Contents

Safety Instructions

Read this operation manual carefully and familiarize yourself with the operation of the inverter before installation, connection (wiring), operation or maintenance and inspection of the device. Be familiar with the inverter, safety information, and safety signs before using the inverter.
In this instruction manual, safety signs are classified into the following categories.

WARNING
Improper operation may result in death or serious injury.

CAUTION
Improper operation may result in slight to medium injury or property damage.

Note: More serious situations than those covered by the CAUTION sign can result depending on the circumstances. It is important that you always follow the instructions.

Compliance with UL/cUL standards [Applicable to products with UL/cUL mark]

CAUTION

1. [WARNING] Take care of electric shock. Be sure to turn the inverter off before starting work.
2. [CAUTION] When the charge lamp is lit, the inverter is still charged at a dangerous voltage.
3. [WARNING] There are two or more live parts inside the inverter.
4. The inverter is approved as a part used inside a panel. Install it inside a panel.
5. Perform wiring to the input, output and control terminals of the inverter, referring to the table below. Use UL certified round crimp terminal to the input and output terminals with insulation cover or covered with reduced tube to obtain the insulation distance. Use a crimping tool recommended by the terminal manufacturer when fabricating crimp terminals.
6. Install a fuse in the power supply to the inverter, referring to the table below.

Voltage	Inverter type	Tightening torque [Nm]		Applicable wire diameter [AWG] (mm^2)[1)]		Fuse [A] [2)]
		L1/L, L2/N U, V, W	Control section	L1/L, L2/N U, V, W	Control section	
Single-phase 200V input	GSX600-0.4-S	1.2	0.4	14 (2.1)	20 (0.5)	10
	GSX600-0.75-S					15
	GSX600-1.5-S			12 (3.3)		30
	GSX600-2.2-S	1.8		10 (5.3)		40

1) Use copper wires of allowable maximum temperature 60 or75 °C.
2) Use UL certified "quick breaking fuse".

7. Connect the power supply satisfying the characteristics shown in the table below as an input power supply of the inverter. (Short circuit rating)

Inverter type	Input max. voltage	Input current
GSX6000.4-2.2-S	AC240V	5,000 A or less

Compliance with low voltage directive in EU [Applicable to products with TÜV mark]

CAUTION

1. Safe separation for control interface of this inverter is provided when this inverter is installed in overvoltage category II. PELV (Protective Extra Low Voltage) circuit or SELV (Safety Extra Low Voltage) circuit from external controller is connected to the interface directly.
2. Basic insulation for control interface of this inverter is provided when this inverter is installed in overvoltage category III. An insulation transformer has to be installed between power supply mains and this inverter when SELV circuit from external controller is connected to this inverter directly. Otherwise supplementary insulation between control interface of this inverter and environment must be provided.
3. The ground terminal ⏚G should always be connected to the ground. Don't use only RCD as the sole method of electric shock protection. Dimensions of external PE conductor should be same as dimensions of input phase conductor and capable for possible fault.
4. Use MCCB or MC that conforms to EN or IEC standard.
5. Where RCD (Residual-current-operated protective device) is used for protection in case of direct or indirect contact, only **RCD of type B** is allowed on the supply side of this EE (Electric equipment). Otherwise another protective measure shall be applied such as separation of the EE from the environment by double or reinforced insulation or isolation of EE and supply system by the transformer.
6. The inverter has to be installed in environment of pollution degree 2. If the environment is pollution degree 3 or 4, the inverter has to be installed in a cabinet of IP54 or higher.
7. Use a prescribed wire according to the EN60204 Appendix C.
8. Install the inverter, AC or DC reactor, output filter in an enclosure that meets the following requirement, to prevent a human body from touching directly to these equipment.
   1) When a person can touch easily on each connecting terminal or live parts, install the inverter, AC or DC reactor, output filter in an enclosure with minimum degree of protection of IP4X.
   2) When a person can not touch easily on each connecting terminal or live parts, install the inverter, AC or DC reactor, output filter in an enclosure with a minimum degree of protection of IP2X.
9. It is necessary to install the inverter in appropriate method using an appropriate RFI filter to conform to the EMC directive. It is customer's responsibility to check whether the equipment, the inverter is installed in, conforms to EMC directive.

Compliance with low voltage directive in EU [Continued]

CAUTION Use of wires specified in Appendix C of EN 60204 is recommended.

