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AC Variable Speed Drive

LSLV-M100 series

User's Manual

0.1 ~ 2.2 kW [Single Phase 200V]



Safety Instructions

- Read this manual carefully before installing, wiring, operating, servicing or inspecting this equipment.
- Keep this manual within easy reach for quick reference.



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- Check the protection degree of circuits and equipments used in the inverter degree of circuit protection and the degree of equipment protection. The following connection terminals and components are electrical protection class 0 devices. The circuit is protected by the essential insulation and electric shock may occur if the insulation is done improperly. The same protection measures for electric cables must be taken when the using or installing the following components, or when you connect a cable to the following terminals or components.
 - Multi-function terminals: P1-P3, P4 (Advanced I/O), P5 (Advanced I/O), CM
 - Analog terminal inputs and outputs: VR, V1, I2 (Advanced I/O), AO, CM
 - Other terminal block connectors: Q1 (Standard I/O), EG (Standard I/O), 24, A1, B1, C1, A2 (Advanced I/O), C2 (Advanced I/O)

- Cooling fan
- This inverter is a protection class 1 product.

⚠ Caution

- Do not modify the interior workings of the inverter. Doing so will void the warranty.
- The inverter is designed for 3-phase motor operation. Do not use the inverter to operate a single phase motor.
- Do not place heavy objects on top of electric cables. Doing so may damage the cable and result in an 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-M100 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 RMS symmetrical amperes.
- 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-M100 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	UTE100(E/N)	UTS150(N/H/L)	ABS33c	ABS53c	ABS63c	ABS103c
240V(50/60Hz)	50/65 kA	65/100/150 kA	30 kA	35 kA	35 kA	85 kA

2. Preparing the Installation

2.1 Product Identification

LSLV 0022 M100 ~ 1E0FNS						
Motor capacity	0001-0.1kW	0002-0.2kW	0004-0.4kW	0008-0.75kW	0015-1.5kW	0022-2.2kW
Series name	M100					
Input voltage	1 ~ Single phase 200V ~ 240V					
Keypad	E ~ LED Keypad					
UL Type	O ~ UL Open Type					
EMC Filter	F ~ Built-in EMC Filter (C2)					
Reactor	N ~ Non-Reactor					
I/O	S ~ Standard		A ~ Advanced			

2.2 Installation Considerations

Items	Description
Ambient Temperature ¹⁾	14~122°F (-10~50°C)
Ambient Humidity	95% relative humidity (no condensation)
Storage Temperature	-4~149°F (-20~65°C)
Environmental Factors	An environment free from corrosive or flammable gases, oil residue or dust
Altitude/Vibration	Lower than 3,280 ft (1,000 m) above sea level/less than 1G (9.8 m/sec ²)
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.

⚠ Caution

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

2.3 Selecting and Preparing a Site for Installation

- The inverter must be installed on a wall that can support the inverter's weight.
- The location must be free from vibration. Vibration can adversely affect the operation of the inverter.
- The inverter can become very hot during operation. Install the inverter on a surface that is fire-resistant or flame-retardant arc with sufficient clearance around the inverter to allow air to circulate. The illustrations below detail the required installation clearances.
- Ensure sufficient air circulation is provided around the inverter when it is installed. If the inverter is to be installed inside a panel, enclosure, or cabinet rack, carefully consider the position of the inverter's cooling fan and the ventilation louver. The cooling fan must be positioned to efficiently transfer the heat generated by the operation of the inverter.
- If you are installing multiple inverters in one location, arrange them side by side and remove their top covers (optional). 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 inverter.

Note

- The quantity and dimensions of the mounting brackets vary based on frame size.

⚠ Caution

- 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 an appropriate transport method that is suitable for the weight.
- 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 Specifications

	Load(kW)	Ground		Power I/O			
		mm ²	AWG	mm ²		AWG	
				R/T	U/V/W	R/T	U/V/W
Single Phase 200V	0.1, 0.2, 0.4, 0.75	3.5	12	2	2	14	14
	1.5, 2.2	3.5	12	3.5	3.5	12	12

Note

- Class 3 grounding is required. Resistance to ground must be < 100Ω.

