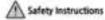
The right choice for the ultimate yield

LS ELECTRIC strives to maximize your profits in gratitude for choosing us as your partner

# **AC Variable Speed Drive**

LSLV-G100 series

User's Maunal 0.4-22kW [200V,400V]



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LS ELECTRIC has reviewed the information in this publication to ensure consistency with the hardware and software described. However, LS ELECTRIC cannot quarantee full consistency, nor be responsible for any damages or compensation, since variance cannot be precluded entirely. Please check again the version of this publication before you use the product.



ISIV-G100 / 2020 09



This operation manual is intended for users with basic knowledge of electricity and electric devices. \* LSLV- G100 is the official name for the G100 series inverters

\* Visit our website at https://www.ls-electric.com for the complete user manual.

### 1. Safety Information

1	.1 Safety symbols in this	manual
	ARK TO SERVICE	Indicates an imminently hazardous situation which, if not avoided, will result in severe injury or death.
	20 Mail and Sept.	Indicates a potentially hazardous situation which, if not avoided, could result in injury or death.
	が (2) という (2) P	Indicates a potentially hazardous situation that, if not avoided, could result in minor injury or property damage.

- Never remove the product cover or touch the internal printed circuit board (PCB) or any contact points when the power is on, Also, do not start the product when the cover is open. This may cause an electrical shock due to the exposure of high voltage terminals or live parts.
- Even if the power is off, do not open the cover unless it is absolutely necessary like for the wiring operation or for regular inspection. Opening the cover may still cause an electrical shock even after the power is blocked because the product has been charged for a long period of time.
- Wait at least 10 minutes before opening the covers and exposing the terminal connections. Before starting work on the inverter, test the connections to ensure all DC voltage has been fully discharged. Otherwise, it may cause an electrical shock and result in personal injury or even death.

- Make sure to install ground connection between the equipment and the motor for safe use. Otherwise, it may cause an electrical shock and result in personal injury or even death.
- Do not turn on the power if the product is damaged or faulty. If you find that the product is faulty, disconnect the
- power supply and have the product professionally repaired • The inverter becomes hot during operation. Avoid touching the inverter until it has cooled to avoid burns. Avoid
- touching the inverter until it has cooled to avoid burns. • Do not allow foreign objects, such as screws, metal chips, debris, water, or oil to get inside the inverter. Allowing foreign objects inside the inverter may cause the inverter to malfunction or result in a fire.
- Do not operate the switch with wet hands. Otherwise, it may cause an electrical shock and result in personal injury
- Check the information about the protection level for the circuits and devices.
- The connection terminals and parts below have electrical protection class 0. This means that the protection class of the circuit depends on basic insulation and there is a danger of electric shock if the basic insulation is not working properly. Therefore, take the same protective measures as handling the power line when connecting wires to the terminals or the device below, or when installing or using the devices.

- Multi-function Input: P1-P8, CM
- Analog Input/Output: VR, V1, V2, I2, AO, IO, CM
- Digital Output: 24, A1/B1/C1, A2/C2, Q1/EG
- Safety: SA/SB/SC
- Communication: S+/S-
- Fan
- The protection level of this equipment (inverter) is electrical protective class 1.

### (i) Caution

- Do not change the inside of the product at your own discretion. This may result in injury or damage to the product due to failure or malfunction. Also, products changed at your own discretion will be excluded from the product warranty.
- Do not use the inverter for single phase motor operation as it has been designed for three phase motor operation. Using a single phase motor may damage the motor.
- Do not place heavy objects on top of electric cables. Heavy objects may damage the cable and result in electric shock.

### Note / Remarque

- Maximum allowed prospective short-circuit current at the input power connection is defined in IEC 60439-1 as 100 kA. Depending on the selected MCCB, the LSLV-G100 Series is suitable for use in circuits capable of delivering a maximum of 100  $kA\,RMS\,symmetrical\,amperes\,at\,the\,drive's\,maximum\,rated\,voltage.\,The\,following\,table\,shows\,the\,recommended\,MCCB\,for$
- Le courant maximum de court-circuit présumé autorisé au connecteur d'alimentation électrique est défini dans la norme IEC 60439-1 comme égal à 100 kA. Selon le MCCB sélectionné, la série LSLV-G100 peut être utilisée sur des circuits pouvant fournir un courant RMS symétrique de 100 kA maximum en ampères à la tension nominale maximale du variateur. Le tableau suivant indique le MCCB recommandé selon le courant RMS symétrique en ampères.

Working Voltage	UTE100E	UTE100H	UTS150L
240V(50/60Hz)	50 kA	100 kA	150 kA
480V(50/60Hz)	25 kA	65 kA	100 kA

## 2. Preparing the Installation

### 2.1 Product Identification

LSLV 0022 G100 – 2EOFN(T)								
0004- 0008- 0015- 0022- 0040- 0055-								
Motor	0.4kW	0.8kW	1.5kW	2.2kW	4.0kW	5.5kW	7.5kW	
capacity	0110-	0150-	0185-	0220-				
	11kW	15kW	18.5kW	22kW				
Series name	G100, G100C – Compact type(0.4–4.0kW)							
Input voltage	2-3 phas	se 200V – 240V	, 4−3 phase	380 -480V				
Keypad	E-LED K	eypad						
UL Type	O-ULO	oen Type						
EMC Filter	N – Non E	Built-in EMC Fil	ter, F – Built-ii	n EMC Filter				
Reactor	N – Non-	N – Non-Reactor						
Safety	Blank – N	Blank – Non-Safety, T – Safety						

### 2.2 Installation Considerations

Items	Description
Ambient Temperature 1)	Heavy load: -10-50°C, Normal load: -10-40°C
Ambient Humidity	Less than 95% relative humidity (no condensation)
Storage Temperature	-20-65℃
Environmental Factors	An environment free from corrosive or flammable gases, oil residue, or dust
	Maximum 3,280 ft(1,000m) above sea level for standard operation.
Altitude/Vibration	From 1000 to 4000m, the rated input voltage and rated output current of the drive
	must be derated by 1% for every 100m./less than 1G (9.8m/sec2)
Air Pressure	70–106 kPa

1) The ambient temperature is the temperature measured at a point 2" (5 cm) from the surface of the inverter.