Power supply voltage	Nominal applied motor [kW]	Inverter type	Molded case circuit breaker (MCCB) or earth leakage circuit breaker (ELCB)[1] Rated current [A]		Recommended wire size [mm^2]				
					Input circuit [2] single phase 200V [L1/L, L2/N]		Output circuit [2] [U, V, W]	DCR [2] circuit [P1] [P(+)]	Control wiring
			With DCR	Without reactor [3]	With DCR	Without reactor [3]			
Single phase 200V	0.4	GSX600-0.4-S	6	10	2.5 [4]	2.5 [4]	2.5 [4]	2.5 [4]	0.5
	0.75	GSX600-0.75-S	10	16					
	1.5	GSX600-1.5-S	16	20		4.0 [4]			
	2.2	GSX600-2.2-S	20	32	4.0 [5]	6.0 [5]	2.5 [5]	4.0 [5]	

1) The applicable frame and series of the molded case circuit breaker (MCCB) and earth leakage circuit breaker (ELCB) vary according to the capacity of the transformer of the equipment. For details of selection, refer to the concerning technical documents.
2) The recommended wire size for the main circuit is the case for the low voltage directive at ambient temperature 40 °C.
3) The power supply impedance without a reactor is considered to be the equivalent of 0.1% of the inverter capacity, with 10% current imbalance accompanied by the voltage imbalance.
4) Crimp terminals up to 7.4 mm in width (including tolerance) can be used.
5) Crimp terminals up to 9.5 mm in width (including tolerance) can be used.
6) Use the grounding cable of a size equal to or larger than that of the input power supply cable.

Instructions on use

WARNING

1. This inverter is designed to drive a three-phase induction motor and is not usable for a single-phase motor or any other purposes.
   There is a risk of fire.
2. This inverter may not be used as is for an elevator, life-support system, or other purpose directly affecting the safety of humans.
   Safety precautions should be established and practiced in terms of the entire system, rather than the independent device.
   Otherwise, an accident could occur.

CAUTION

1. Do not carry the device by holding just the surface cover.
   Inverter may be dropped causing injury.
2. Do not allow foreign matter such as lint, paper dust, small chips of wood or metal, and dust to enter the inverter or adhere to the heat sink.
   Otherwise, a disaster such as burning could occur.
3. Do not install or operate damaged inverter or an inverter with a missing part.
   Otherwise injury could occur.
4. Do not step on the product.
   Otherwise injury could occur.
5. When stacking up in tiers, do not exceed the number of tiers indicated on the packing carton.
   Otherwise injury could occur.

Instructions on transport/installation

WARNING

1. Attach the device to an incombustible material such as metal.
   Otherwise fire could occur.
2. Do not place the device near inflammables.
   Otherwise fire could occur.

Instructions on wiring

WARNING

1. When the inverter is connected to power, connect it via a line-protection molded case circuit breaker or an earth-leakage circuit breaker (Residual current operated protective device).
   Otherwise fire could occur.
2. Be sure to connect the ground wire.
   Otherwise electric shock or fire could occur.
3. Ensure that a licensed specialist **performs the wiring work.**
4. Check before starting the wiring that the power is off (OPEN).
   Otherwise electric shock could occur.
5. Do not wire up the inverter until it has been installed securely.
   Otherwise electric shock or injury could occur.
6. The inverter has to be grounded in accordance with the national and local safety specification.
   Otherwise electric shock could occur.

CAUTION

1. Check that the number of phases and the rated voltage of this product correspond to the number of phases and voltage of the AC power supply.
   Otherwise fire could occur.
2. Do not connect the AC power supply to the output terminals (U, V, W).
   Otherwise injury could occur.
3. Check the output terminals (U,V,W) for the phase order and connect them to the motor correctly.
   Otherwise fire could occur.
4. Do not connect a braking resistor directly to the DC terminals [P(+), N(-)].
   Otherwise fire could occur.
5. Noise is generated from the inverter, motor, and wiring. Take care that this noise does not cause malfunctions in peripheral sensors and equipment.
   Otherwise accidents could occur.

Instructions on operation

WARNING

1. Be sure to put on the surface cover before turning the power ON (CLOSE).
   Never remove the cover while the power is applied to the inverter.
   Otherwise electric shock could occur.
2. Never operate switches with wet fingers.
   Otherwise electric shock could occur.
3. The interior of the inverter may remain charged after turning off the power.
   Therefore, never attempt to remove the surface cover except for wiring service and periodic maintenance.
   Otherwise electric shock could occur.

WARNING

1. When the retry function is selected, the inverter may automatically restart after tripping, depending on the cause of the trip.
   (Design the machine to secure personal safety in the event of restart).
   Otherwise accident could occur.
2. Operating conditions may occasionally be different from the preset acceleration/deceleration time or speed because of activation of the stall prevention function.
   In such a case, personal safety must be secured through adequate machine design.
   Otherwise accident could occur.
3. The stop key is effective only when a function setting has been established.
   Therefore install an emergency switch independently. When operation via the external signal terminal is selected, the STOP key on the keypad panel will be disabled.
   There is a risk of accidents.
4. Operation starts suddenly if alarm reset is done with an running signal input. Check that no running signal is input before alarm reset.
   Otherwise accidents could occur.
5. Never touch the inverter terminals when energized even if it has stopped.
   Otherwise electric shock could occur.
6. Never touch the keys on the keypad panel with a pointed object such as a needle.
   Otherwise electric shock could occur.