⚠ Warning

- Install ground connections for the inverter and the motor by following the correct specifications to ensure safe and accurate operation. Using the inverter and the motor without the specified grounding connections may result in electric shock.

⚠ Caution

- Tighten terminal screws to their specified torque. Loose terminal screws may allow the cables to disconnect and cause short circuit or inverter failure. Over tightening terminal screws may damage the terminals and cause short circuits and malfunctions.

- Use copper cables rated for 600V, 75°C for power terminal wiring.

- Use copper cables rated for 300V, 75°C for control terminal wiring.
- When making wiring connections at the power terminals, do not make a bi-wired connection to a single terminal.
- Power supply cables must be connected to the R and T terminals. Connecting power cables to the U, V, and W terminals will cause internal damage to the inverter. Connect motors to the U, V, and W terminals. Phase sequence arrangement is not necessary.

⚠ 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 provoquer 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,

et une valeur nominale de 300 V, 75 °C pour le câblage de la borne de commande.

- Ne jamais connecter deux câbles à une borne lors du câblage de l'alimentation.
- Les câblages de l'alimentation électrique doivent être connectés aux bornes R, 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 Crimp Terminal Connectors (Bare wire)		With Crimp Terminal Connectors (Bootlace Ferrule)	
	mm ²	AWG	mm ²	AWG
P1~P5/CM/VR/V1/I2/AO/Q1/EG/24 ¹⁾	0.75	18	0.5	20
A1/B1/C1/A2/C2 ¹⁾	1.0	17	1.5	15

1) There are no P4, P5, I2, A2, and C2 terminals on the standard I/O, and there are no Q1 and EG terminals on the Advanced I/O.

⚠ Caution

- Wherever possible use cables with the largest cross-sectional area for mains power wiring, to ensure that voltage drop does not exceed 2%.
- Use copper cables rated for 600V, 75°C for power terminal wiring.
- Use copper cables rated for 300V, 75°C for control terminal wiring.

Cable Wiring

- 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.

⚠ 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.
- The inverter's power is supplied by the supply grounding system. The TT, TN, IT, and corner-grounded systems are not suitable for this inverter.
- The inverter may generate direct current to the inverter's protective ground cable. Only type B Residual Current Devices (RCD) or Residual Current Monitors (RCM) can be installed.
- Use cables with the largest cross-sectional area, appropriate for power terminal wiring, to ensure that voltage drop does not exceed 2%.

- Use copper cables rated at 600V, 75°C for power terminal wiring.

- Use copper cables rated at 300V, 75°C for control terminal wiring.

- Connect the control terminals separately from the power terminal wiring or high potential circuit (200 V relay sequence circuit).
- Ensure that there are no control terminal shorts or improper wiring. Control terminal shorts or improper wiring may damage the inverter or cause malfunction.
- Use a shielded cable while making wiring connections at the control terminal. Unshielded cables may cause the inverter to malfunction due to interference. Use an STP cable if ground connections must be installed.
- 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 electric charge long after the power supply has been turned off.

2.5 Terminal Screw Specification

Input/Output Terminal Screw Specification

Product(kW)		Terminal screw Size								Screw Torque (Kg·cm/Nm)
		E	R	T	B1	B2	U	V	W	
Single phase 200V	0.1/0.2/0.4/0.75	M3								M3 ~M3.5 (2.1~5.0/0.2~0.5) M4 (2.1~8.0/0.2~0.8)
	1.5/2.2	M4				M3.5				

Control Circuit Terminal Screw Specification

Terminal	Terminal Screw Size	Screw Torque(Kgf·cm/Nm)
P1~P5/CM/VR/V1/I2/AO/Q1/EG/24 ²⁾	M2.6	4.0/0.4
A1/B1/C1/A2/C2 ²⁾		