### (0) Caution

Do not allow the ambient temperature to exceed the allowable range while operating the inverter.

## 2.3 Selecting the Installation Site

- •The location must be free from vibration, and the inverter must be installed on a wall that can support the inverter's weight.
- •The inverter can become very hot during operation. Install the inverter on a surface that is fire-resistant or flame-retardant and with sufficient clearance around the inverter to allow air to circulate. The illustrations below detail the required installation clearances.
- · Make sure that sufficient air circulation is provided around the product. When installing the product inside the panel, carefully consider the position of the product's cooling fan and the ventilation louver. The product must be placed for the cooling fan to discharge heat satisfactorily during the operation.
- •If you are installing multiple inverters in one location, arrange them side-by-side and remove the top covers. The top covers MUST be removed for side-by-side installations. Use a flat head screwdriver to remove the top covers
- •If you are installing multiple inverters, of different ratings, provide sufficient clearance to meet the clearance specifications of the larger

- Select a wall or panel suitable to support the installation and check the inverter's mounting bracket dimensions.
- (i) Caunior
  Do not transport the inverter by lifting with the inverter's covers or plastic surfaces. The inverter may tip over if covers break, causing injuries or damage to the product. Always support the inverter using the metal frames when moving it.
- Use a transport method that is suitable for the weight of the product. Some high capacity inverters can be too heavy for one person to carry. Use an adequate number of people and transport tool to safely move the product.
- Do not install the inverter on the floor or mount it sideways against a wall. The inverter must be installed vertically, on a wall or inside a panel, with its rear flat on the mounting surface.

## 2.4 Cable Selection and Cable Wiring

## ■ Ground Cable and Power Cable Specification (\*G100C)

Load(kW)		Ground		Power I/O (mm²)		Power I/O(AWG)		Terminal
		mm2	AWG	R/S/T	U/V/ W	R/S/T	U/V/ W	Size
	0.4/0.75/1.5/2.2	4	12	2.5	2.5	14	14	M3(M3.5*)
	4	4	12	4	4	12	12	M4(M3.5*)
	5.5	6	10	6	6	10	10	M4
3-Phase	7.5	6	10	10	10	8	8	M4
200V	11	16	6	16	16	6	6	M5
	15	16	6	25	25	4	4	M5
	18.5	25	4	35	35	2	2	M6
	22	25	4	35	35	2	2	M6



Load(kW)		Ground		Power I/O (mm²)		Power I/O(AWG)		Terminal	
		mm2	AWG	R/S/T	U/V/ W	R/S/T	U/V/ W	Size	
	0.4/7.5/1.5/2.2/4	2.5	14	2.5	2.5	14	14	M3.5	
	5.5	4	12	4	2.5	12	14	M4	
2 Dl	7.5	4	12	4	4	12	12	M4	
3-Phase 400V	11	10	8	6	6	10	10	M4	
400V	15	10	8	16	10	6	8	M5	
	18.5	16	6	16	10	6	8	M5	
	22	16	6	25	16	4	6	M5	

• 200 V products require Class 3 grounding. Resistance to ground must be  $< 100\Omega$ .

• 400 V products require Special Class 3 grounding. Resistance to ground must be < 10  $\Omega$ 

· Make sure to install ground connection between the equipment and the motor for safe use. Otherwise it may cause an electrical shock and result in personal injury or even death.

•Apply rated torques to the terminal screws. Loose screws may cause short circuits and malfunctions. Tightening the screw too much may damage the terminals and cause short circuits and malfunctions.

- •Use copper wires only with 600V, 75°C rating for the power terminal wiring, and 300V, 75°C rating for the control terminal wiring.
- •Do not connect two wires to one terminal when wiring the power.
- •Power supply wirings must be connected to the R, S, and T terminals. Connecting them to the U, V, W terminals causes internal damages to the inverter. Motor should be connected to the U, V, and W Terminals

Arrangement of the phase sequence is not necessary.

### (C) Attention

- Appliquer des couples de marche aux vis des bornes. Des vis desserrées peuvent provoquer des courts-circuits et des dysfonctionnements. Ne pas trop serrer la vis. car cela risqué d'endommager les bornes et de proyoquer des courts-circuits et des dysfonctionnements. Utiliser uniquement des fils de cuivre avec une valeur nominale
- de 600 V, 75 °C pour le câblage de la borne d'alimentation, tune valeur nominale de 300 V, 75 °C pour le câblage de la borne de commande.
- •Ne iamais connecter deux câbles à une borne lors du câblage de l'alimentation.
- ·Les câblages de l'alimentation électrique doivent être connectés aux bomes R, S et T. Leur connexion aux bornes U, V et W provoque des dommages internes à l'onduleur. Le moteur doit être raccordé aux bornes U, V et W. L'arrangement de l'ordre de phase n'est pas nécessaire

## ■ Signal (Control) Cable Specifications

Terminal / Signal Cable	Without Crir Connectors		With Crimp Terminal Connectors (Bootlace Ferrule)		
	mm²	AWG	mm²	AWG	
P1–P8, CM, SA/SB/SC, VR, V1, V2, I2, AO, IO, 24, A1/B1/C1, A2/C2, Q1/EG, S+/S-	0.8	18	0.5	20	

• Install the ground connection as specified. Complete the cable connections by connecting an appropriately rated cable to the terminals on the power and control terminal blocks.

