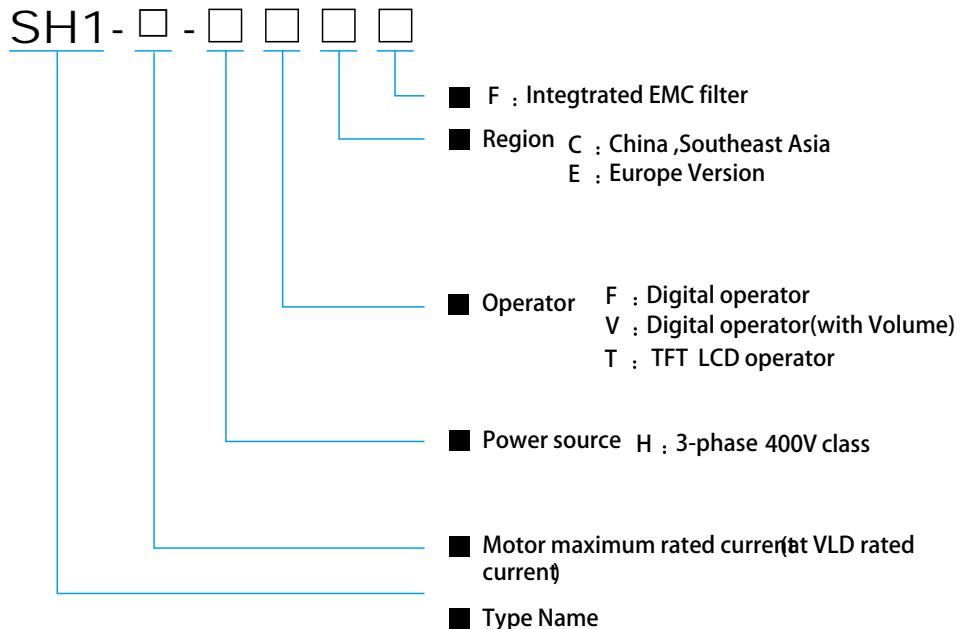
Reduction of 45%
of the cumulative power!

Recommended function

● Multiple rating ● PID control ● PM motor drive
● Sensorless vector control ● EzSQ(programming function)

Model configuration

● Model name indication



● Applicable motor capacity by rating

3-phase 400V class						
Motor capacity (kW) 3-phase AC380V,4P	VLD mode		LD mode		ND mode	
	SH1-□-□-H-□ CF	Rated current	SH1-□-□-H-□ CF	Rated current	SH1-□-□-H-□ CF	rated current
0.75					00041	2.5A
1.5	00041	4.1A	00041	3.1A	00054	4.0A
2.2	00054	5.4A	00054	4.8A	00083	5.5A
3.7	00083	8.3A	00083	6.7A	00126	9.2A
5.5	00126	12.6A	00126	11.1A	00175	14.8A
7.5	00175	17.5A	00175	16.0A	00250	19.0A
11	00250	25.0A	00250	22.0A	00310	25.0A
15	00310	31.0A	00310	29.0A	00400	32.0A
18.5	00400	40.0A	00400	37.0A	00470	39.0A
22	00470	47.0A	00470	43.0A	00620	48.0A
30	00620	62.0A	00620	57.0A	00770	61.0A
37	00770	77.0A	00770	70.0A	00930	75.0A
45	00930	93.0A	00930	85.0A	01160	91.0A
55	01160	116.0A	01160	105.0A	01470	112.0A
75	01470	147.0A	01470	135.0A	01760	150.0A
90	01760	176.0A	01760	160.0A	02130	180.0A
110	02130	213.0A	02130	195.0A	02520	217.0A
132	02520	252.0A	02520	230.0A	03160	260.0A
160	03160	316.0A	03160	290.0A		
Overload current rating	110% 60s / 120% 3s		120% 60s / 150% 3s		150% 60s / 200% 3s	
Applications	Air blower, water pump, air conditioner and other applications which need light load.		Air blower, water pump, air conditioner, conveyor, textile machinery and other applications which need normal load.		lifting machinery, rolling machinery, compressor, punch, metal working, textile machinery, construction machinery and woodworking machinery which need heavy load.	

Standard specifications

• 400V class specifications

Model name (SH1-□□□□□- H)		00041	00054	00083	00126	00175	00250	00310	00400	00470	00620	00770	00930	01160	01470	01760	02130	02520	03160			
Applicable motor capacity (4 poles) (kW) (*1)	VLD	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160			
	LD	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160			
	ND	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132			
Rated output current (A)	VLD	4.1	5.4	8.3	12.6	17.5	25.0	31.0	40.0	47.0	62.0	77.0	93.0	116	147	176	213	252	316			
	LD	3.1	4.8	6.7	11.1	16.0	22.0	29.0	37.0	43.0	57.0	70.0	85.0	105	135	160	195	230	290			
	ND	2.5	4.0	5.5	9.2	14.8	19.0	25.0	32.0	39.0	48.0	61.0	75.0	91.0	112	150	180	217	260			
Overload current rating (*2)	VLD	110% 60sec / 120% 3sec																				
	LD	120% 60sec / 150% 3sec																				
	ND	150% 60sec / 200% 3sec																				
Output	Rated output voltage		3-phase (3-wire) 380 to 460V (corresponding to input voltage)																			
	Rated capacity (kVA)	400V	VLD	2.8	3.7	5.8	8.7	12.1	17.3	21.5	27.7	32.6	43.0	53.3	64.4	80.4	101.8	121.9	147.6	174.6	218.9	
			LD	2.1	3.3	4.6	7.7	11.1	15.2	20.1	25.6	29.8	39.5	48.5	58.9	72.7	93.5	110.9	135.1	159.3	200.9	
		ND	1.7	2.8	3.8	6.4	10.3	13.2	17.3	22.2	27.0	33.3	42.3	52.0	63.0	77.6	103.9	124.7	150.3	180.1		
	500V	VLD	3.6	4.7	7.2	10.9	15.2	21.7	26.8	34.6	40.7	53.7	66.7	80.5	100.5	127.3	152.4	184.5	218.2	273.7		
		LD	2.7	4.2	5.8	9.6	13.9	19.1	25.1	32.0	37.2	49.4	60.6	73.6	90.9	116.9	138.6	168.9	199.2	251.1		
Input	Rated input AC voltage (*3)		Main circuit power supply: 3-phase 380 to 460V 50/60 Hz, Control power supply: 1-phase 380 to 460V 50/60 Hz																			
	Permissible AC voltage/ Frequency fluctuation		AC voltage: 323 to 506V 50/60 Hz, Frequency: ±5%																			
	Power supply capacity (kVA) (*4)		VLD	3.7	4.9	7.5	11.4	15.9	22.7	28.1	36.3	42.6	56.3	69.9	84.4	105.2	133.4	159.7	193.2	228.6	286.7	
Carrier frequency range (*5)	Braking	LD	2.8	4.4	6.1	10.1	14.5	20.0	26.3	33.6	39.0	51.7	63.5	77.1	95.3	122.5	145.2	176.9	208.7	263.1		
			ND	2.3	3.6	5.0	8.3	13.4	17.2	22.7	29.0	35.4	43.5	55.3	68.0	82.6	101.6	136.1	163.3	196.9	235.9	
		ND	0.5 to 10.0kHz																	0.5 to 8.0kHz		
Starting torque (*6)		0.5 to 12.0kHz																		0.5 to 10.0kHz		
Internal BRD circuit (external discharge resistor)		IP20 – UL Open Type																	IP00			
Aprox. weight (kg)		3	3	3	3	6	6	6	8.5	8.5	8.5	22	31	31	31	41	41	53	53			

*1: The applicable motor refers to Hitachi standard 3-phase motor (4-pole). To use other motors, be sure to prevent the rated motor current (50Hz) from exceeding the rated output current of the inverter.
 *2: Electronic thermal protection is valid in accordance to derating. *3: In order to comply with the Low Voltage Directive (LVD), it must be connected to a neutral grounding supply. 200V class: -Pollution degree 2 -Overvoltage category 3. 400V class: -Pollution degree 2 -Overvoltage category 3 (In the case the input supply is 380 to 460Vac) -Overvoltage category 2 (If the input supply is 460Vac or more).
 *4: The power supply capacity is the value of the output rated current at 220V / 440V. The impedance at the supply side may be affected by the wiring, breaker, input reactor, etc. *5: Carrier frequency may be limited in the range according to the use of drive. *6: The values for the sensorless vector control are assigned according to the values in the ND rating in the Hitachi standard motor table. Torque characteristics may vary by the control system and the motor in use. *7: Usually, an external regenerative braking is necessary. By your order it is possible to include the built-in braking circuit. By attaching the braking resistor the regenerative braking unit is no longer required.



SH1- □ -HTCF
【00400~00620】



SH1- □ -HFCF
【00175~00310】

Common specifications

Items		General Specifications	
PWM system		Sine-wave PWM system	
Output frequency range (*1)		0.00 to 590.00Hz	
Frequency accuracy		For the highest frequency, digital $\pm 0.01\%$, analogue $\pm 0.2\%$ ($25 \pm 10^\circ\text{C}$)	
Frequency resolution		Digital: 0.01Hz, Analogue: Max. frequency / 4000 (Ai1 terminal / Ai2 terminal: 12 bit / 0 to +10V or 0 to +20 mA, Ai3 terminal: 12 bit / -10 to +10V)	
Control system (*2)	IM	V/f control (constant torque / reduced torque / free), Automatic boost control, V/f control with encoder (constant torque / reduced torque / free), Automatic boost control with encoder, Cascade type sensorless vector control, 0Hz sensorless vector control, Cascade type vector control with encoder (position and torque).	
	SM/PMM	Methods of synchronous startup for vectorless smart control / Methods of IVMS startup for vectorless smart control	
Speed fluctuation (*3)		$\pm 0.5\%$ (sensorless vector control)	
Acceleration/deceleration time		0.00 to 3600.00s (Linear, S-curve, U-curve, Inverted-U-curve, EL-S-curve)	
Display		Output frequency, Output current, output torque, trip history, input/output terminal function, input/output power (*4), PN voltage, etc.	
Start functions		DC braking after the start, matching frequency after the start, active frequency matching start, Low-voltage start, retry restart.	
Stop functions		After free run stop, deceleration stop; DC braking or external DC braking operation (Braking force, time, adjustment of operation speed)	
Stall prevention function		Overload limit function, overcurrent suppression, overvoltage suppression function	
Protection functions (*5)		Overcurrent error, overload error, brake resistor overload, overvoltage error, memory error, undervoltage error, current detector error, CPU error, external trip error, USP error, ground error, supply overvoltage error, power loss error, temperature detector error, Cooling-fan rotation speed decrease, temperature error, phase input error, IGBT error, phase output error, thermistor error, brake error, low-speed range overload error, inverter overload, RS485 communication error, RTC error etc.	
Other functions		V/f free setting (7 points), upper and lower frequency limit, frequency jump, curve acceleration and deceleration, manual torque boost, energy-saving operation, analogue output adjustment, minimum speed, carrier frequency adjustment, motor electronic thermal function (free is possible), inverter thermal function, external start-end (speed and rate), frequency input selection, trip retry, restart stop, various signal output, initialization setting, PID control, auto-decel at shut-off, brake control function, commercial switching function, auto-tuning (on/offline) etc.	
Input	Frequency setting	Panel	up, down, left and right keys to the set parameter.
		External signal (*6)	Ai1 / Ai2 terminal (Current and Voltage is able to switched.) 0 to 10Vdc (input impedance: 10k Ω) / 0 to 20mA (input impedance: 100 Ω)
		Ai3 terminal	-10 to +10Vdc (input impedance: 10k Ω)
		Multi-speed terminal	16multi-speed (With the use of the intelligent input terminal)
	Forward / reverse Start / stop	Pulse train-input	Maximum 32 kHz x2
		Panel	By RUN / Stop key (With the set parameter, forward / reverse can be switched)
		External signal	Forward (FW) / Reverse (RV) / 3-wire input allowed (STA, STP, FR) (When input terminal functions are assigned)
		External port	RS485 serial communication (Protocol: Modbus-RTU, Maximum: 115.2kbps)
	Intelligent input terminals	11 terminals (A or B terminal accept a pulse train)	FW (Forward rotation) / RV (Reverse rotation), CF1 to 4 (Multi-speed 1 to 4), SF1 to 7 (Multi-speed bit 1 to 7), ADD (Trigger for frequency addition), SCHG (Command change), STA (3-wire start) / STP (3-wire stop) / FR (Forward / reverse by 3-wire), AHD (Analogue command holding, FUP (Remote control up) / FDN (Remote control down), UDC (Remote data clearance), F-OP (Forcible operation), SET (2nd-motor), RS (Reset), JG (Jogging), DB (External DC braking), 2CH (2-stage acc / decel), FRS (Free-run stop), EXT (External trip), USP (Unattended start protection), CS (Commercial power supply switching), SFT (Software lock), BOK (Braking confirmation), OLR (Overload restriction selection), KHC (Accumulated input power clear), OKHC (Accumulated input), PID (PID1 disable), PIDC (PID1 integration reset), PID2 (PID2 disable), PIDC2 (PID2 integration reset), SVC1 to 4 (PID1 multistage target value 1 to 4), PRO (PID gain change), PIO1 (PID output change), SLP (SLEEP trigger) / WAKE (WAKE trigger), TL (Enable torque limit), TRQ1/2 (Torque limit 1/2), PPI (P/PI switching), CAS (Control gain switching), FOC (Forcing), ATR (Enable torque command input), TBS (Enable torque bias), LAC (Acceleration / Deceleration cancellation), M1 to 11 (General-purpose input1 to 11), PCC (Pulse counter clearance), ECOM (EZCOM activation), PRG (EZSQ programme start), HLD (Acc / decel stop), REN (Motion enable signal), DISP (Display lock), PLA (Pulse train input A), PLB (Pulse train input B), DTR (Data trace start), DISP (Display lock), SON (servo on), ORT (orientation), PCLR (Clearance of position deviation), STAT (pulse train position command input enable), PUP (Position bias (ADD)), PDN (Position bias (SUB)), CP1 to 4 (Multistage position settings selection 1 to 4), ORL (Limit signal of Homing function), ORG (Start signal of Homing function), FOT (Forward Over Travel), ROT (Reserve Over Travel), SPD (speed / position switching), PSET (Position data presetting).
		Backup supply terminal	P+ / P-: DC24V input (Input allowable voltage: 24V $\pm 10\%$)
		Thermistor input terminal	1 terminal (PTC / NTC resistor allowed)
		Intelligent output terminals	Transistor output terminal 5, 1c contact relay 1 point
		Intelligent alarm relay (1c)	RUN (While in run), FA1 to 5 (Reached frequency signal), IRDY (Inverter ready), FWR (Forward rotation), RVR (Reverse rotation), FREF (panel frequency reference), REF (panel motion operation), SETM (2nd-motor selected), AL (Alarm signal), MJA (Major failure signal), OTQ (Over-torque), IP (Power loss), UV (Undervoltage), TRQ (Torque limited), IPS (Decel. Power loss), RNT (RUN time exceeded), ONT (On time exceeded), THM (Motor electronic thermal warning), THC (Electronic thermal warning), WAC (Capacitor life warning), WAF (Cooling-fan life warning), FR (Operation signal), OHF (heat sink overheat warning), LOC / LOC2 (Low-current indication signal), OL / OL2 (Overload warning 1/2), BRK (Brake release), BER (Brake error), ZS (0Hz detection signal), OD / OD2 (Output deviation for PID control), FBV / FBV2 (PID feedback comparison), NDc (Communication disconnection), Ai1Dc / Ai2Dc / Ai3Dc (Analogue Ai1 / Ai2 / Ai3 disconnection), WCA1 / WCA2 / WCA3 (Window comparator Ai1 / Ai2 / Ai3), LOG1 to 7 (logical operation result 1 to 7), MO1 to 7 (General-output 1 to 7), OVS (Over-Voltage power supply), PCMP (Pulse counter compare output), WFT (Trace function waiting for trigger), TRA (Trace function data logging), PDD (Position deviation over), POK (Positioning completed), etc.
	Output terminal monitor (*7)	The data of the monitor can be selected by the parameter of the output.	
EMC filter activation (*8)		EMC filter can be activated (method to switch bares)	
PC external access		USB Micro-B	
Environment	Ambient temperature (*9)	-10 to 50°C (ND), -10 to 45°C (LD), -10 to 40°C (VLD)	
	Storage temperature(*10)	-20 to 65°C	
	Level of humidity	20 to 90%RH (No condensation allowed)	
	Vibration tolerance (*11)	SH1-00041-H to SH1-00620H	
	Installation Place (*12)	More than SH1-00770-H	
Components life span(*13)		Main circuit smoothing capacitors is 10 years. / Cooling-fan is 10 years.	
Conformity standars		CE marking(EN 61800-3:2004/A1:2012, EN 61800-5-1:2007)	
Optional slots		3 ports	
Option	Input / ouput	Analog I/O (available soon)	
	Communication	Ethernet (Modbus TCP), EtherCAT, PROFIBUS-DP, PROFINET (available soon)	
	Feedback	Line driver input (RS422)	
Other optional components		Braking resistor, AC reactor, noise filter, operator cable, harmonics suppression unit, noise filter, LCRfilter, analog panel, regenerative braking unit, PC software ProdriveNext, Screw type terminal block(P1-TM2)	

*1: To operate the motor beyond 50/60Hz, please consult with the motor manufacturer about the maximum allowable rotation speed. *2: If the setting of the motor constant is not appropriate, there is a case when the starting torque is not sufficient or unstable. *3: Speed fluctuation will vary depending on your system and the motor of the use environment. Please contact us for more information.

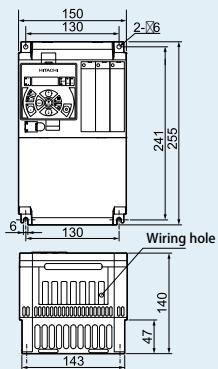
*4: Both Input power and the output power are reference (not actual) value. Not suitable for calculations for such as the actual efficiency. *5: IGBT error [E030] also occurs by IGBT damage not only by short-circuit protection. Depending on the operating status of the inverter, Overcurrent error [E001] occurs instead of the IGBT error [E030]. *6: The frequency command is the maximum frequency at 9.8V for input voltage 0 to 10Vdc, or at 19.8 mA for input current 4 to 20 mA. Characteristic change is adjusted by using external start-end function. *7: The analogue voltage and analogue current monitor are estimated outputs of the analogue meter connection. Maximum output value might deviate slightly from 10V or 20 mA by variation of the analogue output circuit. If you want to change the characteristics, adjust the Ao1 and Ao2 adjustment functions. There is monitor data that cannot be part of the output. *8: When the EMC filter is enabled, please connect to the power supply with neutral grounding. Otherwise, it may increase leakage current. *9: Derating is set in accordance to carrier frequency. *10: Storage temperature is the temperature during transport.

*11: In accordance with the test methods of JIS C 60068-2-6: 2010 (IEC 60068-2-6:2007). *12: In case of utilization at an altitude of 1000 m or more, take into account that the atmospheric pressure is reduced by 1% for every 100 m up. Please apply a derating of a 1% from the rated current every 100 m. Conduct and evaluation and contact us if you plan on using it above 2500 m.

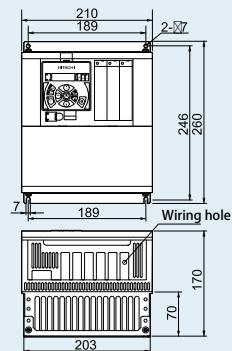
*13: The ambient temperature is 40 °C (annual average). Without corrosive gas, flammable gas, oil mist and dust.) The above design life is a calculated value, not a guaranteed value. Output current at the calculation is 80% of the rated current of the inverter.