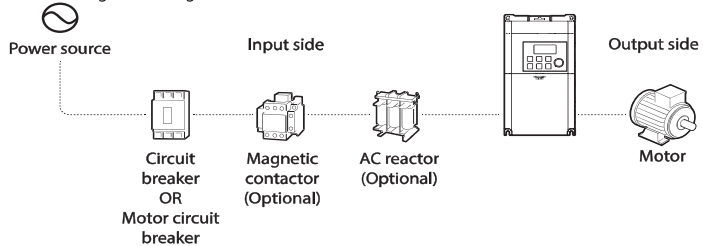
2) P4, P5, I2, A2, and C2 terminals are unavailable when using the standard I/O. Q1 and EG terminals are unavailable when using the advanced I/O.

⚠ 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 malfunctions.
- ⚠ Attention
 - Appliquer des couples de marche aux vis des bornes. Des vis desserrées peuvent provoquer des courts-circuits et des dysfonctionnements.

3. Installing the Inverter

3.1 Basic Configuration Diagram



⚠ Caution

- Figures in this manual are shown with covers or circuit breakers removed to show a more detailed view of the installation arrangements. Install covers and circuit breakers before operating the inverter. Operate the product according to the instructions in this manual.
- Do not start or stop the inverter using a magnetic contactor, installed on the input power supply.
- 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 is 10 times over the inverter's power.

3.2 Peripheral Devices

Compatible Circuit Breaker, Leakage Breaker), Magnetic Contactor) and Motor Circuit Breaker

(MMS) Models (manufactured by LS ELECTRIC)

Inverter Capacity	Circuit Breaker		Leakage Breaker		Magnetic Contactor		Motor Circuit Breaker (MMS)			
	Model	Rating [A]	Model	Rating [A]	Model	Rating [A]	Model	Rating [A]		
0.1kW-1	UTE100N	15	EBS33c	5	MC-6a	9	MMS-32H-1	1		
0.2kW-1							MMS-32H-2.5	2.5		
0.4kW-1							MMS-32H-6	6		
0.8kW-1				MMS-32H-8			8			
1.5kW-1				15			MC-18a, 18b	18	MMS-32H-17	17
2.2kW-1				20			20	MC-22b	22	MMS-32H-32

Fuse and Reactor Specifications

Inverter capacity	AC Input Fuse		AC Reactor	
	Current [A]	Voltage[V]	Inductance[mH]	Current [A]
0.1/0.2kW-1	5	600	4.2	3.5
0.4/0.8kW-1	10		1.2	10
1.5kW-1	15		0.88	14
2.2kW-1	20		0.56	20

⚠ Caution

- Use Class H or RK5 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.
- ⚠ Attention
 - Utiliser UNIQUEMENT des fusibles d'entrée homologués de Classe H ou RK5 UL et des disjoncteurs UL. Se reporter au tableau ci-dessus pour la tension et le courant nominal des fusibles et des disjoncteurs.

■ Braking Resistor Specification		
Product(kW)	Resistance(Ω)	Rated Capacity(W)
1.5	60	300
2.2	50	400
•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.		

3.3 Power Terminal Labels and Descriptions		
Terminal Labels	Name	Description
R/T	AC power input terminal	Mains supply AC power connections.
B1/B2(1.5kW~2.2kW)	Brake resistor terminals	Brake resistor wiring connection.
U/V/W	Motor output terminals	3-phase induction motor wiring connections.

Note

- Use STP (Shielded Twisted Pair) cables to connect a remotely located motor with the inverter. Do not use 3 core cables.
- Ensure that the total cable length does not exceed 165ft (50m).
- 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 following formula:
Voltage Drop (V) = [√3 X cable resistance (mΩ/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 drop.

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. Doing so may result in electric shock.