## 60 Caution

- Install the inverter before carrying out wiring connections.
- •Ensure that no small metal debris, such as wire cut-offs, remain inside the inverter. Metal debris in the inverter may cause inverter failure.
- •Tighten terminal screws to their specified torque. Loose terminal block screws may allow the cables to disconnect and cause short circuit or inverter failure.
- •Do not place heavy objects on top of electric cables. Heavy objects may damage the cable and result in electric shock.  $\bullet \text{The power supply system for this equipment (inverter) is a grounded system (TT, TN). The inverter is not suitable for \\$
- •The equipment may generate direct current in the protective ground wire. When installing the residual current device (RCD) or residual current monitoring (RCM), only Type B RCDs and RCMs can be used.
- •Use cables with the largest cross-sectional area, appropriate for power terminal wiring, to ensure that voltage drop does not
- •Use copper cables rated at 600V, 75°C for power terminal wiring.
- •Use copper cables rated at 300V, 75°C for control terminal wiring.
- •Separate control circuit wires from the main circuits and other high voltage circuits (200 V relay sequence circuit).
- •Check for short circuits or wiring failure in the control circuit. They could cause system failure or device malfunction. •Use shielded cables for control terminal wiring. Failure to do so may cause malfunction due to interference. When grounding is needed, use shielded twisted pair (STP) cables.
- •If you need to re-wire the terminals due to wiring-related faults, ensure that the inverter keypad display is turned off and the charge lamp under the front cover is off before working on wiring connections. The inverter may hold a high voltage

### 2.5 Terminal Screw Specification

## ■ Input/Output Terminal Screw Specification (\*G100C)

electric charge long after the power supply has been turned off.

Product(kW)		Terminal screw Size	Screw Torque (Kgf•cm/Nm)	
	0.4 / 0.75	R/S/T, U/V/W: M3 (M3.5*)	R/S/T, U/V/W: 5.1 / 0.5 (10.3 / 1.0*)	
	1.5 / 2.2	R/S/T, U/V/W: M4 (M3.5*)	R/S/T, U/V/W: 12.1 / 1.2 (10.3 / 1.0*)	
3-Phase	4	R/S/T, U/V/W : M4	R/S/T, U/V/W: 18.4 / 1.8	
200V	5.5 / 7.5	R/S/T, U/V/W : M4	R/S/T: 14.0/1.4, U/V/W: 15.0 / 1.5	
	11/15	R/S/T, U/V/W: M5	R/S/T, U/V/W: 25.34/2.5	
	18.5/22	R/S/T, U/V/W: M6	R/S/T, U/V/W: 30.5/3	
	0.4 / 0.75/1.5/2.2	R/S/T, U/V/W: M3.5	R/S/T, U/V/W: 10.3 / 1.0	
3-Phase	4	R/S/T, U/V/W : M4	R/S/T, U/V/W: 18.4 / 1.8	
400V	5.5 / 7.5	R/S/T, U/V/W : M4	R/S/T: 14.0/1.4, U/V/W: 18.4 / 1.8	
	11/15/18.5/22	R/S/T, U/V/W: M5	R/S/T, U/V/W: 25.34/2.5	

# ■ Control Circuit Terminal Screw Specification(G100/G100C)

Terminal	Terminal Screw Size	Screw Torque (Kgf·cm/Nm)
24, P1–P5, CM	M2.6	4/0.4
VR, V1, I2, AO, CM, S+ / S-, A1/B1/C1, A2/C2 , Q1/EG*	M2.6	5.2/0.5

\*G100C series models support Q1/EG terminal as a substitute for A2/C2 terminal.

### ■ Control Circuit Terminal Screw Specification (G100 Safety)

Terminal	Terminal Screw Size	Screw Torque (Kgf·cm/Nm)	
A1/B1/C1, A2/C2	M2.6	5.2/0.5	
24, P1-P6, CM, SA/SB/SC	M2	2/0.2	
P7-P8, AO, IO, VR, V1, I2, V2, CM, S+/S-	M2	2/0.2	

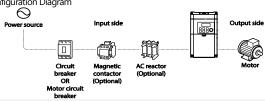
### (0) Caution

 Apply rated torques to the terminal screws. Loose screws may cause short circuits and malfunctions. Tightening the screw too much may damage the terminals and cause short circuits and malfuctions.

Appliquer des couples de marche aux vis des bornes. Des vis desserrées peuvent provoquer des courts-circuits

## 3. Installing the Inverter

# 3.1 Basic Configuration Diagram



### (i) Caution

•Note that the illustration on this user manual may represent the product with the cover open or the circuit breaker removed for explanation. When operating the inverter, make sure to follow the instructions of user

manual after fully installing the necessary parts, such as the cover and circuit breaker •Do not start or stop the inverter with a magnetic contactor. This may cause damage to the inverter. •If the inverter is damaged and loses control, the machine may cause a dangerous situation. Install an additional

safety device such as an emergency brake to prevent these situations. •High levels of current draw during power-on can affect the system. Ensure that correctly rated circuit breakers

are installed to operate safely during power-on situations. Reactors can be installed to improve the power factor. Note that reactors may be installed within 30 ft (9.14 m)

from the power source if the input power exceeds 10 times of inverter capacity.