Dimensions

•SH1-00041~00126HFCF

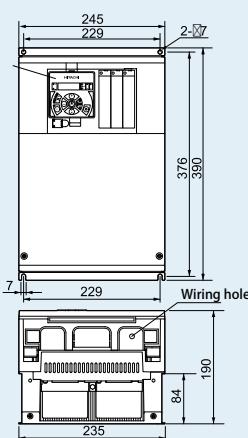


•SH1-00175~00310HFCF

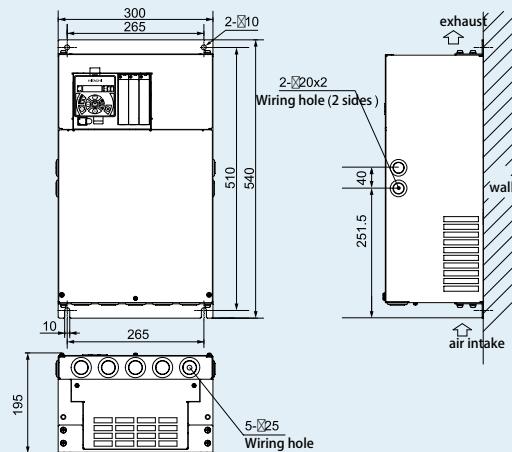


[UNIT: mm]

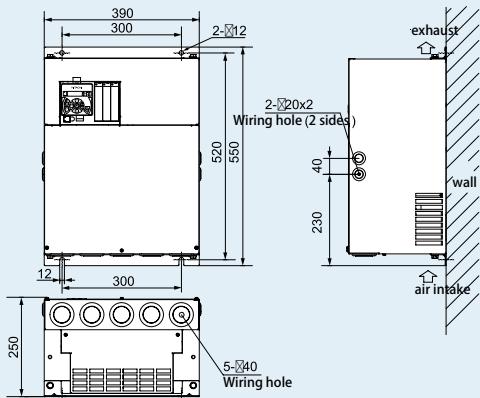
•SH1-00400~00620HFCF



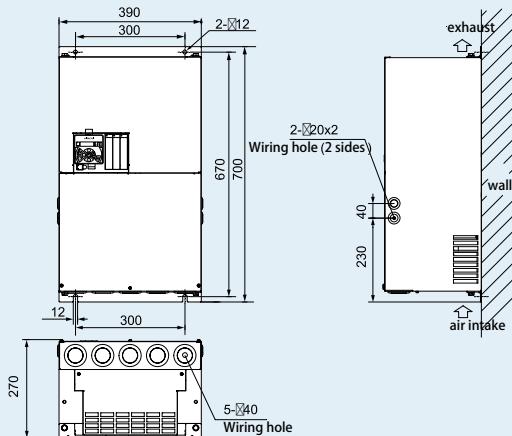
•SH1-00770HFCF



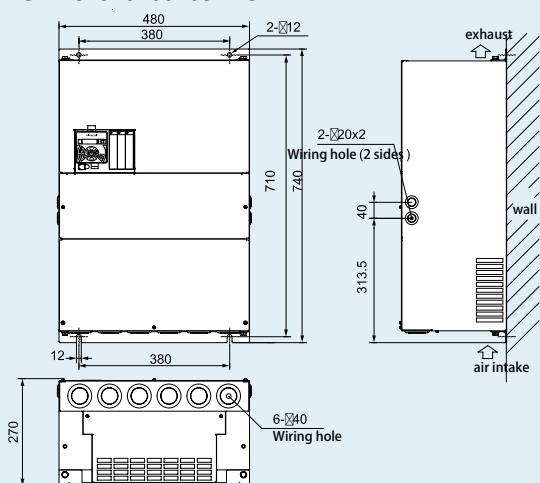
•SH1-00930~01470HFCF



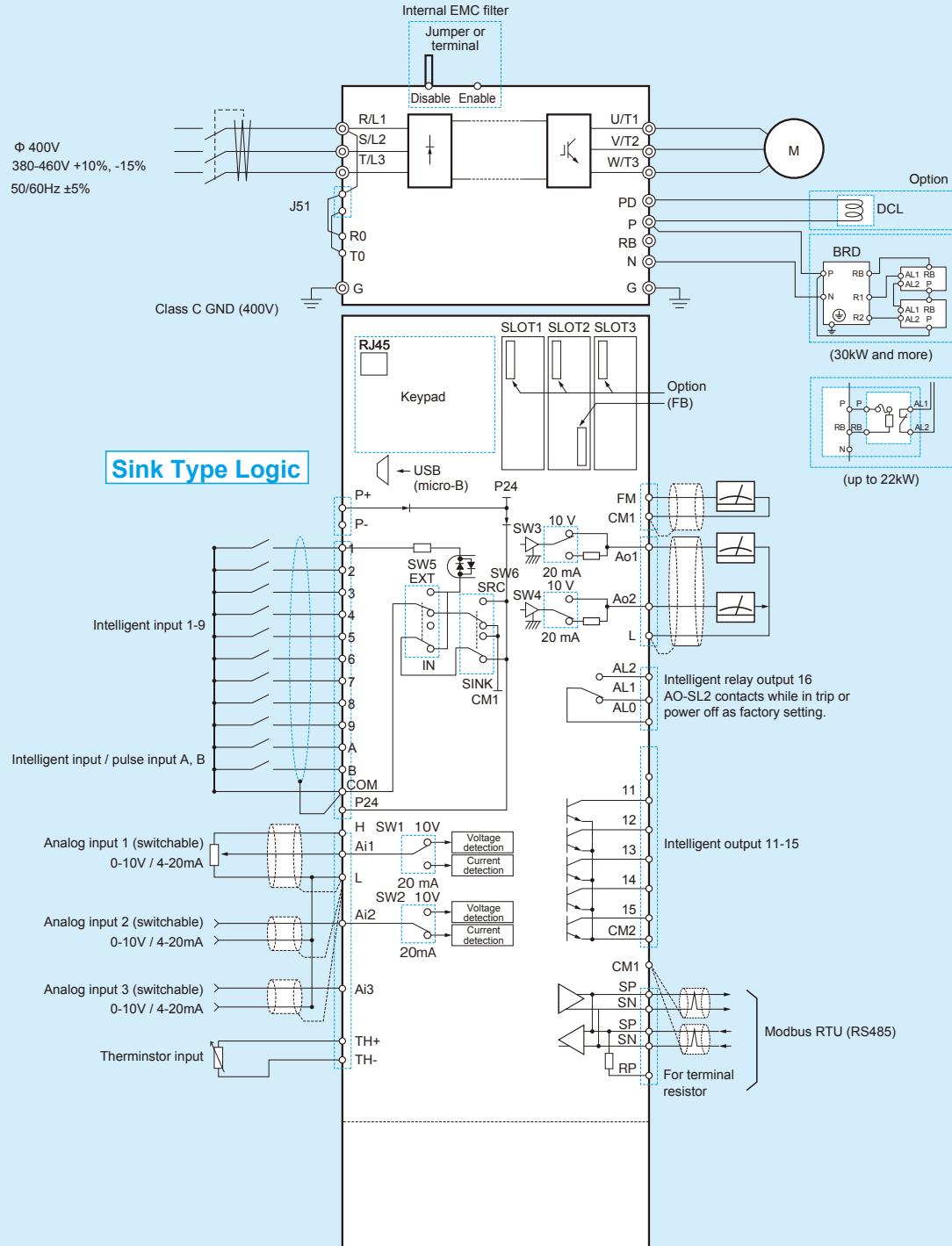
•SH1-01760~02130HFCF



•SH1-02520~03160HFCF



Connecting Diagram



Note1: Common to each terminal varies.

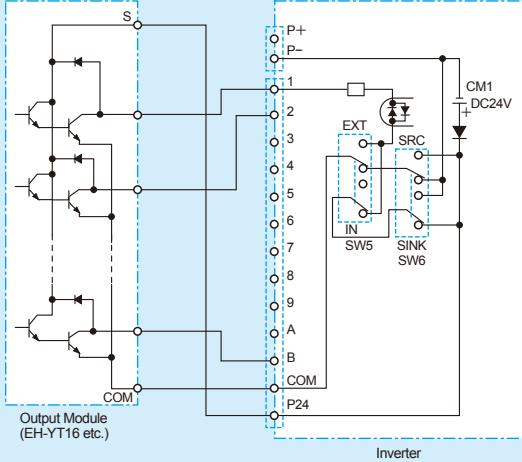
Note2: Disconnect J51 when to supply R0-T0 separately. UV error is issued when main supply is off while in operation.

Connecting to PLC

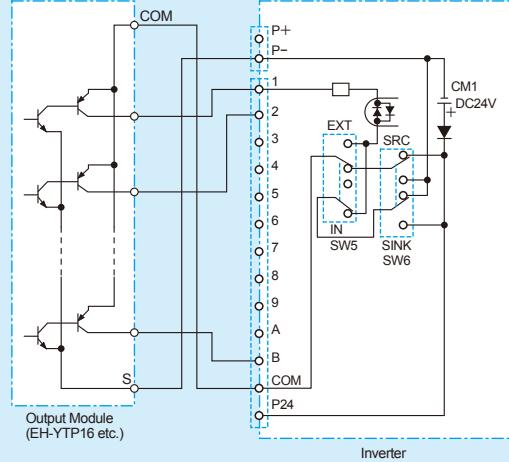
• Connection with Input Terminals

1. Using Internal Power Supply of The Inverter

(1) Sink type logic



(2) Source type logic

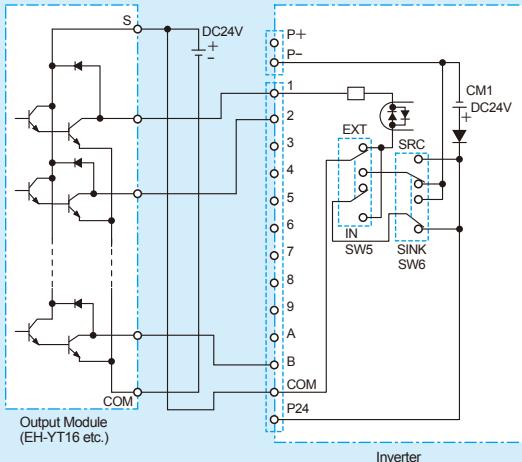


- When using internal power supply of the inverter, the SW5 to "IN".
- When connecting sink type module, the SW6 to "SINK".

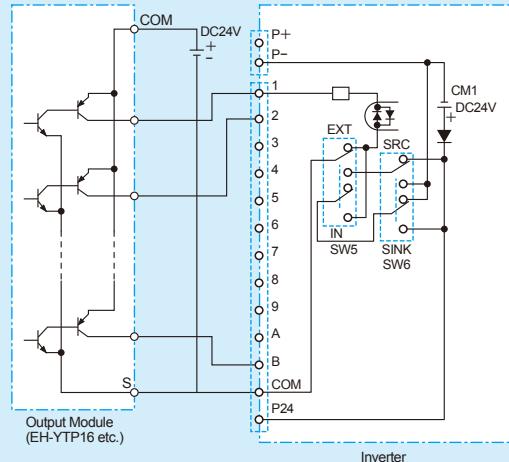
- When using internal power supply of the inverter, the SW5 to "IN".
- When connecting source type module, the SW6 to "SRC".

2. Using External Power Supply

(1) Sink type logic



(2) Source type logic



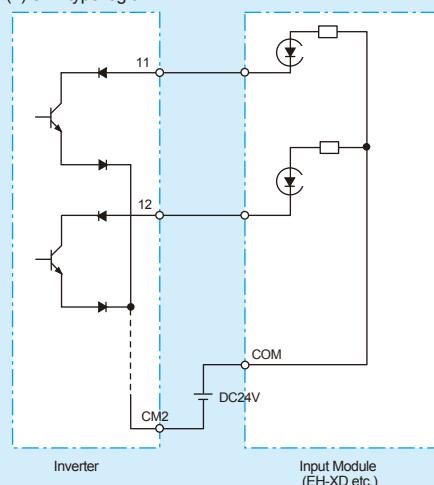
- When using external power supply, the SW5 to "EXT".
- When connecting sink type module, the SW6 to "SINK".

- When using external power supply, the SW5 to "EXT".
- When connecting source type module, the SW6 to "SRC".

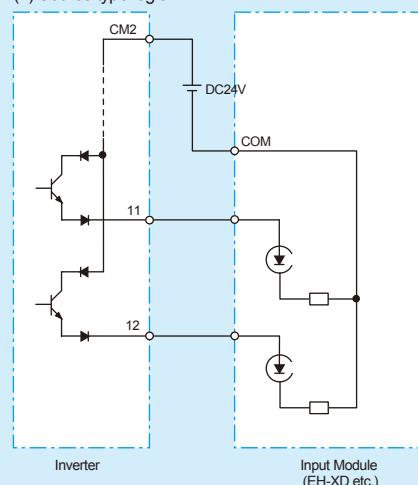
(Note: Be sure to turn on the inverter after turning on the PLC and its external power source to prevent the parameters in the inverter from being modified.)

• Connection with Output Terminals

(1) Sink type logic



(2) Source type logic



Terminals

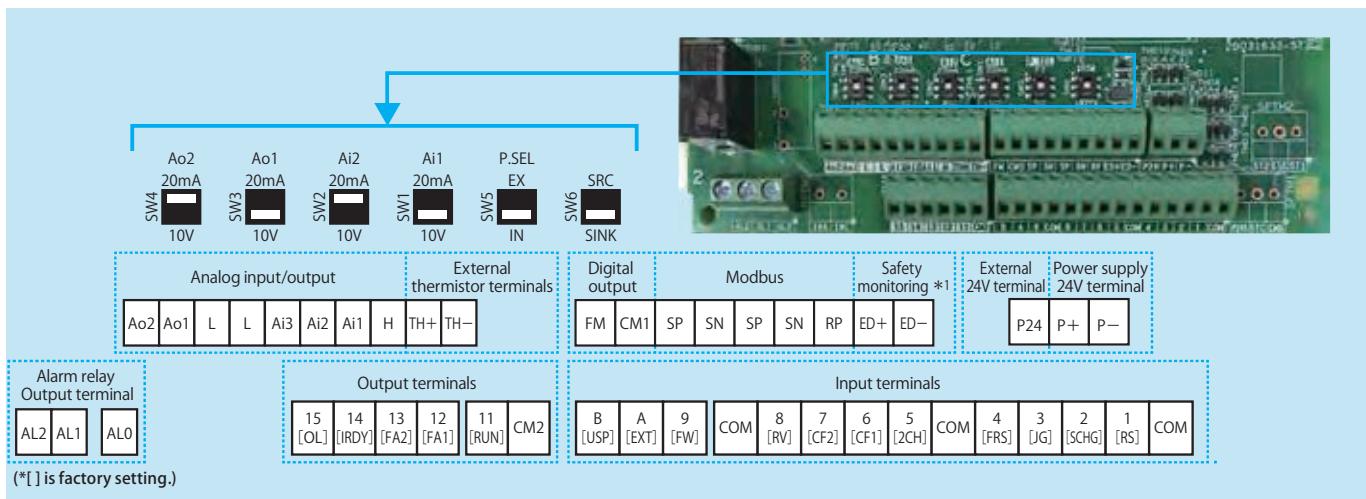
(1) Main Circuit Terminals

● Terminal Description

Terminal Symbol	Terminal Name	Terminal Symbol	Terminal Name
R/L1, S/L2, T/L3	Main power supply input terminals	P+/, N/☒	External braking unit connection terminals
U/T1, V/T2, W/T3	Inverter output terminals	G	Ground connection terminal
PD/+1, P+/-	DC reactor connection terminals	R0, T0	Control power supply input terminals
P+/, RB	External braking resistor connection terminals		

(2) Control Circuit Terminals

● Terminal Description



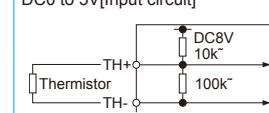
● Configuration of switches

Indication	Name of switch	Description (before shipment: underlined part)
Ai1(SW1)	Analog input 1 change	Change the input specification of Analog input 1 (Ai1 terminal) 10V: Voltage input is available. 20mA: Current input is available.
Ai2(SW2)	Analog input 2 change	Change the input specification of Analog input 2 (Ai2 terminal) 10V: Voltage input is available. 20mA: Current input is available.
Ao1(SW3)	Analog output 1 change	Change the output specification of Analog output 1 (Ao1 terminal). 10V: Voltage output is applied. 20mA: Current output is applied.
Ao2(SW4)	Analog output 2 change	Change the output specification of Analog output 2 (Ao2 terminal). 10V: Voltage output is applied. 20mA: Current output is applied.
PSEL(SW5)	Change of the power supply method to input terminals	Change the power supply method to input terminals. IN: Activate input terminals by an internal power source. EX: Activate input terminals by inputting an external power source.(For EX, power supply is required between input terminals and COM.)
SRC/SINK(SW6)	Input terminal Sink/Source logic switching	Sink or source logic of the input terminal is switched. This is enabled when SW5 is IN. SINK: Switch to Sink logic. SRC: Switch to Source logic.

Surrounding tools/options

Applicable motor capacity	Model: SH1- □-HFCF			DCL	Input ACL	Output DCL	EMC filter	Radio noise filter	Input side radio noise filter
	ND	LD	VLD						
3Phase 400V	0.75kW	00041	—	DCL-H-0.7	ALI-2.5H2	ACL-H2-0.75	NF-H7	ZCL-A ZCL-B40 ZCL-B75 ZCL-B95 ZCL-B150	CFI-H
	1.5kW	00054	00041	DCL-H-1.5		ACL-H2-1.5			
	2.2kW	00083	00054	DCL-H-2.2	ALI-5.5H2	ACL-H2-2.2			
	3.7kW	00126	00083	DCL-H-3.7		ACL-H2-3.7			
	5.5kW	00175	00126	DCL-H-5.5	ALI-11H2	ACL-H2-5.5			
	7.5kW	00250	00175	DCL-H-7.5		ACL-H2-7.5			
	11kW	00310	00250	DCL-H-11	ALI-22H2	ACL-H2-11			
	15kW	00400	00310	DCL-H-15		ACL-H2-15			
	18.5kW	00470	00400	DCL-H-22	ALI-33H2	ACL-H2-18.5			
	22kW	00620	00470	DCL-H-30		ACL-H2-22			
	30kW	00770	00620	DCL-H-37	ALI-50H2	ACL-H2-30			
	37kW	00930	00770	DCL-H-45		ACL-H2-37			
	45kW	01160	00930	DCL-H-45	ALI-75H2	ACL-H2-45			
	55kW	01470	01160	DCL-H-55		ACL-H2-55			
	75kW	01760	01470	DCL-H-75	ALI-120H2	ACL-H2-75			
	90kW	02130	01760	DCL-H-90		ACL-H2-90			
	110kW	02520	02130	DCL-H-110	ALI-180H2	ACL-H2-110			
	132kW	03160	02520	DCL-H-132		ACL-H2-132			
	160kW	—	03160	DCL-H-160	ALI-220H2	ACL-H2-160	NF-H400		

● Terminal Description

		Symbol	Terminal name	Description	Electric characteristics	
Voltage/current switchable analog input/output terminal		L	COM for analog power supply	COM terminals for analog input terminals (Ai1,Ai2,Ai3) and analog output terminals (Ao1,Ao2). Two L terminals are available.	-	
		H	Speed setting power supply	DC10V power supply. Used for voltage input with analog input terminals (Ai1,Ai2,Ai3) using a variable resistor.	Max. allowable input current 20mA	
Analog input	Ai1	Analog input terminal 1 (Voltage/current selector SW1)	Either Ai1 or Ai2 can be used by switching the selector switch to DC0 to 10V voltage input or 0-to 20mA current input. Used as speed input and feedback input.			
	Ai2	Analog input terminal 2 (Voltage/current selector SW2)				
	Ai3	Analog input terminal 3	DC-10 to 10V voltage input is available. Used as speed input and feedback input.	Voltage input only: <ul style="list-style-type: none">• Input impedance Approx.10kΩ• Allowable voltage input DC-0.3V to 12V		
Analog output	Ao1	Analog output terminal 1 (Voltage/current selector SW3)	Either Ao1 or Ao2 can be used as an output for inverter monitoring data by switching the selector switch to DC0 to 10V voltage output or 0 to 20mA current output.			
	Ao2	Analog output terminal 2 (Voltage/current selector SW4)				
	24V power supply		P24	24V output power source terminal	This terminal supplies DC24V power for contact signals.	Max. output 100mA
			P+	Terminal for external 24V input (24V)	Input external DC24V power supply to the inverter. Inputting 24V power supply can change parameter settings and perform optional communication operations without control power supply.	
			P-	Terminal for external 24V input (0V)		
Intelligent input terminal	Digital input	Contact point	9 8 7 6 5 4 3 2 1	Input terminal	Terminal functions are selectable according to the parameter settings for each terminal. Switching SW6 to SRC or SINK allows you to select SINK or Source logic.	
		Pulse	A	Pulse input-A	This is a terminal for pulse input. A and B terminals can be used also as an input terminal. Terminal functions are selectable according to the parameter settings for each terminal. The maximum input pulse rate is 32kpps.	
			B	Pulse input-B		
		Common	COM	Input (common)	This is a common terminal for digital input terminals (1,2,3,4,5,6,7,8,9,A and B). Three COM terminals are available.	
Intelligent output terminals	Digital output	Open collector	15 14 13 12 11	Output terminal	Terminal functions are selectable according to the parameter settings for each terminal.This is available for both SINK and Source logics.	
			CM2	Output (common)	This is a common terminal for output terminals 11 to 15.	
		Relay	AL0 AL1 AL2	1c relay terminal	Relays for C contact output	
FM output terminal	FM output	Monitor output	FM	Digital monitor (voltage)	Digital monitor output is selectable from PWM output with 6.4ms cycle or pulse output with a variable duty cycle of approx. 50%.	
			CM1	COM for digital monitor	This is a common terminal for digital monitor.This is also used as 0V reference potential for P24.	
Thermistor terminal	Analog input	TH+	External thermistor input	Connect to an external thermistor to make the inverter trip if an abnormal temperature is detected.	DC0 to 5V[Input circuit] 	
		TH-	Common terminal for external thermistor input	Connect the thermistor to TH+ and TH-. The impedance to detect temperature errors can be adjusted within the range 0Ω to 9,999Ω. [Recommended thermistor properties] Allowable rated power: 100 mW or more Impedance at temperature error: 3kΩ		
RS485 communication	Serial communication	SP SN RP (CM1)	MODBUS terminal (RS-485)	SP terminal : RS-485 differential(+) signal SN terminal : RS-485 differential(-) signal RP terminal : Connect to SP through a termination resistor CM1 terminal : Connect to the signal ground of external communication devices. There are two SP and two SN terminals, which are connected internally. The maximum baud rate is 115.2kbps.	Termination resistor (120Ω) integrated Enabled: RP-SN shorted Disabled: RP-SN opened	