⚠ Caution

- Power supply cables must be connected to the R and T terminals. Connecting power cables to other terminals will damage the inverter.
- Use insulated ring lugs when connecting cables to R/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.
- To avoid circuit interruption or damaging connected equipment, do not install phase-advanced condensers, surge protection, or electronic noise filters on the output side of the inverter.
- To avoid circuit interruption or damaging connected equipment, do not install magnetic contactors on the output side of the inverter.

3.4 Control Terminal Labels and Descriptions

- Terminal labels are the same for the both of Standard I/O and Advanced I/O.
- If a specified terminal is only available in Standard I/O, it will be indicated as (Standard I/O).
- If a specified terminal is only available in Advanced I/O, it will be indicated as (Advanced I/O).

■ Control Board Switches	
Switch	Description
SW1	NPN/PNP mode selection switch
SW2(Advanced I/O)	Analog voltage/current input terminal (I2) selection switch
SW3(Advanced I/O)	Terminating resistor selection switch

■ Connectors	
Connector	Description
RJ45 Port	Connection of the remote keypad, Smart Copier, or RS 485 communication (Advanced IO)

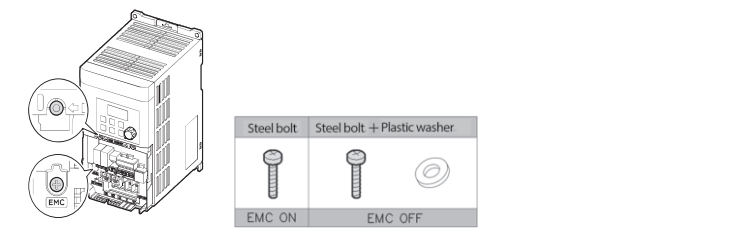
■ Input Terminal Labels and Descriptions			
Function	Label	Name	Description
Multi-function terminal configuration	P1~P5	Multi-function Input 1~5	Configurable for multi-function input terminals. Factory default terminals and setup are as follows: <ul style="list-style-type: none">• P1:Fx• P2:Rx• P3:Emergency stop trip• P4:Fault reset (RESET)• P5:Jog operation command (JOG) (Terminal P1~P3 are available only in case of Standard I/O)
	CM	Common Sequence	Common terminal for analog terminal inputs and outputs.
Analog input configuration	VR	Potentiometer frequency reference input	Used to setup or modify a frequency reference via analog voltage or current input. <ul style="list-style-type: none">• Maximum Voltage Output: 12V• Maximum Current Output: 100mA,• Potentiometer: 1~5kΩ
	V1	Voltage input for frequency reference input	Used to setup or modify a frequency reference via analog voltage input terminal. <ul style="list-style-type: none">• Unipolar: 0~10V (12V Max.)

Function	Label	Name	Description
	I2 (Advanced I/O)	Voltage/current input for frequency reference input	Used to setup or modify a frequency reference via analog voltage or current input terminals. Switch between voltage (V2) and current (I2) modes using a control board switch (SW2). V Mode : <ul style="list-style-type: none">• Unipolar: 0~10 V (12 V Max.) I Mode : <ul style="list-style-type: none">• Input current : 4~20 mA

■ Output/Communication Terminal Labels and Descriptions			
Function	Label	Name	Description
Analog output	AO	Voltage Output	Used to send inverter output information to external devices: output frequency, output current, output voltage, or a DC voltage. <ul style="list-style-type: none">• Output voltage: 0~10 V• Maximum output voltage/current: 10V, 10 mA• Factory default output: Output frequency
Digital output	Q1 (Standard I/O)	Multi-functional (open collector)	DC 26 V, 100 mA or less
	EG (Standard I/O)	Common	Common ground contact for an open collector (with external power source)
	24	External 24V power source	Maximum output current: 50 mA
	A1/C1/B1	Fault signal output	Sends out alarm signals when the inverter's safety features are activated (AC 250V <1A, DC 30V < 1A). <ul style="list-style-type: none">• 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)
	A2/C2 (Advanced I/O)	Fault signal output	Sends out alarm signals when the inverter's safety features are activated (AC 250V <1A, DC 30V < 1A). <ul style="list-style-type: none">• Fault condition: A2 and C2 contacts are connected• Normal operation: A2 and C2 contacts are open connection
Communication	RJ45	Remote keypad signal line	Used to send or receive the remote keypad (optional) signals.
		RS-485 signal line (Advanced I/O)	Used to send or receive RS-485 signals.