### 3.2 Drive View9

•For the G100 series, you can set the parameters and monitor the inverter status using DriveView9 which is a PC software provided free of charge. In DriveView9, both Modbus-RTU and LS INV 485 protocols are available.

# ■ Compatible Circuit Breaker, Leakage Breaker), Magnetic Contactor) Models

## (manufactured by LS ELECTRIC)

Inverter	Circuit Breaker		Leakag	je Breaker	Magnetic Contactor	
Capacity	Model	Rating [A]	Model	Rating [A]	Model	Rating [A]
0.4-2				5	MC-6a	9
0.75-2	UTE100•H•FTU•15•3P•UL	15		10	MC-9a, 9b	11
1.5-2			EBS33c	15	MC-18a, 18b	18
2,2-2	UTE100+H+FTU+20+3P+UL	20		20	MC-22b	22
4.0-2	UTE100•H•FTU•30•3P•UL	30		30	MC-32a	32
5.5-2	UTS150•H•FTU•50•3P•UL	50	EBS53c	50	MC-50a	55
7.5-2	UTS150•H•FTU•60•3P•UL	60	EBS63c	60	MC-65a	65
11-2	UTS150•H•FTU•80•3P•UL	80	EBS103C	100	MC-85a	85
15-2	UTS150•H•FTU•100•3P•UL	100	EBS103C	125	MC-130a	130
18.5-4	UTS150•H•FTU•125•3P•UL	125	EBS203C	150	MC-150a	150
22-4	UTS150+H+FTU+150+3P+UL	150	EBS203C	175	MC-185a	185
0.4-4	UTS150•L•MCP•3.2•3P•UL	3.2		5	MC-6a	7
0.75-4	UTS150+L+MCP+6.3+3P+UL	6.3		5	MC-6a	/
1.5-4	UTS150•L•MCP•12•3P•UL	12		10	MC-9a, 9b	9
2,2-4	013130*L*IVICP*12*3P*0L	12	EBS33c	10	MC-12a, 12b	12
4.0-4	UTS150•L•MCP•20•3P•UL	20		20	MC-18a, 18b	18
5.5-4	UTS150•L•MCP•32•3P•UL	30		30	MC-22b	22
7.5-4	U13150•L•IVICP•32•3P•UL	30		30	MC-32a	32
11-4	UTS150•L•FTU•50•3P•UL	50	EBS53c	50	MC-50a	50
15-4	UTS150•L•FTU•60•3P•UL	60	EBS63c	60	MC-65a	65
18.5-4	UTS150•L•FTU•70•3P•UL	70	EBS103c	75	MC-75a	75
22-4	UTS150•L•FTU•90•3P•UL	90	EBS103c	100	MC-85a	85

### ■ Fuse and Reactor Specifications

Inverte	r capacity	Model	Current [A]	Voltage[V]	Inductance(mH)	Current(A)
	0.4 / 0.75	DFJ-10 <sup>1)</sup>	10		1.20	10
	1.5	DFJ-15	15		0.88	14
	2.2	DFJ-20	20		0.56	20
2	4.0	DFJ-30	30		0.39	30
3- Phase	5.5	DFJ-50	50		0.30	34
200V	7.5	DFJ-60	60		0.22	45
200V	11	DFJ-80	80		0.16	64
	15	DFJ-100	100	600	0.13	79
	18.5	DFJ-110	110		0.12	96
	22	DFJ-125	125		0.11	112
	0.4 / 0.75	DFJ-10	10		4.81	4.8
	1.5	DF)-10			3.23	7.5
	2.2	DFJ-15	15		2.34	10
2	4.0	DFJ-20	20		1.22	15
3-	5.5	DFJ-30	30		1.12	19
Phase 400V	7.5	DFJ-35	35		0.78	27
4000	11	DFJ-50	50		0.59	35
	15	DFJ-60	60		0.46	44
	18.5	DFJ-70	70		0.40	52
	22	DFJ-100	100		0.30	68
NI-1-1\D	FI Class II	COOL / L L	lal annua a Cilia	<u> </u>		•

Note1) DFJ is Class J/600V level model name of the Bussmann company.

### (6) Cautier

• Use Class CC, G, J, L, R or T UL Listed Input Fuse and UL Listed Breaker Only. See the table above For the Voltage and Current rating of the fuse and the breaker.

•Utiliser UNIQUEMENT des fusibles d'entrée homologués de Classe CC, G, J, L, R ou T UL et des disjoncteurs UL. Se reporter au tableau ci-dessus pour la tension et le courant nominal des fusibless et des disjoncteurs.

	Braking Resistor Specification							
	Produ	ct(kW)	Resistance(Ω)	Rated Capacity(W)	Produ	ct(kW)	Resistance(Ω)	Rated Capacity(W)
		0.4	300	100		0.4	1,200	100
		0.75	150	150		0.75	1,200 600 300 200 130 130 85 60 40 30 20	150
		1.5	60	300		1.5	300	300
		2.2	50	400		0.4 0.75 1.5 2.2 3.7 4	200	400
		3.7	33	600	3-Phase 4 1 1 400V 5.5 8 7.5 6 11 4 15 3 18.5 2	130	600	
3	3-Phase	4	33	600	3-Phase	4	130	600
2	200V	5.5	20	800	400V	5.5	85	1,000
		7.5	15	1,200		7.5	60	1,200
		11	10	2,400		11	40	2,000
		15	8	2,400		15	30	2,400
		18.5	5	3,600		18.5	20	3,600
		22	5	3,600		22	20	3,600

 $<sup>\</sup>bullet$  The standard for braking torque is 150 % and the working rate (%ED) is 5 %. If the working rate is 10 %, the rated capacity for braking resistance must be calculated at twice the standard.