CAUTION

1. Never touch the heat sink because they become very hot.
   Otherwise burns could occur.
2. The inverter can set high-speed operation easily. Carefully check the limit of the motor and machine before changing the setting.
   Otherwise injuries could occur.
3. Do not use the inverter brake function for mechanical holding.
   Otherwise injuries could occur.

Instruction on maintenance/inspection, and replacement

WARNING

1. Do not commence inspection work until at least five minutes after the power has been turned off (OPEN).
   (In addition, make sure that the charge lamp has gone off and check that the DC voltage between terminals P(+) and N(-) does not exceed 25V DC).
   Otherwise electric shock could occur.
2. Only qualified personnel should perform maintenance and inspection or replacement operations.
   (Take off all metal objects watch, ring, etc. before starting and use well-insulated tools).
   Otherwise electric shock or injury could occur.
3. Never modify the product.
   Otherwise electric shock or injury could occur.

Instruction on disposal

CAUTION

Since this product contains lead solder, it must be treated as industrial waste when it is disposed of. Entrust it to a waste processing company when disposing it.

General instructions

The figures in this operation manual may show the inverter with covers and safety screens removed to explain the structure in details. Therefore, be sure to replace the covers and screens to their original positions and operate the inverter according to the instruction manual.

1 Before Using This Product

1-1 Receiving Inspections

Unpack and check the product as explained below.
If you have any questions or problems with this product, please contact Bonfiglioli Riduttori div. Silectron sistemi.

1) Check the ratings name plate to confirm that the delivered product is the ordered one.

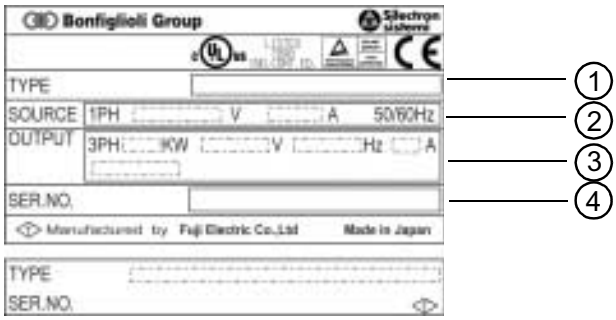


Figure 1-1-1 Ratings nameplate

① TYPE: Inverter Type

GSX600-0.75-S

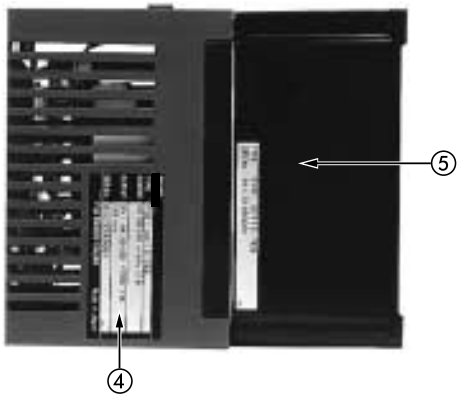
- Power voltage supply system: S → single-phase 200V input series
- Nominal applied motor: 0.75 → 0.75kW
- Series name
- Product type: GSX

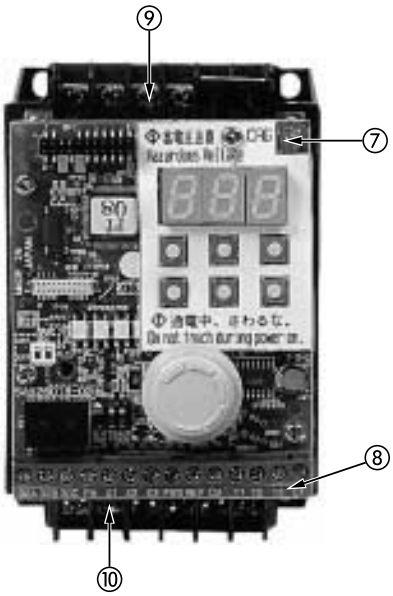
② SOURCE: Number of input phases, rated input voltage, rated input frequency, rated input current

③ OUTPUT: Number of output phases, rated output capacity, rated output voltage, output frequency range, rated output current, overload capacity

④ SER. No.: Product number

1-2 Appearance





① Surface cover
② Keypad panel
③ Frequency setting POT (VR) (built-in POT)
④ Ratings nameplate
⑤ Heat sink
⑥ Cooling fan (1.5 kW or more)
⑦ Charge lamp CRG
⑧ Control terminal block
⑨ Main circuit terminal block
Single-phase 200V[⏚G,L1/L,L2/N,P1,P(+)]
⑩ Main circuit terminal block
[P(+),N(-),U,V,W,⏚G]