3.5 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
	[RUN] key	Used to run the inverter (inputs a RUN command).
	[STOP/RESET] key	STOP: stops the inverter. RESET: resets the inverter following fault or failure condition.
	[▲] key, [▼] key	Switch between codes, or to increase or decrease parameter values.
	[MODE/SHIFT] key	Switch between groups, or to move the cursor during parameter setup or modification.
	[ENTER] key	Used to enter the parameter setting mode, apply the set parameter, and enter the operation information screen from the fault notice screen when a fault occurs.
	[Volume] key	Used to set the operation frequency.

4.2 Control Menu		
•The M100 inverter control menu uses the following groups.		
Group	Display	Description
Operation	-	Configures basic parameters for inverter operation.
Drive (Drive)		Configures parameters for basic operations. These include jog operation, torque boost, and other parameters.
Basic (Basic)		Configures basic parameters, including motor-related parameters and multi-step frequencies.
Advanced (Advanced)		Configure acceleration or deceleration patterns and to setup frequency limits.
Control (Control)		Configures functions such as carrier frequency or speed search.
Input Terminal (Input)		Configures input terminal-related features, including digital multi-functional inputs and analog inputs.
Output Terminal (Output)		Configures output terminal-related features such as relays and analog outputs.
Communication (Communication)		Configures communication features for RS-485 or other communication options. ※Available only for models equipped with advanced I/O.
Application (Application)		Configures PID control-related sequences and operations.
Protection (Protection)		Configures motor or inverter protection features.
Secondary Motor (2 nd Motor)		Configures secondary motor related features. ※The secondary motor (M2) group appears on the keypad only when one of the multi-function input terminals (standard I/O model: In65-67, advanced I/O model: In65-69) has been set to 12 (Secondary motor).
Configuration (Configuration)		Configures various features such as parameter setting,

4.3 Table of Functions in operation group

- Groups, except the Operation group, are not displayed on the group list and not accessible as factory default to prevent parameter input error. To display and access all groups, go to the OGr code in the Operation group and set the parameter to 1.

Display	Comm. Address	Name	Setting Range	Initial Value	Property*
0.00	0h1F00	Command frequency	0.00~Maximum frequency [Hz]	0.00	O
ACC	0h1F01	Acceleration time	0.0~6000.0 [s] ¹⁾	5.0	O
dEC	0h1F02	Deceleration time		10.0	O
drv	0h1F03	Command source	0 Keypad	1	X
			1 Fx/Rx-1		
			2 Fx/Rx-2		
			3 RS-485 communication ²⁾		
Frq	0h1F04	Frequency Setting method	0 Keypad 1	0	X
			1 Keypad 2		
			2 V0: 0~5 [V], Built-in Volume		
			3 V1: 0~10 [V]		
			4 I2(I): 0~20 [mA] ²⁾		
			5 I2(V): 0~10 [V] ²⁾		
			6 V0+I2 (I) ²⁾		
			7 V0+I2 (V) ²⁾		
			8 V0+V1		
			9 RS-485 communication ²⁾		
MkW	0h1F05	Motor selection	0.1~0.1kW	-	X
			0.2~0.2kW		
			0.4~0.4kW		
MrC ³⁾	0h1F06	Rated motor current	0.4~0.4kW	-	X
			0.75~0.75kW		
			1.5~1.5kW		
MbF	0h1F07	Base frequency	0.1~150.0[A]	-	X
FrM	0h1F08	Maximum frequency	30.00~400.00[Hz]	60.00	X
IOv	0h1F09	Output voltage setting	40.00~400.00[Hz]	60.00	X
Ftb	0h1FOA	Forward boost	0, 170~264[V]	0	X
rtb	0h1FOB	Reverse boost	0.0~20.0[%]	4.0	X
CUr	0h1FOC	Output current	0.0~20.0[%]	4.0	X
			-	-	-