### 3.4 Power Terminal Labels and Descriptions

Terminal Labels	Name	Description
<b>-</b>	Ground Terminal	Connect earth grounding.
R(L1)/S(L2)/T(L3)	AC power input terminal	Mains supply AC power connections.
B1/B2	Brake resistor terminals	Brake resistor wiring connection.
U/V/W	Motor output terminals	3-phase induction motor wiring connections.

- Do not use 3 core cables to connect a remotely located motor with the inverter.
- $\bullet \ \ When you operating \ Brake \ resistor, the \ motor \ may \ vibrate \ under \ the \ Flux \ braking \ operation. \ In \ this \ case,$ please turn off the Flux braking (Pr.50).
- Make sure that the total cable length does not exceed 665 ft (202 m). For inverters < = 4.0 kW capacity, ensure that the total cable length does not exceed 165 ft (50 m).
- Long cable runs can cause reduced motor torque in low frequency applications due to voltage drop. Long cable runs also increase a circuit's susceptibility to stray capacitance and may trigger over-current protection devices or result in malfunction of equipment connected to the inverter. Voltage drop is calculated by using the
- Voltage Drop (V) = [ $\sqrt{3}$  X cable resistance (m $\Omega$ /m) X cable length (m) X current (A)] / 1000
- Use cables with the largest possible cross-sectional area to ensure that voltage drop is minimized over long cable runs. Lowering the carrier frequency and installing a micro surge filter may also help to reduce voltage

d	rop.					
	Distance	< 165 ft (50 m)	< 330 ft (100 m)	> 330 ft (100 m)		
	Allowed Carrier Frequency	< 15 kHz	< 5 kHz	< 2.5 kHz		

### ∆ Warning

- Do not connect power to the inverter until installation has been fully completed and the inverter is ready to be operated. Otherwise, it may cause an electrical shock and result in personal injury or even death.
- terminals will damage the inverter.
- Power supply cables must be connected to the R, S, and T terminals. Connecting power cables to other • Use insulated ring lugs when connecting cables to R/S/T and U/V/W terminals
- The inverter's power terminal connections can cause harmonics that may interfere with other communication devices located near to the inverter. To reduce interference the installation of noise filters or line filters may be required.
- Are advanced-phase capacitors, surge protection and electromagnetic interference filters installed correctly?
- To avoid circuit interruption or damaging connected equipment, do not install magnetic contactors on the output side of the inverter. Metal debris in the inverter may cause inverter failure.
- 3.5 Control Terminal Labels and Descriptions

## ■ Control Board Switches and Connector

Switch	Description
SW1	NPN/PNP mode selection switch
SW2	Terminating Resistor selection switch
SW3	I2/PTC selection switch
RJ-45 Connector	Connect to Remote I/O or smart copier, connect with RS-485 communication.

### ■ Input Terminal Labels and Descriptions

Function	Label	Name	Description					
Multi-function	P1-P5	Multi-function Input 1-5	Configurable for multi-function input terminals. Factory default terminals and setup are as follows:					
terminal	P1-P8	Multi-function	• P1: Fx, P2: Rx, P3: BX, P4: RST, P5: Speed-L					
configuration	(Safety Type)	Input 1-8	P6: Speed-M, P7: Speed-H, P8: None					
	CM	Common Sequence	Common terminal for analog terminal inputs and outputs.					
	VR	Potentiometer frequency reference input	Used to setup or modify a frequency reference via analog voltage or current input.  • Maximum Voltage Output: 12V (G100C: 20mA)  • Maximum Current Output: 100mA,  • Potentiometer: 1-5kΩ					
	V1	Voltage input	Used to setup or modify a frequency reference via analog voltage input terminal.					
Analog input	V2 (Safety Type)	for frequency reference input	<ul> <li>Unipolar: 0-10V (12V Max)</li> <li>Bipolar: -10-10V (±12V Max)</li> </ul>					
	12*	Current input for frequency reference input	Used to setup or modify a frequency reference via current input terminal. V Mode :  Input current: 4-20 mA, Maximum Input current: 24mA  Input resistance: $249 \Omega$					
		PTC input (Safety Type)	PTC or PT1000 sensor is used					

<sup>\*</sup> For Safety Type, SW3 operates as I2 when set to the right and as PTC when set to the left