Function list

■ Monitor mode List

Code No.	Parameter Meaning	Selectable User Setting
da-01	Output frequency monitor	0.00 to 590.00(Hz)<current output frequency>
da-02	Output current monitor	0.00 to 655.35(A)
da-03	Rotation direction monitor	F (Forward RUN) /r (Reverse RUN) /d (Zero-speed Out) /o (Stop)
da-04	Frequency reference monitor(After calculation)	-590.00 to 590.00(Hz)<target value>
da-06	Output frequency scale conversion monitor	0.00 to 59000.00(Hz)
da-08	Detect speed monitor	-590.00 to 590.00(Hz)<monitor feedback is required>
da-12	Output Frequency Monitor (signed)	-590.00 to 590.00(Hz)
da-14	Frequency upper limit monitor	0.00 to 590.00(Hz)
da-15	Torque reference monitor(After calculation)	-1000.0 to 1000.0(%<Torque control mode required>)
da-16	Torque limit monitor	0.0 to 500.0(%)
da-17	Output Torque monitor	-1000.0 to 1000.0(%)
da-18	Output Voltage monitor	0.0 to 800.0(V)
da-20	Current position monitor	when [AA123]=03 -268435455 to +268435455(pulse) when [AA123]=03 -1073741823 to +1073741823(pulse)
da-26	Pulse train position deviation monitor	-2147483647 to +2147483647(pulse)
da-28	Pulse count monitor	0 to 2147483647(pulse)
da-30	Input power monitor	0.0 to 600.00(kW)
da-32	Accumulation input power monitor	0.0 to 1000000.0(kWh)
da-34	Output power monitor	0.0 to 600.00(kW)
da-36	Accumulation output power monitor	0.0 to 1000000.0(kWh)
da-38	Motor temperature monitor	-20.0 to 200.0(°C)
da-40	DC-bus voltage monitor	0.0 to 1000.0(Vdc)
da-41	BRD Load rating monitor	
da-42	Electronic thermal Load rating monitor (MTR)	0.00 to 100.00(%)
da-43	Electronic thermal Load rating monitor (CTL)	
da-45	Safety STO monitor	00 (no) /01 (P-1A) /02 (P-2A) /03 (P-1b) /04 (P-2b) /05 (P-1C) /06 (P-2C) /07 (STO)
da-46	Safety option hardware monitor	Refer to guidebook for option
da-47	Safety option monitor	
da-50	Control terminal status	00 (Standard) /02 (P1-TM2) /15 (Not connect)
da-51	Input terminal monitor	
da-54	Output terminal monitor	
da-60	Analog input/output status monitor	
da-61	Analog input [Ai1] monitor	0.00 to 100.00(%)
da-62	Analog input [Ai2] monitor	
da-63	Analog input [Ai3] monitor	-100.00 to 100.00(%)
da-64	Extension Analog input [Ai4] monitor	0.0 to 100.00(%)
da-65	Extension Analog input [Ai5] monitor	
da-66	Extension Analog input [Ai6] monitor	-100.00 to 100.00(%)
da-70	Pulse train input monitor (internal)	-100.00 to 100.00(%)
da-71	Pulse train input monitor (Option)	-100.00 to 100.00(%)
da-81	Option slot-1 status	00:(no) /01:(P1-EN) /02:(P1-ECT) /03:(P1-PN) /06:(P1-PB) /08:(P1-CO) /18:(P1-AG) <da-82 only>33:(P1-FB) <da-83 only>48:(P1-FS)
da-82	Option slot-2 status	
da-83	Option slot-3 status	
db-01	Program download monitor	00 (Program is not installed) /01 (Program is installed)
db-02	Program No. monitor	0000 to 9999
db-03	Program counter (Task-1)	
db-04	Program counter (Task-2)	
db-05	Program counter (Task-3)	
db-06	Program counter (Task-4)	
db-07	Program counter (Task-5)	
db-08	User monitor-0	
db-10	User monitor-1	
db-12	User monitor-2	
db-14	User monitor-3	
db-16	User monitor-4	
db-18	Analog output monitor YA0	
db-19	Analog output monitor YA1	
db-20	Analog output monitor YA2	0 to 10000
db-21	Analog output monitor YA3	
db-22	Analog output monitor YA4	
db-23	Analog output monitor YA5	
db-30	PID1 Feedback value 1 monitor	
db-32	PID1 Feedback value 2 monitor	0.00 to 100.00(%) (adjustable with [AH-04][AH-05][AH-06])
db-34	PID1 Feedback value 3 monitor	
db-36	PID2 Feedback value monitor	0.00 to 100.00(%) (adjustable with [AJ-04][AJ-05][AJ-06])
db-38	PID3 Feedback value monitor	0.00 to 100.00(%) (adjustable with [AJ-24][AJ-25][AJ-26])
db-40	PID4 Feedback value monitor	0.00 to 100.00(%) (adjustable with [AJ-44][AJ-45][AJ-46])
db-42	PID1 target value monitor	0.00 to 100.00(%) (adjustable with [AH-04][AH-05][AH-06])
db-44	PID1 feedback value monitor	
db-50	PID1 Output monitor	
db-51	PID1 Deviation monitor	
db-52	PID1 Deviation 1 monitor	-100.00 to +100.00(%)
db-53	PID1 Deviation 2 monitor	
db-54	PID1 Deviation 3 monitor	

Code No.	Parameter Meaning	Selectable User Setting
db-55	PID2 Output monitor	
db-56	PID2 Deviation monitor	
db-57	PID3 Output monitor	
db-58	PID3 Deviation monitor	
db-59	PID4 Output monitor	
db-60	PID4 Deviation monitor	
db-61	Current PID P-Gain monitor	0.0 to 100.0
db-62	Current PID I-Gain monitor	0.0 to 3600.0(s)
db-63	Current PID D-Gain monitor	0.00 to 100.00(s)
db-64	PID FeedForward monitor	
dC-01	Inverter Load type status	00 (VLD) /01 (LD) /02 (ND)
dC-02	Rated current monitor	0.0 to 6553.5(A)
dC-07	Main speed input source monitor	
dC-08	Sub speed input source monitor	
dC-10	RUN command input source monitor	Displayed on operator panel. Refer to user's guide for detail.
dC-15	Cooling-fin temperature monitor	-20.0 to 200.0(°C)
dC-16	Life assessment monitor	
dC-20	Accumulation Start number monitor	1 to 65535(times)
dC-21	Accumulation Power-on number monitor	
dC-22	Accumulated time monitor in RUN status monitor	
dC-24	Accumulation power-on time monitor	0 to 1000000(hour)
dC-26	Accumulation cooling fan running time monitor	
dC-37	Icons2 LIM monitor	00-- /01(OC suppress) /02 (OL restriction) /03 (OV suppress) /04 (TRQ Limit) /05 (Freq Limit) /06 (Min.Freq)
dC-38	Icons2 ALT monitor	00 (-) /01(Over Load) /02 (Thermal(Motor)) /03 (Thermal(CTR)) /04 (Over Heat(MTR))
dC-39	Icons2 RETRY detail monitor	00(-) /01(waiting to retry) /02 (waiting to restart)
dC-40	Icons2 NRDY detail monitor	00 (-) /01(Trip) /02 (Power failure) /03 (Reset) /04 (STO) /05 (Wait) /06 (Warning) /07 (Sequence Error) /08 (Freerun) /09 (interrupted)
dC-45	IM/SM monitor	00 (IM) /01 (SM)
dC-50	Firmware Ver. Monitor	00.00 to 99.255
dC-53	Firmware Gr. Monitor	00(Standard)
dE-50	Warning monitor	Refer to user's guide

※1)This parameter is specially used for safety function, not for SH1 series

※2)This parameter is only effective when using multifunctional digital operator

■ Variable mode monitor (F code)

Code No.	Parameter Meaning	Selectable User Setting
FA-01	Main Speed reference monitor	0.00 to 590.00(Hz)
FA-02	Sub Speed reference monitor	-590.00 to 590.00(Hz) when configured with parameter, 0.00 to 590.00(Hz)
FA-10	Acceleration time monitor	0.00 to 3600.00(s)
FA-12	Deceleration time monitor	
FA-15	Torque reference monitor	-500.0 to 500.0(%)
FA-16	Torque bias monitor	-500.0 to 500.0(%)
FA-20	Position reference monitor	when [AA123]=0 -268435455 to +268435455(pulse)/ when [AA123]=03 -1073741823 to +1073741823(pulse)
FA-30	PID1 Set Value 1 monitor	
FA-32	PID1 Set Value 2 monitor	0.00 to 100.00(%) (adjustable with [AH-04][AH-05][AH-06])
FA-34	PID1 Set Value 3 monitor	
FA-36	PID2 Set Value monitor	0.00 to 100.00(%) (adjustable with [AJ-04][AJ-05][AJ-06])
FA-38	PID3 Set Value monitor	0.00 to 100.00(%) (adjustable with [AJ-24][AJ-25][AJ-26])
FA-40	PID4 Set Value monitor	0.00 to 100.00(%) (adjustable with [AJ-44][AJ-45][AJ-46])

※3)This parameter is only effective when using multifunctional digital operator

● Parameter mode Lis

■Parameter naming (Nomenclature)

*By default the motor 1 is enabled in the case that 08:[SET] is no assigned in the intelligent Input terminals [CA-01] to [CA-11].

AA 1 01

- Internal number in the group
- :-Common for 1st and 2nd motor
- 1:1st motor enabled if function [SET] is OFF
2:2nd motor enabled if function [SET] is ON
- Parameter group

■Parameter mode (A code)

Code No.	Parameter Meaning	Selectable User Setting	Initial value
AA101	Main speed input source selection, 1st-motor	01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(Option)) /14 (Setting by EzSQ) /15 (PID function) /16 (Volume on keypad)	07(*FF)/ 01(*FEF, *FUF)
AA102	Sub frequency input source selection, 1st-motor	00 (Disable) /01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(Option)) /14 (Setting by EzSQ) /15 (PID function) /16 (Volume on keypad)	00
AA104	Sub speed setting, 1st-motor	0.00 to 590.00(Hz)	0.00
AA105	Calculation symbol selection for Speed reference, 1st-motor	00 (Disable) /01 (Addition(ADD)) /02 (Subtraction(SUB)) /03 (Multiplication(MUL))	00
AA106	Add frequency setting, 1st-motor	-590.00 to +590.00(Hz)	0.00
AA111	Run-command input source selection, 1st-motor	00 (Terminal [FW]/[RV]) /01 (3-wire) /02 (RUN key on keypad) /03 (Setting by RS485) /04 (Option-1) /05 (Option-2) /06 (Option-3)	02(*FF)/ 00(*FEF, *FUF)
AA-12	RUN-key of keypad Rotation Direction, 1st-motor	00 (Forward) /01 (Reverse)	00
AA-13	STOP-key enable at RUN-command from terminal, 1st-motor	00 (Disable) /01 (Enable) /02 (Enable at only trip reset)	01
AA114	RUN-direction restriction, 1st-motor	00 (Disable) /01 (Enable only Forward rotation) /02 (Enable only Reverse rotation)	00
AA115	STOP mode selection, 1st-motor	00 (Deceleration until stop) /01 (Free-run stop)	00
AA121	Control mode selection, 1st-motor	IM control: 00 (VF control (Constant torque)) /01 (VF control (Reduced torque)) /02 (VF control (Free-V/f)) /03 (Constant torque with Automatic-trq boost) /04 (VF control with encoder (Constant torque)) /05 (VF control with encoder (Reduced torque)) /06 (VF control with encoder (Free-V/f)) /07 (VF control with PG (Constant torque with Automatic-trq boost)) /08 (Sensorless vector control) /09 (0Hz Sensorless vector control) /10 (Vector control with encoder) SM/PMM control: 11 (Synchronous start up for smart sensorless vector control) /12 (IVMS start up for smart sensorless vector control)	00
AA123	Vector control mode selection, 1st-motor	00 (Speed/Torque control mode) /01 (Pulse train position control) /02 (Position control) /03 (High-resolution position control)	00
AA201	Main speed input source selection, 2nd-motor	same to AA101	07(*FF)/ 01(*FEF, *FUF)
AA202	Sub speed input source selection, 2nd-motor	same to AA102	00
AA204	Sub speed setting, 2nd-motor	same to AA104	0.00
AA205	Calculation symbol selection for Speed reference, 2nd-motor	same to AA105	00
AA206	Add frequency setting, 2nd-motor	same to AA106	0.00
AA211	Run-command input source selection, 2nd-motor	same to AA111	02(*FF)/ 00(*FEF, *FUF)
AA214	RUN-direction restriction, 1st-motor	same to AA114	00
AA215	STOP mode selection, 1st-motor	same to AA115	00
AA221	Control mode selection, 2nd-motor	same as AA121	00
AA223	Vector control mode selection, 2nd-motor	same to AA123	00
Ab-01	Frequency conversion gain	0.01 to 100.00	1.00
Ab-03	Multispeed operation selection	00 (Binary (16-speeds)) /01 (Bit (8-speeds))	00
Ab110	Multispeed-0 setting, 1st-motor	0.00 to 590.00(Hz)	0.00
Ab-11 to Ab-25	Multispeed-1 to Multispeed-15 setting		
Ab210	Multispeed-0 setting, 2nd-motor		

Code No.	Parameter Meaning	Selectable User Setting	Initial value
AC-01	Acceleration/ Deceleration time input selection	00 (Setting by parameter) /01 (Setting from Option-1) /02 (Setting from Option-2) /03 (Setting from Option-3) /04 (Setting by programing function)	00
AC-02	Acceleration/ Deceleration selection	00 (Common setting) /01 (Multi stage Acceleration/ Deceleration)	00
AC-03	Acceleration curve selection	00 (Liner Acceleration) /01 (S-curve Acceleration) /02 (U-curve Acceleration) /03 (Reverse U-curve Acceleration) /04 (Elevete S-curve Acceleration)	00
AC-04	Deceleration curve selection	1 to 10	2
AC-05	Acceleration curve constant setting		
AC-06	Deceleration curve constant setting		
AC-08	EL-S-curve ratio @start of acceleration	0 to 100	25
AC-09	EL-S-curve ratio @end of acceleration		
AC-10	EL-S-curve ratio @start of deceleration		
AC-11	EL-S-curve ratio @end of deceleration	Select method to switch to Accel2/Decel2 Profile, 1st-motor	00
AC115	00 (Switching by [2CH] terminal) /01 (Switching by setting) /02 (Switching only when rotation is reversed)		
AC116	Accel1 to Accel2 Frequency transition point, 1st-motor	0.00 to 590.00(Hz)	0.00
AC117	Decel1 to Decel2 Frequency transition point, 1st-motor		
AC120	Acceleration time setting 1, 1st-motor	0.00 to 3600.00(s)	30.00
AC122	Deceleration time setting 1, 1st-motor		
AC124	Acceleration time setting 2, 1st-motor		
AC126	Deceleration time setting 2, 1st-motor		
AC-30, 34, 38, 42, 46, 50, 54, 58, 62, 66, 70, 74, 78, 82, 86	Acceleration time setting for Multispeed-1 to Multispeed-15	0.00 to 3600.00(s)	0.00
AC-32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88	Deceleration time setting for Multispeed-1 to Multispeed-15		
AC215	Select method to switch to Accel2/Decel2 Profile, 2nd-motor	same to AC115	00
AC216	Accel1 to Accel2 Frequency transition point, 2nd-motor	same to AC116	0.00
AC217	Decel1 to Decel2 Frequency transition point, 2nd-motor	same to AC117	
AC220	Acceleration time setting 1, 2nd-motor	same to AC120	30.00
AC222	Deceleration time setting 1, 2nd-motor	same to AC122	
AC224	Acceleration time setting 1, 2nd-motor	same to AC124	
AC226	Deceleration time setting 1, 2nd-motor	same to AC126	15.00
Ad-01	Torque reference input source selection	01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(Option)) /14 (Setting by EzSQ) /15 (PID function)	07
Ad-02	Torque reference value setting	-500.0 to 500.0(%)	0.0
Ad-03	Polarity selection for torque reference	00 (As indication by the sign) /01 (Depending on the operation direction)	00
Ad-04	Switching time of Speed control to Torque control	0 to 1000(ms)	100
Ad-11	Torque bias input source selection	00 (Disable) /01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(Option)) /15 (PID function)	00
Ad-12	Torque bias value setting	-500.0 to 500.0(%)	0.0
Ad-13	Polarity selection for torque bias	00 (As indication by the sign) /01 (Depending on the operation direction)	00
Ad-14	Terminal [TBS] active	00 (Disable) /01 (Enable)	00
Ad-40	Input selection for speed limit at torque control	01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(Option)) /15 (PID function)	07
Ad-41	Speed limit at torque control (at Forward rotation)	0.00 to 590.00(Hz)	0.00
Ad-42	Speed limit at torque control (at Reverse rotation)		

Code No.	Parameter Meaning	Selectable User Setting	Initial value
AE-01	Electronic gear setting point selection	00 (Feedback side) /01 (Reference side)	00
AE-02	Electronic gear ratio numerator	1 to 10000	1
AE-03	Electronic gear ratio denominator	1 to 10000	1
AE-04	Positioning complete range setting	0 to 10000(Pulse)	5
AE-05	Positioning complete delay time setting	0.00 to 10.00(s)	0.00
AE-06	Position feed-forward gain setting	0 to 655.35	0.00
AE-07	Position loop gain setting	0.00 to 100.00	0.50
AE-08	Position bias setting	-2048 to 2048(Pulse)	0
AE-10	Stop position selection of Home search function	00 (Setting by parameter) /01 (Option-1) /02 (Option-2) /03 (Option-3)	00
AE-11	Stop position of Home search function	0 to 4095	0
AE-12	Speed reference of Home search function	0.00 to 120.00(Hz)	0.00
AE-13	Direction of Home search function	00 (forward) /01 (reverse)	00
AE-20 to AE-50	Position reference [0] to [15] setting	When [AA121]≠10 or [AA123]≠03 -268435455 to +268435455 (pls)/ When [AA121]=10 and [AA123]=03 -1073741823 to +1073741823 (pls)	0
AE-52	Position control range setting(forward)	When [AA121]≠10 or [AA123]≠03 0 to +268435455 (pls)/ When [AA121]=10 and [AA123]=03 0 to +1073741823 (pls)	268435455
AE-54	Position control range setting(reverse)	When [AA121]≠10 or [AA123]≠03 -268435455 to 0 (pls)/ When [AA121]=10 and [AA123]=03 -1073741823 to 0 (pls)	-268435455
AE-56	Position control mode selection	00 (Enabling Position control range) /01 (Disabling Position control range)	00
AE-60	Teach-in function target selection	00 to 15(X00 to X15)	00
AE-61	Current position saving at power-off	00(disabled)/01(enabled)	00
AE-62	Preset position data	when [AA123]≠03, -268435455 to +268435455(pulse) when [AA123]=03, -1073741823 to +1073741823(pulse)	0
AE-64	Deceleration stop distance calculation Gain	50.00 to 200.00(%)	100.00
AE-65	Deceleration stop distance calculation Bias	0.00 to 655.35(%)	0.00
AE-66	Speed Limit in APR control	0.00 to 100.00(%)	1.00
AE-67	APR start speed	0.00 to 100.00(%)	0.20
AE-70	Homing function selection	00 (Low speed homing) /01 (High speed homing 1) /01 (High speed homing 2)	00
AE-71	Direction of Homing function	00(Foward)/01(Reverse)	00
AE-72	Low-speed of homing function	0.00 to 10.00(Hz)	0.00
AE-73	High-Speed of homing function	0.00 to 590.00(Hz)	
AF101	DC braking selection, 1st-motor	00 (Disable) /01 (Enable) /02 (Enable (Activate only by a speed reference))	00
AF102	Braking type selection, 1st-motor	00 (DC braking) /01 (Speed servo lock) /02 (Position servo lock)	00
AF103	DC braking frequency, 1st-motor	0.00 to 590.00(Hz)	0.50
AF104	DC braking delay time, 1st-motor	0.00 to 5.00(s)	0.00
AF105	DC braking force setting, 1st-motor	0 to 100(%)	30
AF106	DC braking active time at stop, 1st-motor	0.00 to 60.00(s)	0.00
AF107	DC braking operation method selection, 1st-motor	00(Edge)/01(Level)	01
AF108	DC braking force at start, 1st-motor	0 to 100(%)	30
AF109	DC braking active time at start, 1st-motor	0.00 to 60.00(s)	0.00
AF120	Contactor Control Enable, 1st-motor	00 (Disable) /01 (Enable(Power side)) /02 (Enable(Motor side))	00
AF121	Run delay time, 1st-motor	0.00 to 2.00(s)	0.20
AF122	Contactor off delay time, 1st-motor		0.10
AF123	Contactor answer back check time, 1st-motor	0.00 to 5.00(s)	0.10
AF130	Brake Control Enable, 1st-motor	00 (Disable) /01 (Brake control 1 enable) /02 (Brake control 1 enable (FWD/REV separate setting)) /03 (Brake control 2 enable)	00
AF131	Brake Wait Time for Release, 1st-motor (Forward side)	0.00 to 5.00(s)	0.00
AF132	Brake Wait Time for Accel., 1st-motor (Forward side)		
AF133	Brake Wait Time for Stopping, 1st-motor (Forward side)		
AF134	Brake Wait Time for Confirmation, 1st-motor (Forward side)		
AF135	Brake Release Frequency Setting, 1st-motor (Forward side)	0.00 to 590.00(Hz)	0.00

Code No.	Parameter Meaning	Selectable User Setting	Initial value
AF136	Brake Release Current Setting, 1st-motor (Forward side)	INV rated current ×(0.00 to 2.00)	1.00 × Inverter rated current
AF137	Braking Frequency, 1st-motor (Forward side)	0.00 to 590.00(Hz)	0.00
AF138	Brake Wait Time for Release, 1st-motor (Reverse side)	0.00 to 5.00(s)	0.00
AF139	Brake Wait Time for Accel., 1st-motor (Reverse side)		
AF140	Brake Wait Time for Stopping, 1st-motor (Reverse side)		
AF141	Brake Wait Time for Confirmation, 1st-motor (Reverse side)		
AF142	Brake Release Frequency Setting, 1st-motor (Reverse side)	0.00 to 590.00(Hz)	0.00
AF143	Brake Release Current Setting, 1st-motor (Reverse side)	INV rated current ×(0.00 to 2.00)	1.00 × Inverter rated current
AF144	Braking Frequency, 1st-motor (Reverse side)	0.00 to 590.00(Hz)	0.00
AF150	Brake open delay time, 1st-motor	0.00 to 2.00(s)	0.20
AF151	Brake close delay time, 1st-motor		
AF152	Brake answer back check time, 1st-motor	0.00 to 5.00(s)	0.10
AF153	Servo lock/ DC injection time at start, 1st-motor	0.00 to 10.00(s)	0.60
AF154	Servo lock/ DC injection time at stop, 1st-motor		
AF201	DC braking selection, 2nd-motor	same to AF101	00
AF202	Braking type selection, 2nd-motor	same to AF102	00
AF203	DC braking frequency, 2nd-motor	same to AF103	0.50
AF204	DC braking delay time, 2nd-motor	same to AF104	0.00
AF205	DC braking force setting, 2nd-motor	same to AF105	30
AF206	DC braking active time at stop, 2nd-motor	same to AF106	0.00
AF207	DC braking operation method selection, 2nd-motor	same to AF107	01
AF208	DC braking force at start, 2nd-motor	same to AF108	30
AF209	DC braking active time at start, 2nd-motor	same to AF109	0.00
AF220	ContactorControl Enable, 2nd-motor	same to AF120	00
AF221	Run delay time, 2nd-motor	same to AF121	0.20
AF222	Contactor off delay time, 2nd-motor	same to AF122	0.10
AF223	Contactor answer back check time, 2nd-motor	same to AF123	0.10
AF230	Brake Control Enable, 2nd-motor	same to AF130	00
AF231	Brake Wait Time for Release, 2nd-motor (Forward side)	same to AF131	0.00
AF232	Brake Wait Time for Accel., 2nd-motor (Forward side)	same to AF132	
AF233	Brake Wait Time for Stopping, 2nd-motor (Forward side)	same to AF133	
AF234	Brake Wait Time for Confirmation, 2nd-motor (Forward side)	same to AF134	
AF235	Brake Release Frequency Setting, 2nd-motor (Forward side)	same to AF135	0.00
AF236	Brake Release Current Setting, 2nd-motor (Forward side)	same to AF136	1.00 × Inverter rated current
AF237	Braking Frequency, 2nd-motor (Forward side)	same to AF137	0.00
AF238	Brake Wait Time for Release, 2nd-motor (Reverse side)	same to AF138	0.00
AF239	Brake Wait Time for Accel., 2nd-motor (Reverse side)	same to AF139	
AF240	Brake Wait Time for Stopping, 2nd-motor (Reverse side)	same to AF140	
AF241	Brake Wait Time for Confirmation, 2nd-motor (Reverse side)	same to AF141	
AF242	Brake Release Frequency Setting, 2nd-motor (Reverse side)	same to AF142	0.00
AF243	Brake Release Current Setting, 2nd-motor (Reverse side)	same to AF143	1.00 × Inverter rated current
AF244	Braking Frequency, 2nd-motor (Reverse side)	same to AF144	0.00