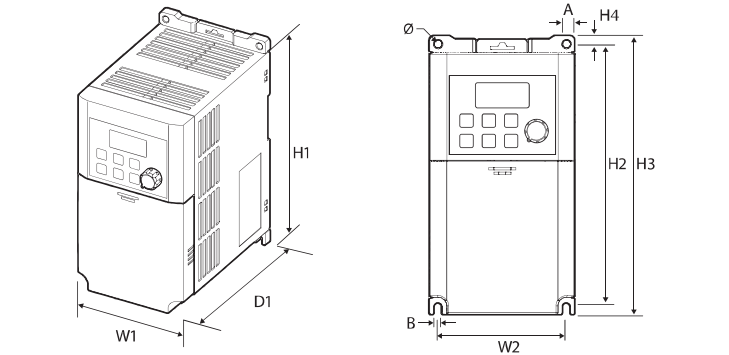
Display	Comm. Address	Name	Setting Range		Initial Value	Property*
rPM	0h1F0D	Motor RPM	-		-	-
dCL	0h1FOE	Inverter DC voltage	-		-	-
vOL, POr, tOr, v1M, I2M ⁴⁾	0h1FOF	User select signal	vOL	Output voltage	vOL	-
			POr	Output power		
			tOr	Output torque		
			v1M	Analog V1 terminal input		
			I2M	Analog I2 terminal input		
nOn	0h1F10	Currently out of order	-		-	-
OGr	0h1F11	Open hidden groups	0	Hide groups except for operation group	0	-
			1	Enable all groups		

1) The setting range varies depending on the set value of the bA 8 code.
2) Available only for models equipped with advanced I/O.
3) The initial value varies depending on the motor capacity setting (MkW) and the value is set based on the 220/440 HIGEN motor when shipping.
4) Display information can be selected at dr81 (Monitor item setting).^{*}Settings can be changed during the inverter operation.

5. Technical Specification								
5.1 Input and Output Specification								
Model LSLV□□□□M100~1E0FN□			0001	0002	0004	0008	0015	0022
Applied motor	Heavy load	HP	0.125	0.25	0.5	1.0	2.0	3.0
		kW	0.1	0.2	0.4	0.75	1.5	2.2
Rated output	Rated capacity (kVA)		0.3	0.6	0.95	1.9	3.0	4.5
	Rated current (A)		0.8	1.4	2.4	4.2	7.5	11.0
	Output frequency		0~400Hz					
	Output voltage (V)		3-phase 200~240V					
Rated input	Working voltage (V)		Single phase 200~240Vac (-15%~+10%)					
	Input frequency		50~60Hz(±5%)					
	Rated current (A)		1.0	1.8	3.7	7.1	13.6	18.7
Weight(lb/kg)			1.46/0.66		2.2/1		3.2/1.45	

5.2 External Dimensions

■ 0.1~2.2kW(Single Phase)



Items	W1	W2	H1	H2	H3	H4	D1	A	B	Φ
0001M100-1, 0002M100-1	85 (3.34)	75 (2.95)	135 (5.31)	135.5 (5.33)	145 (5.70)	5 (0.19)	100 (3.93)	5 (0.19)	4.5 (0.18)	4.5 (0.18)
0004M100-1, 0008M100-1	85 (3.34)	75 (2.95)	153 (6.02)	153.5 (6.04)	163 (6.42)	5 (0.19)	123 (4.84)	5 (0.19)	4.5 (0.18)	4.5 (0.18)
0015M100-1, 0022M100-1	100 (3.94)	90 (3.54)	180 (7.08)	180.5 (7.10)	190 (7.48)	5 (0.19)	140 (5.51)	5 (0.19)	4.5 (0.18)	4.5 (0.18)

Unit: mm (inches)