Output/Communication Terminal Labels and Descriptions							
Function	Label	Name	Description				
Andre O to t	AO	Voltage Output terminal	Used to send inverter output information to external devices: output frequency, output current, output voltage, or a DC voltage.  Output voltage: 0-10 V  Maximum output voltage/current: 12V, 10 mA  Factory default output Output frequency				
Analog Output	IO (Safety Type)	Current Output terminal	Used to send inverter output information to external devices: output frequency, output current, output voltage, or a DC voltage.  Output current: 0-20 mA  Maximum output current: 24 mA  Factory default output: Output frequency				
	24 External 24 V power source		Maximum output current: 100 mA*				
Digital Output	A1/C1/B1 Fault signal output 1		Sends out alarm signals when the inverter's safety features are activated (AC 250V < 1A, DC 30V < 1A).  • Fault condition: A1 and C1 contacts are connected (B1 and C1 open connection)  • Normal operation: B1 and C1 contacts are connected (A1 and C1 open connection)				
Digital Output	A2/C2	Fault signal output 2	Sends out alarm signals when the inverter's safety features are activated (AC 250V <1A, DC 30V < 1A), Fault condition: A2 and C2 contacts are open connection Normal operation: A2 and C2 contacts are connected				
	Q1/EG (G100C)	Open Collector	The G100C provides an open-collector output terminal (Q1/EG) insted of a fault signal output2 terminal(A2/C2). DC 24V, 100mA or less				
RS-485 Communication	S+/S-	RS-485 signal line	Used to send or receive RS-485 signals.				

Communication S+/S-\* When terminals SA and SB are connected to SC, the maximum output current of terminal 24 is 90mA.

## ■ Safety Function Input Terminal Labels and Descriptions

Function	Label	Name	Description				
	SA	Safety input A	In case of an emergency, the output is cut off based on the incoming input signal.				
Safety Function	SB Safety input B		SA and SB connected to SC : Normal operation     SA or SB disconnected to SC : Output cut-off				
	SC	Safety input power	DC 24V, 10mA or less				

3.6 Disabling the EMC Filter for Power Sources with Asymmetrical Grounding

•Before using the inverter, confirm the power supply's grounding system. Disable the EMC filter if the power source has an asymmetrical grounding connection. Check the location of the EMC filter on/off screw and attach the plastic washer to the screw under the control terminal block.





# 4. Learning to Perform Basic Operations

# 4.1 Operation Keys

• The following table lists the names and functions of the keypad's operation keys.

Key	Name	Description
(B)	[RUN] key	Used to run the inverter (inputs a RUN command).
and a	[STOP/RESET] key	STOP: Stops the inverter. RESET: Resets the inverter if a fault or failure occurs
<u>&gt;</u>	[▲] key, [▼] key	Switch between codes, or to increase or decrease parameter values.
%000 %400	[MODE/SHIFT] key	Moves between groups or moves to the digit on the left when setting the parameter. Press the MODE/SHIFT key once again on the maximum number of digits to move to the minimum number of digits.
AND	[ENTER] key	Switches from the selected state of parameter to the input state. Edits parameter and apply change. Accesses the operation information screen during failure on the failure screen.
	[Volume]	Used to set the operation frequency.

- \* Operates as ESC key if two keys out of [MODE/SHIFT] key,  $[\blacktriangle]$  key and  $[\blacktriangledown]$  key are entered at the same time. - Press ESC in the group navigation mode to go to the initial screen (the frequency display screen).
- Press ESC in the mode to change parameter to go to group navigation mode without saving.

## 4.2 Control Menu

• The control menu uses the following groups.

		33 1
Group	Display	Description
Operation	-	Configures basic parameters for inverter operation.
Drive ( <b>Dr</b> ive)	dr	Configures parameters for basic operations. These include jog operation, motor capacity evaluation, torque boost, and other keypad related parameters.
Basic ( <b>Ba</b> sic)	ьЯ	Configures basic operation parameters. These parameters include motor parameters and multi-step frequency parameters.
Advanced (Advanced)	Яd	Configures acceleration or deceleration patterns, frequency limits, etc.

Group	Display	Description				
Control (Control)	Ľπ	Configures sensorless vector-related features.				
Input Terminal (Input)		Configures input terminal-related features, including digital multi-functional inputs and analog inputs.				
Output Terminal (Output)	ОU	Configures output terminal-related features such as relays and analog outputs.				
Communication (Communication)	Eñ	Configures communication features for RS-485 or other communication options.				
Application (Application)	8P	Configures functions related to PID control.				
Protection ( <b>Pr</b> otection)	Pr	Configures motor and inverter protection features.				
Secondary Motor (2 <sup>nd</sup> Motor)	ñΖ	Configures secondary motor related features.  The secondary motor (M2) group appears on the keypad only when one of the multi-function input terminals (In.65–In.72) has been set to 26 (Secondary motor).				
User Sequence (User Sequence)	U5	Implement a simple sequence using a combination of				
User Sequence Function (User Sequence Function)	UF	different Function Blocks.				

<sup>\*</sup>The User Sequence feature can only be used with the G100 drive that has main firmware V3.2 and later.