Code No.	Parameter Meaning	Selectable User Setting	Initial value
AF250	Brake open delay time, 2nd-motor	same to AF150	0.20
AF251	Brake close delay time, 2nd-motor	same to AF151	
AF252	Brake answer back check time, 2nd-motor	same to AF152	0.10
AF253	Servo lock/ DC injection time at start, 2nd-motor	same to AF153	0.60
AF254	Servo lock/ DC injection time at stop, 2nd-motor	same to AF154	
AG101	Jump frequency 1, 1st-motor	0.00 to 590.00(Hz)	0.00
AG102	Jump frequency width 1, 1st-motor	0.00 to 10.00(Hz)	
AG103	Jump frequency 2, 1st-motor	0.00 to 590.00(Hz)	
AG104	Jump frequency width 2, 1st-motor	0.00 to 10.00(Hz)	
AG105	Jump frequency 3, 1st-motor	0.00 to 590.00(Hz)	
AG106	Jump frequency width 3, 1st-motor	0.00 to 10.00(Hz)	
AG110	Acceleration stop frequency setting, 1st-motor	0.00 to 590.00(Hz)	
AG111	Acceleration stop time setting, 1st-motor	0.00 to 60.00(s)	0.0
AG112	Deceleration stop frequency setting, 1st-motor	0.00 to 590.00(Hz)	0.00
AG113	Acceleration stop time setting, 1st-motor	0.00 to 60.00(s)	0.0
AG-20	Jogging frequency	0.00 to 10.00(Hz)	6.00
AG-21	Jogging stop mode selection	00 (Free run at Jogging stop (Disable at run)) /01 (Deceleration stop at Jogging stop (Disable at run)) /02 (Dynamic brake at Jogging stop (Disable at run)) /03 (Free run at Jogging stop (Enable at run)) /04 (Deceleration stop at Jogging stop (Enable at run)) /05 (Dynamic brake at Jogging stop (Enable at run))	00
AG201	Jump frequency 1, 2nd-motor	same to AG101	0.00
AG202	Jump frequency width 1, 2nd-motor	same to AG102	
AG203	Jump frequency 2, 2nd-motor	same to AG103	
AG204	Jump frequency width 2, 2nd-motor	same to AG104	
AG205	Jump frequency 3, 2nd-motor	same to AG105	
AG206	Jump frequency width 3, 2nd-motor	same to AG106	
AG210	Acceleration stop frequency setting, 2nd-motor	same to AG110	
AG211	Acceleration stop time setting, 2nd-motor	same to AG111	0.0
AG212	Deceleration stop frequency setting, 2nd-motor	same to AG112	0.00
AG213	Acceleration stop time setting, 2nd-motor	same to AG113	0.0
AH-01	PID1 enable	00 (Disable) /01 (Enable) /02 (Enable (with reverse output))	00
AH-02	PID1 deviation inverse	00 (Disable) /01 (Enable)	00
AH-03	Unit selection for PID1	refer to the table for unit	01
AH-04	PID1 scale adjustment (at 0%)	-10000 to 10000	0
AH-05	PID1 scale adjustment (at 100%)		10000
AH-06	PID1 scale adjustment (point position)	0 to 4	2
AH-07	Input source selection of Set-point for PID1	00 (Not use) /01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(option))	07
AH-10	Set-point-1 setting for PID1	0.00 to 100.00(%) Display range can be changed with [AH-04], [AH-05], [AH-06]	0.00
AH-12 to AH-40	PID1 Multi stage set-point 1 to 15 setting		
AH-42	Input source selection of Set-point 2 for PID1	00 (Not use) /01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(option))	00
AH-44	Set-point 2 setting for PID1	0.00 to 100.00(%) Display range can be changed with [AH-04], [AH-05], [AH-06]	0.00
AH-46	Input source selection of Set-point 3 for PID1	00 (Not use) /01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(option))	00
AH-48	Set-point 2 setting for PID1	0.00 to 100.00(%) Display range can be changed with [AH-04], [AH-05], [AH-06]	0.00
AH-50	Calculation symbol selection of Set-point 1 for PID1	01 (Addition) /02 (Subtraction) /03 (Multiplication) /04 (Division) /05 (Minimum deviation) /06 (Maximum deviation)	01

Code No.	Parameter Meaning	Selectable User Setting	Initial value
AH-51	Input source selection of Process data 1 for PID1	00 (Disable) /01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(option))	01
AH-52	Input source selection of Process data 2 for PID1		00
AH-53	Input source selection of Process data 3 for PID1		00
AH-54	Calculation symbol selection of Process data for PID1	01 (Addition) /02 (Subtraction) /03 (Multiplication) /04 (Division) /05 (Square root of FB1) /06 (Square root of FB2) /07 (Square root of (FB1-FB2)) /08 (Average of PV-1 to PV-3) /09 (Minimum data of PV-1 to PV-3) /10 (Maximum data of PV-1 to PV-3)	01
AH-60	PID1 gain change method selection	00 (Using gain-1 only) /01 (Changed by Terminal[PRO])	00
AH-61	PID1 proportional gain 1	0.0 to 100.0	1.0
AH-62	PID1 integral time constant 1	0.0 to 3600.0(s)	1.0
AH-63	PID1 derivative gain 1	0.0 to 100.0(s)	0.00
AH-64	PID1 proportional gain 2	0.0 to 100.0	0.0
AH-65	PID1 integral time constant 2	0.0 to 3600.0(s)	0.0
AH-66	PID1 derivative gain 2	0.0 to 100.0(s)	0.00
AH-67	PID1 gain change time	0 to 10000(ms)	100
AH-70	PID feed-forward selection	00 (Disable) /01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6])	00
AH-71	PID1 output variable		0.00
AH-72	PID1 Deviation over level	0.00 to 100.00(%)	3.00
AH-73	PID1 Feedback compare signal turn-off level		100.00
AH-74	PID1 Feedback compare signal turn-on level	0.00 to 100.00(%)	0.00
AH-75	PID soft start function enable	00 (Disable) /01 (Enable)	00
AH-76	PID soft start target level	0.00 to 100.00(%)	100.00
AH-78	Acceleration time setting for PID soft start function	0.00 to 3600.00(s)	30.00
AH-80	PID soft start time	0.00 to 100.00(s)	0.00
AH-81	PID soft start error detection enable	00 (Disable) /01 (Enable(Error output)) /02 (Enable(Warning output))	00
AH-82	PID soft start error detection level	0.00 to 100.00(s)	0.00
AH-85	PID sleep trigger selection	00 (Disable) /01 (Low output) /02 (Terminal [SLEP] input)	00
AH-86	PID sleep start level	0.00 to 590.00(Hz)	0.00
AH-87	PID sleep active time	0.0 to 100.0(s)	0.00
AH-88	Setpoint boost before PID sleep enable	00 (Disable) /01 (Enable)	00
AH-89	Setpoint boost time	0.00 to 100.00(s)	0.00
AH-90	Setpoint boost value	0.00 to 100.00(s)	0.00
AH-91	Minimum RUN time before PID sleep		0.00
AH-92	Minimum active time of PID sleep	0.00 to 100.00(s)	0.00
AH-93	PID sleep trigger selection	01 (Deviation value) /02 (Low feedback) /03 (Terminal [WAKE] input)	01
AH-94	PID wake start level	0.00 to 100.00(%)	0.00
AH-95	PID wake start time	0.00 to 100.00(s)	
AH-96	PID wake start deviation value	0.00 to 100.00(%)	
AJ-01	PID2 enable	00 (Disable) /01 (Enable) /02 (Enable (with reverse output))	00
AJ-02	PID2 deviation inverse	00 (Disable) /01 (Enable)	00
AJ-03	PID2 unit selection	refer to the separated list for unit	01
AJ-04	PID2 scale adjustment(at 0%)		0
AJ-05	PID2 scale adjustment(at 100%)	-10000 to 10000	10000
AJ-06	PID2 scale adjustment (point position)	0 to 4	2
AJ-07	Input source selection of Set-point for PID2	00 (Disable) /01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(option))	07
AJ-10	Set-point setting for PID2	0.00 to 100.00(%) Display range can be changed with [AJ-04], [AJ-05], [AJ-06]	0.00
AJ-12	Input source selection of Process data for PID2	00 (Not use) /01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(option))	02
AJ-13	PID2 proportional gain	0.0 to 100.0	1.0
AJ-14	PID2 integral time constant	0.0 to 3600.0(s)	1.0
AJ-15	PID2 derivative gain	0.00 to 100.00(s)	0.00
AJ-16	PID2 output variable		0.00
AJ-17	PID2 Deviation over level		3.00
AJ-18	PID2 Feedback compare signal turn-off level	0.00 to 100.00(%)	100.00
AJ-19	PID2 Feedback compare signal turn-on level		0.00
AJ-21	PID3 enable	00 (Disable) /01 (Enable) /02 (Enable (with reverse output))	00
AJ-22	PID3 deviation inverse	00 (Disable) /01 (Enable)	00
AJ-23	PID3 unit selection	refer to the separated list for unit	01
AJ-24	PID3 scale adjustment (at 0%)	-10000 to 10000	0

Code No.	Parameter Meaning	Selectable User Setting	Initial value
AJ-25	PID3 scale adjustment (at 100%)	-10000 to 10000	10000
AJ-26	PID3 scale adjustment (point position)	0 to 4	2
AJ-27	Input source selection of Set-point for PID3	00 (Not use) /01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(Option))	07
AJ-30	Set-point setting for PID3	0.00 to 100.00(%) Display range can be changed with [AJ-24], [AJ-25], [AJ-26]	0.00
AJ-32	Input source selection of Process data for PID3	00 (Not use) /01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(Option))	01
AJ-33	PID3 proportional gain	0.0 to 100.0	1.0
AJ-34	PID3 integral time constant	0.0 to 3600.0(s)	1.0
AJ-35	PID3 derivative gain	0.00 to 100.00(s)	0.00
AJ-36	PID3 output variable		0.00
AJ-37	PID3 Deviation over level		3.00
AJ-38	PID3 Feedback compare signal turn-off level	0.00 to 100.00(%)	100.00
AJ-39	PID3 Feedback compare signal turn-on level		0.00
AJ-41	PID4 enable	00 (Disable) /01 (Enable) /02 (Enable (with reverse output))	00
AJ-42	PID4 deviation inverse	00 (Disable) /01 (Enable)	00
AJ-43	PID4 unit selection	refer to the separated list for unit	01
AJ-44	PID4 scale adjustment (at 0%)		0
AJ-45	PID4 scale adjustment (at 100%)	-10000 to 10000	10000
AJ-46	PID4 scale adjustment (point position)	0 to 4	2
AJ-47	Input source selection of Set-point for PID4	00 (Not use) /01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(Option))	07
AJ-50	Set-point setting for PID4	0.00 to 100.00(%) Display range can be changed with [AJ-44], [AJ-45], [AJ-46]	0.00
AJ-52	Input source selection of Process data for PID4	00 (Not use) /01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(Option))	01
AJ-53	PID4 proportional gain	0.0 to 100.0	1.0
AJ-54	PID4 integral time constant	0.0 to 3600.0(s)	1.0
AJ-55	PID4 derivative gain	0.00 to 100.00(s)	0.00
AJ-56	PID4 output variable		0.00
AJ-57	PID4 Deviation over level		3.00
AJ-58	PID4 Feedback compare signal turn-off level	0.00 to 100.00(%)	100.00
AJ-59	PID4 Feedback compare signal turn-on level		0.00

Code No.	Parameter Meaning	Selectable User Setting	Initial value
baA122	Overload restriction 1 mode selection, 1st-motor	00 (Disable) /01 (Enable during accel. and constant speed) /02 (Enable during constant speed) /03 (Enable during accel. and constant speed (Accel. during regeneration))	01
baA123	Overload restriction 1 active level, 1st-motor	INV rated current ×(0.00 to 2.00)	1.50 × Inverter rated current (A)
baA124	Overload restriction 1 active level, 1st-motor	11 (Option-3)	1.00
baA126	Overload restriction 2 mode selection, 1st-motor	00 (Disable) /01 (Enable during accel. and constant speed) /02 (Enable during constant speed) /03 (Enable during accel. and constant speed (Accel. during regeneration))	01
baA127	Overload restriction 2 active level, 1st-motor	INV rated current ×(0.00 to 2.00)	1.50 × Inverter rated current (A)
baA128	Overload restriction 2 active level, 1st-motor	0.10 to 3600.00(s)	1.00
baA30	Deceleration-stop at power failure	00 (Disable) /01 (Deceleration stop) /02 (Deceleration-stop at power failure (with resume)) /03 (Deceleration-stop at power failure (without resume))	00
baA31	Decel.-stop at power failure starting voltage	(200V class) 220.0 (400V class) 440.0	
baA32	Decel.-stop at power failure control target level	(200V class) 0.0 to 410.0(Vdc) (400V class) 0.0 to 820.0(Vdc)	(200V class) 360.0 (400V class) 720.0
baA34	Decel.-stop at power failure control target level	0.01 to 3600.00(s)	1.00
baA36	Decel.-stop at power failure freq. width at deceleration start	0.00 to 10.00(Hz)	0.00
baA37	Decel.-stop at power failure DC-bus voltage constant control P-gain	0.00 to 5.00	0.20
baA38	Decel.-stop at power failure DC-bus voltage constant control I-gain	0.00 to 150.00(s)	1.00
baA40	Over-voltage suppression enable, 1st-motor	00:Disable /01:DC bus constant control (deceleration stop) /02:Enable acceleration /03:Enable acceleration (at constant speed and deceleration)	00
baA41	Over-voltage suppression active level, 1st-motor	(200V class) 330.0 to 400.0(Vdc) (400V class) 660.0 to 800.0(Vdc)	(200V class) 380.0 (400V class) 760.0
baA42	Over-voltage suppression active level, 1st-motor	0.00 to 3600.00(s)	1.00
baA44	DC bus constant control proportional gain, 1st-motor	0.00 to 5.00	0.20
baA45	DC bus constant control integral gain, 1st-motor	0.00 to 150.00(s)	1.00
baA46	Over magnetization function selection, 1st-motor	00 (Disable), 01 (Always enable) 02 (At deceleration only) 03 (Operation at setting level) 04 (Operation at setting level at deceleration only)	02
baA47	Over magnetization output filter time constant, 1st-motor	0.00 to 1.00(s)	0.30
baA48	Over magnetization voltage gain, 1st-motor	50 to 400(%)	100
baA49	Over magnetization level setting, 1st-motor	(200V class) 330.0 to 400.0(Vdc) (400V class) 660.0 to 800.0(Vdc)	(200V class) 360.0 (400V class) 720.0
baA60	Dynamic brake usage rate	0.0 to 10.0×[baA63]/(minimum resistance)(%)	10.0
baA61	Dynamic brake selection	00:Disable /01:Enable (Disabling at stop) /02:Enable (Enabling at stop)	00
baA62	Dynamic brake active level	(200V class) 330.0 to 400.0(V) (400V class) 660.0 to 800.0(V)	(200V class) 360.0 (400V class) 720.0
baA63	Dynamic brake resistor value	minimum resistance to 600(Ω)	Minimum resistance. (It depends on inverter models.)
baA70	Cooling FAN control method selection	00 (Usually active) /01 (Active during driving) /02 (Temperture matter)	00
baA71	Cooling fan accumulation running time monitor clearance selection	00 (Disable) /01 (Clear)	00
baA201	Frequency limit selection, 2nd motor	same as baA101	00
baA202	Upper frequency limit, 2nd motor	same as baA102	0.00
baA203	Lower frequency limit, 2nd motor	same as baA103	0.00
baA210	Torque limit selection, 2nd-motor	same as baA110	07
baA211	Torque limit parameter mode selection, 2nd-motor	same as baA111	00
baA212	Torque limit 1 (Forward driving), 2nd-motor	same as baA112	
baA213	Torque limit 2 (Reverse regenerative), 2nd-motor	same as baA113	150.0(%)
baA214	Torque limit 3 (Reverse driving), 2nd-motor	same as baA114	
baA215	Torque limit 4 (Forward regenerative), 2nd motor	same as baA115	
baA216	Torque limit LADSTOP selection, 2nd-motor	same as baA116	00
baA220	Over current suppress enable, 2nd-motor	same as baA120	01
baA221	Over current suppress Level, 2nd-motor	same as baA121	1.80 × Inverter rated current (A)
baA222	Overload restriction 1 mode selection, 2nd-motor	same as baA122	01
baA223	Overload restriction 1 active level, 2nd-motor	same as baA123	1.50 × Inverter rated current (A)

■Parameter mode (B code)

Code No.	Parameter Meaning	Selectable User Setting	Initial value
baA101	Frequency limit selection, 1st-motor	00 (Disable) 01 (Setting by Terminal [Ai1]) 02 (Setting by Terminal [Ai2]) 03 (Setting by Terminal [Ai3]) 04 (Setting by Terminal [Ai4]) 05 (Setting by Terminal [Ai5]) 06 (Setting by Terminal [Ai6]) 07 (Setting by parameter) 08 (Setting by RS485) 09 (Option-1) 10 (Option-2) 11 (Option-3) 12 (Pulse train input(internal)) 13 (Pulse train input(Option))	00
baA102	Upper Frequency limit, 1st-motor	0.00 to 590.00(Hz)	0.00
baA103	Lower Frequency limit , 1st-motor	0.00 to 590.00(Hz)	0.00
baA110	Torque limit selection, 1st-motor	00 (Disable) /01 (Setting by Terminal [Ai1]) /02 (Setting by Terminal [Ai2]) /03 (Setting by Terminal [Ai3]) /04 (Setting by Terminal [Ai4]) /05 (Setting by Terminal [Ai5]) /06 (Setting by Terminal [Ai6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3)	07
baA111	Torque limit parameter mode selection, 1st-motor	00 (Quadrant-specific setting) /01 (Switching by terminal [TRQ])	00
baA112	Torque limit 1 (Forward driving), 1st-motor		
baA113	Torque limit 2 (Reverse regenerative), 1st-motor		
baA114	Torque limit 3 (Reverse driving), 1st-motor	0.0 to 500.0(%)	150.0
baA115	Torque limit 4 (Forward regenerative), 1st-motor		
baA116	Torque limit LADSTOP selection, 1st-motor	00 (Disable) / 01 (Enable)	00
baA120	Over current suppress enable, 1st-motor	00 (Disable) / 01 (Enable)	01
baA121	Over current suppress Level, 1st-motor	INV rated current ×(0.00 to 2.00)	1.80 × Inverter rated current (A)

Code No.	Parameter Meaning	Selectable User Setting	Initial value
ba224	Overload restriction 1 active level, 2nd-motor	same as bA124	1.00
ba226	Overload restriction 2 mode selection, 2nd-motor	same as bA126	01
ba227	Overload restriction 2 active level, 2nd-motor	same as bA127	1.50 × Inverter rated current (A)
ba228	Overload restriction 2 active level, 2nd-motor	same as bA128	1.00
ba240	Over-voltage suppression enable, 2nd-motor	same as bA140	00
ba241	Over-voltage suppression active level, 2nd-motor	same as bA141	(200V class) 380.0 (400V class) 760.0
ba242	Over-voltage suppression active level, 2nd-motor	same as bA142	1.00
ba244	DC bus constant control proportional gain, 2nd-motor	same as bA144	0.20
ba245	DC bus constant control integral gain, 2nd-motor	same as bA145	1.00
ba246	Over magnetization function selection, 2nd-motor	same as bA146	02
ba247	Over magnetization output filter time constant, 2nd-motor	same as bA147	0.30
ba248	Over magnetization voltage gain, 2nd-motor	same as bA148	100
ba249	Over magnetization level setting, 2nd-motor	same as bA149	(200V class) 360.0 (400V class) 720.0
bb101	Carrier frequency setting, 1st-motor	[Ub-03]=02 : Normal Duty 0.5 to 16.0(kHz) [Ub-03]=01 : Light Duty 0.5 to 12.0(kHz) [Ub-03]=00 : Very Light Duty 0.5 to 10.0(kHz) P1-01760-H(P1-750H) to P1-03160-H(P1-1320H) are as follows [Ub-03]=02 : 0.5 to 10.0(kHz) [Ub-03]=00 or 01 : 0.5 to 8.0(kHz)	2.0
bb102	Sprinkle carrier pattern selection, 1st-motor	00 (Disable) /01 (Enable Pattern-1) /02 (Enable Pattern-2) /03 (Enable Pattern-3)	00
bb103	Automatic-carrier reduction selection, 1st-motor	00 (Disable) /01 (Enable(Current)) /02 (Enable(Temperature))	00
bb-10	Automatic error reset selection	00 (Disable) /01 (Effective by Run command is turn-off) /02 (effective after set time) /03 (Emergency force drive)	00
bb-11	Alarm signal selection at Automatic error reset is active	00 (Output) /01 (No output)	00
bb-12	Automatic error reset wait time	0 to 600(s)	2
bb-13	Automatic error reset number	0 to 10(times)	3
bb-20	The number of retries after instantaneous power failure	0 to 16,255	0
bb-21	The number of retries after under voltage		0
bb-22	The number of retries after over current	0 to 5	0
bb-23	The number of retries after over voltage		0
bb-24	Selection of restart mode at Instantaneous power failure/ under-voltage trip	00 (Start with 0Hz) 01 (Start with frequency matching) 02 (Start with Active frequency matching) 03 (Detect speed) 04 (Trip after Deceleration stop)	01
bb-25	Allowable under-voltage power failure time	0.3 to 25.0(s)	1.0
bb-26	Retry wait time before motor restart	0.3 to 100.0(s)	0.3
bb-27	Instantaneous power failure/under-voltage trip alarm enable	00 (Disable) /01 (Enable) /02 (Disable at during stop & during deceleration stop)	00
bb-28	Selection of restart mode at over-current	00 (Start with 0Hz) 01 (Start with frequency matching) 02 (Start with Active frequency matching) 03 (Detect speed) 04 (Trip after Deceleration stop)	01
bb-29	Wait time of restart at over-current	0.3 to 100.0(s)	0.3
bb-30	Selection of restart mode at over-voltage	00 (Start with 0Hz) 01 (Start with frequency matching) 02 (Start with Active frequency matching) 03 (Detect speed) 04 (Trip after Deceleration stop)	01
bb-31	Wait time of restart at over-voltage	0.3 to 100.0(s)	0.3
bb-40	Restart mode after FRS release	00 (Start with 0Hz) /01 (Start with frequency matching) /02 (Start with Active frequency matching) /03 (Detect speed)	00
bb-41	Restart mode after RS release		00
bb-42	Restart frequency threshold	0.00 to 590.00(Hz)	0.00
bb-43	Restart level of Active frequency matching	INV rated current×(0.20 to 2.00)	1.00 × Inverter rated current
bb-44	Restart constant(speed) of Active Frequency matching		0.50
bb-45	Restart constant(Voltage) of Active Frequency matching	0.10 to 30.00(s)	0.50
bb-46	OC-supress level of Active frequency matching	INV rated current×(0.20 to 2.00)	1.00 × Inverter rated current
bb-47	Restart speed selection of Active frequency matching	00 (Output frequency at shut down) /01 (Maximum frequency) /02 (Setting frequency)	00
bb160	Over current detection level, 1st-motor	INV rated current×(0.20 to 2.20)	2.20 × Inverter ND rated current

Code No.	Parameter Meaning	Selectable User Setting	Initial value
bb-61	Power supply over voltage selection	00 (warning) /01 (error)	00
bb-62	Power supply over voltage level setting	(200V class) 300.0 to 410.0(V) (400V class) 600.0 to 820.0(V)	(200V class) 390.0 (400V class) 780.0
bb-64	Ground fault selection		01
bb-65	Input phase loss enable	00 (Disable) /01 (Enable)	00
bb-66	Output phase loss enable		00
bb-67	Output phase loss detection sensitivity	1 to 100(%)	10
bb-70	Thermistor error level	0 to 10000(Ω)	3000
bb-80	Over speed detection level	0.0 to 150.0(%)	135.0
bb-81	Over speed detection time	0.0 to 5.0(s)	0.5
bb-82	Speed deviation error mode selection	00 (warning) /01 (error)	00
bb-83	Speed deviation error detection level	0.0 to 100.0(%)	15.0
bb-84	Speed deviation error detection time	0.0 to 5.0(s)	0.5
bb-85	Position deviation error mode selection	00 (warning) /01 (error)	00
bb-86	Position deviation error detection level	0 to 65535(×100pulse)	4096
bb-87	Position deviation error detection time	0.0 to 5.0(s)	0.5
bb201	Carrier frequency setting, 2nd-motor	same as bb101	2.0
bb202	Sprinkle carrier pattern selection, 2nd-motor	same as bb102	00
bb203	Automatic-carrier reduction selection, 2nd-motor	same as bb103	00
bb260	Over current detection level, 2nd-motor	same as bb160	2.20 × Inverter rated current
bC110	Electronic thermal level setting, 1st-motor	INV rated current×(0.20 to 3.00)	1.00 × Inverter rated current
bC111	Electronic thermal characteristic selection, 1st-motor	00 (Reduced torque characteristic(VT)) /01 (Constant torque characteristic(CT)) /02 (Free setting(FREE))	00(**FF) /01(**FEF, *FUF)
bC112	Electronic thermal Subtraction function enable, 1st-motor	00 (Disable) /01 (Enable)	01
bC113	Electronic thermal Subtraction time, 1st-motor	1 to 1000(s)	600
bC14	Electronic thermal counter memory selection at Power-off	00 (Disable) /01 (Enable)	01
bC120	Free electronic thermal frequency-3, 1st-motor	0.00 to bc122(Hz)	0.00
bC121	Free electronic thermal current-1, 1st-motor	INV rated current×(0.20 to 3.00)	0.0
bC122	Free electronic thermal frequency-2, 1st-motor	bc120 to bc124(Hz)	0.00
bC123	Free electronic thermal current-2, 1st-motor	INV rated current×(0.20 to 3.00)	0.0
bC124	Free electronic thermal frequency-3, 1st-motor	bc122 to 590.00(Hz)	0.00
bC125	Free electronic thermal current-3, 1st-motor	INV rated current×(0.20 to 3.00)	0.0
bC210	Electronic thermal level setting, 2nd-motor	same as bC110	1.00 × Inverter rated current
bC211	Electronic thermal characteristic selection, 2nd-motor	same as bC111	00(**FF) /01(**FEF, *FUF)
bC212	Electronic thermal Subtraction function enable, 2nd-motor	same as bC112	01
bC213	Electronic thermal Subtraction time, 2nd-motor	same as bC113	600
bC220	Free electronic thermal frequency-1, 2nd-motor	0.00 to bC222	0.00
bC221	Free electronic thermal current-1, 2nd-motor	same as bC121	0.0
bC222	Free electronic thermal frequency-2, 2nd-motor	bc220 to bc224	0.00
bC223	Free electronic thermal current-2, 2nd-motor	same as bC123	0.0
bC224	Free electronic thermal frequency-3, 2nd-motor	bc222 to 590.00(Hz)	0.00
bC225	Free electronic thermal current-3, 2nd-motor	same as bC125	0.0
bd-01 ^{※4}	STO input display selection	00 (Warning(with display)) /01 (Warning(without display)) /02 (Trip)	00
bd-02 ^{※4}	STO input change time	0.00 to 60.00(s)	1.00
bd-03 ^{※4}	Display selection at STO input change time	00 (Warning(display)) /01 (Warning(display))	00
bd-04 ^{※4}	Action selection after STO input change time	00 (only condition is hold) /01 (Disable) /02 (TRIP)	00

※4) This parameter is specially used for safety function, not for SH1 series.

■Parameter mode (C code)

Code No.	Parameter Meaning	Selectable User Setting	Initial value
CA-01	Input terminal [1] function		028
CA-02	Input terminal [2] function		015
CA-03	Input terminal [3] function		029
CA-04	Input terminal [4] function		032
CA-05	Input terminal [5] function		031
CA-06	Input terminal [6] function		003
CA-07	Input terminal [7] function		004
CA-08	Input terminal [8] function		002
CA-09	Input terminal [9] function		001
CA-10	Input terminal [A] function		033
CA-11	Input terminal [B] function		034
CA-21 to CA-31	Input terminal [1] to [9],[A],[B] active state	00 (Normal open)/01 (Normal close)	00
CA-41 to CA-51	Input terminal [1] to [9],[A],[B] response time	0 to 400(ms)	2
CA-55	Multistage input determination time	0 to 2000(ms)	0
CA-60	FUP/FDN overwrite target selection	00 (Speed Reference)/01 (PID1 Setpoint)	00
CA-61	FUP/FDN data save enable	00 (Not save)/01 (Save)	00
CA-62	FUP/FDN UDC selection	00 (0Hz)/01 (save data)	00
CA-64	Acceleration time setting for FUP/FDN function		30.00
CA-66	Deceleration time setting for FUP/FDN function	0.00 to 3600.00(s)	
CA-70	Speed command selection when [F-OP] active	01 (Setting by Terminal [A1]) /02 (Setting by Terminal [A2]) /03 (Setting by Terminal [A3]) /04 (Setting by Terminal [A4]) /05 (Setting by Terminal [A5]) /06 (Setting by Terminal [A6]) /07 (Setting by parameter) /08 (Setting by RS485) /09 (Option-1) /10 (Option-2) /11 (Option-3) /12 (Pulse train input(internal)) /13 (Pulse train input(option)) /14 (Setting by EzSQ) /15 (PID function) /16 (Volume on keypad)	01
CA-71	RUN command source selection at [F-OP] is active	00 (Terminal [FW]/[RV]) /01 (3-wire) /02 (RUN key on keypad) /03 (Setting by RS485) /04 (Option-1) /05 (Option-2) /06 (Option-3)	00
CA-72	Reset mode selection	00 (Trip release at turn-on) /01 (Trip release at turn-off) /02 (Effective only in trip ON condition) /03 (Effective only in trip OFF condition)	00
CA-81	Encoder constant setting	32 to 65535(PUs)	1024
CA-82	Encoder position selection	00 (Phase-A Lead) /01 (Phase-B Lead)	00
CA-83	Motor gear ratio Numerator	1 to 10000	1
CA-84	Motor gear ratio Denominator	1 to 10000	1
CA-90	Pulse train detection object selection	00 (Disable) /01 (reference) /02 (Speed feedback) /03 (Pulse count)	00
CA-91	Mode selection of pulse train input	00 (90°shift pulse train) /01 (Forward/ Reverse pulse train and direction signal) /02 (Forward pulse train and Reverse pulse train)	00
CA-92	Pulse train frequency Scale	0.05 to 32.0(kHz)	25.00
CA-93	Pulse train frequency Filter time constant	0.01 to 2.00(s)	0.10
CA-94	Pulse train frequency Bias value	-100.0 to 100.0(%)	0.0
CA-95	Pulse train frequency High Limit		100.0
CA-96	Pulse train frequency detection low level		
CA-97	Comparing match output ON-level for Pulse count		0
CA-98	Comparing match output OFF-level for Pulse count		0
CA-99	Comparing match output Maximum value for Pulse count		65535
Cb-01	Filter time constant of Terminal [A1]	1 to 500(ms)	16
Cb-03	Start value of Terminal [A1]	0.00 to 100.00(%)	0.00
Cb-04	End value of Terminal [A1]		100.00
Cb-05	Start rate of Terminal [A1]	0.0 to [Cb-06](%)	0.0
Cb-06	End rate of Terminal [A1]	[Cb-05] to 100.0(%)	100.0
Cb-07	Start point selection of Terminal [A1]	00 (Start value) /01 (0%)	01
Cb-11	Filter time constant of Terminal [A2]	1 to 500(ms)	16
Cb-13	Start value of Terminal [A2]	0.00 to 100.00(%)	0.00
Cb-14	End value of Terminal [A2]		100.00
Cb-15	Start rate of Terminal [A2]	0.0 to [Cb-16](%)	20.0
Cb-16	End rate of Terminal [A2]	[Cb-15] to 100.0(%)	100.0
Cb-17	Start point selection of Terminal [A2]	00 (Start value) /01 (0%)	01
Cb-21	Filter time constant of Terminal [A3]	1 to 500(ms)	16
Cb-22	Terminal [A3] selection	00 (single) /01 (added to A1/Ai2 : forward and reverse) /02 (added to A1/Ai2 : forward only)	00
Cb-23	Start value of Terminal [A3]	-100.00 to 100.00(%)	-100.00
Cb-24	End value of Terminal [A3]		100.00
Cb-25	Start rate of Terminal [A3]	-100.0 to [Cb-26]	-100.0
Cb-26	End rate of Terminal [A3]	[Cb-25] to 100.0	100.0
Cb-30	[A1] Voltage/Current zero-bias adjustment	-100.00 to 100.00(%)	0.00
Cb-31	[A1] Voltage/Current gain adjustment	0.00 to 200.00(%)	100.00
Cb-32	[A2] Voltage/Current zero-bias adjustment	-100.00 to 100.00(%)	0.00

Code No.	Parameter Meaning	Selectable User Setting	Initial value
Cb-33	[A2] Voltage/Current gain adjustment	0.00 to 200.00(%)	100.00
Cb-34	[A3] Voltage -10V-bias adjustment	-100.00 to 100.00(%)	0.00
Cb-35	[A3] Voltage gain adjustment	0.00 to 200.00(%)	100.00
Cb-40	Thermistor type selection	00 (Disable) /01 (PTC) /02 (NTC)	00
Cb-41	Thermistor gain adjustment	0.0 to 1000.0	100.0
Cb-51	Filter time constant of Volume on QOP	1 to 500(ms)	100
Cb-53	Start value of Volume on QOP		0.00 to 100.00(%)
Cb-54	End value of Volume on QOP		
Cb-55	Start rate of Volume on QOP	0.0 to [Cb-56](%)	0.0
Cb-56	End rate of Volume on QOP	[Cb-55] to 100.0(%)	100.0
Cb-57	Start point selection of Volume on QOP	00 ([Cb-53]) /01 (0%)	01
CC-01	Output terminal [11] function		refer to "output terminal functions list"
CC-02	Output terminal [12] function		
CC-03	Output terminal [13] function		
CC-04	Output terminal [14] function		
CC-05	Output terminal [15] function		
CC-06※5	Relay output terminal [16] function		
CC-07	Relay output terminal [AL] function		
CC-11 to 15	Output terminal [11] to [16] active state		00 (Normal open) /01 (Normal close)
CC-17	Relay output terminal [AL] active state		
CC-20	Output terminal [11] on-delay time		0.00 to 100.00(s)
CC-21	Output terminal [11] off-delay time		
CC-22	Output terminal [12] on-delay time		
CC-23	Output terminal [12] off-delay time		
CC-24	Output terminal [13] on-delay time		
CC-25	Output terminal [13] off-delay time		
CC-26	Output terminal [14] on-delay time		
CC-27	Output terminal [14] off-delay time		
CC-28	Output terminal [15] on-delay time		
CC-29	Output terminal [15] off-delay time		
CC-30※5	Output relay [16] on-delay time		
CC-31※5	Relay output terminal [16] off-delay time		
CC-32	Relay output terminal [AL] on-delay time		
CC-33	Relay output terminal [AL] off-delay time		
CC-40	Logical calculation target 1 selection of LOG1	< output terminal functions list >	000
CC-41	Logical calculation target 2 selection of LOG1	062 : LOG1 to 068 : LOG7 cannot be selected	000
CC-42	Logical calculation symbol selection of LOG1	00 (AND) /01 (OR) /02 (XOR)	00
CC-43	Logical calculation target 1 selection of LOG2	< output terminal functions list >	000
CC-44	Logical calculation target 2 selection of LOG2	062 : LOG1 to 068 : LOG7 cannot be selected	000
CC-45	Logical calculation symbol selection of LOG2	00 (AND) /01 (OR) /02 (XOR)	00
CC-46	Logical calculation target 1 selection of LOG3	< output terminal functions list >	000
CC-47	Logical calculation target 2 selection of LOG3	062 : LOG1 to 068 : LOG7 cannot be selected	000
CC-48	Logical calculation symbol selection of LOG3	00 (AND) /01 (OR) /02 (XOR)	00
CC-49	Logical calculation target 1 selection of LOG4	< output terminal functions list >	000
CC-50	Logical calculation target 2 selection of LOG4	062 : LOG1 to 068 : LOG7 cannot be selected	000
CC-51	Logical calculation symbol selection of LOG4	00 (AND) /01 (OR) /02 (XOR)	00
CC-52	Logical calculation target 1 selection of LOG5	< output terminal functions list >	000
CC-53	Logical calculation target 2 selection of LOG5	062 : LOG1 to 068 : LOG7 cannot be selected	000
CC-54	Logical calculation symbol selection of LOG5	00 (AND) /01 (OR) /02 (XOR)	00
CC-55	Logical calculation target 1 selection of LOG6	< output terminal functions list >	000

※5) This parameter is not for SH1 series

Code No.	Parameter Meaning	Selectable User Setting	Initial value
CC-56	Logical calculation target 2 selection of LOG6	< output terminal functions list > 062 : LOG1 to 068 : LOG7 cannot be selected	000
CC-57	Logical calculation symbol selection of LOG6	00 (AND) /01 (OR) /02 (XOR)	00
CC-58	Logical calculation target 1 selection of LOG7	< output terminal functions list >	000
CC-59	Logical calculation target 2 selection of LOG7	062 : LOG1 to 068 : LOG7 cannot be selected	000
CC-60	Logical calculation symbol selection of LOG7	00 (AND) /01 (OR) /02 (XOR)	00
Cd-01	[FM] monitor output wave form selection	00 (PWM output (Duty)) /01 (Frequency output)	00
Cd-02	[FM] monitor output base frequency (at PWM output)	0 to 3600(Hz)	2880
Cd-03	[FM] monitor output selection	Monitor code to be selected. [dA-01]	[dA-01]
Cd-04	[Ao1] monitor output selection		[dA-01]
Cd-05	[Ao2] monitor output selection		[dA-01]
Cd-10	Analog monitor adjust mode enable	00 (Disable) /01 (Enable)	00
Cd-11	Filter time constant of [FM] monitor	1 to 500(ms)	100
Cd-12	[FM] Data type selection	00 (Absolute data) /01 (Signed data)	00
Cd-13	[FM] monitor bias adjustment	-100.0 to 100.0(%)	0.0
Cd-14	[FM] monitor gain adjustment	-1000.0 to 1000.0(%)	100.0
Cd-15	Output level setting at [FM] monitor adjust mode	-100.0 to 100.0(%)	100.0
Cd-21	Filter time constant of [Ao1] monitor	1 to 500(ms)	100
Cd-22	[Ao1] Data type selection	00 (Absolute data) /01 (Signed data)	00
Cd-23	[Ao1] monitor bias adjustment	-100.0 to 100.0(%)	0.0
Cd-24	[Ao1] monitor gain adjustment	-1000.0 to 1000.0(%)	100.0
Cd-25	Output level setting at [Ao1] monitor adjust mode	-100.0 to 100.0(%)	100.0
Cd-31	Filter time constant of [Ao2] monitor	1 to 500(ms)	100
Cd-32	[Ao2] Data type selection	00 (Absolute data) /01 (Signed data)	00
Cd-33	[Ao2] monitor bias adjustment	-100.0 to 100.0(%)	20.0
Cd-34	[Ao2] monitor gain adjustment	-1000.0 to 1000.0(%)	100.0
Cd-35	Output level setting at [Ao2] monitor adjust mode	-100.0 to 100.0(%)	100.0
CE101	Low current signal output mode selection, 1st motor	00 (During Accel./Decel. and constant speed) /01 (During constant speed only)	01
CE102	Low current detection level 1, 1st motor	INV rated current ×(0.00 to 2.00)	1.00 × Inverter rated current
CE103	Low current detection level 2, 1st motor		
CE105	Over load signal output mode selection, 1st motor	00 (During Accel./Decel. and constant speed) /01 (During constant speed only)	01
CE106	Over load detection level 1, 1st motor	INV rated current ×(0.00 to 2.00)	1.00 × Inverter rated current
CE107	Over load detection level 2, 1st motor		
CE-10	Arrival frequency setting during acceleration 1	0.00 to 590.00(Hz)	0.00
CE-11	Arrival frequency setting during deceleration 1		
CE-12	Arrival frequency setting during acceleration 2		
CE-13	Arrival frequency setting during deceleration 2		
CE120	Over torque level (Forward driving), 1st motor	0.0 to 500.0(%)	100.0
CE121	Over torque level (Reverse regenerative), 1st motor		
CE122	Over torque level (Reverse driving), 1st motor		
CE123	Over torque level (Forward regenerative), 1st motor		
CE-30	Electronic thermal warning level (MTR)	0.00 to 100.00(%)	80.00
CE-31	Electronic thermal warning level (CTL)		
CE-33	Zero speed detection level	0.00 to 100.00(Hz)	0.50
CE-34	Cooling FAN over-heat warning level	0 to 200(°C)	120
CE-36	Accum.RUN(RNT)/ Accum.Power-on(ONT) time setting	0 to 100000(hour)	0
CE-40	Window comparer for [Ai1] higher level	0 to 100(%)	100
CE-41	Window comparer for [Ai1] lower level		
CE-42	Window comparer for [Ai1] hysteresis width	0 to 10(%)	0
CE-43	Window comparer for [Ai2] higher level	0 to 100(%)	100
CE-44	Window comparer for [Ai2] lower level		

