T-solution Leader in Electrics & Automation

Uniquely designed for the Fan & Pump

STARVERT iP5

An optimum solution for the VT application control and energy savings

5.5~30kW(7.5~40HP) 3Phase 200~230Volts
5.5~30kW(7.5~40HP) 3Phase 380~460Volts

Automation Equipment

LG Industrial Systems
www.lgis.com

Building up a clean and productive industrial society became possible by offering our superb Total-Solution. LGIS is the leader of the industrial Electric and Automation business.

The Starvert iP5 series is optimally designed for the use of the VT(Fan & Pump) applications and the energy savings. Its powerful performance, easy-to-use, and highly considered safety are the core product development spirit of LG Starvert iP5 series.

Contents

STARVERT iP5

The powerful sensorless vector control and the optimized functions for the VT applications fully satisfy our customers' needs.

The iP5 series, specifically designed for VT applications, provide various distinctive functions such as Auto tuning, PID control, Flying-Start, Sleep and -10~+10V inputs.

The optimum control performance for Fan & Pump

STARVERT iP5 Series

LG STARVERT iP5 for Fan & Pump exclusive use inverter guarantees its powerful performances and optimum control features

PID control
PID control can be defined as a tool of maintaining the volumes of controlled objects, such as the oil volume, temperature, pressure degree etc, in a certain and precise level by operating the Proportion and Integral processes of the inverter with detected signal values.

Dual direction loader
Reducing the default parameters by 37% enables dual direction shifts between the groups and easy searching and operation of various functions.

High performance μ-processor
Adoption of the high performance digital signal process chip enhances the efficiencies of process speeds,flexibility, stability and the internal noise reduction functions.

Multi-function input terminal setup
Selective use of needed functions and a maximum 16 steps of multi-step speed controlling became possible.

To make an optimum performance VT application exclusive inverter, our iP5 series enhances its safety and defendability by stably controlling the loads fluctuations during long time operation.

Our Fan & Pump application exclusive inverter STARVERT iP5 series improves the process speeds, flexibility, defendability and internal noise by adopting the high performance digital signal processor, STARVERT iP5 series basically provides the V/F control operation and shows a remarkably improved sensorless vector control mode which used to generate motor speeds change problems that occur from the load changes and also the newly adopted Sleep function, among LG Starvert series, boosts the energy saving function.

The external NTC input and the flying start provide much more improved protection functions and the built-in PID and Auto tuning functions bring the optimal control features for airflow and oil volumes.

Dynamic braking

Speed reduction generates the regenerative voltages which are burnt down as thermal energy at the 2nd resistor of motor and this procedure generates the braking power.

Note1) Do not use in case of unasval thermal generation.

Built-in RS485 communication

The built-in RS485 communication enables the long-distance communication controlling between the PLC and PC and the inverter.

Sensorless vector control

Our sensorless vector control method improves the torque inefficiency at low speeds and the motor speed variations according to the application changes.

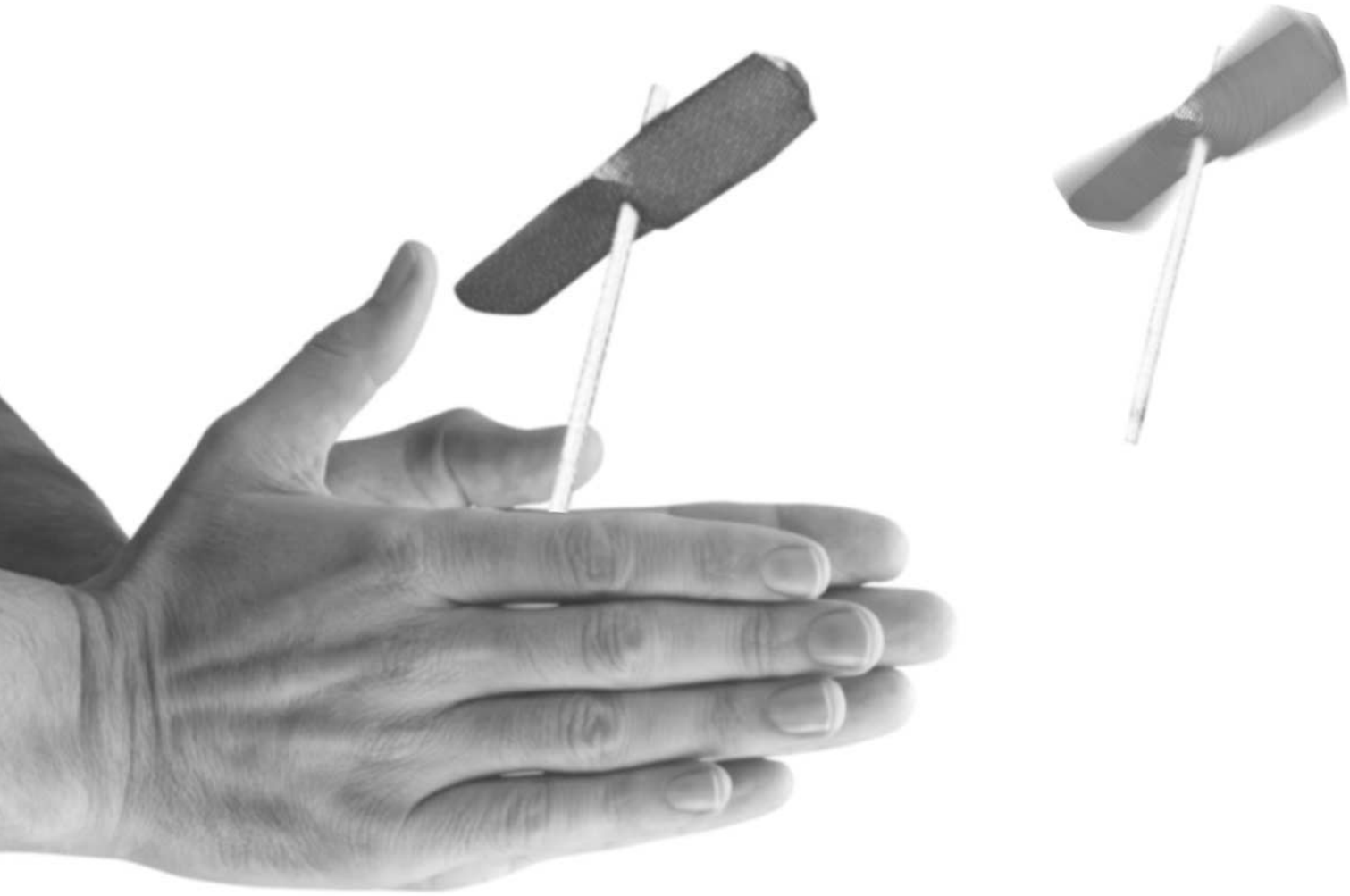
Flying-start

As one of the Fan exclusive functions, it protects inverter from trips when the Fan rotates reversely due to external influences.

Note1) The Flying-Start function shows its normal operation only in the case that the directions of motor rotation and command are identical.
Note2) This function is not available in the sensorless mode

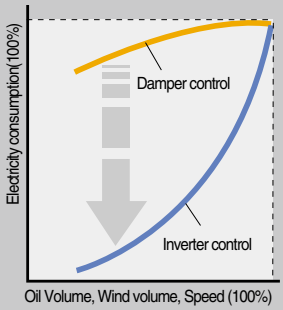
The best of the best choice for Fan & Pump exclusive use.

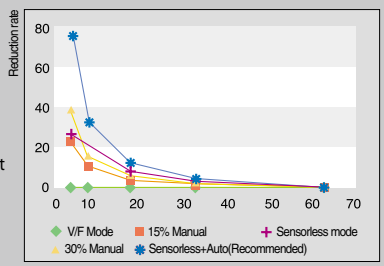
STARVERT iP5 Series



Auto energy saving

Depending on the application conditions, at normal speed operation, iP5 searches its parameter setting values and this enables to perform the energy saving function.
The auto energy saving function guarantees an optimum energy use efficiency in the applications like Fan, Pump and HVAC where require a constant operation speed and long-time operation.

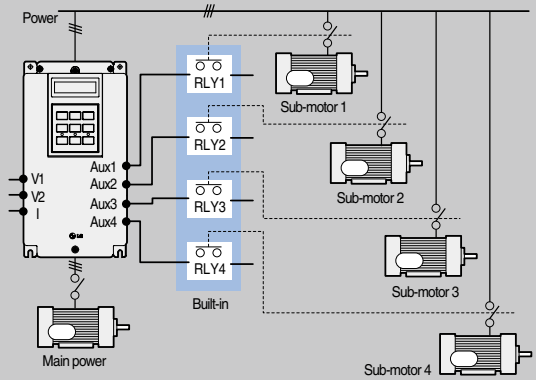




Note) In case of heavy loads or requiring a frequent speed Acc/Decelerations the efficiency of auto energy saving may decrease.

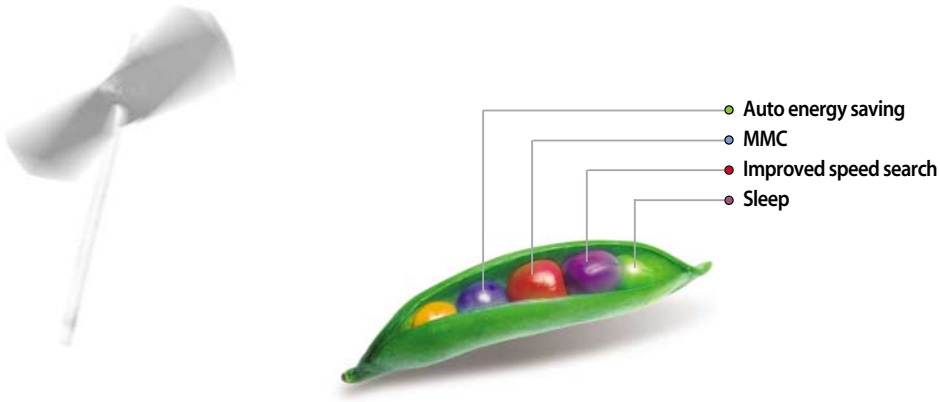
MMC (Multi motor control)

In case the oil volume or its pressure degree is lower or higher than its usual level, controlling those degrees through the main motor may not be strong enough considering its capacity, then operating a sub-motor with the main motor enables to maintain those degrees in a definite level. (Controlling maximum 4 sub-motors is possible with one main motor)



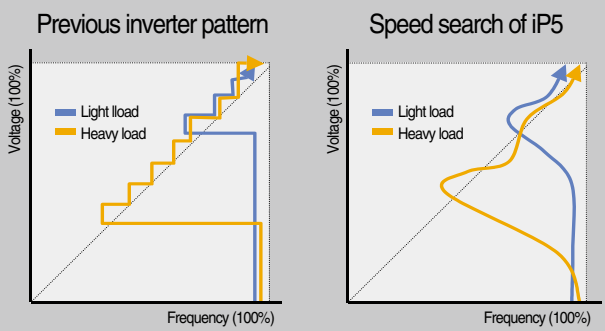
Enhanced energy efficiency & Fan and Pump exclusive functions

Newly adopted auto energy saving function of iP5 solved the energy shortage problems of previous inverters.
More good news of iP5 is the realizations of speed search improvement, MMC and sleep functions.
These functions help to make iP5 as a optimum solution of VT applications such as Fans and Pumps.



Improved speed search

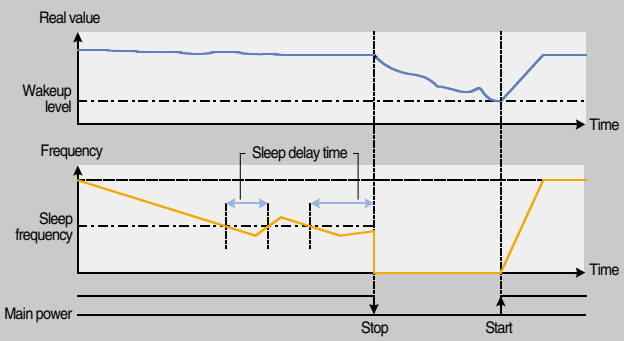
The speed search function basically works by controlling the output voltage and frequency in order not to give any unusual impact to the inverter and this allows proper rotation of the motor according as users' needs under unexpected situations such as instantaneous power failure.
The speed searching of inverter was performed controlling the output voltages and frequencies in order, yet iP5 controls those factors simultaneously which results in a prompt response and bi-directional speed search becomes possible.