### 4.3 Table of Functions in operation group

Code	Comm Address	Name	Keypad Display		Setting Range	Initial Value	Property*	V/F	SL
-	0h1D00	Target frequency	0.00	0-Ma	kimum frequency (Hz)	0.00	0	0	0
-	0h1D01	Acceleration time	REE	0.0-6	500.0(s)	5.0	0	0	0
-	0h1D02	Deceleration time	dEE	0.0-6	500.0(s)	10.0	0	0	0
				0	Keypad				
				1	Fx/Rx-1				
	0h1D03	Command Source	,	2	Fx/Rx-2	1:	x	_	0
-	UITIDUS	Command Source	dru	3	Int 485	Fx/Rx-1	^	U	
				4	Fieldbus <sup>1</sup>				
				5	UserSeqLink				
				0	Keypad-1				
				1	Keypad-2			0	
				2	V1				
		F		3	V2	0:			
-	0h1D04	Frequency reference	8-9	4	V0,Built-in Volume	V: Keypad-1	Х	0	0
		source		5	12	кеурац-т			
				6	Int 485				
				8	Fieldbus <sup>1</sup>				
				9	UserSeqLink				
	0h1D05	Multi-step speed frequency	5E 1	0.00	-Maximum	10.00	0/7	0	0
_	UITIDUS	1	3C 1	frequ	iency (Hz)	10.00	0/1	0	0
	0h1D06	Multi-step speed frequency	562	0.00-	-Maximum	20.00	0/7	0	0
	OITIDOO	2	366		iency (Hz)	20.00	0/1	٥	Ŭ
_	0h1D07	Multi-step speed frequency	553	0.00	Maximum	30.00	0/7	0	О
		3		frequ	iency (Hz)	50.00	·		
-	0h1D08	Output current	Elle				-/7	0	0
-	0h1D09	Motor revolutions per minute	rPñ.				-/7	0	0
	0h1D0A	Inverter DC voltage	d£L	-		-	-/7	0	0
-	0h1D0B	Inverter output voltage	υÜL				-/7	0	0
-	0h1D0C	Out of order signal	nΩn				-/7	0	0
	0h1D0D	Select rotation direction		F	Forward run	F			0
-	טטטוווט	select rotation direction	dr[	r	Reverse run	Г	0/7	0	١٠

<sup>&</sup>lt;sup>1</sup> Table of options are provided separately in the option manual.

## 5. Technical Specification

5.1 Input and Output Specification

• 3-phase 200V (0.4–22kW)

• 3-pna:	se 2007 (0.4–22	(KVV)											
Model □	□□□G100-2□		0004	8000	0015	0022	0040	0055	0075	0110	0150	0185	0220
		HP	0.5	1.0	2.0	3.0	5.0	7.5	10	15	20	25	30
Applied motor Normal I  Rated ca (RVA)  Rated Cu (3-Phase life)  Rated output (60Hz, 1-F Output I Output I Output I Output I Output I Rated cun I Share I Output I Output I Rated Cun I Output I Output I Output I Output I Rated Cun I Output I Output I Output I Output I Output I Rated Cun I Output I Rated Cun I Output I Rated Cun I Rated Cu	Heavy load	kW	0.4	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22
motor		HP	1.0	2.0	3.0	5.0	7.5	10	15	20	25	30	-
	Normal load	kW	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22	-
	Rated capacity	Heavy load	1.0	1.9	3.0	4.2	6.5	9.1	12.2	17.9	22.9	28.6	33.5
	(kVA)	Normal load	1.2	2.3	3.7	4.6	6.9	11.4	152	21.3	26.7	31.2	-
	Rated current(A)	Heavy load	2.5	5.0	8.0	11.0	17.0	24.0	32.0	47	60	75	88
	[3-Phase input]	Normal load	3.1	6.0	9.6	12.0	18.0	30.0	40.0	56	70	85	-
	Rated current(A)	Heavy load	1.5	2.8	4.6	6.1	9.3	12.8	17.4	26.8	34	41	48
	[60Hz, 1-Phase input]	Normal load	2.0	3.6	5.9	6.7	9.8	16.3	22.0	31	38	45	-
	Rated current(A)	Heavy load	1.5	2.7	4.5	5.9	9.1	12.4	16.9	26	33.1	39.9	46.7
	[50Hz, 1-Phase input]	Normal load	1.9	3.5	5.7	6.5	9.5	15.8	21.3	30	36.9	43.7	-
	Output frequency		0-400Hz(IM Sensorless: 0-120Hz)										
	Output voltage (V)		3-phas	e 200-24	10 V							25 185 30 22 286 312 75 85 41 45 399 43.7	
	Working voltage (V)		3-phase 200-240 VAC (-15% to +10%) / 1-phase 240 VAC (-5% to +10%)										
Rated	Input frequency		50-60Hz(±5%)										
input	Rated current	Heavy load	2.2	4.9	8.4	11.8	18.5	25.8	34.9	53.2	68.4	85.5	101.6
	Heavy load kW  Normal load HP  Rated capacity Hes (kVA) Noi  Rated current(A) Hes (3-Phase input) Noi  Rated current(A) Hes (60Hz, 1-Phase input) Noi  Cutput frequency  Output voltage (V)  Working voltage (V)  Input frequency  Rated current  A Hes (3-Phase input) Noi  Output voltage (V)  Working voltage (V)  Rated current  Rated current  Rated current  A Hes (3-Phase input) (A) Noi  (G)	Normal load	3.0	6.3	10.8	13.1	19.4	32.7	442	63.8	79.8	94.6	-
Weight (kg)				1.06	1.36	1.4	1.89	3.08	321	4.84	7.6	111	11.18
*(G100C)			*(0.81)	*(0.83)	*(1.1)	*(1.13)	*(1.78)	3.00	اعدا	4.04	1.0	(1.1	11.10