Code No.	Parameter Meaning	Selectable User Setting	Initial value
CE-45	Window comparer for [Ai2] hysteresis width	0 to 10(%)	0
CE-46	Window comparer for [Ai3] higher level	-100 to 100(%)	100
CE-47	Window comparer for [Ai3] lower level		
CE-48	Window comparer for [Ai3] hysteresis width	0 to 10(%)	0
CE-50	Operation level at [Ai1] disconnection	0 to 100(%)	0
CE-51	Operation level selection at [Ai1] disconnection	00 (Disable) /01 (Enable(at WC* active)) /02 (Enable(at WC* de-active))	00
CE-52	Operation level at [Ai2] disconnection	0 to 100(%)	0
CE-53	Operation level selection at [Ai2] disconnection	00 (Disable) /01 (Enable(at WC* active)) /02 (Enable(at WC* de-active))	00
CE-54	Operation level at [Ai3] disconnection	-100 to 100(%)	0
CE-55	Operation level selection at [Ai3] disconnection	00 (Disable) /01 (Enable(at WC* active)) /02 (Enable(at WC* de-active))	00
CE201	Low current signal output mode selection, 2nd-motor	Same as CE101	01
CE202	Low current detection level 1, 2nd-motor	Same as CE102	1.00 × Inverter rated current
CE203	Low current detection level 2, 2nd-motor	Same as CE103	
CE205	Over load signal output mode selection, 2nd-motor	Same as CE105	01
CE206	Over load detection level 1, 2nd-motor	Same as CE106	1.00 × Inverter rated current
CE207	Over load detection level 2, 2nd-motor	Same as CE107	
CE220	Over torque level (Forward driving), 2nd-motor	Same as CE120	100.0
CE221	Over torque level (Reverse regenerative), 2nd-motor	Same as CE121	
CE222	Over torque level (Reverse driving), 2nd-motor	Same as CE122	
CE223	Over torque level (Forward regenerative), 2nd motor	Same as CE123	
CF-01	RS485 communication baud rate selection	03 (2400bps) /04 (4800bps) /05 (9600bps) /06 (19.2kbps) /07 (38.4kbps) /08 (57.6kbps) /09 (76.8kbps) /10 (115.2kbps)	05
CF-02	RS485 communication Node allocation	1 to 247	1
CF-03	RS485 communication parity selection	00 (No parity) /01 (Even parity) /02 (Odd parity)	00
CF-04	RS485 communication stop-bit selection	01 (1bit) /02 (2bit)	01
CF-05	RS485 communication error selection	00 (Error) /01 (Error output after Deceleration stop) /02 (Ignore) /03 (Free run stop) /04 (Deceleration stop)	02
CF-06	RS485 communication timeout setting	0.00 to 100.00(s)	0.00
CF-07	RS485 communication wait time setting	0 to 1000(ms)	2
CF-08	RS485 communication mode selection	01 (Modbus-RTU) /02 (Communication between inverters (EzCOM)) /03 (Communication between inverters (EzCOM Administrator))	01
CF-11	RS485 register data selection	00 (A,V) /01(%)	00
CF-20	EzCOM Start node No.	01 to 08	01
CF-21	EzCOM End node No.	01 to 08	01
CF-22	EzCOM Start method selection	00 (Terminal [ECOM]) /01 (Always comm.)	00
CF-23	EzCOM data size	01 to 05	05
CF-24	EzCOM destination address 1	1 to 247	1
CF-25	EzCOM destination resister 1	0000 to FFFF	0000
CF-26	EzCOM source resister 1		
CF-27	EzCOM destination address 2	1 to 247	2
CF-28	EzCOM destination resister 2	0000 to FFFF	0000
CF-29	EzCOM source resister 2	0000 to FFFF	0000
CF-30	EzCOM destination address 3		
CF-31	EzCOM destination resister 3	1 to 247	3
CF-32	EzCOM source resister 3	0000 to FFFF	0000
CF-33	EzCOM destination address 4		
CF-34	EzCOM destination resister 4	1 to 247	4
CF-35	EzCOM source resister 4	0000 to FFFF	0000
CF-36	EzCOM destination address 5	1 to 247	5
CF-37	EzCOM destination resister 5	0000 to FFFF	0000
CF-38	EzCOM source resister 5	1 to 247	1
CF-50	USB communication Node allocation		

■Parameter mode (H code)

Code No.	Parameter Meaning	Selectable User Setting	Initial value
HA-01	Auto-tuning selection	00 (Disable) /01 (Not rotation) /02 (Rotation) /03 (IVMS)	00
HA-02	RUN command selection at Auto-tuning	00 (Force "RUN" key) /01 (Setting by AA111/AA211)	00
HA-03	Online auto-tuning selection	00 (Disable) /01 (Enable)	00
HA110	Stabilization constant, 1st-motor	0 to 1000(%)	100
HA115	Speed response, 1st-motor		100
HA120	ASR gain switching mode selection, 1st-motor	00 (Switching by Terminal [CAS]) /01 (Switching by parameter)	00
HA121	ASR gain switching time setting, 1st-motor	0 to 10000(ms)	100
HA122	ASR gain mapping intermediate speed 1, 1st-motor	0.00 to 590.00(Hz)	0.00
HA123	ASR gain mapping intermediate speed 2, 1st-motor		
HA124	ASR gain mapping Maximum speed, 1st-motor		
HA125	ASR gain mapping P-gain 1, 1st-motor	0.0 to 1000.0(%)	100.0
HA126	ASR gain mapping I-gain 1, 1st-motor		
HA127	ASR gain mapping P-gain 1 at P-control, 1st-motor		
HA128	ASR gain mapping P-gain 2, 1st-motor		
HA129	ASR gain mapping I-gain 2, 1st-motor		
HA130	ASR gain mapping P-gain 2 at P-control, 1st-motor		
HA131	ASR gain mapping P-gain 3, 1st-motor		
HA132	ASR gain mapping I-gain 3, 1st-motor		
HA133	ASR gain mapping P-gain 4, 1st-motor		
HA134	ASR gain mapping I-gain 4, 1st-motor		
HA210	Stabilization constant, 2nd-motor	same as HA110	100
HA215	Speed response, 2nd-motor	same as HA115	100
HA220	ASR gain switching mode selection, 2nd-motor	same as HA120	00
HA221	ASR gain switching time setting, 2nd-motor	same as HA121	100
HA222	ASR gain mapping intermediate speed 1, 2nd-motor	same as HA122	0.00
HA223	ASR gain mapping intermediate speed 2, 2nd-motor	same as HA123	
HA224	ASR gain mapping Maximum speed, 2nd-motor	same as HA124	
HA225	ASR gain mapping P-gain 1, 2nd-motor	same as HA125	
HA226	ASR gain mapping I-gain 1, 2nd-motor	same as HA126	
HA227	ASR gain mapping P-gain 1 at P-control, 2nd-motor	same as HA127	
HA228	ASR gain mapping P-gain 2, 2nd-motor	same as HA128	
HA229	ASR gain mapping I-gain 2, 2nd-motor	same as HA129	
HA230	ASR gain mapping P-gain 2 at P-control, 2nd-motor	same as HA130	
HA231	ASR gain mapping P-gain 3, 2nd-motor	same as HA131	
HA232	ASR gain mapping I-gain 3, 2nd-motor	same as HA132	100.0
HA233	ASR gain mapping P-gain 4, 2nd-motor	same as HA133	
HA234	ASR gain mapping I-gain 4, 2nd-motor	same as HA134	
Hb102	Async.Motor capacity setting, 1st-motor	0.01 to 160.00(kW)	
Hb103	Async.Motor poles setting, 1st-motor	2 to 48(Pole)	
Hb104	Async.Motor Base frequency setting, 1st-motor	10.00 to 590.00(Hz)	60.00(*FF, *FUF) /50.00(*FEF)
Hb105	Async.Motor Maximum frequency setting, 1st-motor	10.00 to 590.00(Hz)	
Hb106	Async.Motor rated voltage, 1st-motor	(200V class) : 200(*FF) /230(*FEF, *FUF) (400V class) : 400(*FF, *FEF) /460(*FUF)	

Code No.	Parameter Meaning	Selectable User Setting	Initial value
Hb108	Async.Motor rated current, 1st-motor	0.01 to 10000.00(A)	**6)
Hb110	Async.Motor constant R1, 1st-motor	0.000001 to 1000.000000(Ω)	
Hb112	Async.Motor constant R2, 1st-motor	0.000001 to 1000.000000(Ω)	
Hb114	Async.Motor constant L, 1st-motor	0.000001 to 1000.000000(mH)	
Hb116	Async.Motor constant Io, 1st-motor	0.01 to 1000.00(A)	
Hb118	Async.Motor constant J, 1st-motor	0.00001 to 10000.000000(kgm²)	
Hb130	Minimum frequency adjustment, 1st-motor	0.00 to 10.00(Hz)	0.50
Hb131	Reduced voltage start time setting, 1st-motor	0 to 2000(ms)	36
Hb140	Manual torque boost operational mode selection, 1st-motor	00 (Disabled) /01 (Enabled) /02 (Only forward) /03 (Only reverse)	01
Hb141	Manual torque boost value, 1st-motor	0.0 to 20.0(%)	0.0
Hb142	Manual torque boost Peak speed, 1st-motor	0.0 to 50.0(%)	0.0
Hb145	Eco drive enable, 1st-motor	00 (Disable) /01 (Enable)	00
Hb146	Eco drive response adjustment, 1st-motor	0 to 100(%)	50.0
Hb150	Free-V/f frequency 1 setting, 1st-motor	0.00 to [Hb152](Hz)	0.00
Hb151	Free-V/f Voltage 1 setting, 1st-motor	0.0 to 1000.0(V)	0.0
Hb152	Free-V/f frequency 2 setting, 1st-motor	[Hb150] to [Hb154](Hz)	0.00
Hb153	Free-V/f Voltage 2 setting, 1st-motor	0.0 to 1000.0(V)	0.0
Hb154	Free-V/f frequency 3 setting, 1st-motor	[Hb152] to [Hb156](Hz)	0.00
Hb155	Free-V/f Voltage 3 setting, 1st-motor	0.0 to 1000.0(V)	0.0
Hb156	Free-V/f frequency 4 setting, 1st-motor	[Hb154] to [Hb158](Hz)	0.00
Hb157	Free-V/f Voltage 4 setting, 1st-motor	0.0 to 1000.0(V)	0.0
Hb158	Free-V/f frequency 5 setting, 1st-motor	[Hb156] to [Hb160](Hz)	0.00
Hb159	Free-V/f Voltage 5 setting, 1st-motor	0.0 to 1000.0(V)	0.0
Hb160	Free-V/f frequency 6 setting, 1st-motor	[Hb158] to [Hb162](Hz)	0.00
Hb161	Free-V/f Voltage 6 setting, 1st-motor	0.0 to 1000.0(V)	0.0
Hb162	Free-V/f frequency 7 setting, 1st-motor	[Hb160] to [Hb105](Hz)	0.00
Hb163	Free-V/f Voltage 7 setting, 1st-motor	0.0 to 1000.0(V)	0.0
Hb170	Slip Compensation P-gain with encoder, 1st-motor	0 to 1000(%)	100
Hb171	Slip Compensation I-gain with encoder, 1st-motor	0 to 1000(%)	100
Hb180	Output voltage gain, 1st-motor	0 to 255(%)	100
Hb202	Async.Motor capacity setting, 2nd-motor	Same as Hb102	**6)
Hb203	Async.Motor poles setting, 2nd-motor	Same as Hb103	
Hb204	Async.Motor Base frequency setting, 2nd-motor	Same as Hb104	
Hb205	Async.Motor Maximum frequency setting, 2nd-motor	Same as Hb105	
Hb206	Async.Motor rated voltage, 2nd-motor	Same as Hb106	((200V class) : 200(*FF) /230(*FEF, *FUF) (400V class) : 400(*FF, *FEF) /460(*FUF))
Hb208	Async.Motor rated current, 2nd-motor	Same as Hb108	
Hb210	Async.Motor constant R1, 2nd-motor	Same as Hb110	
Hb212	Async.Motor constant R2, 2nd-motor	Same as Hb112	
Hb214	Async.Motor constant L, 2nd-motor	Same as Hb114	
Hb216	Async.Motor constant Io, 2nd-motor	Same as Hb116	
Hb218	Async.Motor constant J, 2nd-motor	Same as Hb118	((200V class) : 200(*FF) /230(*FEF, *FUF) (400V class) : 400(*FF, *FEF) /460(*FUF))
Hb230	Minimum frequency adjustment, 2nd-motor	Same as Hb130	
Hb231	Reduced voltage start time setting, 2nd-motor	Same as Hb131	
Hb240	Manual torque boost operational mode selection, 2nd-motor	Same as Hb140	
Hb241	Manual torque boost value, 2nd-motor	Same as Hb141	

*6) Varies depending on inverter models and settings of duty rating.

Code No.	Parameter Meaning	Selectable User Setting	Initial value
Hb242	Manual torque boost Peak speed, 2nd-motor	Same as Hb142	0.0
Hb245	Eco drive enable, 2nd-motor	Same as Hb145	00
Hb246	Eco drive response adjustment, 2nd-motor	Same as Hb146	50.0
Hb250	Free-V/f frequency 1 setting, 2nd-motor	Same as Hb150	0
Hb251	Free-V/f Voltage 1 setting, 2nd-motor	Same as Hb151	0.0
Hb252	Free-V/f frequency 2 setting, 2nd-motor	Same as Hb152	0.00
Hb253	Free-V/f Voltage 2 setting, 2nd-motor	Same as Hb153	0.0
Hb254	Free-V/f frequency 3 setting, 2nd-motor	Same as Hb154	0.00
Hb255	Free-V/f Voltage 3 setting, 2nd-motor	Same as Hb155	0.0
Hb256	Free-V/f frequency 4 setting, 2nd-motor	Same as Hb156	0.00
Hb257	Free-V/f Voltage 4 setting, 2nd-motor	Same as Hb157	0.0
Hb258	Free-V/f frequency 5 setting, 2nd-motor	Same as Hb158	0.00
Hb259	Free-V/f Voltage 5 setting, 2nd-motor	Same as Hb159	0.0
Hb260	Free-V/f frequency 6 setting, 2nd-motor	Same as Hb160	0.00
Hb261	Free-V/f Voltage 6 setting, 2nd-motor	Same as Hb161	0.0
Hb262	Free-V/f frequency 7 setting, 2nd-motor	Same as Hb162	0.00
Hb263	Free-V/f Voltage 7 setting, 2nd-motor	Same as Hb163	0.0
Hb270	Slip Compensation P-gain with encoder, 2nd-motor	Same as Hb170	100
Hb271	Slip Compensation I-gain with encoder, 2nd-motor	Same as Hb171	100
Hb280	Output voltage gain, 2nd-motor	Same as Hb180	100
HC101	Automatic torque boost voltage compensation gain, 1st-motor	0 to 255(%)	100
HC102	Automatic torque boost slip compensation gain, 1st-motor	0 to 255(%)	100
HC110	Zero speed area limit, 1st-motor	0 to 100(%)	80
HC111	Boost value at start, 1st-motor (IM-SLV,IM-CLV)	0 to 50(%)	0
HC112	Boost value at start, 1st-motor(IM-0Hz-SLV)	0 to 50(%)	10
HC113	Secondary resistance correction, 1st-motor	00 (Disable) /01 (Enable)	00
HC114	Reverse direction run protection selection, 1st-motor	00 (Disable) /01 (Enable)	00
HC120	Torque current reference filter time constant, 1st-motor	0 to 100(ms)	2
HC121	Speed feedforward compensation gain, 1st-motor	0 to 1000(%)	0
HC201	Automatic torque boost voltage compensation gain, 2nd-motor	same as HC101	100
HC202	Automatic torque boost slip compensation gain, 2nd-motor	same as HC102	100
HC210	Zero speed area limit, 2nd-motor	same as HC110	80
HC211	Boost value at start, 2nd-motor(IM-SLV,IM-CLV)	same as HC111	0
HC212	Boost value at start, 2nd-motor(IM-0Hz-SLV)	same as HC112	10
HC213	Secondary resistance correction, 2nd-motor	same as HC113	00
HC214	Counter direction run protection selection, 2nd-motor	same as HC114	00
HC220	Torque current reference filter time constant, 2nd-motor	same as HC120	2
HC221	Speed feedforward compensation gain, 2nd-motor	same as HC121	0
Hd102	Sync.Motor capacity setting, 1st-motor	0.01 to 160.00(kW)	*6)
Hd103	Sync.Motor Poles setting, 1st-motor	2 to 48(Pole)	
Hd104	Sync.Base frequency setting, 1st-motor	10.00 to 590.00(Hz)	
Hd105	Sync.Maximum frequency setting, 1st-motor		
Hd106	Sync.Motor rated voltage, 1st-motor	1 to 1000(V)	
Hd108	Sync.Motor rated current, 1st-motor	0.01 to 10000.00(A)	

Code No.	Parameter Meaning	Selectable User Setting	Initial value
Hd110	Sync.Motor constant R, 1st-motor	0.000001 to 1000.000000(Ω)	*6)
Hd112	Sync.Motor constant Ld, 1st-motor	0.000001 to 1000.000000(mH)	
Hd114	Sync.Motor constant Lq, 1st-motor		
Hd116	Sync.Motor constant Ke, 1st-motor	0.1 to 10000.0(mVs/rad)	
Hd118	Sync.Motor constant J, 1st-motor	0.00001 to 10000.00000(kgm ²)	
Hd130	Minimum Frequency for Sync.M, 1st-motor	0 to 50(%)	
Hd131	No-Load current for Sync. M, 1st-motor	0 to 100(%)	10
Hd132	Starting Method for Sync. M, 1st-motor	00 (Synchronous) /01 (Initial position estimate)	00
Hd133	IMPE 0V wait number for Sync.M, 1st-motor	0 to 255	10
Hd134	IMPE detect wait number for Sync.M, 1st-motor		10
Hd135	IMPE detect number for Sync.M, 1st-motor		30
Hd136	IMPE voltage gain for Sync.M, 1st-motor	0 to 200(%)	100
Hd137	IMPE Mg-pole position offset, 1st-motor	0 to 359(°)	0
Hd41	Carrier frequency at IVMS	0.5 to 16.0(kHz)	2.0
Hd42	Filter gain of current detection at IVMS	0 to 1000	100
Hd43	Open phase voltage detection gain	00, 01, 02, 03	00
Hd44	Open phase switching threshold compensation	00 (Disable) /01 (Enable)	01
Hd45	P-Gain for speed control, SM(PMM)-IVMS	0 to 1000	100
Hd46	I-Gain for speed control, SM(PMM)-IVMS	0 to 10000	
Hd47	Wait time for open phase switching, SM(PMM)-IVMS	0 to 1000	15
Hd48	Limitation of decision about the drive direction, SM(PMM)-IVMS	00 (Disable) /01 (Enable)	01
Hd49	Open phase voltage detection timing adjustment, SM(PMM)-IVMS	0 to 1000	10
Hd50	Minimum pulse width adjustment, SM(PMM)-IVMS		100
Hd51	IVMS threshold current limit	0 to 255	100
Hd52	IVMS threshold gain		
Hd58	IVMS carrier-frequency switching start/fin sh point	0 to 50(%)	5
Hd202	Sync.Motor capacity setting, 2nd-motor	same as Hd102	
Hd203	Sync.Motor poles setting, 2nd-motor	same as Hd103	
Hd204	Sync.Base frequency setting, 2nd-motor	same as Hd104	
Hd205	Sync.Maximum frequency setting, 2nd-motor	same as Hd105	
Hd206	Sync.Motor rated voltage, 2nd-motor	same as Hd106	*6)
Hd208	Sync.Motor rated current, 2nd-motor	same as Hd108	
Hd210	Sync.Motor constant R, 2nd-motor	same as Hd110	
Hd212	Sync.Motor constant Ld, 2nd-motor	same as Hd112	
Hd214	Sync.Motor constant Lq, 2nd-motor	same as Hd114	
Hd216	Sync.Motor constant Ke, 2nd-motor	same as Hd116	
Hd218	Sync.Motor constant J, 2nd-motor	same as Hd118	
Hd230	Minimum Frequency for Sync.M, 2nd-motor	same as Hd130	8
Hd231	No-Load current for Sync. M, 2nd-motor	same as Hd131	10
Hd232	Starting Method for Sync. M, 2nd-motor	same as Hd132	00
Hd233	IMPE 0V wait number for Sync.M, 2nd-motor	same as Hd133	10
Hd234	IMPE detect wait number for Sync.M, 2nd-motor	same as Hd134	10
Hd235	IMPE detect number for Sync.M, 2nd-motor	same as Hd135	30
Hd236	IMPE voltage gain for Sync.M, 2nd-motor	same as Hd136	100
Hd237	IMPE Mg-pole position offset, 2nd-motor	same as Hd137	0

*6) Varies depending on inverter models and settings of duty rating.

■Parameter mode (O code)

Code No.	Parameter Meaning	Selectable User Setting	Initial value
oA-10	Operation mode on option card error (SLOT-1)	00 (Error) /01 (Ignor error (keep running))	00
oA-11	Communication Watch Dog Timer (SLOT-1)	0.00 to 100.00(s)	1.00
oA-12	Action selection at communication error (SLOT-1)	00 (Error) /01 (Trip after Deceleration stop) /02 (Ignore) /03 (Free run stop) /04 (Deceleration stop)	01
oA-13	Run command selection at start up (SLOT-1)	00 (run command disabled) /01 (run command enabled)	00
oA-20	Operation mode on option card error (SLOT-2)	00 (Error) /01 (Ignor error (keep running))	00
oA-21	Communication Watch Dog Timer (SLOT-2)	0.00 to 100.00(s)	1.00
oA-22	Action selection at communication error (SLOT-2)	00 (Error) /01 (Trip after Deceleration stop) /02 (Ignore) /03 (Free run stop) /04 (Deceleration stop)	01
oA-23	Run command selection at start up (SLOT-2)	00 (run command disabled) /01 (run command enabled)	00
oA-30	Operation mode on option card error (SLOT-3)	00 (Error) /01 (Ignor error (keep running))	00
oA-31	Communication Watch Dog Timer (SLOT-3)	0.00 to 100.00(s)	1.00
oA-32	Action selection at communication error (SLOT-3)	00 (Error) /01 (Trip after Deceleration stop) /02 (Ignore) /03 (Free run stop) /04 (Deceleration stop)	01
oA-33	Run command selection at start up (SLOT-3)	00 (run command disabled) /01 (run command enabled)	00
ob-01	Encoder constant setting	32 to 65535(PIs)	1024
ob-02	Encoder position selection	00 (Phase-A Lead) /01 (Phase-B Lead)	00
ob-03	Motor gear ratio Numerator	1 to 10000	1
ob-04	Motor gear ratio Denominator	1 to 10000	1
ob-10	Pulse train detection object selection (option)	00 (reference) /01 (Pulse train position reference)	00
ob-11	Mode selection of pulse train input (option)	00 (90°shift pulse train) /01 (Forward/ Reverse pulse train and direction signal) /02 (Forward pulse train and Reverse pulse train)	01
ob-12	Pulse train frequency Scale (option)	0.05 to 200.00(kHz)	25.00
ob-13	Pulse train frequency Filter time constant (option)	0.01 to 2.00(s)	0.10
ob-14	Pulse train frequency Bias value (option)	-100.0 to 100.0(%)	0.0
ob-15	Pulse train frequency High Limit (option)		100.0
ob-16	Pulse train frequency detection low level (option)	0.0 to 100.0(%)	0.0
OC-01※7)	Safety option input display selection	00 (Warning(with display)) /01 (Warning(without display))	00
OC-10※7)	Safety option input display selection		30.00
OC-12※7)	SS1-A deceleration time setting	0.00 to 3600.00(s)	30.00
OC-14※7)	SLS-A Speed upper limit(Forward)		0.00
OC-15※7)	SLS-A Speed upper limit(Reverse)	0.00 to 590.00(Hz)	0.00
OC-16※7)	SLS-A Speed upper limit(Reverse)	0.00 to 3600.00(s)	30.00
OC-18※7)	SDI-A limited direction	00 (limit) /01 (invert)	00
OC-20※7)	SDI-A limited direction		30.00
OC-22※7)	SS1-B deceleration time setting	0.00 to 3600.00(s)	30.00
OC-24※7)	SLS-B Speed upper limit(Forward)		0.00
OC-25※7)	SLS-B Speed upper limit(Reverse)	0.00 to 590.00(Hz)	0.00
OC-26※7)	SLS-B Speed upper limit(Reverse)	0.00 to 3600.00(s)	30.00
OC-28※7)	SDI-B limited direction	00 (limit) /01 (invert)	00
oE-01	Filter time constant of Terminal [Ai4]	1 to 500(ms)	16
oE-03	Start value of Terminal [Ai4]	0.00 to 100.00(%)	0.00
oE-04	End value of Terminal [Ai4]	0.00 to 100.00(%)	100.00
oE-05	Start rate of Terminal [Ai4]	0.0 to [oE-06] (%)	0.0
oE-06	End rate of Terminal [Ai4]	[oE-05] to 100.0(%)	100.0
oE-07	Start point selection of Terminal [Ai4]	00 (Start value[oE-03]) /01 (0%)	01
oE-11	Filter time constant of Terminal [Ai5]	1 to 500(ms)	16
oE-13	Start value of Terminal [Ai5]	0.00 to 100.00(%)	0.00
oE-14	End value of Terminal [Ai5]	0.00 to 100.00(%)	100.00
oE-15	Start rate of Terminal [Ai5]	0.0 to [oE-16] (%)	0.0
oE-16	End rate of Terminal [Ai5]	[oE-15] to 100.0(%)	100.0
oE-17	Start point selection of Terminal [Ai5]	00 (Start value[oE-03]) /01 (0%)	01
oE-21	Filter time constant of Terminal [Ai6]	1 to 500(ms)	16
oE-23	Start value of Terminal [Ai6]	-100.0 to 100.00(%)	-100.00
oE-24	End value of Terminal [Ai6]	-100.0 to 100.00(%)	100.00
oE-25	Start rate of Terminal [Ai6]	-100.0 to [oE-26] (%)	-100.0
oE-26	End rate of Terminal [Ai6]	[oE-25] to 100.0(%)	100.0

Code No.	Parameter Meaning	Selectable User Setting	Initial value
oE-28	[Ai4] Voltage/Current zero-bias adjustment	-100.00 to 100.00(%)	0.00
oE-29	[Ai4] Voltage/Current gain adjustment	0.00 to 200.00(%)	100.00
oE-30	[Ai5] Voltage/Current zero-bias adjustment	-100.00 to 100.00(%)	0.00
oE-31	[Ai5] Voltage/Current gain adjustment	0.00 to 200.00(%)	100.00
oE-32	[Ai6] Voltage zero-bias adjustment	-100.00 to 100.00(%)	0.00
oE-33	[Ai6] Voltage gain adjustment	0.00 to 200.00(%)	100.00
oE-35	Window compareter for [Ai4] higher level	0 to 100(%)	100
oE-36	Window compareter for [Ai4] lower level		0
oE-37	Window compareter for [Ai4] hysteresis width	0 to 10(%)	0
oE-38	Window compareter for [Ai5] higher level	0 to 100(%)	100
oE-39	Window compareter for [Ai5] lower level		0
oE-40	Window compareter for [Ai6] hysteresis width	0 to 10(%)	0
oE-41	Window compareter for [Ai6] higher level	-100 to 100(%)	100
oE-42	Window compareter for [Ai6] lower level		-100
oE-43	Window compareter for [Ai6] hysteresis width	0 to 10(%)	0
oE-44	Operation level at [Ai4] disconnection	0 to 100(%)	0
oE-45	Operation level selection at [Ai4] disconnection	00 (Disable) /01 (Enable: At WC* is active) /02 (Enable: At WC* is not active)	00
oE-46	Operation level at [Ai5] disconnection	0 to 100(%)	0
oE-47	Operation level selection at [Ai5] disconnection	00 (Disable) /01 (Enable: At WC* is active) /02 (Enable: At WC* is not active)	00
oE-48	Operation level at [Ai6] disconnection	-100 to 100(%)	0
oE-49	Operation level selection at [Ai6] disconnection	00 (Disable) /01 (Enable: At WC* is active) /02 (Enable: At WC* is not active)	00
oE-50	[Ao3] monitor output selection	Monitor Code to be specified	dA-01
oE-51	[Ao4] monitor output selection		dA-01
oE-52	[Ao5] monitor output selection		dA-01
oE-56	Filter time constant of [Ao3] monitor	1 to 500(ms)	100
oE-57	[Ao3] Data type selection	00 (Absolute data) /01 (Signed data)	00
oE-58	[Ao3] monitor bias adjustment	-100.0 to 100.0(%)	0.0
oE-59	[Ao3] monitor gain adjustment	-1000.0 to 1000.0(%)	100.0
oE-60	Output level setting at [Ao3] monitor adjust mode	-100.0 to 100.0(%)	100.0
oE-61	Filter time constant of [Ao4] monitor	1 to 500(ms)	100
oE-62	[Ao4] Data type selection	00 (Absolute data) /01 (Signed data)	00
oE-63	[Ao4] monitor bias adjustment	-100.0 to 100.0(%)	0.0
oE-64	[Ao4] monitor gain adjustment	-1000.0 to 1000.0(%)	100.0
oE-65	Output level setting at [Ao4] monitor adjust mode	-100.0 to 100.0(%)	100.0
oE-66	Filter time constant of [Ao5] monitor	1 to 500(ms)	100
oE-67	[Ao5] Data type selection	00 (Absolute data) /01 (Signed data)	00
oE-68	[Ao5] monitor bias adjustment	-100.0 to 100.0(%)	0.0
oE-69	[Ao5] monitor gain adjustment	-1000.0 to 1000.0(%)	100.0
oE-70	Output level setting at [Ao5] monitor adjust mode	-100.0 to 100.0(%)	100.0
oH-01	IP-Address selection	00 (Gr.1) /01 (Gr.2)	00
oH-02	Communication speed (port-1)	00 (Auto Negotiation) /01 (100M/Full-duplex) /02 (100M/Half-duplex) /03 (10M/Full-duplex)	00
oH-03	Communication speed (port-2)	/04 (10M/Half-duplex)	00
oH-04	Ethernet communication timeout	1 to 65535(x10ms)	3000
oH-05	Modbus TCP Port No.(IPv4)	502,1024 to 65535	502
oH-06	Modbus TCP Port No.(IPv6)	502,1024 to 65535	502
oH-20	Profibus Node address	0 to 125	0
oH-21	Profibus clear mode selection	00 (Clear) /01 (Keep last value)	00
oH-22	Profibus Map selection	00 (PPO) /01 (Conventional) /02 (FlexibleMode)	00
oH-23	Setting enable from Profi master	00 (Enable) /01 (Disable)	00
oH-24	Setpoint telegram/ Actual value telegram Gr. Selection	00 (Gr.A) /01 (Gr.B) /02 (Gr.C)	00
oH-30	IP-Address selection	00 (Gr.1) /01 (Gr.2)	00

Code No.	Parameter Meaning	Selectable User Setting	Initial value
oH-31	Communication speed (port-1)	00 (Auto Negotiation) /01 (100M/Full-duplex) /02 (100M/Half-duplex) /03 (10M/Full-duplex) /04 (10M/Half-duplex)	00
oH-32	Communication speed (port-2)		00
oH-33	Ethernet communication timeout	1 to 65535(×10ms)	3000
oH-34	Setpoint telegram/ Actual value telegram Gr. Selection	00 (Gr.A) /01 (Gr.B) /02 (Gr.C)	00
oJ-01 to oJ-10	Flexible command registration writing register 1 to 10, Gr.A	0000 to FFFF	0000
oJ-11 to oJ-20	Flexible command registration Reading register 1 to 10, Gr.A		
oJ-21 to oJ-30	Flexible command registration writing register 1 to 10, Gr.B		
oJ-31 to oJ-40	Flexible command registration Reading register 1 to 10, Gr.B		
oJ-41 to oJ-50	Flexible command registration writing register 1 to 10, Gr.C		
oJ-51 to oJ-60	Flexible command registration Reading register 1 to 10, Gr.C		
oL-01	IPv4 IP address (1), Gr.1	192	
oL-02	IPv4 IP address (2), Gr.1	168	
oL-03	IPv4 IP address (3), Gr.1	0	
oL-04	IPv4 IP address (4), Gr.1	2	
oL-05	IPv4 Sub-net mask (1), Gr.1	255	
oL-06	IPv4 Sub-net mask (2), Gr.1	255	
oL-07	IPv4 Sub-net mask (3), Gr.1	255	
oL-08	IPv4 Sub-net mask (4), Gr.1	0	
oL-09	IPv4 Default gateway (1), Gr.1	192	
oL-10	IPv4 Default gateway (2), Gr.1	168	
oL-11	IPv4 Default gateway (3), Gr.1	0	
oL-12	IPv4 Default gateway (4), Gr.1	1	
oL-20 to oL-27	IPv6 IP address (1) to (8), Gr.1	0000 to FFFF	0000
oL-28	IPv6 Prefix of Sub-net, Gr.1	0 to 127	64
oL-29 to oL-36	IPv6 Default gateway (1) to (8), Gr.1	0000 to FFFF	0000
oL-40	IPv4 IP address (1), Gr.2	192	0 to 255
oL-41	IPv4 IP address (2), Gr.2	168	
oL-42	IPv4 IP address (3), Gr.2	0	
oL-43	IPv4 IP address (4), Gr.2	2	
oL-44	IPv4 Sub-net mask (1), Gr.2	255	
oL-45	IPv4 Sub-net mask (2), Gr.2	255	
oL-46	IPv4 Sub-net mask (3), Gr.2	255	
oL-47	IPv4 Sub-net mask (4), Gr.2	0	
oL-48	IPv4 Default gateway (1), Gr.2	192	
oL-49	IPv4 Default gateway (2), Gr.2	168	
oL-50	IPv4 Default gateway (3), Gr.2	0	
oL-51	IPv4 Default gateway (4), Gr.2	1	
oL-60 to oL-67	IPv6 IP address (1) to (8), Gr.2	0000 to FFFF	0000
oL-68	IPv6 Prefix of Sub-net, Gr.2	0 to 127	64
oL-69 to oL-76	IPv6 Default gateway (1) to (8), Gr.2	0000 to FFFF	0000

※7) This parameter is not for SH1 series.
oE-01~oL-76 needs to use together with corresponding option card.

■ Parameter mode (P code)

Code No.	Parameter Meaning	Selectable User Setting	Initial value
PA-01	Mode selection for Emergency-force drive	00 (Disable) /01 (Enable)	00
PA-02	Frequency reference setting at Emergency-force drive	0.00 to 590.00(Hz)	0.00
PA-03	Direction command at Emergency-force drive	00 (Forward Rotation) /01 (Reverse Rotation)	00
PA-04	Commercial power supply bypass function selection	00 (Disable) /01 (Enable)	00
PA-05	Delay time of Bypass function	0.0 to 1000.0(s)	5.0
PA-20	Simulation mode enable	00 (Disable) /01 (Enable)	00
PA-21	Error code selection for Alarm test	000 to 255	000
PA-22	Output current monitor optional output enable	00 (Disable) /01 (Setting by Keypad) /02 (Setting by Terminal[Ai1]) /03 (Setting by Terminal[Ai2]) /04 (Setting by Terminal[Ai3]) /05 (Setting by Terminal[Ai4]) /06 (Setting by Terminal[Ai5]) /07 (Setting by Terminal[Ai6])	01
PA-23	Output current monitor optional output value setting	INV related current ×(0.00 to 3.00)	0.0
PA-24	DC-bus voltage monitor optional output enable	00 (Disable) /01 (Setting by Keypad) /02 (Setting by Terminal[Ai1]) /03 (Setting by Terminal[Ai2]) /04 (Setting by Terminal[Ai3]) /05 (Setting by Terminal[Ai4]) /06 (Setting by Terminal[Ai5]) /07 (Setting by Terminal[Ai6])	01
PA-25	DC-bus voltage monitor optional value output	(200V class) 0.0 to 450.0Vdc (400V class) 0.0 to 900.0Vdc	(200V class) 270.0 (400V class) 540.0
PA-26	Output voltage monitor optional output enable	00 (Disable) /01 (Setting by Keypad) /02 (Setting by Terminal[Ai1]) /03 (Setting by Terminal[Ai2]) /04 (Setting by Terminal[Ai3]) /05 (Setting by Terminal[Ai4]) /06 (Setting by Terminal[Ai5]) /07 (Setting by Terminal[Ai6])	01
PA-27	Output voltage monitor optional output value setting	(200V class) 0.0 to 300.0(V) (400V class) 0.0 to 600.0(V)	0.0
PA-28	Output torque monitor optional output enable	00 (Disable) /01 (Setting by Keypad) /02 (Setting by Terminal[Ai1]) /03 (Setting by Terminal[Ai2]) /04 (Setting by Terminal[Ai3]) /05 (Setting by Terminal[Ai4]) /06 (Setting by Terminal[Ai5]) /07 (Setting by Terminal[Ai6])	01
PA-29	Output torque monitor optional output value setting	-500.0 to 500.0(%)	0.0
PA-30	Start with frequency matching optional Setting enable	00 (Disable) /01 (Setting by Keypad) /02 (Setting by Terminal[Ai1]) /03 (Setting by Terminal[Ai2]) /04 (Setting by Terminal[Ai3]) /05 (Setting by Terminal[Ai4]) /06 (Setting by Terminal[Ai5]) /07 (Setting by Terminal[Ai6])	01
PA-31	Start with frequency matching optional value setting	0.00 to 590.00(Hz)	0.00

Parameter mode (U code)

Code No.	Parameter Meaning	Selectable User Setting	Initial value
UA-01	Password for Display	0000 to FFFF	0000
UA-02	Password for SoftLock		0000
UA-10	Display restriction selection	/00 (Full display) /01 (Function-specific display) /02 (User setting display) /03 (Data comparison display) /04 (Monitor only)	00
UA-12	Accumulation input power monitor clear	/00 (Disable) /01 (Clear)	00
UA-13	Display gain for Accumulation input power monitor	1 to 1000	1
UA-14	Accumulation output power monitor clear	/00 (Disable) /01 (Clear)	00
UA-15	Display gain for Accumulation output power monitor	1 to 1000	1
UA-16	Soft Lock selection	00 (Terminal [SFT]) /01(Always effective)	00
UA-17	Soft Lock target selection	/00 (All the data change is impossible) /01 (Data change is impossible except setting Speed)	00
UA-18	Data R/W selection	/00 (Enabling R/W by operator) /01 (Disabling R/W by operator)	00
UA-19	Low battery warning enable	/00 (Disable) /01 (Warning) /02 (Error)	00
UA-20	Action selection at keypad disconnection	/00 (Error) /01 (Error output after Deceleration stop) /02 (Ignore) /03 (Free run stop) /04 (Deceleration stop)	02
UA-21	2nd-motor parameter display selection	00 (Hidden) /01 (Display)	01
UA-22	Option parameter display selection		01
UA-30	User parameter auto setting function enable	/00 (Disable) /01 (Enable)	00
UA-31 to UA-62	User parameter 1 to 32 selection	no/dA-01 to UF-32 (except UA-31 to UA-62)	no
UA-90	QOP indication off waiting time	0 to 60(min)	0
UA-91	Initial Disply selection	(to be selectro from d, F parameters)	dA-01
UA-92	Auto-return to Initial display enable		00
UA-93	Setting enable at Monitor display	00 (Disable) /01 (Enable)	00
UA-94	Multispeed change on the frequency reference monitor display		00
Ub-01	Initialize Mode selection	/00 (Disable) /01 (Error history clear) /02 (Data initialize) /03 (Error history clear & Data initialize) /04 (Error history clear & Data initialize & EzSQ clear) /05 (he parameter related to the terminal is excluded) /06 (The parameter related to the comm. is excluded) /07 (The parameter related to the terminal and comm. is excluded) /08 (EzSQ only) /09 (Trace Data only)	00
Ub-02	Initialize Data selection	00 (MODE0) /01 (MODE1) /02 (MODE2) /03 (MODE3)	00(*FF)/01(*FEF) 02(*FUF)
Ub-03	Load type selection	00 (VLD) /01 (LD) /02 (ND)	02
Ub-05	Initialize Enable	/00 (Disable) /01 (Initialize start)	00
UC-01	Debug mode enable	(Please don't change.)	00
UD-01	Trace function enable	/00 (Disable) /01 (Enable)	00
UD-02	Trace start	00 (Stop) /01 (Start)	00
UD-03	Trace data number setting	0 to 8	1
UD-04	Trace signal number setting		1
UD-10 to UD-17	Trace data 0 to 7 selection	(to be selectro from d, F parameters)	dA-01
UD-20	Trace signal 0 Input/Output selection	00 (Input : [Ud-21]) /01 (Output : [Ud-22])	00
UD-21	Trace signal 0 Input Terminal selection	same as [CA-01]	001
UD-22	Trace signal 0 Output Terminal selection	same as [CC-01]	001
UD-23	Trace signal 1 Input/Output selection	00 (Input : [Ud-24]) /01 (Output : [Ud-25])	00
UD-24	Trace signal 1 Input Terminal selection	same as [CA-01]	001
UD-25	Trace signal 1 Output Terminal selection	same as [CC-01]	001
UD-26	Trace signal 2 Input/Output selection	00 (Input : [Ud-27]) /01 (Output : [Ud-28])	00
UD-27	Trace signal 2 Input Terminal selection	same as [CA-01]	001
UD-28	Trace signal 2 Output Terminal selection	same as [CC-01]	001
UD-29	Trace signal 3 Input/Output selection	00 (Input : [Ud-30]) /01 (Output : [Ud-31])	00
UD-30	Trace signal 3 Input Terminal selection	same as [CA-01]	001
UD-31	Trace signal 3 Output Terminal selection	same as [CC-01]	001
UD-32	Trace signal 4 Input/Output selection	00 (Input : [Ud-33]) /01 (Output : [Ud-34])	00
UD-33	Trace signal 4 Input Terminal selection	same as [CA-01]	001
UD-34	Trace signal 4 Output Terminal selection	same as [CC-01]	001
UD-35	Trace signal 5 Input/Output selection	00 (Input : [Ud-36]) /01 (Output : [Ud-37])	00
UD-36	Trace signal 5 Input Terminal selection	same as [CA-01]	001
UD-37	Trace signal 5 Output Terminal selection	same as [CC-01]	001

Code No.	Parameter Meaning	Selectable User Setting	Initial value
Ud-38	Trace signal 6 Input/Output selection	00 (Input : [Ud-39]) /01 (Output : [Ud-40])	00
Ud-39	Trace signal 6 Input Terminal selection	same as [CA-01]	001
Ud-40	Trace signal 6 Output Terminal selection	same as [CC-01]	001
Ud-41	Trace signal 7 Input/Output selection	00 (Input : [Ud-42]) /01 (Output : [Ud-43])	00
Ud-42	Trace signal 7 Input Terminal selection	same as [CA-01]	001
Ud-43	Trace signal 7 Output Terminal selection	same as [CC-01]	001
Ud-50	Trace trigger 1 selection	00 (Trip) /01 (Trace data 0) /02 (Trace data 1) /03 (Trace data 2) /04 (Trace data 3) /05 (Trace data 4) /06 (Trace data 5) /07 (Trace data 6) /08 (Trace data 7) /09 (Trace signal 0) /10 (Trace signal 1) /11 (Trace signal 2) /12 (Trace signal 3) /13 (Trace signal 4) /14 (Trace signal 5) /15 (Trace signal 6) /16 (Trace signal 7)	00
Ud-51	Trigger 1 action selection at trace data trigger	00 (Action at exceeded trigger level) /02 (Action at fall trigger level)	00
Ud-52	Trigger 1 level setting at trace data trigger	0 to 100(%)	0
Ud-53	Trigger 1 action selection at trace signal trigger	00 (Action by signal on) /01 (Action by signal off)	00
Ud-54	Trace trigger 2 selection	00 (Trip) /01 (Trace data 0) /02 (Trace data 1) /03 (Trace data 2) /04 (Trace data 3) /05 (Trace data 4) /06 (Trace data 5) /07 (Trace data 6) /08 (Trace data 7) /09 (Trace signal 0) /10 (Trace signal 1) /11 (Trace signal 2) /12 (Trace signal 3) /13 (Trace signal 4) /14 (Trace signal 5) /15 (Trace signal 6) /16 (Trace signal 7)	00
Ud-55	Trigger 2 action selection at trace data trigger	00 (Action at exceeded trigger 2 level) /02 (Action at fall trigger 2 level)	00
Ud-56	Trigger 2 level setting at trace data trigger	0 to 100(%)	0
Ud-57	Trigger 2 action selection at trace signal trigger	00 (Action by signal on) /01 (Action by signal off)	00
Ud-58	Trigger condition selection	00 (At trace trigger 1 formation) /01 (At trace trigger 2 formation) /02 (At OR condition formation of Trigger-1 and Trigger-2) /03 (At AND condition formation of Trigger-1 and Trigger-2)	00
Ud-59	Trigger point setting	0 to 100(%)	0
Ud-60	Sampling time selection	01 (0.2ms) /02 (0.5ms) /03 (1ms) /04 (2ms) /05 (5ms) /06 (10ms) /07 (50ms) /08 (100ms) /09 (500ms) /10 (1000ms)	03
UE-01	EzSQ operation cycle	00 (1ms) /01 (2ms : same as SJ700/L700)	00
UE-02	EzSQ function enable	00 (Disable) /01 (Terminal [PRG]) /02 (Always active)	00
UE-10 to UE-73	EzSQ User parameter U(00) to (63)	0 to 65535	0
UF-02 to UF-32	EzSQ User parameter UL(00) to (15)	-2147483647 to 2147483647	0

[Unit table]

Number	Unit
00	non
01	%
02	A
03	Hz
04	V
05	kW
06	W
07	hr
08	s
09	kHz
10	ohm
11	mA
12	ms
13	P
14	kgm2
15	pls
16	mH
17	Vdc
18	°C
19	kWh
20	mF
21	mVs/rad
22	Nm
23	min-1
24	m/s
25	m/min
26	m/h
27	ft/s
28	ft/min
29	ft/h
30	m

Number	Unit
31	cm
32	°F
33	l/s
34	l/min
35	l/h
36	m3/s
37	m3/min
38	m3/h
39	kg/s
40	kg/min
41	kg/h
42	t/min
43	t/h
44	gal/s
45	gal/min
46	gal/h
47	ft3/s
48	ft3/min
49	ft3/h
50	lb/s
51	lb/min
52	lb/h
53	mbar
54	bar
55	Pa
56	kPa
57	PSI
58	mm

■Input terminal function list

Function code	Symbol	Function name
0	no	Not use
1	FW	Forward rotation
2	RV	Reverse rotation
3 to 6	CF1 to 4	Multi speed selection 1 to 4
7 to 13	SF1 to 7	Multi speed Bit-1 to 7
14	ADD	Trigger for frequency addition[Ab105]
15	SCHG	Speed reference change
16	STA	3-wire Start
17	STP	3-wire Stop
18	FR	Forward Over Travel
19	AHD	analog command holding
20	FUP	Remote control Speed-UP function
21	FDN	Remote control Speed-DOWN function
22	UDC	Remote control data clearing
23	F-OP	Force operation
24	SET	2nd-motor control
28	RS	Reset
29	JG	Jogging
30	DB	External Dynamic brake
31	2CH	2-step Acceleration/Deceleration
32	FRS	Free run stop
33	EXT	External fault
34	USP	unattended start protection
35	CS	Commercial Supply change
36	SFT	Soft-Lock
37	BOK	Answer back from Brake
38	OLR	Overload restriction selection
39	KHC	Accumulation input power clearance
40	OKHC	Accumulation output power clearance
41	PID	Disable PID1
42	PIDC	PID1 integration reset
43	PID2	Disable PID2
44	PIDC2	PID2 integration reset
45	PID3	Disable PID3
46	PIDC3	PID3 integration reset
47	PID4	Disable PID4
48	PIDC4	PID4 integration reset
51 to 54	SVC1 to 4	Multi set-point selection 1 to 4
55	PRO	PID gain change
56	PIO1	PID output switching 1
57	PIO2	PID output switching 2
58	SLEP	SLEEP condition activation
59	WAKE	WAKE condition activation
60	TL	Torque limit enable
61	TRQ1	Torque limit selection bit 1
62	TRQ2	Torque limit selection bit 2
63	PPI	P/PI control mode selection
64	CAS	Control gain change
65	SON	Servo-on
66	FOC	Forcing
67	ATR	Permission of torque control
68	TBS	Torque Bias enable
69	ORT	Orientation
71	LAC	Acceleration/Deceleration cancellation
72	PCLR	Position deviation clear
73	STAT	pulse train position command input enable
74	PUP	Position bias (ADD)
75	PDN	Position bias (SUB)
76 to 79	CP1 to 4	Multistage position settings selection 1 to 4
80	ORL	Limit signal of Homing function
81	ORG	Start signal of Homing function
82	FOT	Forward Over Travel
83	ROT	Reserve Over Travel
84	SPD	speed / position switching
85	PSET	Position data presetting
86 to 96	MI1 to 11	General-purpose input 1 to 11
97	PCC	Pulse counter clearing
98	ECON	EzCOM activation
99	PRG	Program RUN
100	HLD	Acceleration/Deceleration disable
101	REN	RUN enable
102	DISP	Display lock
103	PLA	Pulse count A
104	PLB	Pulse count B
105	EMF	Emergency-Force Drive activation
107	COK	Contactor check signal
108	DTR	Data trace start
109	PLZ	Pulse train input Z
110	TCT	Teach-in signal

■Intelligent output terminal function list

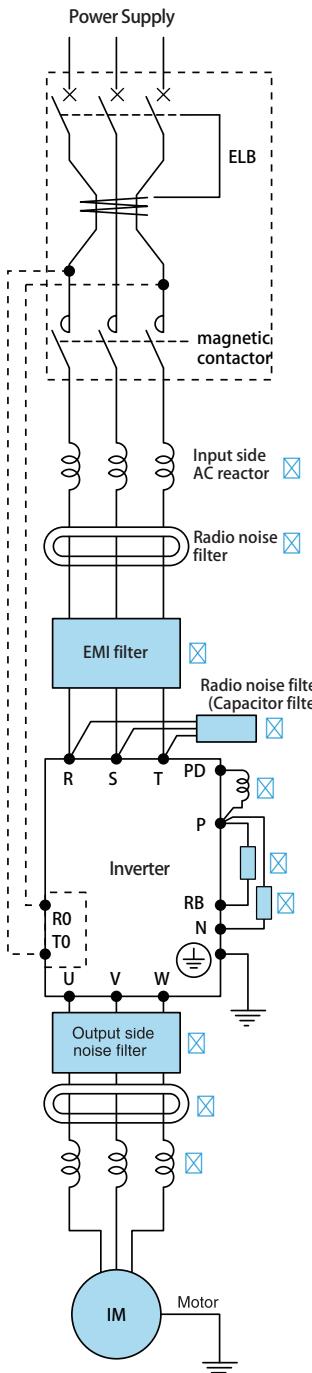
Function code	Symbol	Function name
0	no	Not use
1	RUN	Running
2	FA1	Constant-speed reached
3	FA2	Set speed overreached
4	FA3	Set frequency reached
5	FA4	Set speed overreached 2
6	FA5	Set speed reached
7	IRDY	inverter ready
8	FWR	Forward rotation
9	RVR	Reverse rotation
10	FREF	Speed referenc = Keypad is selected
11	REF	Run command = Keypad is selected
12	SETM	2nd control is selected
16	OPO	Option output
17	AL	Alarm
18	MJA	Major failure
19	OTQ	Over-torque
20	IP	Instantaneous power failure
21	UV	Undervoltage
22	TRQ	Torque limited
23	IPS	IP-Non stop function is active
24	RNT	Accumulated operation time over
25	ONT	Accumulated power-on time over
26	THM	Electronic thermal alarm signal(MTR)
27	THC	Electronic thermal alarm signal(CTL)
29	WAC	Capacitor life warning
30	WAF	Cooling-fan speed drop
31	FR	Starting contact signal
32	OHF	Heat sink overheat warning
33	LOC	Low-current indication signal
34	LOC2	Low-current indication signal 2
35	OL	Overload notice advance signal (1)
36	OL2	Overload notice advance signal (2)
37	BRK	Brake release
38	BER	Brake error
39	CON	Contactor control
40	ZS	0Hz detection signal
41	DSE	Excessive speed deviation
42	PDD	Position deviation over
43	POK	Positioning completed
44	PCMP	Pulse count compare match output
45	OD	Deviation over for PID control
46	FBV	PID1 feedback comparison
47	OD2	OD:Deviation over for PID2 control
48	FBV2	PID2 feedback comparison
49	NDC	Communication line disconnection
50	AI1DC	Analog [Ai1] disconnection detection
51	AI2DC	Analog [Ai2] disconnection detection
52	AI3DC	Analog [Ai3] disconnection detection
53	AI4DC	Analog [Ai4] disconnection detection
54	AI5DC	Analog [Ai5] disconnection detection
55	AI6DC	Analog [Ai6] disconnection detection
56 to 61	WCA1 to 6	Window comparator Ai1 to 6
62 to 68	LOG1 to 7	Logical operation result 1 to 7
69 to 75	MO1 to 7	General-purpose output 1 to 7
76	EMFC	Bypass mode indicator
77	EMBP	Speed deviation over
78	WFT	Trace function waiting for trigger
79	TRA	Trace function data logging
80	LBK	Low-battery of keypad
81	OVS	Over-Voltage power Supply
84 to 87	AC0 to 3	Alarm code bit-0 to 3
89	OD3	Deviation over for PID control
90	FBV3	PID3 feedback comparison
91	OD4	Deviation over for PID4 control
92	FBV4	PID4 feedback comparison
93	SSE	PID soft start error

Error events

Code	Details	Corrective actions	Related parameter
E001	▪ By the load and the operating conditions, overcurrent has occurred	<ul style="list-style-type: none"> ▪ If the acceleration is fast, increase the acceleration time ▪ Use the overcurrent suppression function ▪ Use the overload restriction function ▪ Use the overcurrent retry function ▪ In order to stabilize the control, adjust the constant 	[AC120] [bA120] [bA122] [bb-22] [HA-01]
E005 E039	▪ By the load and the operating conditions, current has increased.	<ul style="list-style-type: none"> ▪ If the acceleration is fast, increase the acceleration time ▪ Use the overload restriction function ▪ If the motor sound is abnormal, in order to stabilize the control, adjust the constant 	[AC120] [bA122] [HA-01]
E006	▪ Braking resistor use is limited.	<ul style="list-style-type: none"> ▪ If the deceleration is fast, increase the deceleration time ▪ Reselection of the braking resistor is necessary 	[AC122] [bA-60]
E007	<ul style="list-style-type: none"> ▪ Internal voltage has increased ▪ Insufficient capacity of the inverter 	<ul style="list-style-type: none"> ▪ If the deceleration is fast, increase the deceleration time ▪ Use the overvoltage suppression functions ▪ Use the overvoltage retry function ▪ Use a braking option 	[AC122] [bA140][bA146] [bb-23] -
E008 E011	▪ Main CPU abnormality	<ul style="list-style-type: none"> ▪ Carry out counter measures for the inverter noise ▪ Consecutive errors may cause a failure 	- -
E009	▪ Main circuit supply has drop	<ul style="list-style-type: none"> ▪ To disable the undervoltage error, change setting ▪ Use the undervoltage retry function 	[bb-27] [bb-21]
E010	▪ Current detector abnormality	<ul style="list-style-type: none"> ▪ Carry out counter measures for the inverter noise ▪ Consecutive errors may cause a failure, replacement of the components is necessary 	- -
E012	▪ [EXT] input terminal is ON	<ul style="list-style-type: none"> ▪ Check the signal status of the input terminal ▪ Check if there are no operations by communication or programme 	[dA-51] -
E013	▪ [USP] input terminal is ON if at the start-up, the RUN command was issued right at the start up	▪ Make sure that an operation command is not introduced at the time of turning ON the inverter	[dA-51]
E014	▪ Ground fault detected at main circuit voltage turning-on	▪ Check for ground fault of the motor, wiring, etc.	-
E015	▪ Continued state of incoming high power	▪ Review the power circumstances, such as the power supply capacity	[dA-40]
E016	▪ Instantaneous power failure, control supply has dropped	▪ If you wish to avoid the tripping, use the power loss retry function.	[bb-20]
E019	▪ Abnormality in temperature detector circuit	<ul style="list-style-type: none"> ▪ Carry out counter measures for the inverter noise ▪ Consecutive errors may cause a failure 	- -
E020	▪ Because of cooling-fan life span, internal temperature has raised	▪ Change of the cooling-fan is necessary	-

Error events

Wiring and Accessories



Motor Output (kW(HP))	Model	Rating	Power line cable AWG(mm ²) R,S,T,U,V, W,P,PD,N	Grounding cable AWG(mm ²)	External braking resistor between P and RB AWG(mm ²)	Power line cable Terminal screw size	Crimp terminal	Tightening torque N·m	Fuse (UL rated, Class J or T)	
									Voltage(V)	Current(A)
0.75(1)	••4-00041-H	ND,LD,VLD	14(2.1)	14(2.1)	M4	2-4/2-4	1.4	600	15	
1.5(2)	••4-00054-H	ND,LD,VLD	14(2.1)	14(2.1)	M4	2-4/2-4	1.4	600	20	
2.2(3)	••4-00083-H	ND,LD,VLD	14(2.1)	14(2.1)	M4	2-4/2-4	1.4	600	30	
3.7(5)	••4-00126-H	ND,LD,VLD	14(2.1) 12(3.3)	14(2.1) 12(3.3)	M4	2-4/2-4 5.5-4/5.5-4	1.4	600	30	
5.5(7.5)	••4-00175-H	ND,LD,VLD	12(3.3)	12(3.3)	M5	5.5-5/5.5-5	3.0	600	75	
7.5(10)	••4-00250-H	ND,LD,VLD	10(5.3)	10(5.3)	M5	5.5-5/5.5-5 8-5/8-5	3.0	600	75	
11(15)	••4-00310-H	ND,LD,VLD	8(8.4)	8(8.4)	M6	8-6/8-6	4.0	600	75	
15(20)	••4-00400-H	ND,LD,VLD	8(8.4)	8(8.4)	M6	8-6/8-6	4.0	600	100	
18.5(25)	••4-00470-H	ND,LD,VLD	8(8.4) 6(13.3)	8(8.4) 6(13.3)	M6	8-6/8-6 14-6/8-6	4.0	600	100	
22(30)	••4-00620-H	ND,LD,VLD	6(13.3)	6(13.3)	M6	14-6/8-6 22-6/8-6	4.0	600	100	
30(40)	••4-00770-H	ND,LD,VLD	4(21.2)	3(26.7)	M8	38-8/14-8 60-8/14-8	6.0	600	200	
37(50)	••4-00930-H	ND,LD,VLD	1(42.4)	6(13.3)	M8	60-8/14-8	15.0	600	200	
45(60)	••4-01160-H	ND,LD,VLD	1(42.4) 1/0(53.5)	6(13.3)	M8	60-8/14-8 70-8/14-8	6.0 to 10.0	600	200	
55(75)	••4-01470-H	ND,LD,VLD	1/0(53.5) 1/0x2(53.5x2)	4(21.2)	M8	70-8/22-8 60-8/22-8	6.0 to 10.0	600	250	
75	••4-01760-H	ND,LD,VLD	1/0x2(53.5x2)	4(21.2)	M10	60-10	6.0 to 10.0	600	300	
90	••4-02130-H	ND,LD,VLD	1/0x2(53.5x2) 2/0x2(67.4x2)	3(26.7)	M10	60-10 70-10	6.0 to 10.0	600	400	
110	••4-02520-H	ND,LD,VLD	2/0x2(67.4x2) 3/0x2(85.0x2)	1(42.4)	M10	70-10 80-10	19.6	600	500	
132	••4-03160-H	ND,LD,VLD	3/0x2(85.0x2) 4/0x2(107.2x2) 250kcx2(127x2)	1(42.4)	M10	80-10 100-10 150-10	19.6	600	500	

Note1: Field wiring connection must be made by a UL and c-UL listed closed-loop terminal connector sized for the wire gauge involved. Connector must be fixed using the crimping tool specified by the connector manufacturer.

Note2: Be sure to use large wire gauges for power wiring if the distance exceeds 20m (66ft).

Note3: The wire gauges in the above table shows the designed values based on HIV cables (with thermal resistance of 75° C).

Note4: Please use the round type crimp terminals (for the UL standard) suitable for the use electric wire when you connect the electric wire with the main circuit terminal block. Please put on pressure to the crimp terminals with a crimp tool that the crimp terminal maker recommends.

Name		Function
①	Input side AC reactor	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.
②	EMI filter	Reduces the conducted noise on the power supply wiring generated by the inverter.
③	Radio noise filter	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).
④	Radio noise filter (Capacitor filter)	This capacitor filter reduces radiated noise from the main power wires in the inverter input side.
⑤	DC link choke	Suppresses harmonics generated by the inverter.
⑥	Braking resistor	This is useful for increasing the inverter's control torque for high duty-cycle (on/off applications, and improving the decelerating capability.
⑦	Braking unit	
⑧	Output side noise filter	Reduces radiated noise from wiring in the inverter output side.
⑨	Radio noise filter	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).
⑩	AC reactor	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.

Option cassette

Three option cassettes can be installed in SH1. Please extend according to machine and system specifications.

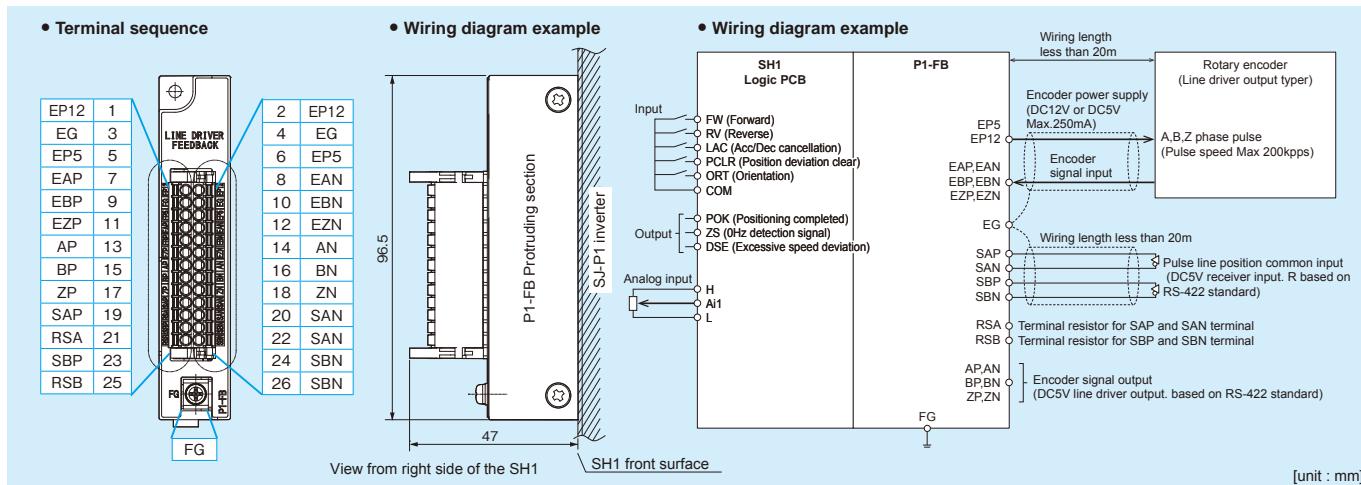
● Encoder feedback option [P1-FB]

P1-FB successfully detects the rotation speed of the motor equipped with an encoder and feedbacks to the inverter. Thus, it contributes to suppressing the speed variation and helps to operate with high accuracy.

In addition, such function can be realized such as position command, synchronous operation and orientation function.

[Application example]

High precision operation of main motor for Winding machine, Wire drawing machine, Transport machine, Extruder and more.



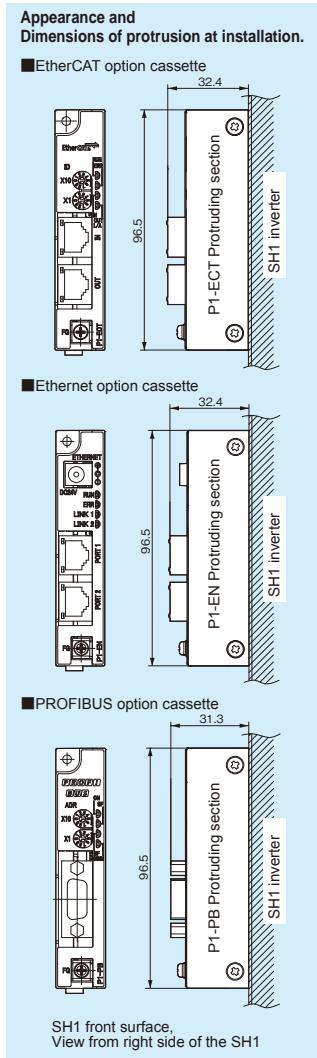
● Field network communication option [P1-ECT, P1-EN, P1-PB]

With the field network option, the inverter can be operated, status monitor, parameter management etc from the host controller. Since these are cassette type mounted on the front of the inverter, installation, wiring, station number setting and status check of various indicators are very easy.

Item		Specification
EtherCAT OPTION 	Communication protocol	EtherCAT CiA402 Drive profile
	Physical layer	100BASE-TX (IEEE802.3)
	Connector	RJ45 (IN / OUT)
	Communication distance	Distance between nodes(between devices) : 100[m]max
	Station address*	1 to 99 : Set by the address setting switch, 1 to 65535 : Set by configuration (The station address setting depends on the addressing mode used by the EtherCAT master.)
	Distributed clock	Free run mode (asynchronous)
	Process data	PDO free mapping
	Mailbox (CoE)	Emergency messages, SDO requests, SDO responses, Abort SDO
	CiA402 drive profile	Velocity mode
	Applicable cable	100BX-TX support (category 5e or higher) STP(Shield twist pair) cable (Straight or Crossed).
Ethernet (Modbus-TCP) OPTION 	Applicable standards	IEEE802.3
	Communication protocol	TCP/IP (Available for IPv4 and IPv6)
	Communication protocol (application layer)	Modbus TCP
	Physical layer	10BASE-T,100BASE-TX (IEEE802.3)
	Connector	RJ45 (PORT1/PORT2)
	Communication distance	Distance between nodes(between devices) : 100[m]max
	Communication method (transmission speed)	Fixed transmission speed : 10Mbps Full/Half-duplex or 100Mbps Full/Half-duplex Auto detection transmission speed : Auto negotiation
	Auto MDI-X	According to selection of communication method (transmission speed). Selecting the auto negotiation: the function Auto MDI-X is enable. Selecting others: the function Auto MDI-X is disable.
	Port number	502 (it can be configured by the inverter parameter setting)
	Maximum number of sessions	4 (Do not connect our PC setup software(ProDriveNext) multiple at the same time)
PROFIBUS OPTION 	External power supply	DC24V±10%, Current consumption: 1A to 1.5A (Current consumption fluctuates with inverter and/or other options operating and so on.)
	Dielectric strength	AC500V (Between insulation circuit)
	Applicable cable	100BX-TX support (category 5e or higher) STP(Shield twist pair) cable (Straight or Crossed).
	Communication protocol	PROFIBUS DPV0 PROFIBUS DPV1
	Connector, Cable	D-sub 9 pin, PROFIBUS DP cable (EN 50170 part 8-2 as "Cable Type A")
Common environment specification	Node address	0 to 99 : set by rotary switches 1 to 126 : set by parameters (In case of rotary switch setting is in 0)
	Profile	PROFIdrive
	Ambient operating temperature, Ambient operating humidity, Storage temperature	-10 to 50°C, 20 to 90%RH, -20 to 65°C (No icing or condensation conditions.)
	Vibration resistance	5.9m/s ² (0.6G), 10 to 55Hz
	Conformance to EMC and electrical safety standards	IEC/EN61800-3 Second environment, Category C3 IEC/EN61800-5-1 SELV
	Enclosure rating	IP00
	Weight	170g

*NOTE: When installing the optional cassette, it protrudes from the SH1 surface as shown in the figure. Please design the depth dimension of enclosure considering this protrusion, connector, wiring etc. EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

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