Sleep

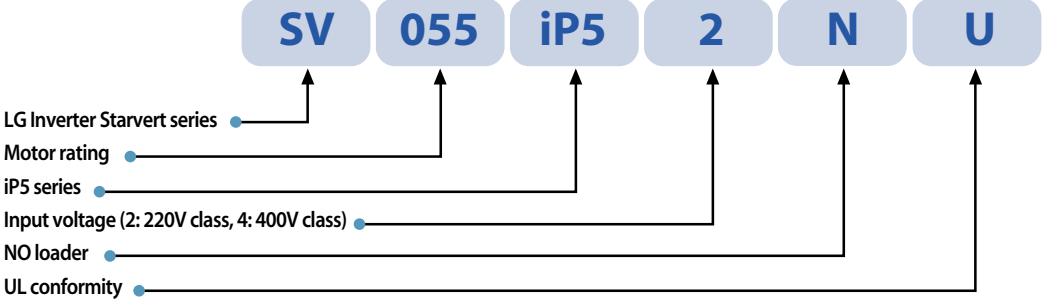
The " Sleep" function can be defined as one of the energy saving functions. When the flow demand is low if the inverter operates during sleep delay time, at below fixed sleep frequency, it stops the motor so that the consuming energy is saved. However, the control and monitoring functions are being operated during sleep and the "Wake-Up" function is initiated in case the real value of control volume is dropped below the wake-up level.

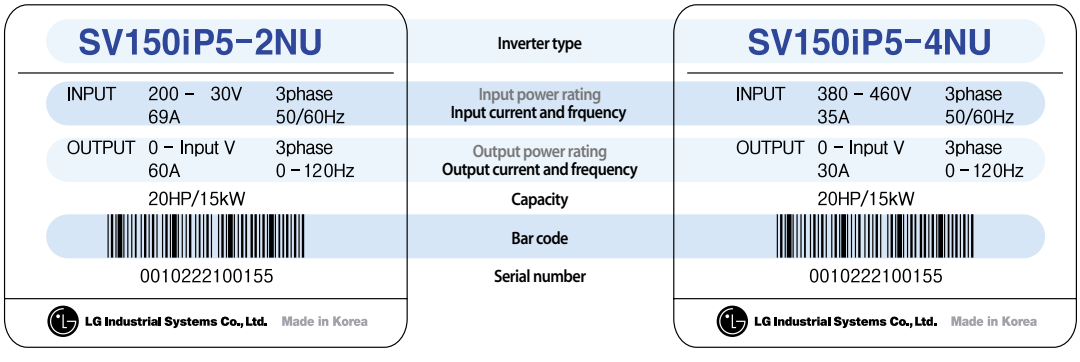
Note) The "Sleep" function is not operated if the sleep delay time is set to "0"



Basic information

Motor rating	200V class	400V class
5.5kW (7.5HP)	SV055iP5-2NU	SV055iP5-4NU
7.5kW (10HP)	SV075iP5-2NU	SV075iP5-4NU
11kW (15HP)	SV110iP5-2NU	SV110iP5-4NU
15kW (20HP)	SV150iP5-2NU	SV150iP5-4NU
18.5kW (25HP)	SV185iP5-2NU	SV185iP5-4NU
22kW (30HP)	SV220iP5-2NU	SV220iP5-4NU
30kW (40HP)	SV300iP5-2NU	SV300iP5-4NU





Basic specification

■ 200V class

Type SV□□□iP5-2			055	075	110	150	185	220	300
Maximum Note1) motor rating		(HP)	7.5	10	15	20	25	30	40
		(kW)	5.5	7.5	11	15	18.5	22	30
Output rating	Capacity Note2)	(kVA)	9.1	12.2	17.5	22.9	28.2	33.5	45
	Rated current	(A)	24	32	46	60	74	88	115
	Output frequency		0~120 Hz						
	Output voltage		200~230 V						
Input rating	Voltage		3 Ø 200~230 V(-15% ~ +10%) Note3)						
	Frequency		50~60 Hz (± 5%)						
Weight		(kg)	4.9	7.5	7.7	14.3	19.4	20	20

■ 400V class

Type SV□□□iP5-4			055	075	110	150	185	220	300
Maximum Note1) motor rating		(HP)	7.5	10	15	20	25	30	40
		(kW)	5.5	7.5	11	15	18.5	22	30
Output rating	Capacity Note2)	(kVA)	9.1	12.2	18.3	22.9	29.7	34.3	45
	Rated current	(A)	12	16	24	30	39	45	61
	Output frequency		0~120 Hz						
	Output voltage		380~480 V						
Input rating	Voltage		3 Ø 380~480 V(-15% ~ +10%) Note3)						
	Frequency		50~60 Hz (± 5%)						
Weight		(kg)	4.9	7.5	7.7	14.4	20	20	20

Note1) Indicates the maximum applicable capacity when using 4 pole LG motor
Note2) Rate capacity ($\sqrt{3} \times V \times 1$) is based on 220V for 200V class and 440V for 400V class.
Note3) Maximum output voltage will not be greater than the input voltage. Output voltage less than the input voltage may be programmed.

Specification

■ Common specification

Regenerative braking torque	Maximum braking Time/Rate	20% Continuous Note1)
		Option(braking unit, braking resistor)
Cooling		Forced cooling
Protection		NEMA1, UL Type1 for 5.5~11kW as standard, Option for 15~30kW

■ Control

Control type	V/F, Slip compensation, Sensorless vector control
Frequency setting resolution	Digital: 0.01Hz(below 100Hz),).1Hz (over 100Hz) Analog: 0.01Hz/60Hz
Frequency accuracy	Digital: 0.01% of maximum output frequency Analog: 0.1% of maximum output frequency
V/F rate	Linear. Squared pattern, User V/F
Overload capacity	110%/1minute, 120%/1 minute Note2)
Torque boost	Manual torque boost(setting as 0~15%), Auto torque boost

■ Operation

Type		Key/ Terminal/ Communication operation
Frequency Setting		Analog: 0~10V/-10V~10V/ 4~20mA/ Pulse Digital: Loader
Input signal	Start signal	Forward, Reverse
	Multi-step	Maximum 16 steps(Multi-function terminal)
	Multi-step Acc/Decel	0.1~6,000Seconds, Up to 4 types can be set and selected for each setting (use multi-function terminal)
	Acc/Decl pattern	Selectable among Linear, U and S shapes.
	Emergency stop	Momentary output blocking
	JOG	Jog operation
Output signal	Fault reset	Trip status is removed when protection function is active
	Operating status	Frequency detection level, Overload alarm, Stalling, Over voltage, Under voltage, Inverter overheating, Running,Stopping, Constant speed running, Inverter By-pass, Speed searching
	Fault output	Contact output(30A, 30C, 30B)-AC250V 1A, DC30V 1A
	Indicator	Choose 2 from output frequency, Output current, Output voltage, DC voltage, Output torque (Output voltage: 0~10V)
Operation function		DC Braking, Frequency limit, Frequency jump, Second function, compensation, Reverse rotation prevention, Auto restart, pass, Auto-Tuning, PID control

■ Protection

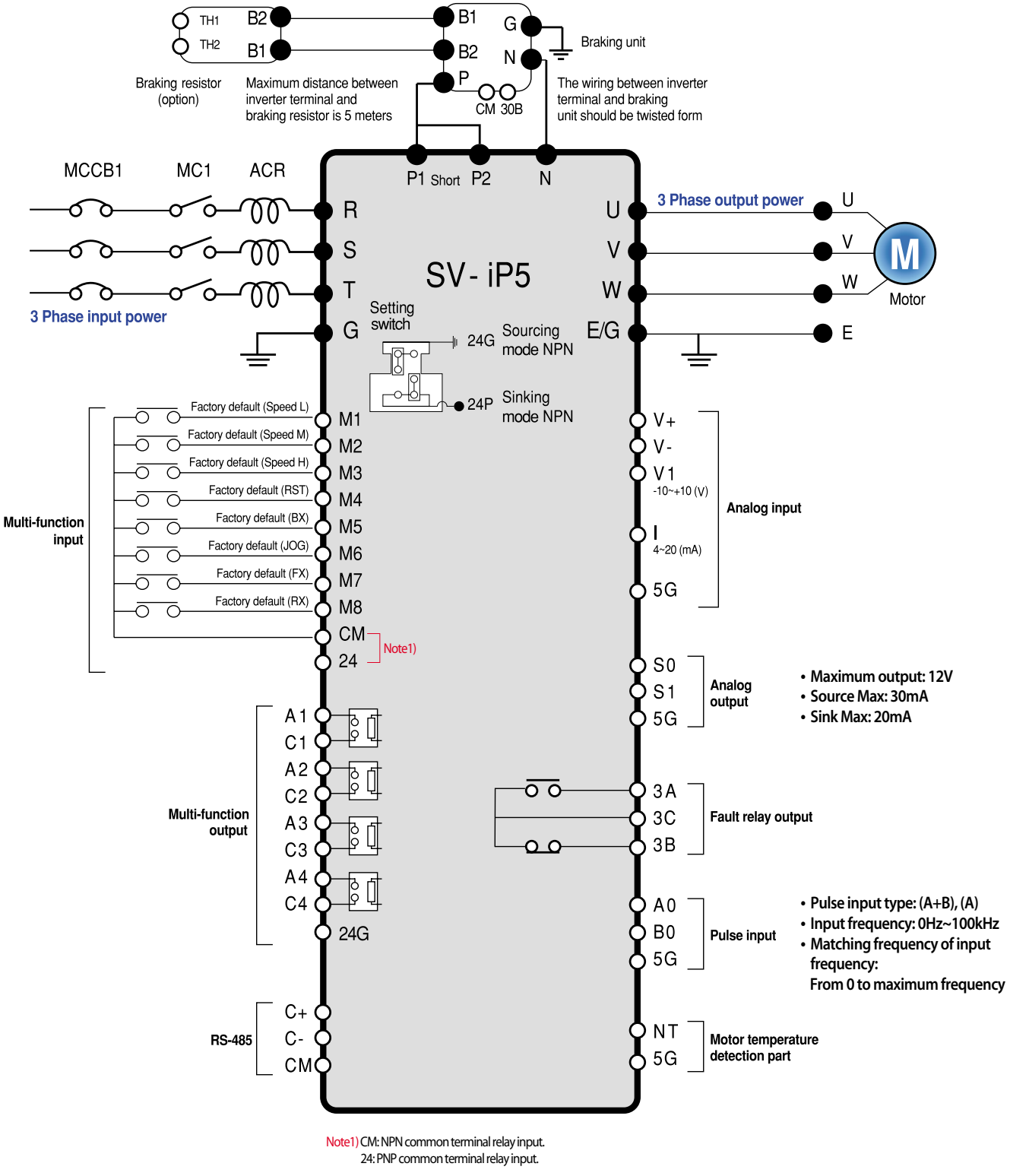
Inverter trip		Over voltage, Under voltage, Over current, Ground fault, Inverter overheating, Motor overheating, Output phase loss, Overload protection, External fault1,2 Communication error, Loss of speed command, Hardware fault, Option fault etc.
Inverter alarm		Stall prevention, Overload alarm, NTC fault
Momentary power failure	Below 15 msec	Continuos operation, Above 15msec: Auto restart active failure
Loader	Operation information	Output frequency, Output current, Output voltage, Frequency value setting, Operating speed, DC voltage
	Trip information	Indicates a fault when the protection function activates, retains upto 5 faults

■ Environment

Ambient temperature	-10˚C ~40˚C
Storage temperature	-20˚C ~65˚C
Ambient humidity	Less than 90%RH Max (non-condensing)
Altitude-vibration	Below 1,000m or 3,300ft. Below 5.9m/s^2(=0.6g)
Application site	No corrosive gas, Combustible gas, Oil mist or dust

Note1) About 20% of regenerative braking torque means the deceleration stopping average braking torque of motor loss
Note2) The overload capacity 120%/1 minute bases on 25˚C of ambient temperature

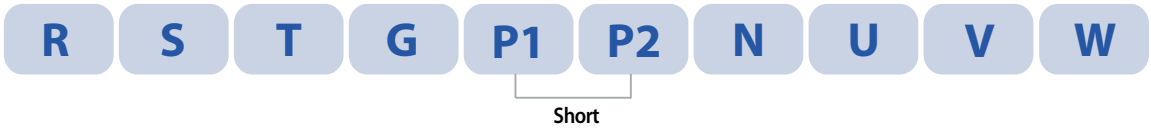
Wiring



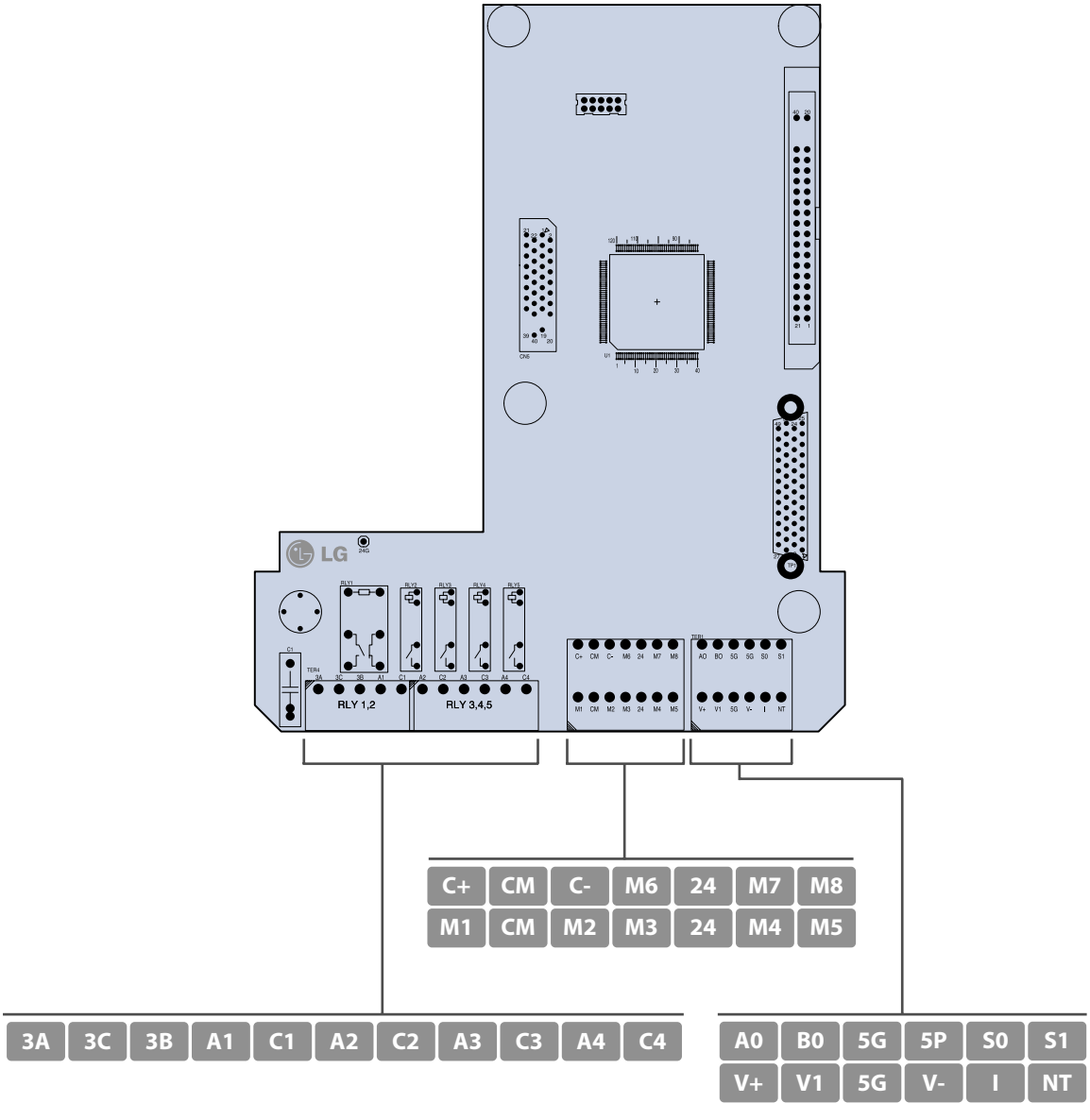
Note1) CM: NPN common terminal relay input.
24: PNP common terminal relay input.

Main circuit terminal

■ 5.5 ~30kW (200V/400V)



Terminal symbol	Terminal name	Description
R, S, T	AC input	AC Line voltage input
G	Earth ground	Inverter chasis earth ground
P1, P2	DC Reactor connection	External DC reactor connection terminals (Jumper must be removed)
P2, N	Braking unit connection	DB unit (P2-N) connection terminals
U, V, W	Inverter output	3 Phase power output terminals to motor



Control circuit terminal

■ Control circuit terminal

Type		Symbol	Name	Description
Input signal	Starting contact function selection	M1, M2, M3	Multi-function input 1, 2, 3	Used for multi-function input terminal. (Factory default is set to "Multi-step frequency 1, 2, 3")
		FX(M7)	Forward run	Forward run/stop terminals by ON/OFF operations.
		RX(M8)	Reverse run	Reverse run/stop terminals by ON/OFF operations.
		JOG(M6)	Jog frequency reference	Runs at jog frequency when the jog signal is ON. The direction is set by the FX(or RX) signal.
		Note) BX(M5)	Emergency stop	When the BX signal is ON the output of the inverter is turned off. When motor uses an electrical brake to stop, BX is used to turn off the output signal. When BX signal is off(Not turned off by latching) and FX signal (or RX signal) is ON, motor continues to run.
		RST(M4)	Fault reset	Used for fault reset
		CM	Sequence common	Common terminal for NPN contact inputs
		24	Sequence common	Common terminal for PNP contact inputs
	Analog frequency setting	V+, V-	Frequency setting power (+12V,-12V)	Used as power for analog frequency setting. Maximum output: +12V, 100mA, -12V, 100mA
		V1	Frequency reference (Voltage)	Used for DC 0-10V or -10~10V input frequency reference input resistance is 20㏀
		I	Frequency reference (Current)	Used for 4-20mA input frequency reference input resistance is 250㏀
		A0, B0	Frequency setting(Pulse)	Used for pulse input frequency reference
		5G	Frequency setting common terminal	Common terminal for analog frequency reference signal and FM(for monitoring)
	Built-in type RS 485 terminal	C+, C-	RS 485 signal. High and Low	RS485 Signal
		CM	RS 485 common	
Output signal	Voltage	S0, S1	For external monitoring	Outputs one of the followings: Output frequency, Output current, Output voltage, DC link voltage. Default is set to output frequency. Maximum output voltage and output current are 0-12V and 1mA, 500Hz.
	Contact	3A, 3C, 3B	Fault contact output	Activates when protective function is operating. AC 250V, 1A or less; DC 30V, 1A or less. Fault: 30A-30C closed (30B-30C open) Normal: 30B-30C closed (30A-30C open)
		A1~4, C1~4	Multi-function output relay	Use after defining multi-function output terminal. AC 250V, 1A or less; DC30V, 1A or less.

Note) The multi-function input terminals; M1~M4 and M6~M8 ,excluding M5(BX), are modifiable those function into others.

Loader

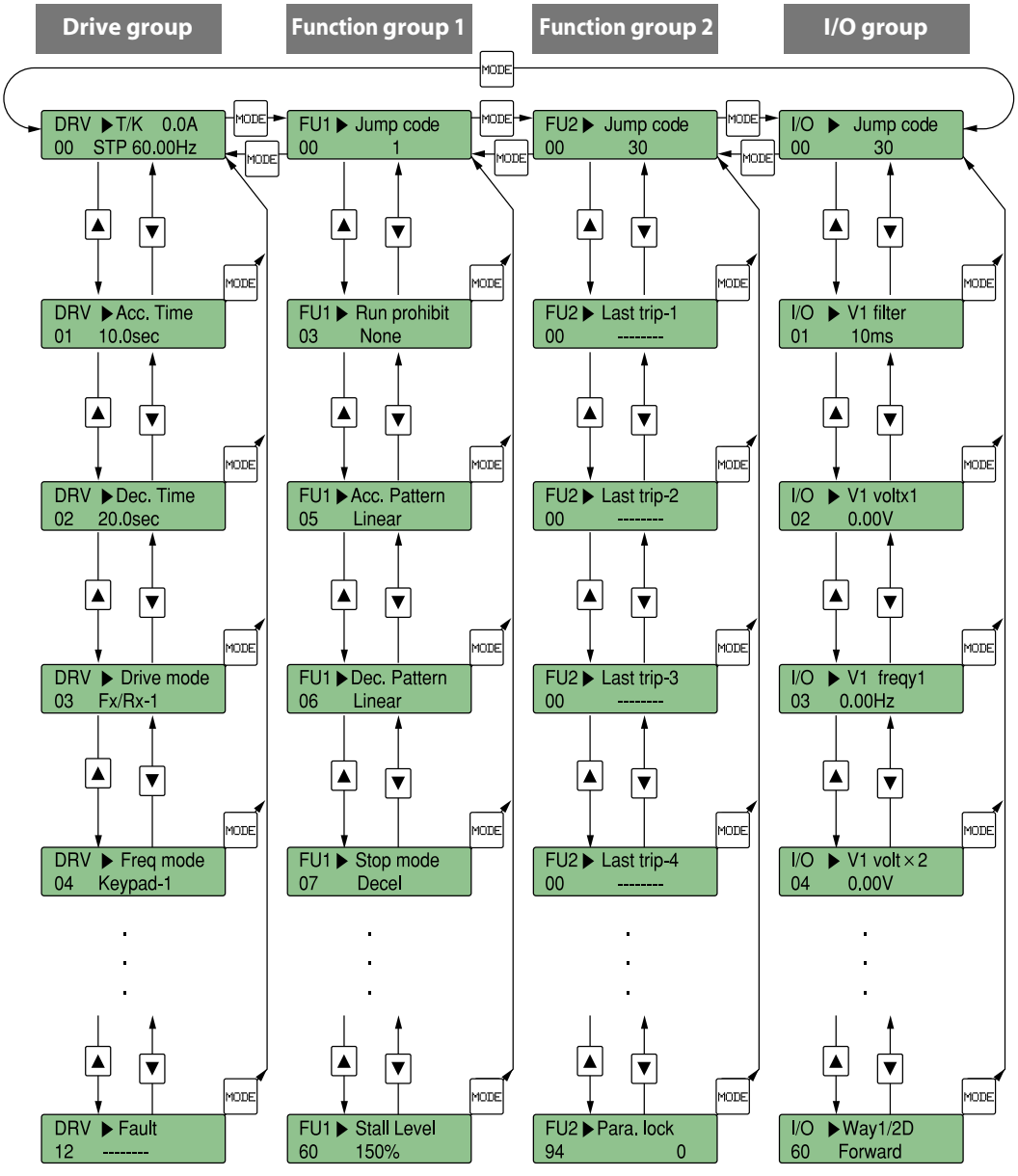
■ LCD loader

Segment	Display	Name	Description
KEY	MODE	Mode key	For shift between groups and upper codes within a group
	PROG	Program key	Parameter setting alteration
	ENT	Ente key	Saving the altered parameter values
	▲ UP	Up key	Code shifts or Parameter setting value increase
	▼ Down	Down key	Code shifts or Parameter setting value decrease
	SHIFT/ESC	Shift/ESC key	Use the shift key in case of setting mode and the ESC key other cases
	REV	Reverse key	Reverse run
	STOP/RESET	Stop/Reset key	Stop key during run / Fault reset key
	FWD	Forward key	Forward run
LED	REV	Reverse run display	Turns on during reverse run Blinks during ACC/DEC and turns on with normal run
	STOP/RESET	STOP/RESET display	Turns on with stop and blinks at fault
	FWD	Forward run display	Turns on during forward run Blinks during ACC/DEC and turns on with normal run

■ LED 7-segment loader

Segment	Display	Name	Description
ENCODER	JOG	JOG	Used for the code shifts and the parameter value up/down For group shift between DRV and others
KEY	PROG/ENT	Set key	Parameter setting value changes and saves
	SHIFT/ESC	Shift/ESC key	Shift right with the shift key in case of setting mode and use ESC key in other cases(Shift to DRV-00
	STOP/RESET	Stop/Reset key	Stop key during run. Fault reset key
	RUN	Run key	Run Key
LED	(PROG/ENT)	Setting mode display	Turns on in setting mode
	(STOP/RESET)	Stop/Fault display	Turns on in stop and blinks in ACC/DEC
	(RUN)	Run display	
	(DRV)	Drive group	Turns on at drive group
	(FU1)	Function group1	Turns on at function group 1
	(FU2)	Function group2	Turns on at function group 2
	(I/O)	Input/Output group	Turns on at Input/Output group
	(EXT)	Sub-group	Turns on at sub-group
	(I/O) + (EXT)	Option group	Turns on at option group
	(I/O)+(EXT) +(FU2)	Application group	Turns on at application group

Shifts between each group/each code by LCD loader

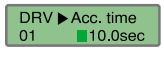


■ Parameter use instruction

1

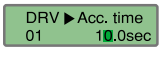
Shift to the code you move to

2



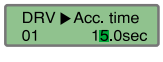
Press (PROG) key then the setting mode appears

3



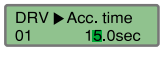
Move the cursor by using the (SHIFT/ESC)

4



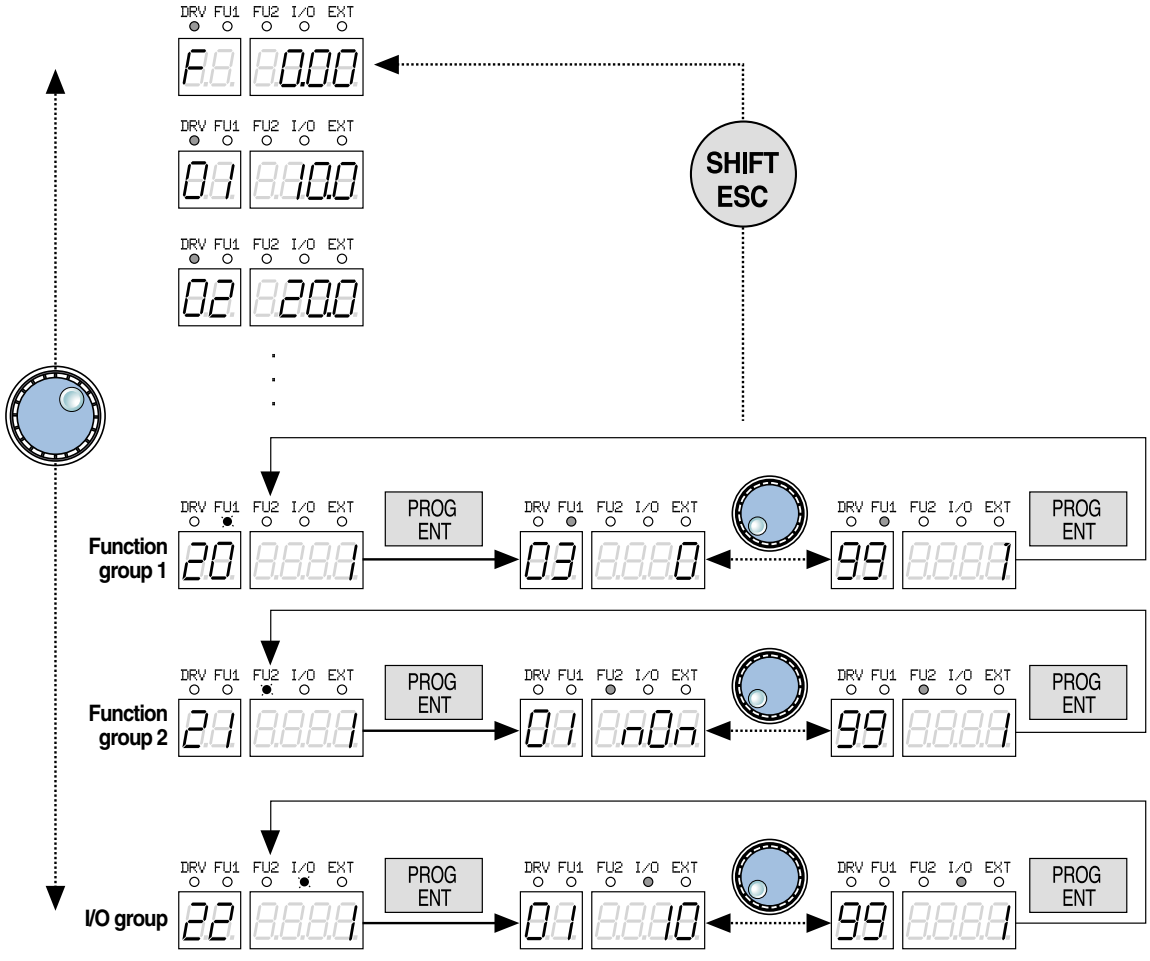
Data value change by using the UP and down keys

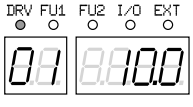
5



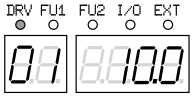
Save the changed data value by the (ENT) key

Shifts between each group/each code by LCD loader

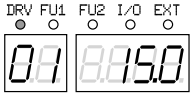




1) Code shift by JOG



2) Pressing the (PROG/ENT) key let the higher digit number blink and then shift digit by pressing (SHIFT/ESC) key then change the setting value by JOG



3) After changing the setting value, save by pressing the (PROG/ENT) key

Note) ● : Blink ◉ : Turn on ○ : Turn off

Function codes table

■ Drive group [DRV]

	Code	Description	Keypad display	Setting range		Factory default	Adj.during run
				LCD	7-segment		
Note1)	※ DRV-00	Command frequency (output frequency during motor run, Reference frequency during motor stop) Output current	Cmd. freq	0 to FU1-30 (Max. freq)		0.00 [Hz]	Yes
	DRV-01	Acceleration time	Acc. time	0 to 6000		20.0 [sec]	Yes
	DRV-02	Deceleration time	Dec. time	0 to 6000		30.0 [sec]	Yes
	DRV-03	Drive mode (Run/Stop method)	Drive mode	Keypad Fx/Rx-1 Fx/Rx-2 Int. 485	0 1 2 3	Fx/Rx-1	No
	DRV-04	Frequency mode (Frequency setting method)	Freq mode	Keypad-1 Keypad-2 V1 V1S I V1+I Pulse Int. 485	0 1 2 3 4 5 6 7	Keypad-1	No
	DRV-05	Step frequency 1	Step freq-1	0 to FU1-30(0 to Max. freq)		10.00 [Hz]	Yes
	DRV-06	Step frequency 2	Step freq-2			20.00 [Hz]	
	DRV-07	Step frequency 3	Step freq-3			30.00 [Hz]	
	DRV-08	Output current	Current	Load current in RMS		[A]	-
	DRV-09	Motor speed	Speed	Motor speed in rpm		[rpm]	-
	DRV-10	DC link voltage	DC link Vtg	Inverter DC link voltage		[V]	-
	DRV-11	User display selection	User disp			Output voltage	-
	DRV-12	Fault display	Fault	-	-	None nOn	-
	DRV-13	Motor direction set	Not displayed in LCD keypad	Not available	0 [Forward] 1 [reverse]	0	Yes
	DRV-14	Target/Output frequency display	Tar/Out Freq.	-	-	0.00 [Hz]	Yes
	DRV-15	Reference/Feedback frequency display	Ref/Fbk Freq.	-	-	0.00 [Hz]	Yes
	DRV-16	Speed unit selection	Hz/Rpm Disp	Hz disp Rpm disp	0 1	-	Yes
Note2)	※ DRV-17	Drive mode 2	Drive mode 2	Fx/Rx-1	1	1	No
Note3)	※ DRV-18	Frequency mode 2	Freq mode 2	Keypad-1	0	1	No
	DRV-20	FU1 group selection	Not displayed in LCD keypad	Not available	Press [PROG/ENT] key	1	Yes
	DRV-21	FU2 group selection					
	DRV-22	I/O group selection					
	DRV-23	EXT group selection					
	DRV-24	COM group selection				1	Yes
	DRV-25	APP group selection				1	Yes

Note1) Speed unit is changed from (Hz) to (%) when DRV-16 is set to (Rpm)
Note2) DRV-17 appears by setting the parameter as (Int485) at DRV-04
Note3) DRV-18 appears by setting the parameter as (main drv) at IO-20
※ These hiding codes are only displayed in case of setting those related codes.

■ FU1 Group [FU1]

Code	Description	Keypad display		Setting range		Factory default	Adj.during run
		LCD	7-segment	LCD	7-segment		
FU1-00	Jump to desired code #	Jump code	Not displayed	1 to 74	Not available	1	Yes
FU1-01	Run prevention	Run Prev.	01	None Forward Prev Reverse Prev	0 1 2	None	No
FU1-02	Acceleration pattern	Acc. pattern	02	Linear S-curve U-curve	0 1 2	Linear	No
FU1-03	Deceleration pattern	Dec. pattern	03	Linear S-curve U-curve	0 1 2	Linear	No
Note4) ※ FU1-04	Start side for S-curve Accel/Decel pattern	Start Curve	04	0 to 100 [%]		50%	No
※ FU1-05	End side for S-curve Accel/Decel pattern	End Curve	05	0 to 100 [%]		50%	No

Note4) FU1-4~5 appears by setting the parameter value as (S-curve) at FU1-2.
※ These hiding codes are only displayed in case of setting those related codes.

Function codes table

■ FU1 group [FU1]

	Code	Description	Keypad display		Setting range		Factory default	Adj.during run
			LCD	7-segment	LCD	7-segment		
	FU1-20	Start mode	Start mode	20	Accel DC-start Flying start	0 1 2	Accel	No
Note5)	※ **FU1-21**	Starting DC injection braking time	DcSt time	21	0 to 60 [sec]		0.0 [sec]	No
	FU1-22	Starting DC injection braking voltage	DcSt value	22	0 to 150 [%]		50 [%]	No
	FU1-23	Stop mode	Stop mode	23	Decel DC-brake Free-run	3 4 5	Decel	No
Note6)	※ **FU1-24**	DC injection braking on-delay time	DcBlk time	24	0 to 60 [sec]		0.1 [sec]	No
	※ **FU1-25**	DC injection braking frequency	DcBr freq	25	0.1 to 60 [Hz]		5.00 [Hz]	No
	※ **FU1-26**	DC injection braking time	DcBr time	26	0 to 60 [sec]		1.0 [sec]	No
	※ **FU1-27**	DC injection braking voltage	DcBr value	27	0 to 200 [%]		50 [%]	No
	FU1-28	Dynamic braking	Dynamic B	28	No Yes	0 1	No	No
	FU1-30	Maximum frequency	Max freq	30	40 to 120 [Hz]		60.00 [Hz]	No
	FU1-31	Base frequency	Base freq	31	30 to FU1-30		60.00 [Hz]	No
	FU1-32	Starting frequency	Start freq	32	0.01 to 10 [Hz]		0.50 [Hz]	No
	FU1-33	Frequency limit selection	Freq limit	33	No Yes	0 1	No	No
Note7)	※ **FU1-34**	Low limit frequency	F-limit Lo	34	0 to FU1-35		0.50 [Hz]	Yes
	※ **FU1-35**	High limit frequency	F-limit Hi	35	FU1-34 to FU1-30		60.00 [Hz]	No
	FU1-40	Volts/Hz pattern	V/F pattern	40	Linear Square User V/F	0 1 2	Linear	No
Note8)	※ **FU1-41**	User V/F - frequency 1	User freq 1	41	0 to FU1-30		15.00 [Hz]	No
	※ **FU1-42**	User V/F - voltage 1	User volt 1	42	0 to 100 [%]		25 [%]	No
	※ **FU1-43**	User V/F - frequency 2	User freq 2	43	0 to FU1-30		30.00 [Hz]	No
	※ **FU1-44**	User V/F - voltage 2	User volt 2	44	0 to 100 [%]		50 [%]	No
	※ **FU1-45**	User V/F - frequency 3	User freq 3	45	0 to FU1-30		45.00 [Hz]	No
	※ **FU1-46**	User V/F - voltage 3	User volt 3	46	0 to 100 [%]		75 [%]	No
	※ **FU1-47**	User V/F - Frequency 4	User freq 4	47	0 to FU1-30		60.00 [Hz]	No
	※ **FU1-48**	User V/F - voltage 4	User volt 4	48	0 to 100 [%]		100 [%]	No
	FU1-49	Input voltage adjustment	VAC 440.0V	49	73 to 115.0[%]		100.0 [%]	No
	FU1-50	Output voltage adjustment	Volt control	50	40 to 110 [%]		100.0 [%]	No
	FU1-51	Energy save	Energy save	51	None Manual Auto	0 1 2	None	Yes
Note9)	※ **FU1-52**	Energy save %	Manual save%	52	0 to 30 [%]		0 [%]	Yes
	FU1-60	Electronic thermal selection	ETH select	60	No Yes	0 1	No	Yes
Note10)	※ **FU1-61**	Electronic thermal level for 1 minute	ETH 1 min	61	FU1-62 to 200 [%]		130 [%]	Yes
	※ **FU1-62**	Electronic thermal level for continuous	ETH cont	62	50 to FU1-61 (Maximum 150%)		120 [%]	Yes
	※ **FU1-63**	Electronic thermal characteristic selection(motor type)	Motor type	63	Self-cool Forced-cool	0 1	Self-cool	Yes
	FU1-64	Overload warning level	OL level	64	30 to 110 [%]		110 [%]	Yes
	FU1-65	Overload warning time	OL time	65	0 to 30 [sec]		10.0 [sec]	Yes
	FU1-66	Overload trip selection	OLT select	66	No Yes	0 1	Yes	Yes
	FU1-67	Overload trip level	OLT level	67	30 to 150 [%]		120 [%]	Yes
	FU1-68	Overload trip delay time	OLT time	68	0 to 60 [sec]		60.0 [sec]	Yes
	FU2-69	Input/Output phase loss protection	Trip select	69	00 to 11(Bit set)		00	Yes
	FU1-70	Stall prevention mode selection	Stall prev.	70	000 to 111(Bit set)		000	No
	FU1-71	Stall prevention level	Stall level	71	30 to 150 [%]		100 [%]	No
	FU2-72	Accel/Decel change frequency	Acc/Dec ch F	72	0 to FU1-30		0.00 [Hz]	No
	FU2-73	Reference frequency for Accel and Decel	Acc/Dec freq	73	Max freq Delta freq	0 1	Max freq	No
	FU2-74	Accel/Decel time scale	Time scale	74	0.01 [sec] 0.1 [sec] 1 [sec]	0 1 2	0.1 [sec]	Yes
	FU1-99	Return code	Not displayed	99	Not available	1	1	-

Note5) FU1-21~22 appears by setting the parameter value as (DC-start) at FU1-20
Note6) FU1-24~27 appears by setting the parameter value as (DC-break) at FU1-23
Note7) FU1-34~35 appears by setting the parameter value as (Yes) at FU1-33
Note8) FU1-41~48 appears by setting the parameter value as (User V/F) at FU1-33
Note9) FU1-52 appears by setting the parameter value as (Manual) at FU1-51
Note10) FU1-61 appears by setting the parameter value as (Yes) at FU1-60
※ These hiding codes are only displayed in case of setting those related codes.

■ FU2 group [FU2]

	Code	Description	Keypad display		Setting range		Factory default	Adj.during run
			LCD	7-segment	LCD	7-segment		
	FU2-00	Jump to desired code #	Jump code	Not displayed	1 to 99	Not available	30	Yes
	FU2-01	Previous fault history 1	Last trip-1	01	By pressing [PROG] and [▲] key, the frequency, current, and operational status at the time of fault can be seen.		None	-
	FU2-02	Previous fault history 2	Last trip-2	02				
	FU2-03	Previous fault history 3	Last trip-3	03				
	FU2-04	Previous fault history 4	Last trip-4	04				
	FU2-05	Previous fault history 5	Last trip-5	05				
	FU2-06	Erase fault history	Erase trips	06	No Yes	0 1	No	Yes
	FU2-07	Dwell time	Dwell time	07	0 to 10 [sec]		0.0 [sec]	No
Note11)	※ FU2-08	Dwell frequency	Dwell freq	08	FU1-32 to FU1-30		5.00 [Hz]	No
	FU2-10	Frequency jump selection	Jump freq	10	No Yes	0 1	No	No
Note12)	※ FU2-11	Jump frequency 1 low	Jump lo 1	11	0 to FU2-12		10.00 [Hz]	Yes
	※ FU2-12	Jump frequency 1 high	Jump Hi 1	12	FU2-11 to FU1-30		15.00 [Hz]	Yes
	※ FU2-13	Jump frequency 2 low	Jump lo 2	13	0 to FU2-14		20.00 [Hz]	Yes
	※ FU2-14	Jump frequency 2 high	Jump Hi 2	14	FU2-13 to FU1-30		25.00 [Hz]	Yes
	※ FU2-15	Jump frequency 3 low	Jump lo 3	15	0 to FU2-16		30.00 [Hz]	Yes
	※ FU2-16	Jump frequency 3 high	Jump Hi 3	16	FU2-15 to FU1-30		35.00 [Hz]	Yes
	FU2-20	Power ON start selection	Power-on run	20	No Yes	0 1	No	Yes
	FU2-21	Restart after fault reset	RST restart	21	No Yes	0 1	No	Yes
	FU2-22	Speed search selection	Speed Search	22	0000 to 1111(Bit set)		0000	No
Note13)	※ FU2-23	P gain during speed search	SS P-gain	23	0 to 9999		100	Yes
	※ FU2-24	I gain during speed search	SS I-gain	24	0 to 9999		200	Yes
Note14)	※ FU2-25	Number of auto restart attempt	Retry number	25	0 to 10		0	Yes
	FU2-26	Delay time before auto restart	Retry Delay	26	0 to 60 [sec]		1.0 [sec]	Yes
	FU2-40	Rated motor selection	Motor select	40	0.75kW 1.5kW 2.2kW 3.7kW 5.5kW 7.5kW 11.0kW 15.0kW 18.5kW 22.0kW 30.0 kW	0 1 2 3 4 5 6 7 8 9 10	4	No
	FU2-41	Number of motor poles	Pole number	41	2 to 12		4	No
	FU2-42	Rated motor slip	Rated-Slip	42	0 to10 [Hz]		5	No
	FU2-43	Rated motor current (RMS)	Rated-Curr	43	1 to 200 [A]			No
	FU2-44	No load motor current (RMS)	Noload-Curr	44	0.5 to 200 [A]			No
	FU2-45	Motor efficiency	Efficiency	45	70 to 100 [%]			No
	FU2-46	Load inertia	Inertia rate	46	0 to 1		0	No
	FU2-47	Gain for motor speed display	RPM factor	47	1 to 1000 [%]		100 [%]	Yes
	FU2-48	Carrier frequency	Carrier freq	48	0.7 to 15 [kHz]		5 [kHz]	Yes
	FU2-60	Control mode selection	Control mode	60	V/F Slip comp Sensorless	0 1 2	V/F	No
Note15)	※ FU2-61	Auto tuning	Auto tuning	61	No Yes	0 1	No	No
	※ FU2-62	Stator resistance of motor	Rs	62	0 to (depending on FU2-40) [ohm]		7	No
	※ FU2-63	Leakage inductance of motor	Lsigma	63	0 to (depending on FU2-40) [mH]		7	No
	※ FU2-64	Pre-excitation time	PreEx time	64	0 to 60 [sec]		1	Yes
	※ FU2-65	P gain for sensorless control	SL P-gain	65	0 to 9999		1000	Yes
	※ FU2-66	I gain for sensorless control	SL I-gain	66	0 to 9999		100	No
	FU2-67	Manual/Auto torque boost selection	Torque boost	67	Manual Auto	0 1	Manual	No
	FU2-68	Torque boost in forward direction	Fwd boost	68	0 to 15 [%]		2.0 [%]	No

Note11) FU2-8 appears by setting the dwell time as (1~10sec) at FU2-7
Note12) FU2-11 appears by setting the parameter value as (Yest) at FU2-10
Note13) FU2-23~24 appears by setting the speed search as (0001~1111) bits at FU2-22
Note14) FU2-26 appears by setting the retry number as (1~10) at FU2-25
Note15) FU2-61~66 appears by setting the parameter value as (Sensorless) at FU2-60
※ These hiding codes are only displayed in case of setting those related codes.

Function codes table

■ FU2 group [FU2]

Code	Description	Keypad display		Setting range		Factory default	Adj.during run
		LCD	7-segment	LCD	7-segment		
FU2-69	Torque boost in reverse direction	Rev boost	69	0 to 15 [%]		2.0 [%]	No
FU2-80	Power on display	PowerOn disp	80	0 to 12		0	Yes
FU2-81	User display selection	User disp	81	Voltage Watt	0 1	Voltage	Yes
FU2-82	Software version	S/W version	82	Ver x.xx		-	-
FU2-90	Parameter display	Para. disp	90	No Yes	0 1	No	No
Note16) ※ FU2-91	Read parameter	Para. Read	91	No Yes	0 1	No	No
※ FU2-92	Write parameter	Para. Write	92	No Yes	0 1	No	No
※ FU2-93	Initialize parameters	Para. Init	93	No All Groups DRV FU1 FU2 I/O EXT	0 1 2 3 4 5 6	No	No
※ FU2-94	Parameter write protection	Para. Lock	94	0 to 999		0	Yes
※ FU2-95	Parameter save	Para. Save	95	No Yes	0 1	No	
FU2-99	Return code	Not displayed	99	Not available	[PROG/ENT] or [SHIFT/ESC]	1	Yes

Note16) FU2-91~95 appears by setting the parameter value as (YES) at FU2-90
※ These hiding codes are only displayed in case of setting those related codes.

■ Input/Output Group [I/O]

Code	Description	Keypad display		Setting range		Factory default	Adj.during run
		LCD	7-segment	LCD	7-segment		
I/O-00	Jump to desired code #	Jump code	Not displayed	1 to 99	Not available	1	Yes
Note17) ※ I/O-01	Filtering time vonstant for V1 signal input	V1 filter	01	0 to 9999 [ms]		10 [ms]	Yes
※ I/O-02	V1 input minimum voltage	V1 volt x1	02	0 to 12 [V]		0.00 [V]	Yes
※ I/O-03	Frequency corresponding to V1 input Minimum voltage	V1 freq y1 / V1 [%] y1	03	0 to FU1-30 [Hz] / 0-150 [%]		0.0 [Hz] / 0[%]	Yes
※ I/O-04	V1 input maximum voltage	V1 volt x2	04	0 to 12 [V]		10.00 [V]	Yes
I/O-05	Frequency corresponding to V1 input maximum voltage	V1 freq y2 / V1 [%] y2	05	0 to FU1-30 / 0-150 [%]		60.00 [Hz] / 100[%]	Yes
※ I/O-06	Filtering time constant for I signal input	I filter	06	0 to 9999 [ms]		10 [ms]	Yes
※ I/O-07	I Input minimum current	I curr x1	07	0 to 20 [mA]		4.00 [mA]	Yes
※ I/O-08	Frequency corresponding to I input minimum current	I freq y1 / I [%] y1	08	0 to FU1-30 / 0-150 [%]		60.0[Hz] / 0[%]	Yes
※ I/O-09	I Input maximum current	I curr x2	09	0 to 20 [mA]		20.00 [mA]	Yes
※ I/O-10	Frequency corresponding to I input maximum current	I freq y2 / I [%] y2	10	0 to FU1-30 / 0-150 [%]		60.00 [Hz] / 100[%]	Yes
※ I/O-11	Pulse input method	P pulse set	11	A+B A	0 1	A+B	Yes
※ I/O-12	Pulse input filter	P filter	12	0 to 9999 [msec]		10 [msec]	Yes
※ I/O-13	Pulse input minimum frequency	P pulse x1	13	0 to 10 [kHz]		0 [kHz]	Yes
※ I/O-14	Frequency corresponding to I/O-13	P pulse y1	14	0 to Maximum freq. [Hz]		0 [Hz]	Yes
※ I/O-15	Pulse input maximum frequency	P pulse x2	15	0 to 10 [kHz]		10 [kHz]	Yes
※ I/O-16	Frequency corresponding to I/O-15	P pulse y2	16	0 to Maximum freq. [Hz]		60 [Hz]	Yes
※ I/O-17	Criteria for analog input signal loss	Wire broken	17	None half of x1 below x1	0 1 2	None	Yes
※ I/O-18	Operating selection at loss of freq. reference	Lost command	18	None FreeRun Stop	0 1 2	None	Yes

Note17) I/O-1~18 appears by setting the parameter value as (V1, V1S,I, V1+I) at DRV-0
※ These hiding codes are only displayed in case of setting those related codes.

■ FU2 group [FU2]

	Code	Description	Keypad display		Setting range		Factory default	Adj.during run
			LCD	7-segment	LCD	7-segment		
Note18)	※ I/O-19	Waiting time after loss of freq. reference	Time out	19	0.1 to 120 [sec]		1.0 [sec]	Yes
	I/O-20	Multi-function input terminal 'M1' define	M1	20	Speed-L Speed-M Speed-H XCEL-L XCEL-M XCEL-H Dc-brake 2nd Func Exchange - Reserved - Up Down 3-Wire Ext Trip-A Ext Trip-B iTerm Clear Open-loop Main-drive Analog hold XCEL stop P Gain2 - Reserved - Interlock1 Interlock2 Interlock3 Interlock4 Speed-X Reset - Reserved - JOG FX RX Ana Change Pre excite	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33	Speed-L	Yes
	I/O-21	Multi-function input terminal 'M2' define	M2 define	21	Same to I/O-20		Speed-M	Yes
	I/O-22	Multi-function input terminal 'M3' define	M3 define	22	Same to I/O-20		Speed-H	Yes
	I/O-23	Multi-function input terminal 'M4' define	M4 define	23	Same to I/O-20		Speed-M	Yes
	I/O-24	Multi-function input terminal 'M5' define	M5 define	24	BX		Speed-H	Yes
	I/O-25	Multi-function input terminal 'M6' define	M6 define	25	Same to I/O-20		Speed-M	Yes
	I/O-26	Multi-function input terminal 'M7' define	M7 define	26	Same to I/O-20		Speed-H	Yes
	I/O-27	Multi-function input terminal 'M8' define	M8 define	27	Same to I/O-20		Speed-M	Yes
	I/O-28	Terminal input status	In status	28	000000000 to 111111111		-	-
	I/O-29	Filtering time constant for multi-function input terminals	Ti Filt Num	29	2 to 50		15	Yes
	I/O-30	Jog frequency setting	Jog freq	30	0 ~ Maximum Frequency		10.00 [Hz]	Yes
	I/O-31	Step frequency 4	Step freq-4	31	Maximum Frequency		40.00 [Hz]	Yes
	I/O-32	Step frequency 5	Step freq-5	32	0 ~ Maximum Frequency		50.00 [Hz]	Yes
	I/O-33	Step frequency 6	Step freq-6	33	0 ~ Maximum Frequency		40.00 [Hz]	Yes
	I/O-34	Step frequency 7	Step freq-7	34	0 ~ Maximum Frequency		30.00 [Hz]	Yes
Note19)	※ I/O-35	Step frequency 8	Step freq-8	35	0 ~ Maximum Frequency		20.00 [Hz]	Yes
	※ I/O-36	Step frequency 9	Step freq-9	36	0 ~ Maximum Frequency		10.00 [Hz]	Yes
	※ I/O-37	Step frequency 10	Step freq-10	37	0 ~ Maximum Frequency		20.00 [Hz]	Yes
	※ I/O-38	Step frequency 11	Step freq-11	38	0 ~ Maximum Frequency		30.00 [Hz]	Yes
	※ I/O-39	Step frequency 12	Step freq-12	39	0 ~ Maximum Frequency		40.00 [Hz]	Yes
	※ I/O-40	Step frequency 13	Step freq-13	40	0 ~ Maximum Frequency		50.00 [Hz]	Yes
	※ I/O-41	Step frequency 14	Step freq-14	41	0 ~ Maximum Frequency		40.00 [Hz]	Yes
	※ I/O-42	Step frequency 15	Step freq-15	42	0 ~ Maximum Frequency		30.00 [Hz]	Yes
	I/O-50	Acceleration time 1 (for step frequency)	Acc time-1	50	0 to 6000 [sec]		20.0 [sec]	Yes

Note18) I/O-19 appear by setting the parameter value as (V1, V1S,I, V1+I) at DRV-0
Note19) I/O-35~42 appears by setting one of parameter values, among I/O-20~27, as (SPD_X).
※ These hiding codes are only displayed in case of setting those related codes.

Function codes table

■ Input/Output group [I/O]

Code	Description	Keypad display		Setting range		Factory default	Adj.during run
		LCD	7-segment	LCD	7-segment		
I/O-51	Deceleration time 1 (for step frequency)	Dec time-1	51	0 to 6000 [sec]		20.0 [sec]	Yes
I/O-52	Acceleration time 2	Acc time-2	52	0 to 6000 [sec]		30.0 [sec]	Yes
I/O-53	Deceleration time 2	Dec time-2	53	0 to 6000 [sec]		30.0 [sec]	Yes
I/O-54	Acceleration time 3	Acc time-3	54	0 to 6000 [sec]		40.0 [sec]	Yes
I/O-55	Deceleration time 3	Dec time-3	55	0 to 6000 [sec]		40.0 [sec]	Yes
I/O-56	Acceleration time 4	Acc time-4	56	0 to 6000 [sec]		50.0 [sec]	Yes
I/O-57	Deceleration time 4	Dec time-4	57	0 to 6000 [sec]		50.0 [sec]	Yes
I/O-58	Acceleration time 5	Acc time-5	58	0 to 6000 [sec]		40.0 [sec]	Yes
I/O-59	Deceleration time 5	Dec time-5	59	0 to 6000 [sec]		40.0 [sec]	Yes
I/O-60	Acceleration time 6	Acc time-6	60	0 to 6000 [sec]		30.0 [sec]	Yes
I/O-61	Deceleration time 6	Dec time-6	61	0 to 6000 [sec]		30.0 [sec]	Yes
I/O-62	Acceleration time 7	Acc time-7	62	0 to 6000 [sec]		20.0 [sec]	Yes
I/O-63	Deceleration time 7	Dec time-7	63	0 to 6000 [sec]		20.0 [sec]	Yes
I/O-70	AM1 (analog meter) output selection	AM1 mode	70	Frequency Current Voltage DC link Vtg Torque	0 1 2 3 4	Frequency	Yes
I/O-71	AM1 output adjustment	AM1adjust	71	10 to 200 [%]		100 [%]	Yes
I/O-72	AM2 (analog meter) output selection	AM2 mode	72	Frequency Current Voltage DC link Vtg Torque	0 1 2 3 4	Frequency	Yes
I/O-73	AM2 output adjustment	AM2 adjust	73	10 to 200 [%]		100 [%]	Yes
Note20) ※ I/O-74	Frequency detection level	FDT freq	74	0 to FU1-30		30.00 [Hz]	Yes
※ I/O-75	Frequency detection bandwidth	FDT band	75	0 to FU1-30		10.00 [Hz]	Yes
I/O-76	Multi-function auxiliary contact output define(Aux terminal)	Aux mode 1	76	FDT-1 FDT-2 FDT-3 FDT-4 FDT-5 OL IOL Stall OV LV OH Lost Command Run Stop Steady INV line COMM line Ssearch Step pulse Seq pulse Ready MMC	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 23	None	Yes
I/O-77	Multi-function auxiliary contact output define	Aux mode 2	45	Same as I/O-76		010	Yes
I/O-78	Multi-function auxiliary contact output define	Aux mode 3	45	Same as I/O-76		010	Yes
I/O-79	Multi-function auxiliary contact output define	Aux mode 4	45	Same as I/O-76		010	Yes
I/O-80	Fault output relay setting (30A, 30B, 30C)	Relay mode	45	000 to 111 (Bit set)		010	Yes

Note20) I/O-74~75 appears by setting the parameter values, among I/O-76~79, as (FDT-1~FDT5).

※ These hiding codes are only displayed in case of setting those related codes

■ Input/Output group [I/O]

Code	Description	Keypad display		Setting range		Factory default	Adj.during run
		LCD	7-segment	LCD	7-segment		
I/O-81	Terminal output status	Out status	16	00000000 to 11111111		00000000	-
I/O-90	Inverter number	Inv No.	90	1 to 31		1	Yes
I/O-91	Baud rate	Baud rate	91	1200 bps 2400 bps 4800 bps 9600 bps 19200 bps	0 1 2 3 4	9600 bps	Yes
Note21) ※ I/O-92	Operating method at loss of freq. reference	COM Lost Cmd	92	None FreeRun Stop	0 1 2	None	No
※ I/O-93	Waiting time after loss of freq. reference	COM Time Out	93	0.1 to 120 [sec]		1.0 [sec]	Yes
I/O-94	A or B contact	In No/Nc set	94	00000000000/11111111111		00000000000	No
I/O-95	Input time	In CheckTime	95	1 to 1000		1 [msec]	Yes
I/O-96		OH Trip sel	96	000 to 111 [bit]		111 [bit]	Yes
I/O-97	Return code	Not Displayed	99	1		1	Yes

Note21) I/O-92~93 appears by setting the parameter value as (Int485) at DRV-04
※ These hiding codes are only displayed in case of setting those related codes

■ Application group [APP]

Code	Description	Keypad display		Setting range		Factory default	Adj.during run
		LCD	7-segment	LCD	7-segment		
APP-00	Jump to desired code #	Jump code	Not displayed	0 to 99	Not available	1	Yes
APP-01	Application mode selection	App Mode	01	None MMC	0 1	None	No
APP-02	PID operation aelection	Proc PI mode	02	No Yes	0 1	No	No
Note22) ※ APP-03	PID F gain	PID F-gain	03	0 to 999.9 [%]		0 [%]	Yes
※ APP-04	PID auxiliary reference mode selection	Aux Ref Mode	04	None Keypad-1 Keypad-2 V1 I V2	0 1 2 3 4 5	None	No
※ APP-06	PID feedback signal selection	PID F/B	06	I V1 V2 Pulse	0 1 3 4	I	No
※ APP-07	P gain for PID control	PID P-gain	07	0 to 999.9 [%]		1.0 [%]	Yes
※ APP-08	I gain for PID control	PID I-time	08	0 to 32.0 [sec]		10.0 [sec]	Yes
※ APP-09	D gain for PID control	PID D-time	09	0 to 1000 [msec]		0.0 [msec]	Yes
※ APP-10	High limit frequency for PID control	PID limit-H	10	0 to 300.00 [Hz]		60.00 [Hz]	Yes
※ APP-11	Low limit frequency for PID control	PID limit-L	11	0 to 300.00 [Hz]		0.00 [Hz]	Yes
※ APP-12	PID output scale	PID Out Scale	12	0.1 to 999.9 [%]		100 [%]	No
※ APP-13	PID P2 gain	PID P2-gain	13	0 to 999.9 [%]		100 [%]	No
※ APP-14	P gain scale	P-gain Scale	14	0 to 100 [%]		100 [%]	No
※ APP-17	PID U curve feedback select	PID U Fbk	17	No Yes	0 1	No	No
APP-20	2nd Acceleration time	2nd Acc time	20	0 to 6000 [sec]		5.0 [sec]	Yes
APP-21	2nd Deceleration time	2nd Dec time	21	0 to 6000 [sec]		10.0 [sec]	Yes
APP-22	2nd base frequency	2nd BaseFreq	22	30 to FU1-20		60.00 [Hz]	No
APP-23	2nd V/F pattern	2nd V/F	23	Linear Square User V/F	0 1 2	Linear	No
APP-24	2nd forward torque boost	2nd F-boost	24	0 to 15 [%]		2.0 [%]	No

Note22) APP-03~17 appears by setting the parameter value as (Yes) at APP-02
※ These hiding codes are only displayed in case of setting those related codes.

Function codes table

■ Application group [APP]

Code	Description	Keypad display		Setting range		Factory default	Adj.during run
		LCD	7-segment	LCD	7-segment		
APP-25	2nd reverse torque boost	2nd R-boost	25	0 to 15 [%]		2.0 [%]	No
APP-26	2nd stall prevention level	2nd Stall	26	30 to 150 [%]		100[%]	No
APP-27	2nd electronic thermal level for 1 minute	2nd ETH 1min	27	FU2-28 to 200 [%]		130 [%]	Yes
APP-28	2nd electronic thermal level for continuous	2nd ETH cont	28	50 to FU2-27 (Maximum 150%)		120 [%]	Yes
Note23) ※ APP-29	2nd rated motor current	2nd R-Curr	29	1 to 200 [A]		3.6 [A]	No
※ APP-40	Number of auxiliary motor run display	Aux Mot Run	40	-		-	-
※ APP-41	Aux. motor start selection	Starting Aux	41	1 to 4		1	Yes
※ APP-42	Operation time display on auto change	Auto Op Time	42	-		-	-
※ APP-43	The number of aux motor	Nbr Aux' s	43	0 to 7		4	Yes
※ APP-44	Start frequency of aux. motor 1	Start freq 1	44	0 ~ Maximum Frequency		49.99 [Hz]	Yes
※ APP-45	Start frequency of aux. motor 2	Start freq 2	45	0 ~ Maximum Frequency		49.99 [Hz]	Yes
※ APP-46	Start frequency of aux. motor 3	Start freq 3	46	0 ~ Maximum Frequency		49.99 [Hz]	Yes
※ APP-47	Start frequency of aux. motor 4	Start freq 4	47	0 ~ Maximum Frequency		49.99 [Hz]	Yes
※ APP-48	Start frequency of aux. motor 2	Start freq 5	48	0 ~ Maximum Frequency		49.99 [Hz]	Yes
※ APP-49	Start frequency of aux. motor 3	Start freq 6	49	0 ~ Maximum Frequency		49.99 [Hz]	Yes
※ APP-50	Start frequency of aux. motor 4	Start freq 7	50	0 ~ Maximum Frequency		49.99 [Hz]	Yes
※ APP-51	Stop frequency of aux. motor 1	Stop freq 1	51	0 ~ Maximum Frequency		20.00 [Hz]	Yes
※ APP-52	Stop frequency of aux. motor 2	Stop freq 2	52	0 ~ Maximum Frequency		20.00 [Hz]	Yes
※ APP-53	Stop frequency of aux. motor 3	Stop freq 3	53	0 ~ Maximum Frequency		20.00 [Hz]	Yes
※ APP-54	Stop frequency of aux. motor 4	Stop freq 4	54	0 ~ Maximum Frequency		20.00 [Hz]	Yes
※ APP-55	Stop frequency of aux. motor 2	Stop freq 5	55	0 ~ Maximum Frequency		15.00 [Hz]	Yes
※ APP-56	Stop frequency of aux. motor 3	Stop freq 6	56	0 ~ Maximum Frequency		15.00 [Hz]]	Yes
※ APP-57	Stop frequency of aux. motor 4	Stop freq 7	57	0 ~ Maximum Frequency		15.00 [Hz]	Yes
※ APP-58	Delay time before operating aux motor	Aux start DT	58	0 to 9999 [sec]		60.0 [sec]	Yes
※ APP-59	Delay time before stopping aux motor	Aux stop DT	59	0 to 9999 [sec]		60.0 [sec]	Yes
※ APP-60	Accel time when the number of pump decreases	Pid AccTime	60	0 to 600.0 [sec]		0.5[sec]	Yes
※ APP-61	Decel time when the number of pump increases	Pid DecTime	61	0 to 600.0 [sec]		0.5 [sec]	Yes
※ APP-62	PID bypass selection	Regul Bypass	62	No Yes	0 1	No	Yes
※ APP-63	Sleep delay time	Sleep Delay	63	0 to 9999 [sec]		60.0 [sec]	Yes
※ APP-64	Sleep frequency	Sleep Freq	64	0 to FU1-30		0.00 [Hz]	Yes
※ APP-65	Wake-Up level	WakeUp Level	65	0 to 100 [%]		35.0 [%]	Yes
※ APP-66	Auto change mode selection	AutoCh-Mode	66	M_FRLS M_FRFS Auxch_FRFS Mainch_FRFS	0 1 2 3	M_FRLS	Yes
※ APP-67	Auto change time	AutoEx-intv	67	00:00 to 99:00		72:00	Yes
※ APP-68	Auto change level	AutoEx-level	68	0 to 100 [%]		20 [%]	Yes
※ APP-69	Inter-lock selection	Inter-lock Actual REF/	69	No Yes	0 1	No	Yes
※ APP-70	Feedback freq/percentage display	FBK	70	[Hz] / [%]	-		
※ APP-71	Aux motor pressure difference between starting and stopping	Aux Pr Diff	71	0 to 100		2 [%]	
※ APP-72	Actual value pressure display	Prs 1 Bar Prs 0.0000pa	72	[Bar]/[Pa]	-	-	-
※ APP-73	Pressure display scale	Scale Disp	73	0 to 50000		1000	Yes

Note23) APP-40~73 appears by setting the parameter value as (MMC) at APP-01.

※ These hiding codes are only displayed in case of setting those related codes.

Peripheral devices

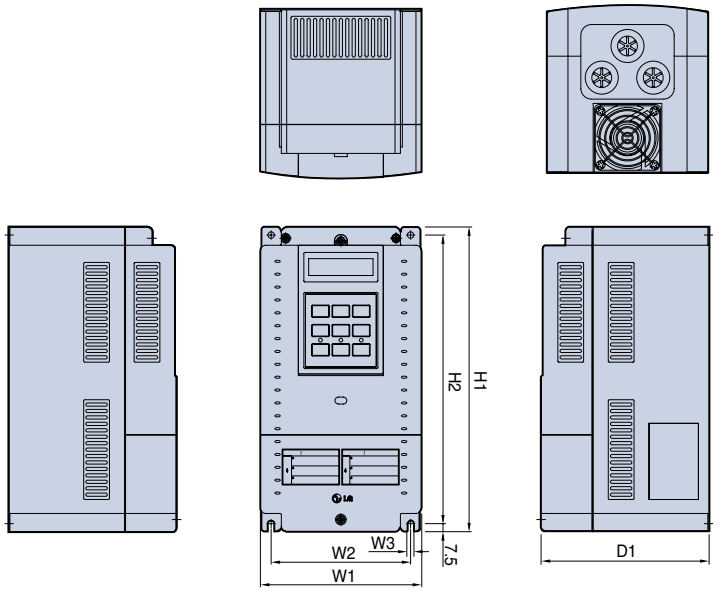
Voltage	Motor(kW)	Inverter type	MCCB or ELCB	MC(LG)	Cable(㎟)		
					R, S, T	U, V, W	Ground
200V class	0.75	**SV055iP5-2**	ABS33b, EBS33b	GMC-12	2	2	3.5
	1.5	**SV055iP5-2**	ABS33b, EBS33b	GMC-12	2	2	3.5
	2.2	**SV055iP5-2**	ABS33b, EBS33b	GMC-18	2	2	3.5
	3.7	**SV055iP5-2**	ABS33b, EBS33b	GMC-22	3.5	3.5	3.5
	5.5	**SV055iP5-2**	ABS53b, EBS53	GMC-22	5.5	5.5	5.5
	7.5	**SV075iP5-2**	ABS103b, EBS103	GMC-32	8	8	5.5
	11	**SV110iP5-2**	ABS103b, EBS103	GMC-50	14	14	14
	15	**SV150iP5-2**	ABS203b, EBSb03	GMC-65	22	22	14
	18.5	**SV185iP5-2**	ABS203b, EBS203	GMC-85	30	30	22
	22	**SV220iP5-2**	ABS203b, EBS203	GMC-100	38	30	22
	30	**SV300iP5-2**	ABS203b, EBS203	GMC-150	38	30	22
400V class	0.75	**SV055iP5-4**	ABS33b, EBS33b	GMC-12	2	2	2
	1.5	**SV055iP5-4**	ABS33b, EBS33b	GMC-12	2	2	2
	2.2	**SV055iP5-4**	ABS33b, EBS33b	GMC-22	2	2	2
	3.7	**SV055iP5-4**	ABS33b, EBS33b	GMC-22	2	2	2
	5.5	**SV055iP5-4**	ABS33b, EBS33b	GMC-22	3.5	2	3.5
	7.5	**SV075iP5-4**	ABS33b, EBS33b	GMC-22	3.5	3.5	3.5
	11	**SV110iP5-4**	ABS53b, EBS53	GMC-22	5.5	5.5	8
	15	**SV150iP5-4**	ABS103b, EBS103	GMC-25	14	8	8
	18.5	**SV185iP5-4**	ABS103b, EBS103	GMC-40	14	8	14
	22	**SV220iP5-4**	ABS103b, EBS103	GMC-50	22	14	14
	30	**SV300iP5-4**	ABS203b, EBS203	GMC-65	22	22	14

Voltage	Motor(kW)	Inverter type	AC input fuse	AC reactor	DC reactor
200V class	0.75	**SV055iP5-2**	10A	2.13mH, 5.7A	7.00mH, 5.4A
	1.5	**SV055iP5-2**	15A	1.20mH, 10A	4.05mH, 9.2A
	2.2	**SV055iP5-2**	25A	0.88mH, 14A	2.92mH, 13A
	3.7	**SV055iP5-2**	40A	0.56mH, 20A	1.98mH, 19A
	5.5	**SV055iP5-2**	40A	0.39mH, 30A	1.37mH, 29A
	7.5	**SV075iP5-2**	50A	0.28mH, 40A	1.05mH, 38A
	11	**SV110iP5-2**	70A	0.20mH, 59A	0.74mH, 56A
	15	**SV150iP5-2**	100A	0.15mH, 75A	0.57mH, 71A
	18.5	**SV185iP5-2**	100A	0.12mH, 96A	0.49mH, 91A
	22	**SV220iP5-2**	125A	0.10mH, 112A	0.42mH, 107A
	30	**SV300iP5-2**	190A	0.07mH, 160A	0.34mH, 152A
400V class	0.75	**SV055iP5-4**	6A	8.63mH, 2.8A	28.62mH, 2.7A
	1.5	**SV055iP5-4**	10A	4.81mH, 4.8A	16.14mH, 4.6A
	2.2	**SV055iP5-4**	10A	3.23mH, 7.5A	11.66mH, 7.1A
	3.7	**SV055iP5-4**	20A	2.34mH, 10A	7.83mH, 10A
	5.5	**SV055iP5-4**	20A	1.22mH, 15A	5.34mH, 14A
	7.5	**SV075iP5-4**	30A	1.14mH, 20A	4.04mH, 19A
	11	**SV110iP5-4**	35A	0.81mH, 30A	2.76mH, 29A
	15	**SV150iP5-4**	45A	0.61mH, 38A	2.18mH, 36A
	18.5	**SV185iP5-4**	60A	0.45mH, 50A	1.79mH, 48A
	22	**SV220iP5-4**	70A	0.39mH, 58A	1.54mH, 55A
	30	**SV300iP5-4**	90A	0.287mH, 80A	1.191mH, 76A

Note) Correct capacity fuses and reactors must be selected for safe use.

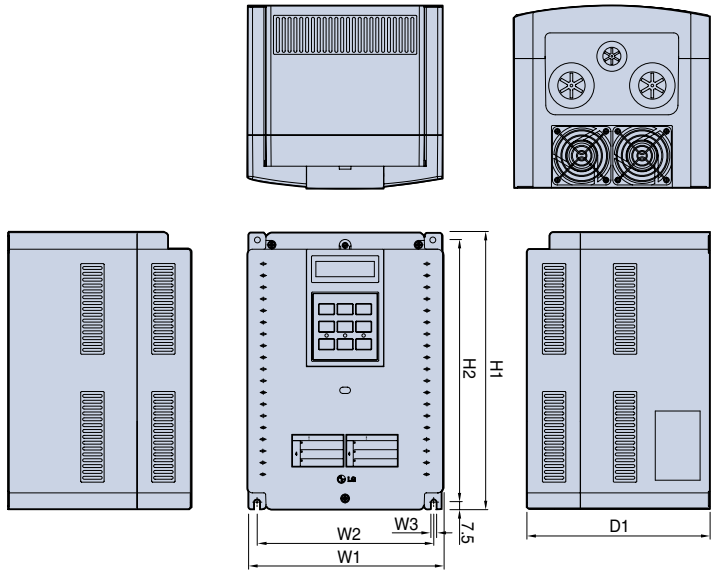
Dimension

■ SV055iP5-2/4 (200V/400V)



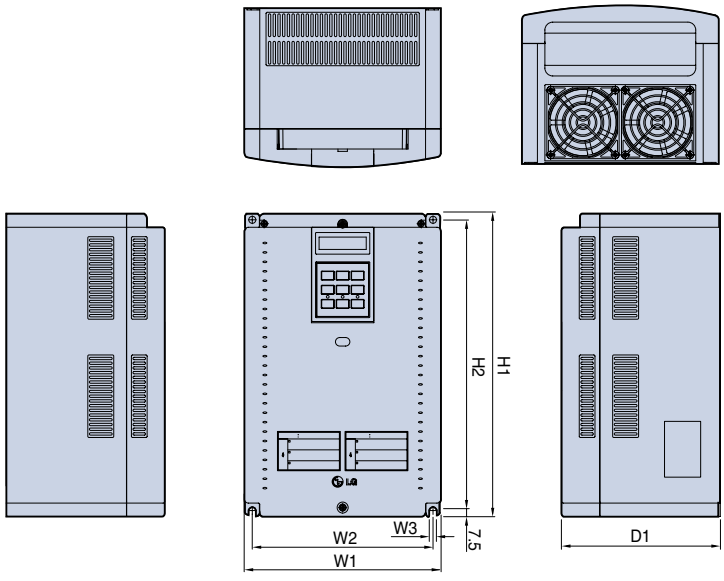
Inverter type	W1	W2	W3	H1	H2	D1
SV055iP5-2/4	150	130	6	284	269	156.5

■ SV075iP5-2/4, SV110iP5-2/4 (200V/400V)



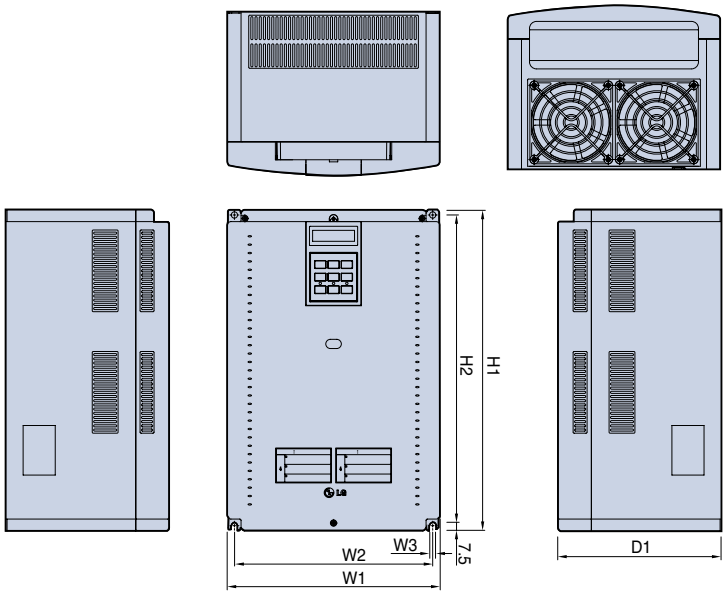
Inverter type	W1	W2	W3	H1	H2	D1
SV075iP5-2/4	200	180	6	284	269	182
SV0110iP5-2/4	200	180	6	284	269	182

■ SV150iP5-2/4, SV185iP5-2/4 (200V/400V)



Inverter type	W1	W2	W3	H1	H2	D1
SV150iP5-2/4	250	230	9	385	370	201
SV185iP5-2/4	250	230	9	385	370	201

■ SV220iP5-2/4, SV300iP5-2/4 (200V/400V)



Inverter type	W1	W2	W3	H1	H2	D1
SV220iP5-2/4	304	284	9	460	445	234
SV300iP5-2/4	304	284	9	460	445	234

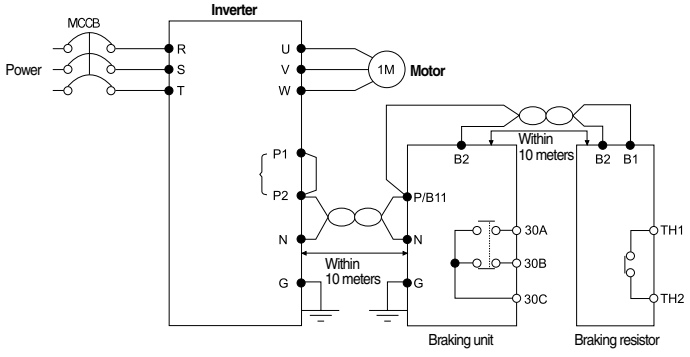
Braking unit

Voltage	Inverter capacity	Braking unit
200V class	5.5 ~ 15kW	SV150DBU-2
	18.5 ~ 22kW	SV220DBU-2
	30kW	SV037DBH-2
400V class	5.5 ~ 15kW	SV150DBU-4
	18.5 ~ 22kW	SV220DBU-4
	30kW	SV037DBH-4

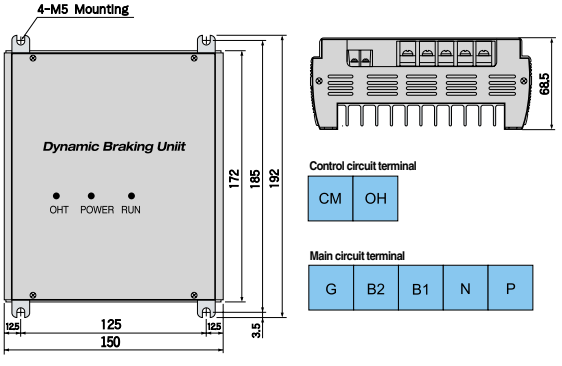
Terminal name		Description
P		Connection terminal of inverter terminal P2 or P
N		Connection terminal of inverter terminal N
B1		Connection terminal of braking unit B1
B2		Connection terminal of braking unit B2
G		Ground terminal
Below 22kW	OH	OH Trip output terminal (open collector output: 20mA, 27V DC)
	CM	Common terminal of OH terminal
Below 30kW	IN+	Continuous operation connection terminal (For SLAVE MODE)
	IN-	Continuous operation connection terminal (For SLAVE MODE)
	OUT+	Continuous operation connection terminal (For SLAVE MODE)
	OUT-	Continuous operation connection terminal (For SLAVE MODE)
	30A,B,C	The fault signal of braking units' protection function is released via these terminals

■ Wiring

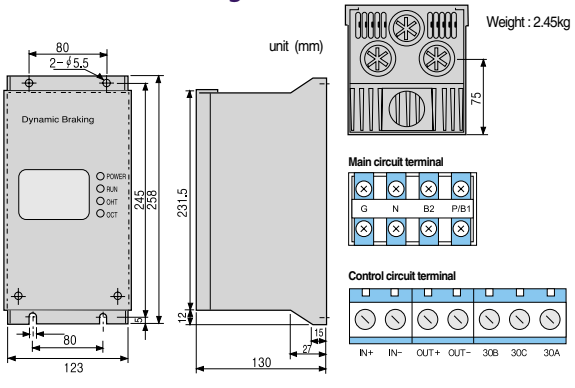
Single use of braking unit



■ Below 22kW braking unit



■ Over 30kW braking unit



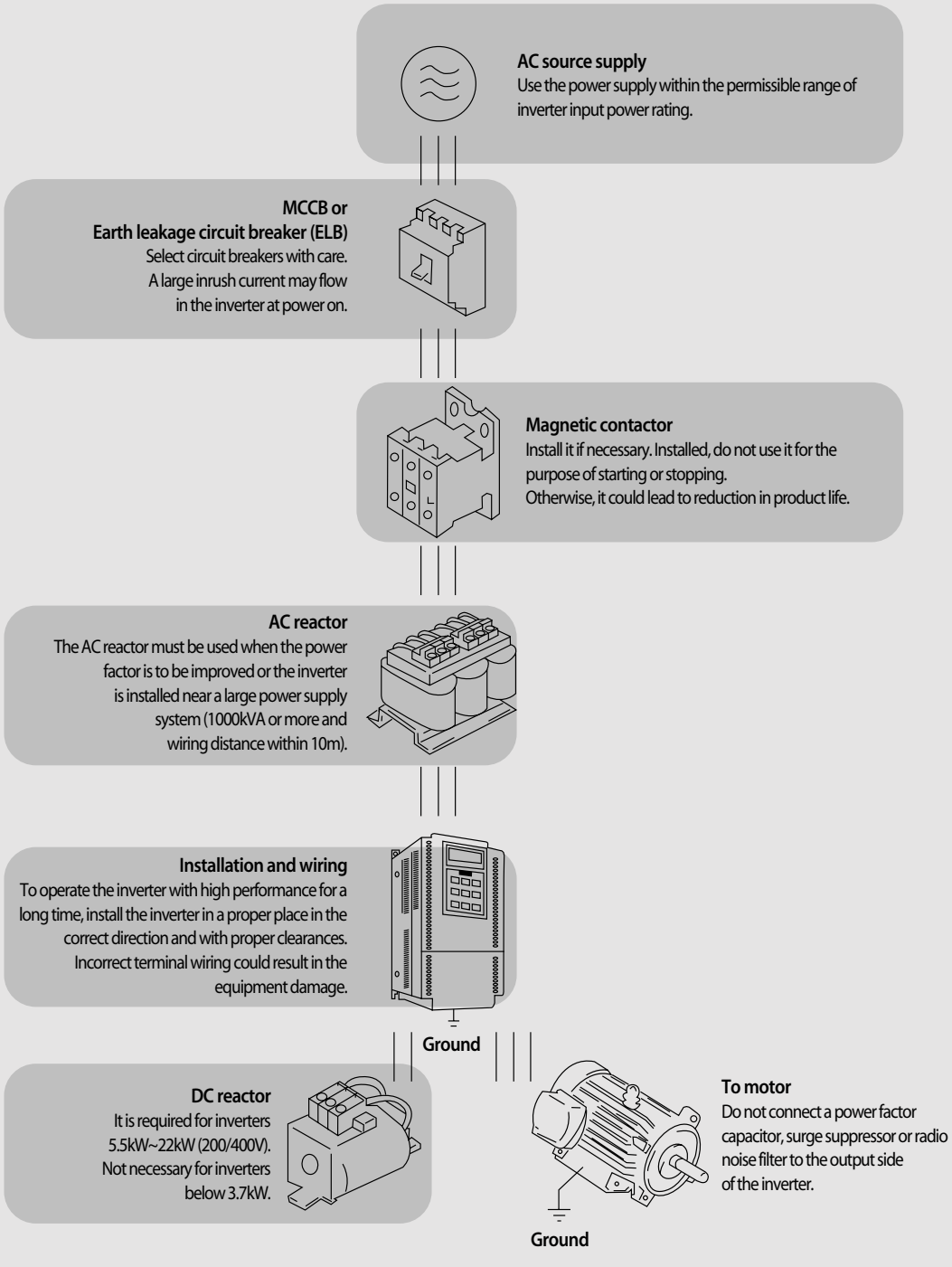
■ Stand-alone type braking resistor

As our iP5 series does not provide the Braking and the braking resistor as a built-in option the Stand-alone type braking unit and resistor should be used solely. The basic use rate(%ED) of below table shown is 5% and in case of 10% use rate, the rated watt of stand-alone type resistor should be doubled.

Voltage	Inverter capacity (kW)	Use rate (%ED/Continuous operation)	100% Braking		150% Braking	
			OHM	WATT	OHM	WATT
200V class	5.5	5%/15sec.	30	700	20	800
	7.5	5%/15sec.	20	1,000	15	1,200
	11	5%/15sec.	15	1,400	10	2,400
	15	5%/15sec.	11	2,000	8	2,400
	18.5	5%/15sec.	9	2,400	5	3,600
	22	5%/15sec.	8	2,800	5	3,600
	30	5%/15sec.	3	5,000	-	-
400V class	5.5	5%/15sec.	120	700	85	1,000
	7.5	5%/15sec.	90	1,000	60	1,200
	11	5%/15sec.	60	1,400	40	2,000
	15	5%/5sec.	45	2,000	30	2,400
	18.5	5%/15sec.	35	2,400	20	3,600
	22	5%/15sec.	30	2,800	20	3,600
	30	5%/15sec.	12	5,000	-	-

Basic configuration

Proper peripheral devices must be selected and correct connections made to ensure proper operation. An incorrectly applied or installed inverter can result in system malfunction or reduction in product life as well as component damage. You must read and understand this manual thoroughly before proceeding.



Memo

Leader in Electrics & Automation

Safety Instructions

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact qualified service technician when you need maintenance.
  Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.

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2004. 03 Starvert iP5(E) 2004. 03/(01) 2004. 03 Printed in Korea STAFF