## • 3-phase 400V (0.4–22kW)

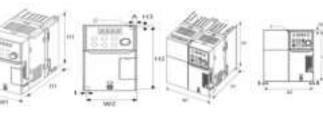
Model			0004	8000	0015	0022	0040	0055	0075	0110	0150	0185	0220
Applied motor	Heavy load	HP	0.5	1.0	2.0	3.0	5.0	7.5	10	15	20	25	30
		kW	0.4	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22
	Normal load	HP	1.0	2.0	3.0	5.0	7.5	10	15	20	25	30	40

		kW	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22	30
	Rated capacity	Heavy load	1.0	1.9	3.0	4.2	6.5	9.1	12.2	18.3	23.6	29.7	34.3
	(kVA)	Normal load	1.5	2.4	3.9	5.3	7.6	12.2	17.5	23.6	29.0	34.3	46.5
	Rated current(A)	Heavy load	1.3	2.5	4.0	5.5	9.0	12.0	16.0	24	31	39	45
	[3-Phase input]	Normal load	2.0	3.1	5.1	6.9	10.0	16.0	23.0	31	38	45	61
Rated	Rated current(A)	Heavy load	0.7	1.4	2.1	2.8	4.9	6.4	8.7	15	18	23	27
output	[60Hz, 1-Phase input]	Normal load	1.3	1.9	2.8	3.6	5.4	8.7	12.6	18	23	27	35
	Rated current(A)	Heavy load	0.7	1.4	2.0	2.7	4.8	6.2	8.5	14.6	17.4	22.3	26.2
	[50Hz, 1-Phase input]	Normal load	1.3	1.8	2.7	3.5	5.2	8.4	12.2	17.4	22.2	26.1	33.8
	Output frequency		0-400Hz(IM Sensorless: 0-120Hz)										
	Output voltage (V)	3-phase 380-480 V											
	Working voltage (V)		3-phase 380-480 VAC (-15% to +10%) / 1-phase 480 VAC (-5% to +10%)										
Rated	Input frequency		50-60Hz(±5%)										
input	Rated current(A)	Heavy load	1.1	2.4	4.2	5.9	9.8	12.9	17.5	27.2	35.3	44.5	51.9
	[3-Phase input]	Normal load	2.0	3.3	5.5	7.5	10.8	17.5	25.4	35.3	43.3	51.9	70.8
Weight (kg)			1.02	1.06	1.4	1.42	1.92	3.08	3.12	489	491	7.63	7.65
(Built-in EMC filter)			(1.04)	(1.08)	(1.44)	(1.46)	(1.98)	(324)	(3.28)	(5.04)	(5.06)	(7.96)	(7.98)
*(G100C)			*(0.82)	*(0.85)	*(1.14)	*(1.14)	*(1.77)	(324)	(320)	(3304)	(300)	(1.50)	(1.30)

## 5.2 External Dimensions

■ 0.4-2.2kW(G100C)

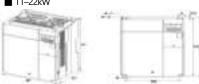
■ 4.0kW(G100C)







### ■ 11-22kW



# Unit: mm(inches)

Items	W1	W2	Н1	H2	НЗ	H4	D1	A	В	Ф
0004G100C-2	70	65.5	128	119	4.5	-	130	4.5	4.5	4.5
0004G100C-4	(2.76)	(2.58)	(5.04)	(4.69)	(0.18)		(5.11)	(0.18)	(0.18)	(0.18)
0008G100C-2	70	65.5	128	119	4.5	=	135	4.5	4.5	4.5
0008G100C-4	(2.76)	(2.58)	(5.04)	(4.69)	(0.18)		(5.31)	(0.18)	(0.18)	(0.18)
0015G100C-2/4	100	95.5	128	119	4.5		135	4.5	4.5	4.5
0022G100C-2/4	(3.93)	(3.76)	(5.04)	(4.69)	(0.18)		(5.31)	(0.18)	(0.18)	(0.18)
0040G100C-2/4	140 (5.51)	132 (5.20)	128 (5.04)	120.5 (4.74)	5 (0.20)		155 (6.10)	ū	4.5 (0.18)	4.5 (0.18)
0004G100-2/4	86.2	76.2	154	154	164	5	131.5	5	4.5	4.5
0008G100-2/4	(3.39)	(3.00)	(6.06)	(6.06)	(6.46)	(0.20)	(5.18)	(0.20)	(0.18)	(0.18)
0015G100-2/4	101	90	167	167	177	5	150.5	5.5	4.5	4.5
0022G100-2/4	(3.98)	(3.54)	(6.57)	(6.57)	(6.97)	(0.20)	(5.93)	(0.22)	(0.18)	(0.18)
0040G100-2	135	125	183	183	193	5	150.5	5.0	4.5	4.5
0040G100-4	(5.31)	(4.92)	(7.20)	(7.20)	(7.60)	(0.20)	(5.93	(0.20)	(0.18)	(0.18)
0055G100-2/4 0075G100-2/4	180 (7.09)	Up side : 162(6.38) Down side : 170(6.70)	220 (8.66)	229.5 (9.04)	240 (9.45)	5.5 (0.22)	144 (5.67)	Up side : 9(0.35) Down side : 5(0.20)	4.5 (0.18)	Φ-1: 4.5(0.18) Φ-2: 9(0.35)
0110G100-2 0110G100-4 0150G100-4	180 (7.09)	157 (6.18)	290 (11.4)	273.7 (10.8)	290 (11.4)	11.3 (0.44)	173 (6.81)	8.5 (0.33)	4.5 (0.18)	Φ-1: 4.5(0.18) Φ-2: 8.5(0.33)
0150G100-2 0185G100-4 0220G100-4	220 (8.66)	193.8 (7.63)	345 (13.6)	331 (13.0)	345 (13.6)	8 (0.31)	187 (7.36)	10.1 (0.40)	5.5 (0.22)	Φ-1: 5.5(0.22) Φ-2: 11(0.43)
0185G100-2 0220G100-2	260 (10.2)	229.8 (9.05)	400 (15.7)	386 (15.2)	400 (15.7)	8 (0.31)	187 (7.36)	11.4 (0.45)	6.6 (0.26)	Ф-1: 6.6(0.26) Ф-2: