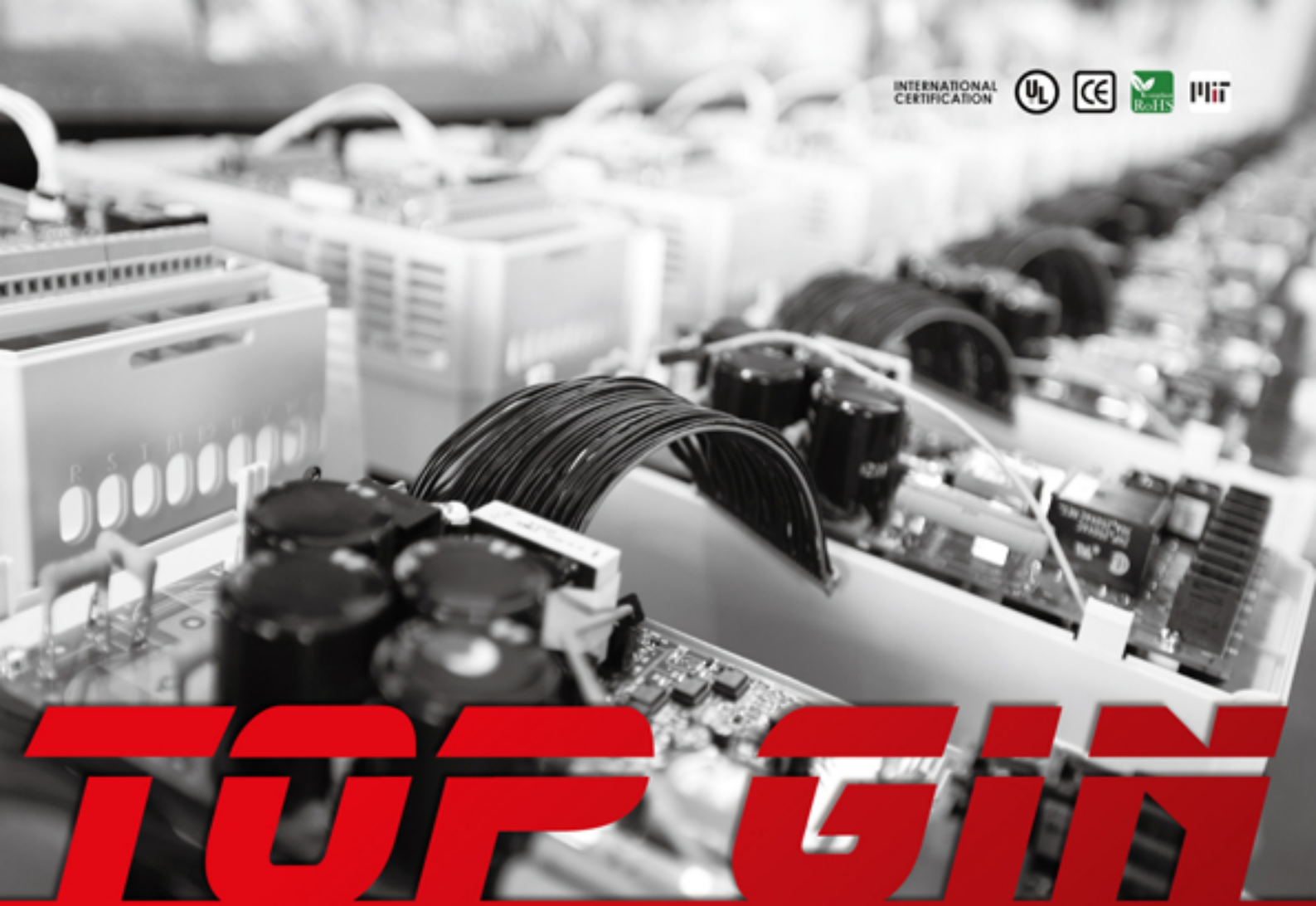


INTERNATIONAL CERTIFICATION

TOPGIN

TG系列使用說明書

TG SERIES INSTRUCTIONS

TG600 / TG600-A / TG900 / TG1000

www.topgin.com.tw

內頁型號皆以TG600代表

TG600 represents other TG series in the inner pages.

32 YEAR

OEM ODM

TOP GIN

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PREFACE

TOP GIN TG-600 is a user-friendly inverter provided with vector control for standard models in addition to V/f control. This instruction manual describes installation, maintenance and inspection, troubleshooting, and specifications of the TG-600. Read this instruction manual thoroughly before operation.

SHANGCHIN ELECTRIC CORPORATION

General Precautions

- Some drawings in this manual are shown with the protective cover or shields removed, in order to describe detail with more clarity. Make sure all covers and shields are replaced before operating this product.
- This manual may be modified when necessary because of improvement of the product, modification, or changes in specifications.
  Such modifications are denoted by a revised manual No.
- To order a copy of this manual, if your copy has been damaged or lost, contact your SHANGCHIN representative.
- SHANGCHIN is not responsible for any modification of the product made by the user, since that will void your guarantee.

NOTES FOR SAFE OPERATION

Read this instruction manual thoroughly before installation, operation, maintenance or inspection of the TG-600. In this manual, NOTES FOR SAFE OPERATION are classified as "WARNING" or "CAUTION".

⚠ WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to personnel.

⚠ CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury to personnel and damage to equipment.
It may also be used to alert against unsafe practices.

Even items described in ⚠ CAUTION may result in a vital accident in some situations. In either case, follow these important notes.

NOTE : These are steps to be taken to insure proper operation.

RECEIVING

⚠ CAUTION

(Ref. page)

- Do not install or operate any inverter which is damaged or has missing parts.
  Failure to observe this caution may result in personal injury or equipment damage. 12

INSTALLATION

⚠ CAUTION

(Ref. page)

- Lift the cabinet by the base. When moving the unit, never lift by the front cover.
  Otherwise, the main unit may be dropped causing damage to the unit. 14
- Mount the inverter on nonflammable material (i.e. metal).
  Failure to observe this caution can result in a fire. 14

  When mounting units in an enclousure, install a fan or other cooling device to keep the intake air temperature below 45°C.
  Overheating may cause a fire or damage to the unit. 14

WIRING

⚠ WARNING

(Ref. page)

- Only commence wiring after verifying that the power supply is turned OFF.
  Failure to observe this warning can result in an electrical shock or a fire. 17
- Wiring should be performed only by qualified personnel.
  Failure to observe this warning can result in an electrical shock or a fire. 17
- When wiring the emergency stop circuit, check the wiring thoroughly before operation.
  Failure to observe this warning can result in personal injury. 17

(Ref. page)

- Make sure to ground the ground terminal ⏚ .
  (Ground resistance
  200V class: 100 Ω or less, 400V class: 10 Ω or less)
  Failure to observe this warning can result in an electrical shock or a fire. 20

⚠ CAUTION

(Ref. page)

- Verify that the inverter rated voltage coincides with the AC power supply voltage.
  Failure to observe this caution can result in personal injury or a fire. 17
- Do not perform a withstand voltage test of the inverter.
  It may cause semi-conductor elements to be damaged. 17
- To connect a braking resistor, braking resistor unit or braking unit.
  Improper connection may cause a fire. 17
- Tighten terminal screws to the specified tightening torque.
  Failure to observe this caution can result in a fire. 17
- Never connect the AC main circuit power supply to output terminals U, V and W.
  The inverter will be damaged and invalidate the guarantee. 20

OPERATION

⚠ WARNING

(Ref. page)

- Only turn ON the input power supply after replacing the front cover. Do not remove the cover while current is flowing.
  Failure to observe this warning can result in an electrical shock. 28

- When the retry function (L5-02) is selected, do not approach the inverter or the load , since it may restart. suddenly after being stopped.
  (Construct machine system, so as to assure safety for personnel, even if the inverter should restart.) Failure to observe this warning can result in personal injury. 28

- Since the stop button can be disabled by a function setting, install a separate emergency stop switch.
  Failure to observe this warning can result in personal injury. 28

- If an alarm is reset with the operation signal ON, the inverter restarts automatically. Only reset the alarm after verifying that the operation signal is OFF.
  Failure to observe this warning can result in personal injury. 28

⚠ CAUTION

(Ref. page)

- Never touch the heatsink or discharging resistor since the temperature is very high.
  Failure to observe this caution can result in harmful burns to the body. 28

- Since it is easy to change operation speed from low to high speed, verify the safe working range of the motor and machine before operation
  Failure to observe this caution can result in personal injury and machine damage. 28

(Ref. page)

- Install a holding brake separately if necessary.
  Failure to observe this caution can result in personal injury. 28

- Do not change signals during operation.
  The machine or the inverter may be damaged.. 28

- All the constants of the inverter have been preset at the factory. Do not change the settings unnecessarily.
  The inverter may be damaged. For supply voltage, follow Par. 4.3. 28

MAINTENANCE AND INSPECTION

⚠ WARNING

(Ref. page)

- Never touch high-voltage terminals in the inverter.
  Failure to observe this warning can result in an electrical shock. 51

- Replace all protective covers before powering up the inverter. To remove the cover, make sure to shut OFF the molded-case circuit breaker.
  Failure to observe this warning can result in an electrical shock. 51

- Perform maintenance or inspection only after verifying that the CHARGELED goes OFF, after the main circuit power supply is turned OFF.
  The capacitors are still charged and can be dangerous. 51

- Only authorized personnel should be permitted to perform maintenance, inspections or parts replacement.
  [Remove all metal objects (watches, bracelets, etc.) before operation.]
  (Use tools which are insulated against electrical shock.)
  Failure to observe this warning can result in an electrical shock. 51

⚠ CAUTION

(Ref. page)

- The control PC board employs CMCO ICs. Do not touch the CMOS elements.
  They are easily damaged by static electricity. 51
- Do not connect or disconnect wires or connectors while power is applied to the circuit.
  Failure to observe this caution can result in personal injury. 51

OTHERS

⚠ WARNING

(Ref. page)

- Never modify the product.
  Failure to observe this warning can result in an electrical shock or personal injury and will invalidate the guarantee. 51

WARNING LABEL

A warning label is displayed on the front cover of the inverter, as shown below. Follow these instructions when handling the inverter.



Warning Label

⚠ WARNING

May cause injury or electric shock.

- Please follow the instructions in the manual before installation or operation.
- Disconnect all power before opening front cover of unit. Wait 1 minute until DC Bus capacitors discharge.
- Use proper grounding techniques.

1 RECEIVING

⚠ CAUTION
• Do not install or operate any inverter which is damaged or has missing parts. Failure to observe this caution may result in personal injury or equipment damage.

This chapter describes how to verify the inverter after delivery to the user.

1 .1 INSPECTION CHECKPOINTS

(1) Receiving Checkpoints

Table 1 Checkpoints

Checkpoints	Description
Does the inverter model number correspond with the purchase order?	Check the model number on the nameplate on the side of the TG-600
Are any parts damaged?	Visually check the exterior and verify that there was no damage during transport.
Is hardware properly seated and securely tightened?	Remove inverter front cover. Check all visble hardware with appropriate tools.
Was an instruction manual received?	TG-600 instruction manual

If any of the above checkpoints are not satisfactory, contact your SHANGCHIN representative.

(2) Checking the Nameplate Data

(a) Nameplate Data

TG 600- _____
SOURCE _____ V_____ Hz
CAPACITY _____ kVA
VOLTS _____ V CURRENTS_____ A
SERIAL NO. _____
TOP GIN MADE IN TAIWAN

Fig. 1 Nameplate Data

(b) Model Designation

- Model Designation

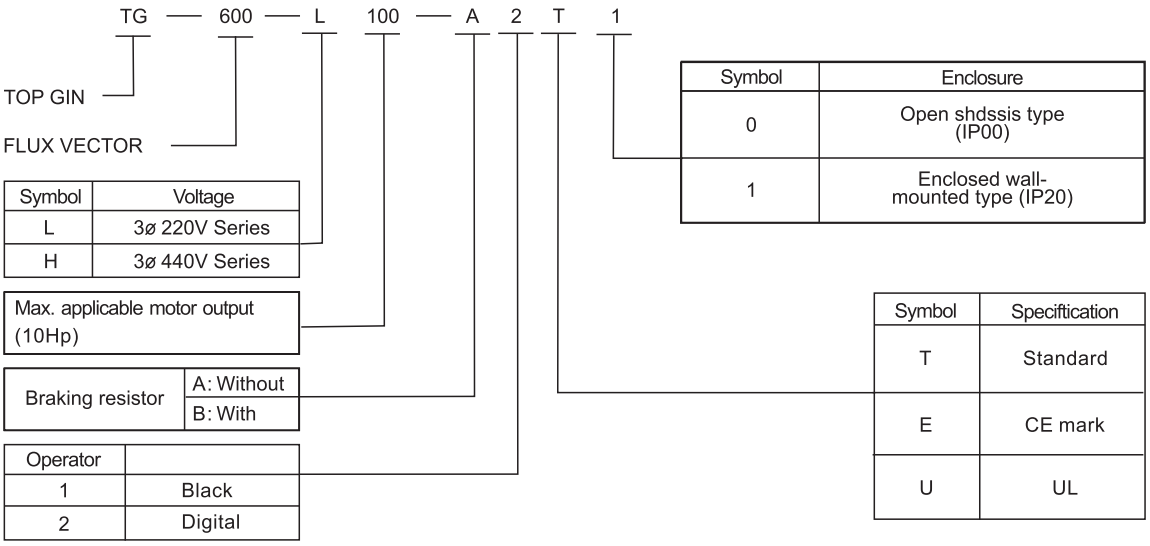


Fig. 2 Model Designation

1 .2 IDENTIFYING THE PARTS



Fig. 3 Configuration of TG-600

2 INSTALLATION

⚠ CAUTION
• Lift the cabinet by the base. When moving the unit, never lift by the front cover. Otherwise, the main unit may be dropped causing damage to the unit. • Mount the inverter on nonflammable material (i.e. metal). Failure to observe this caution can result in a fire. • When mounting units in an enclosure, install a fan or other cooling device to keep the intake air temperature below 45°C Overheating may cause a fire or damage to the unit.

This chapter describes the configuration, location and space when mounting the TG-600.

2 .1 CHOOSING A LOCATION TO MOUNT THE INVERTER

To ensure proper performance and long operating life, follow the recommendations below when choosing a location for installing the TG-600. Make sure the inverter is protected from the following conditions:

☐ Extreme cold and heat.
Use only within ambient temperature range:–10° C to +40°C
☐ Rain, moisture. (For enclosed wall-mounted type)
☐ Oil sprays, splashes
☐ Salt spray.
☐ Direct sunlight. (Avoid using outdoors.)
☐ Corrosive gases or liquids.
☐ Dust or metallic particles in the air. (For enclosed wall-mounted type)
☐ Physical shock, vibration.
☐ Magnetic noise. (Example: welding machines, power devices, etc.)
☐ High humidity.
☐ Radioactive materials.
☐ Combustibles: thinners, solvents, etc.

2 .2 CLEARANCES

Install the **TG－600** vertically and allow sufficient clearances for effective cooling as shown below.

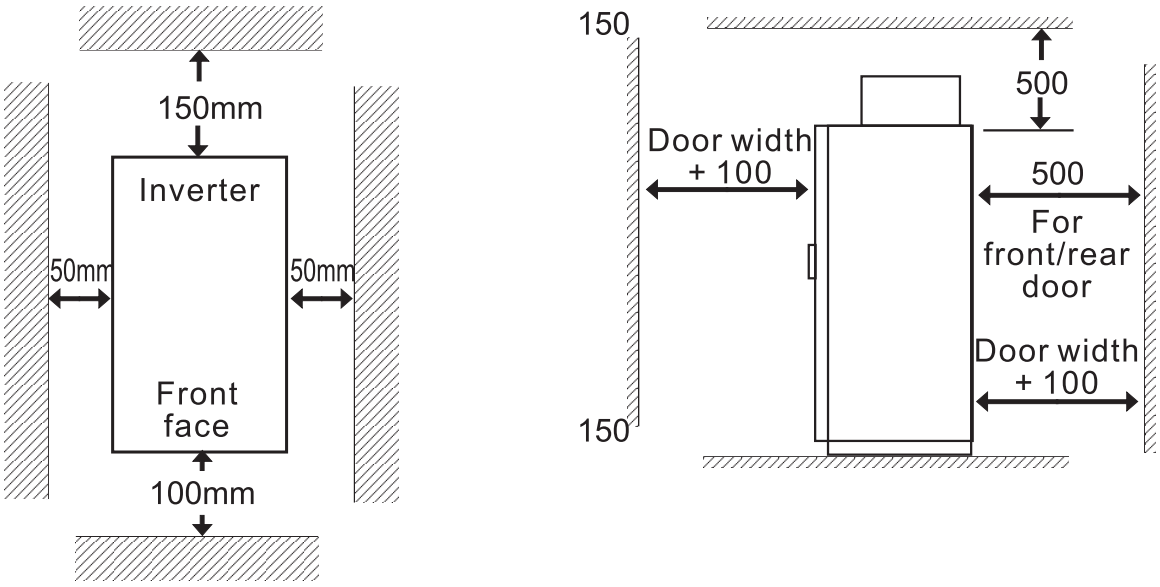


Fig. 4 Clearances

NOTE

1. The clearances required at top/bottom and both sides are common in open chassis type (IP00) and enclosed wall-mounted type (IP20).
2. Remove the top and bottom covers to use the open chassis type of 200V/ 400V 15kW or less.
3. When installing the models of 200V / 400V 30kW or more equipped with eyeblots, extra spacing will be required on either side. For detailed dimensions, contact your SHANGCHIN representative.
4. For the external dimensions and mounting dimensions, refer to APPENDLX 2" DIMENSIONS".
5. Allowable intake air temperature to the inverter:
   - Open chassis type : -10°C to +45°C
   - Enclosed wall-mounted type : -10°C to +40°C
6. Ensure sufficient space for the sections at the upper and lower parts marked with * in order to permit the flow of intake/exhaust air to/from the inverter.

3 WIRING

⚠ WARNING

- Only commence wiring after verifying that the power supply is turned OFF.
  Failure to observe this warning can result in an electrical shock or a fire.
- Wiring should be performed only by qualified personnel.
  Failure to observe this warning can result in an electrical shock or a fire.
- When wiring the emergency stop circuit, check the wiring thoroughly before operation.
  Failure to observe this warning can result in personal injury.

⚠ CAUTION

- Verify that the inverter rated voltage coincides with the AC power supply voltage.
  Failure to observe this caution can result in personal injury or a fire.
- Do not perform a withstand voltage test of the inverter.
  It may cause semi-conductor elements to be damaged.
- To connect a braking resistor, braking resistor unit or braking unit.

  Improper connection may cause a fire.
- Tighten terminal screws to the specified tightening torque.
  Failure to observe this caution can result in a fire.

This chapter describes the main circuit wiring and the control circuit wiring of the TG-600.

3 .1 CONNECTION DIAGRAM

Below is a connection diagram of the main circuit and control circuit. Using the digital operator, the motor can be operated by wiring the main circuit only.

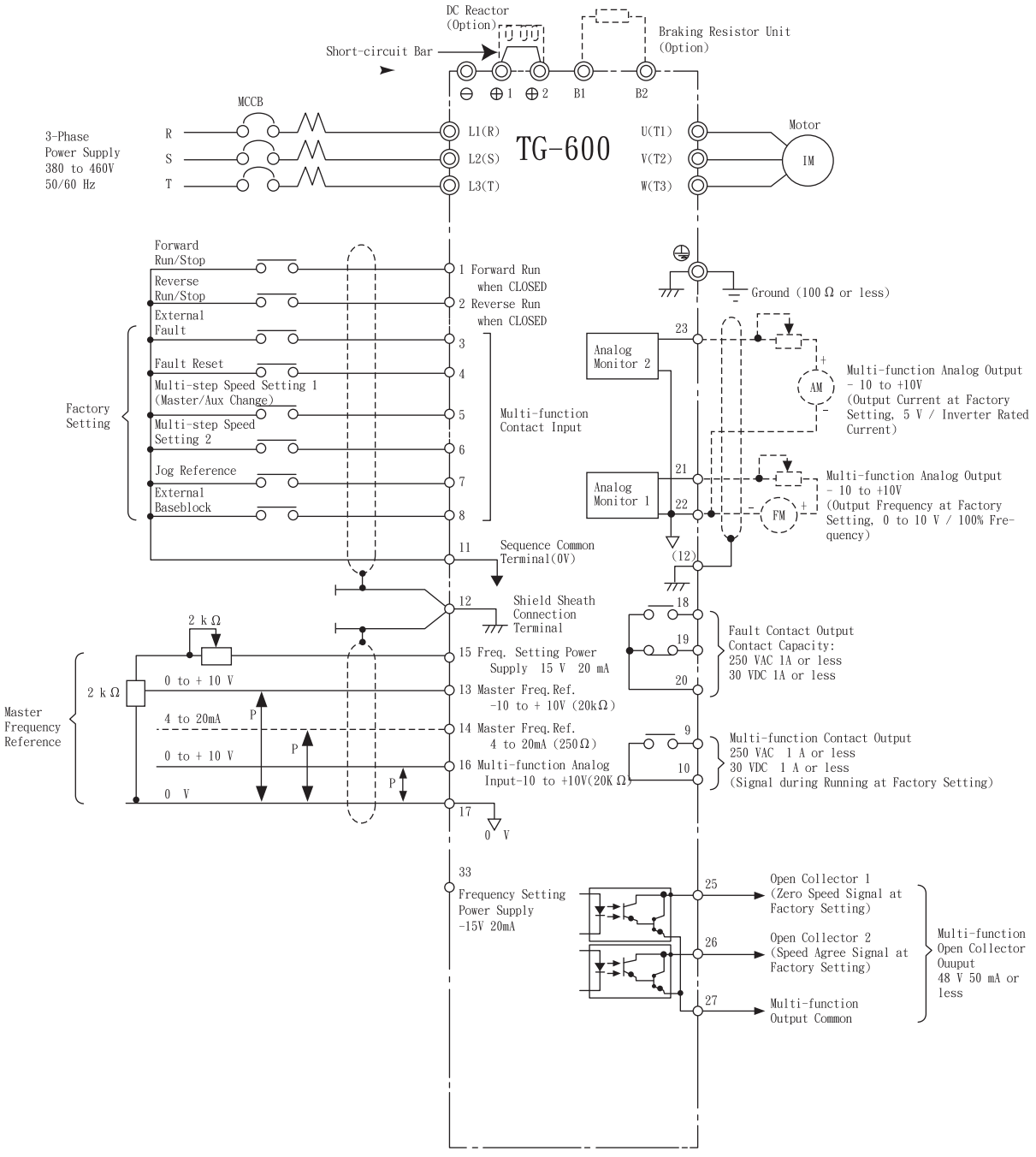


Fig. 5 Connection Diagram

NOTE

Layout of control circuit terminals



NOTE

1. indicates shielded wires and indicates twisted-pair shielded wires.
2. Either control circuit terminal 13 or 14 can be used. (For simultaneous inputs, the two signals are added internally.)
3. Control circuit terminal 15/33 of +15 V/–15 V has a maximum output current capacity of 20 mA.
4. Multi-function analog output should be used for monitoring meters (e.g. output frequency meter) and should not be used for feedback control system. Use analog monitor cards (Model AO-08 or AO-12) for the control system, for a more accurate signal.
5. When using a braling resistor unit, set the constant L3-04 to "0" (stall prevention level during decel is "disabled"). If it is not changed, the motor may not stop within the set decel time.
6. When using model ERF braking resistor (inverter-mounted type), set the braking resistor protection selection to "enabled". If it is not changed, the braking resistor cannot be protected.
7. When installing a DC reactor (connectable for models of 15kW or below by option), remove the short-circuit bar between ⊕ 1 and ⊕2 terminals and connect a DC reactor with the terminals.
8. The models of 200V 30 to 75kW or 400V 55 to 160kW cannot be connected with DC power supply.

3 .2 WIRING THE MAIN CIRCUIT

⚠ WARNING

- Make sure to ground the ground terminal ⏚.
  (Ground resistance 200V class: 100Ω or less, 400V class: 10Ω or less)
  Failure to observe this warning can result in an electrical shock or a fire.

⚠ CAUTION

- Never connect the AC main circuit power supply to output terminals U, V and W.
  The inverter will be damaged and invalidate the guarantee.

(1) Wiring Precautions for Main Circuit Input

(a) Installation of Molded-case Circuit Breaker (MCCB)

Make sure to connect MCCBs or fuses between AC main circuit power supply and TG-600 input terminals L1, L2 and L3 to protect wiring.

(b) Installation of Ground Fault Interrupter

When connecting a ground fault interrupter to input terminals L1, L2 and L3, select one that is not affected by high frequency.

(c) Installation of Magnetic Contactor

Inverters can be used without a magnetic contactor (MC) installed at the power supply side. When the main circuit power supply is shut OFF in the sequence, a magnetic contactor (MC) can be used instead of a molded-case circuit breaker (MCCB). However, when a magnetic contactor is switched OFF at the primary side, regenerative braking does not function and the motor coasts to a stop.

- The load can operated/stopped by opening/closing the magnetic contactor at the primary side. However, frequent switching may cause the inverter to malfunction.
- When using a braking resistor unit, use a sequencer to break power supply side on overload relay trip contact. If the inverter malfunctions, the braking resistor unit may be burned out.

(d) Terminal Block Connection Sequence

Input power supply phases can be connected to any terminal regardless of the order of L1, L2 and L3 on the terminal block.

(e) Installation of Reactor

When connecting an inverter (200V/400V 15kW or less) to a large capacity power supply transformer (600kVA or more), or when switching a phase advancing capacitor, excessive peak current flows in the input power supply circuit, which may damage the converter section. In such cases, install a DC reactor (optional) between inverter ⊕1 and ⊕ 2 terminals or an AC reactor (optional) on the input side. Installation of a reactor is effective for improvement of power factor on the power supply side.

(f) Installation of Surge Suppressor

For inductive loads (magnetic contactors, magnetic relays, magnetic valves, solenoids, magnetic brakes, etc.) connected near the inverter, use a surge suppressor simultaneously.

(g) Prohibition of Installation of Phase Advancing Capacitor

If a phase advancing capacitor or surge suppressor is connected in order to improve the power factor, it may become overheated and damaged by inverter high harmonic components. Also, the inverter may malfunction because of overcurrent.

(2) Wiring Precautions for Main Circuit Output

(a) Connection of Terminal Block and Load

Connect output terminals U(T1), V(T2) and W(T3) to motor lead wires U(T1), V(T2) and W(T3). Verify that the motor rotates in the forward direction (CCW: counterclockwise when viewed from the motor load side) with the forward run command. If the motor rotation is incorrect, exchange any two of output terminals U(T1), V(T2) or W(T3).

(b) Strict Prohibition of Connection of Input Power Supply to Output Terminals

Never connect the input power supply to output terminals U(T1), V(T2) and W(T3).

(c) Strict Prohibition of Short Circuiting or Grounding of Output Circuit

Never touch the output circuit directly or put the output line in contact with the inverter case. Otherwise, it may cause an electrical shock or grounding. In addition, never short circuit the output line.

(d) Prohibition of Connection of Phase Advancing Capacitor or LC/RC Noise Filter

Never connect a phae advancing capacitor or LC/RC noise filter to the output circuit.

(e) Avoidance of Installation of Magnetic Starter

Do not connect a magnetic starter or magnetic contactor to the output circuit. If the load is connected while the inverter is running, the inverter overcurrent protective circuit operates because of inrush current.

(f) Installation of Thermal Overload Relay

An electronic overload protective function is incorporated into the inverter. However, connect a thermal overload relay when driving several motors with one inverter or when using a multi-pole motor. When using a thermal overload relay, set inverter constant L1-01 to 0 (motor protection selection: disabled). Additionally, for thermal overload relay, at 50Hz set the same rated current value as that described on the motor nameplate, or at 60Hz 1.1 times larger than the rated current value described on the motor nameplate.

(g) Wiring Distance between Inverter and Motor

If the total wiring distance between inverter and motor is excessively long and the inverter carrier frequency (main transistor switching frequency) is high, harmonic leakage current from the cable will adversely to affect the inverter and peripheral devices.

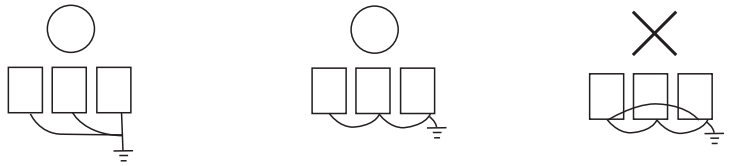
If the wiring distance between inverter and motor is long, reduce the inverter carrier frequency as described below. Carrier frequency can be set by constant C6-01.

Table 2 Wiring Distance between Inverter and Motor

Wiring Distance between Inverter and Motor	Up to 50m	Up to 100m	More than 100m
Carrier Frequency (Set value of constant C6-01)	15kHz or less (15.0)	10kHz or less (10.0)	5kHz or less (5.0)

(3) Grounding

- Ground resistance
  200 V class : 100Ω or less, 400 V class : 10Ω or less.
- Never ground the inverter in common with welding machines, motors, or other large-current electrical equipment. Run all the ground wires in a conduit separate from wires for large-current electrical equipment.
- Use the ground wires described in Tables 5 or 6 and keep the length as short as possible.
- When using several inverter units side by side, ground the units as shown in Fig. 10, (a) or (b). Do not loop the ground wires as shown in (c).



(a) Acceptable (b) Acceptable (c) Not Acceptable

Fig. 6 Grounding of Three Inverter Units

(4) Functions of Main Circuit Terminals

The following table outlines the functions of the main circuit terminals. Wire according to each terminal function.

Table 3 200V Class Terminal Functions

<table>
<tr><td>Models
TG-600</td><td>L15 to L100</td><td>L150 to L200</td><td>L250 to L300</td><td>L400 to L1000</td></tr>
<tr><td>Max Applicable Motor Output</td><td>0.75 to 7.5 kW</td><td>11 to 15 kW</td><td>18.5 to 22 kW</td><td>30 to 75 kW</td></tr>
<tr><td>L1 (R)</td><td colspan="4" rowspan="3">Main circuit input power supply</td></tr>
<tr><td>L2(S)</td></tr>
<tr><td>L3(T)</td></tr>
<tr><td>U(T1)</td><td colspan="4" rowspan="3">Inverter output</td></tr>
<tr><td>V(T2)</td></tr>
<tr><td>W(T3)</td></tr>
<tr><td>B1</td><td rowspan="2">Braking resistor unit</td><td colspan="3" rowspan="2">—</td></tr>
<tr><td>B2</td></tr>
<tr><td>⊖</td><td rowspan="3">• DC reactor
(⊕1 — ⊕2)</td><td rowspan="4">• DC reactor
(⊕1 — ⊕2)
DC bus terminals
• (⊕1 — ⊖)
Braking unit
(B1-B2)</td><td rowspan="4">• DC bus terminals
(⊕1 — ⊖)</td><td rowspan="4">• Braking unit
(P-N)</td></tr>
<tr><td>⊕1</td></tr>
<tr><td>⊕2</td></tr>
<tr><td>⊕3</td><td>—</td></tr>
<tr><td>r (ℓ1)</td><td colspan="2" rowspan="2">—</td><td rowspan="2">Cooling fan power supply</td><td rowspan="2">Cooling fan power supply (Control power supply)</td></tr>
<tr><td>Δ ℓ 2)</td></tr>
<tr><td>⏚</td><td colspan="4">Ground terminal (Ground resistance: 100 Ω or less)</td></tr>
</table>

Table 4 400V Class Terminal Functions

<table>
<tr><td>Models
TG-600</td><td>H30 to H200</td><td>H250 to H600</td><td>H750 to H2000</td><td>H2500 to H4000</td></tr>
<tr><td>Max Applicable Motor Output</td><td>2.2 to 15 kW</td><td>18.5 to 45 kW</td><td>55 to 160 kW</td><td>185 to 300 kW</td></tr>
<tr><td>L1 (R)</td><td colspan="4" rowspan="3">Main circuit input power supply</td></tr>
<tr><td>L2(S)</td></tr>
<tr><td>L3(T)</td></tr>
<tr><td>U(T1)</td><td colspan="4" rowspan="3">Inverter output</td></tr>
<tr><td>V(T2)</td></tr>
<tr><td>W(T3)</td></tr>
<tr><td>B1</td><td rowspan="2">Braking resistor unit</td><td colspan="3" rowspan="2">—</td></tr>
<tr><td>B2</td></tr>
<tr><td>⊖</td><td rowspan="3">• DC reactor
(⊕1－⊕2)</td><td rowspan="3">• DC bus terminals
(⊕1－⊖)
• Braking unit
(⊕1－⊕)</td><td rowspan="3">• Braking unit
(P-N)
• terminals not provided)*</td><td rowspan="3">• DC bus terminals
(⊕1—⊖)
• Braking unit
(⊕3—⊖)
(⊕2 terminal not provided</td></tr>
<tr><td>⊕ 1</td></tr>
<tr><td>⊕ 2</td></tr>
<tr><td>⊕ 3</td><td>—</td></tr>
<tr><td>△ (ℓ2)</td><td rowspan="4">—</td><td rowspan="2">Cooling fan power supply</td><td colspan="2">—</td></tr>
<tr><td>r (ℓ1)</td><td colspan="2" rowspan="3">• Cooling fan power supply
(Control power supply)
r(ℓ1)- △200(ℓ 2 200): 200 to 230 VAC input
r(ℓ1)- △400(ℓ 2 400): 380 to 460 VAC input</td></tr>
<tr><td>△200(ℓ 2200)</td><td rowspan="2">—</td></tr>
<tr><td>△400(ℓ 2400)</td></tr>
<tr><td>⏚</td><td colspan="4">Ground terminal (Ground resistance: 10Ω or less)</td></tr>
</table>

3 .3 WIRING THE CONTROL CIRCUIT

The following table outlines the functions of the control circuit terminals. Wire according to each terminal function.

(1) Functions of Control Circuit Terminals

Table 8 Control Circuit Terminals

Classification	Terminal	Signal Function	Description		Signal Level
Sequence Input Signal	1	Forward run/stop	Forward run when closed, stop when open		Photo-coupler insulation Input : +24 VDC 8 mA
	2	Reverse run/stop	Reverse run when closed, stop when open		
	3	External fault input	Fault when closed, normal state when open	Multi-function contact inputs (H1-01 to H1-06)	
	4	Fault reset input	Reset when closed		
	5	Master/Auxiliary change (Multi-step speed reference 1)	Auxiliary frequency reference when closed		
	6	Multi-step speed reference 2	Effective when closed		
	7	Jog reference	Jog run when closed		
	8	External baseblock	Inv. output stop when closed		
	11	Sequence control input common terminal	—		
Analog Input Signal	15	+15 V Power supply output	For analog command +15V power supply		+15 V (Allowable current 20 mA max.)
	33	-15 V Power supply output	For analog command -15V power supply		-15 V (Allowable current 20 mA max.)
	13	Master frequency reference	-10 to +10V/-100% to +100% 0 to +10 V/100%		-10 to +10 V (20 kΩ), 0 to +10 V (20 kΩ)
	14		4 to 20 mA/100%, -10 to +10 V/-100% to +100%, 0 to +10 V/100%		4 to 20mA (250 Ω)
	16	Multi-function analog input	-10 to +10V/-100% to +100% 0 to +10 V/100%	Auxiliary analog input (H3-05)	-10 to +10 V (20 kΩ), 0 to +10 V (20 kΩ)
	17	Common terminal for control circuit	0 V		—
	12	Connection to shield sheath of signal lead or optional unit grounding	—		—
Sequence Output Signal	9	During running (NO contact)	Closed when running	Multi-function output	Dry contact Contact capacity: 250 VAC 1 A or less 30 VDC 1 A or less
	10				
	25	Zero speed detection	Closed at zero-speed level (b2-01) or below		Open collector output 48 V 50 mA or less *
	26	Speed agree detection	Closed when the freq. reaches to ± 2 Hz of set freq.		
	27	Open collector output common	—		
	18	Fault contact output (NO/NC contact)	Fault when closed between terminals 18 and 20 Fault when open between terminals 19 and 20		Dry contact Contact capacity: 250 VAC 1 A or less 30 VDC 1 A or less
	19				
	20				
Analog Output Signal	21	Frequency meter output	0 to +10 V/100% freq.	Multi-function analog monitor 1 (H4-01,H4-02)	0 to ±10 V Max. ±5% 2 mA or less
	22	Common	—		
	23	Current monitor	5 V/inverter rated current	Multi-function analog monitor 2 (H4-04,H4-05)	

* When an inductive load such as relay coil is driven, insert a fly-wheel diode as shown in the following figure.

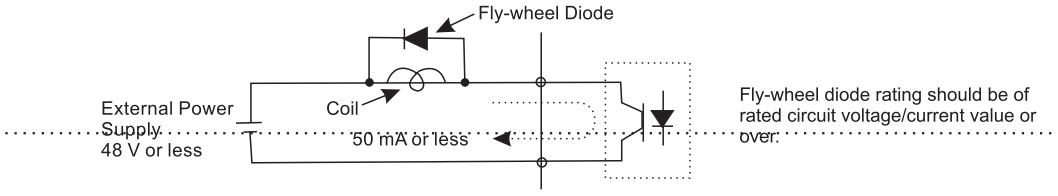




Fig. 7 Control Circuit Terminal Arrangement

(2) Precautions on Control Circuit Wiring

- Separate control circuit wires 1 to 33 from main circuit wires L1, L2, L3 B1, B2, U, V, W, ⊖ , ⊕ 1, ⊕ 2, ⊕ 3 and other power cables to prevent erroneous operation caused by noise interference.
- Separate the wiring of control circuit terminals 9, 10, 18, 19 and 20 (contact output) from those of terminals 1 to 8, 21, 22, 23, 25, 26, 27, 33 and 11 to 17.
- Use twisted shielded or twisted-pair shielded wire for the control circuit line and connect the shielded sheath to inverter terminal 12. (See Fig.12) Wiring distance should be less than 50 m.

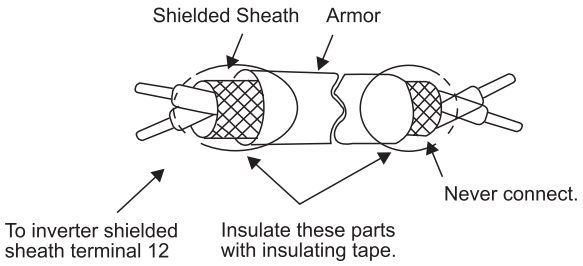


Fig. 8 Shielded Wire Termination

3 .4 WIRING INSPECTION

After completing of installation and wiring, check for the following items. Never use control circuit buzzer check.

☐ Wiring is proper.
☐ Wire clippings or screws are not left in the unit.
☐ Screws are securely tightened.
☐ Bare wire in the terminal does not contact other terminals.

4 OPERATION

⚠ WARNING

- Only turn ON the input power supply after replacing the front cover. Do not remove the cover while current is flowing.
  Failure to observe this warning can result in an electrical shock..
- When the retry function (L5-02) is selected, do not approach the inverter or the load, since it may restart suddenly after being stopped.
  (Construct machine system, so as to assure safety for personnel, even if the inverter should restart.) Failure to observe this warning can result in personal injury.
- Since ther stop button can be disabled by a function setting, install a separate emergency stop switch.
  Failure to observe this warning can result in personal injury.
- If an alarm is reset with the operation signal ON, the inverter restarts automatically. Only reset the alarm after verifying that the operation signal is OFF.
  Failure to observe this warning can result in personal injury.

⚠ CAUTION

- Never touch the heatsink or discharging resistor since the temperature is very high.
  Failure to observe this caution can result in harmful burns to the body.
- Since it is easy to change operation speed from low to high speed, verify the safe working range of the motor and machine before operation.
  Failure to observe this caution can result in personal injury and machine damage.
- Install a holding brake separately if necessary.
  Failure to observe this caution can result in personal injury.
- Do not change signals during operation.
  The machine or the inverter may be damaged.
- All the constants of the inverter have been preset at the factory. Do not change the settings unnecessarily.
  The inverter may be damaged. For supply voltage, follow Par. 4.3.

This chapter describes the basic operation procedures of the TG-600

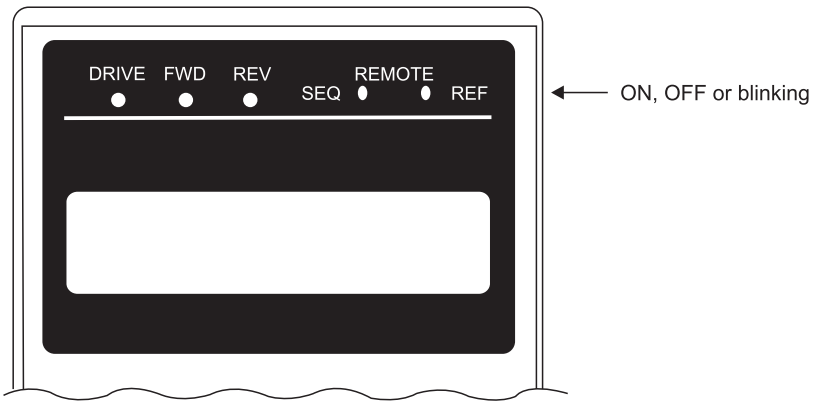
4 .1 OPERATION MODE SELECTION

The TG-600 has two operation modes, LOCAL and REMOTE, as described below. These two modes can be selected by the digital operator "LOCAL/REMOTE" key only while the operation is stopped. The selected operation mode can be verified by observing the digital operator SEQ and REF LEDs as shown below. The operation mode is set to REMOTE (run by control circuit terminals 13 and 14 frequency reference and run command from a control circuit terminal) prior to shipment. Multi-function contact inputs from control circuit terminals 3 to 8 are enabled in both operation modes LOCAL/REMOTE.

- LOCAL : Both frequency reference and run command are set by the digital operator. SEQ and REF LEDs go OFF.
- REMOTE : Master frequency reference and run command can be selected as described below.

Table 9 Reference Selction in REMOTE Mode

Con— stant No	Digital Operator Display	Name	Remarks
b1–01	Reference Source	Reference selection	0 : Master frequency reference from operator (d1-01) (Operator REF LED is OFF.) 1 : Master frequency reference from control circuit terminals 13 and 14 (Operator REF LED is ON.) 2 : Master frequency reference set by transmission (Operator REF LED blinks.) 3 : Master frequency reference set by option (Operator REF LED blinks.)
b1–02	Run Source	Operation method selection	0 : Master frequency reference from operator (d1-01) (Operator REF LED is OFF.) 1 : Master frequency reference from control circuit terminals 13 and 14 (Operator REF LED is ON.) 2 : Master frequency reference set by transmission (Operator REF LED blinks.) 3 : Master frequency reference set by option (Operator REF LED blinks.)



4 .2 TEST RUN CHECKPOINTS

To assure safety, prior to initial operation, disconnect the machine coupling so that the motor is isolated from the machine. If initial operation must be performed while the motor is still coupled to the machine, use great care to avoid potentially hazardous conditions. Check the following items before a test run.

☐ Wiring and terminal connections are correct.
☐ No short circuit caused by wire clippings.
☐ Screw-type terminals are securely tightened.
☐ Motor is securely mounted.
☐ All items are correctly earthed (grounded).

4 .3 SETTING THE LINE VOLTAGE USING JUMPER (FOR 400V CLASS 18.5kW AND ABOVE)

Set the line voltage jumper according to the main circuit power supply. (See Fig 21.) Insert the jumper at the appropriate location corresponding to the input line voltage. It has been preset at the factory to 440V.

Example

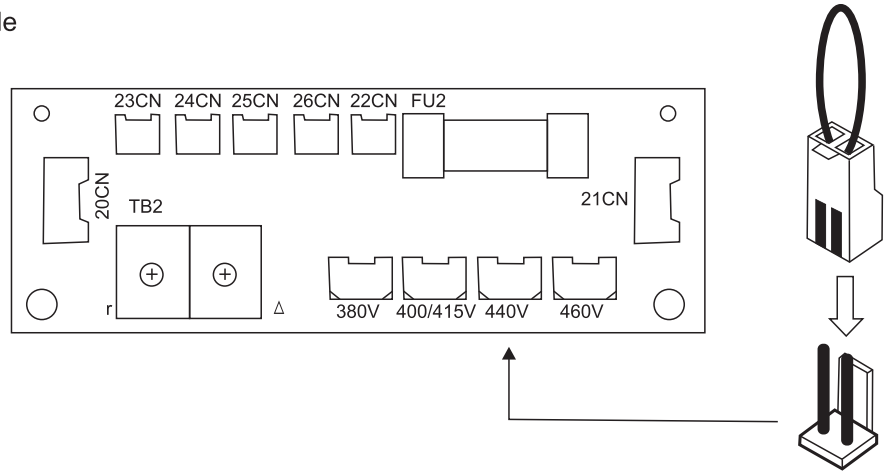


Fig. 9 Line Voltage Jumper (For 400V Class 18.5kW to 45kW)

4.4 TEST RUN

(1) Digital Operator Display at Power-up

When the system is ready for operation, turn ON the power supply. Verify that the inverter powers up properly. If any problems are found, turn OFF the power supply immediately. The digital operator display illuminates as shown below when turning the power supply ON.

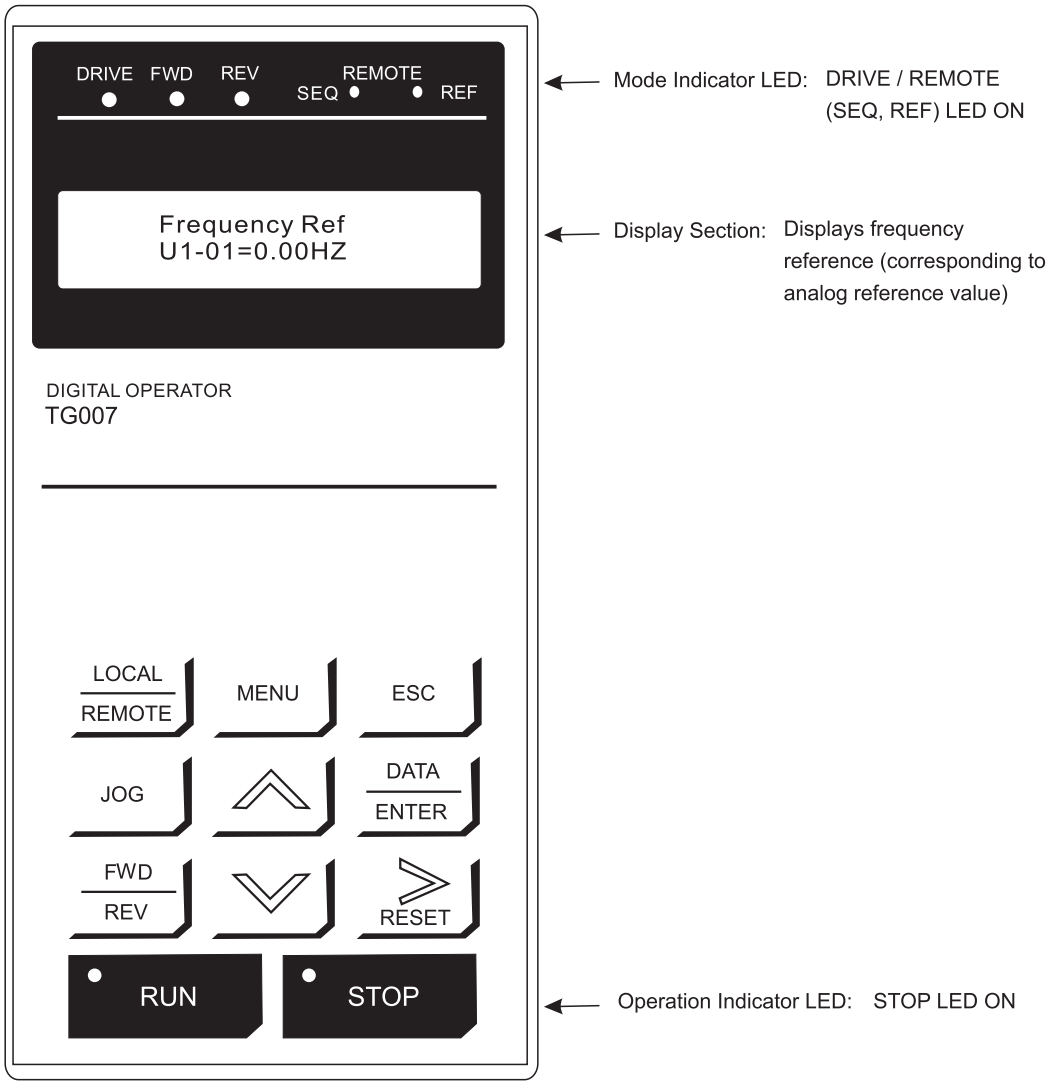


Fig. 10 Digital Operator Display at Power-up

(2) Operation Check Points

Check the following items during operation.

☐Motor rotates smoothly.
☐Motor rotates in the correct direction.
☐Motor does not have abnormal vibration or noise.
☐Acceleration and deceleration are smooth.
☐Current matches the load flow.
☐Status indicator LEDs and digital operator display are correct.

(3) Example of Basic Operation

(a) Operation by Digital Operator

The diagram below shows a typical operation pattern using the digital operator.

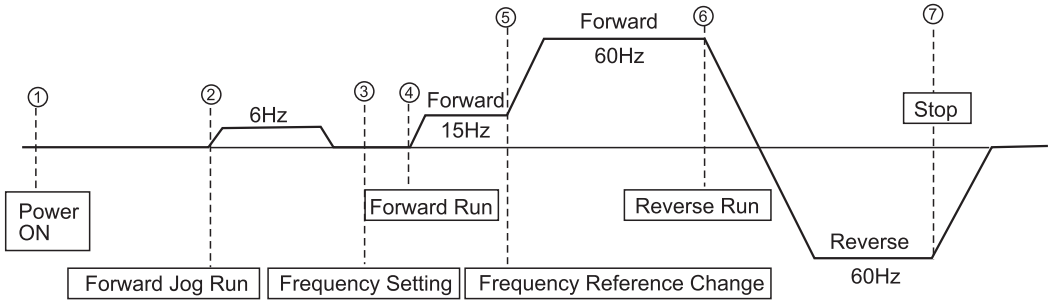


Fig. 11 Operation Sequence by Digital Operator

Table 10 Typical Operation by Digital Operator

Description	Key Sequence	Digital Operator Display
① Power ON · Displays frequency reference value.		Frequency Ref U1-01= 0.00 Hz
Operation Condition Setting · Select LOCAL mode.	LOCAL/REMOTE	REMOTE LED OFF (SEQ, REF)
② Forward Jog Run (6 Hz) · JOG run procedure (Runs while depressing JOG key.)	JOG	
③ Frequency Setting · Change reference value.	DATA/ENTER	Frequency Ref 000.00 Hz Digit to be changed blinks.
	Change the value by depressing 	Frequency Ref 015.00 Hz
	DATA/ENTER	Entry Accepted
· Write-in set value.		Frequency Ref 015.00 Hz
· Select output frequency monitor display.	ESC	Frequency Ref U1 - 01 = 15.00 Hz
		Output Freq U1 - 02 = 0.00 Hz
④ Forward Run · Forward run (15 Hz)	RUN	Output Freq U1 - 02 = 15.00 Hz RUN LED lights. FWD LED lights. RUN

Table 10 Typical Operation by Digital Operator (Cont'd)

Description	Key Sequence	Digital Operator Display
⑤ Frequency Reference Value Change (15 Hz to 60 Hz) · Select frequency reference value display.		Frequency Ref U1-01= 015.00 Hz
		Frequency Ref 015.00 Hz
· Change set value.	Change the value by depressing 	Frequency Ref 060.00 Hz
· Write-in set value.		Entry Accepted
		Frequency Ref 060.00 Hz
· Select output frequency monitor display.		Frequency Ref U1 - 01 = 60.00 Hz
		Output Ref U1 - 02 = 60.00 Hz
⑥ Reverse Run · Switch to reverse run.		Output Freq U1 - 02 = — 60.00 Hz REV LED lights.
⑦ Stop · Decelerates to a stop.		Output Freq U1 - 02 = 0.00 Hz STOP LED lights. (RUN LED blinks during deceleration.) 

(b) Operation by Control Circuit Terminal Signal

The diagram below shows a typical operation pattern using the control circuit terminal signals.

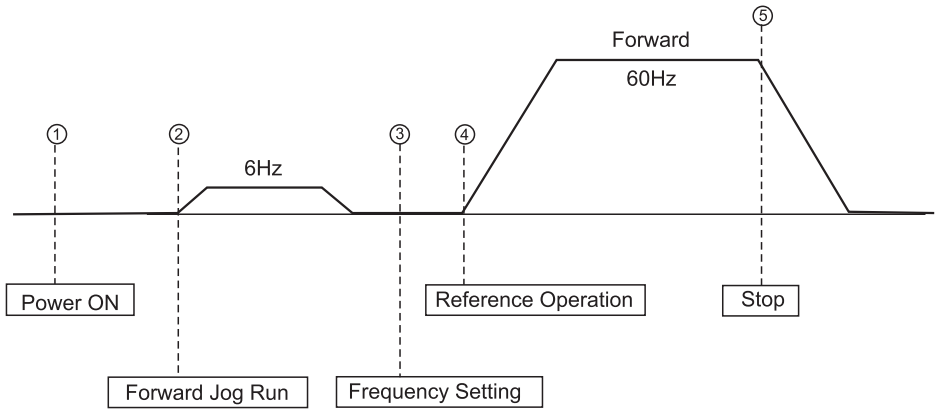


Fig. 12 Operation Sequence by Control Circuit Terminal Signal

Table 11 Typical by Control Circuit Terminal Signal

Description	Key Sequence	Digital Operator Display
① Power ON · Displays frequency reference value. REMOTE mode is preset at the factory.		Frequency Ref U1-01= 0.00 Hz REMOTE LED lights.(SEQ, REF)
Output Frequency Display · Switch to output frequency display.		Output Freq U1 - 02 = 0.00 Hz
② Forward Jog Run (6Hz) · Close between control circuit terminals 1 and 11 with 7 and 11 closed to perform JOG run. · Open between terminal 1 and 11,7 and 11 after verifying normal operation.		Output Freq U1 - 02 = 6.00 Hz RUN LED lights. FWD LED lights. ● RUN
③ Frequency Setting · Input frequency reference voltage(current) by control circuit terminals 13 or 14 and verify the input value by the digital operator.		Frequency Ref U1-01= 60.00 Hz For reference voltage 10V
Output Frequency Display · Select output frequency monitor display.		Output Freq U1 - 02 = 0.00 Hz
④ Forward Run · Close between control circuit terminals 1 and 11 to perform forward run.		Output Freq U1 - 02 = 60.00 Hz RUN LED lights. FWD LED lights. ● RUN
⑤ Stop · Open between control circuit terminal 1 and 11 to stop operation.		Output Freq U1 - 02 = 0.00 Hz STOP LED lights. (RUN LED blinks during deceleration.) ● STOP

5 SETTING OPERATION CONDITIONS

5.1 DIGITAL OPERATOR KEY DESCRIPTION

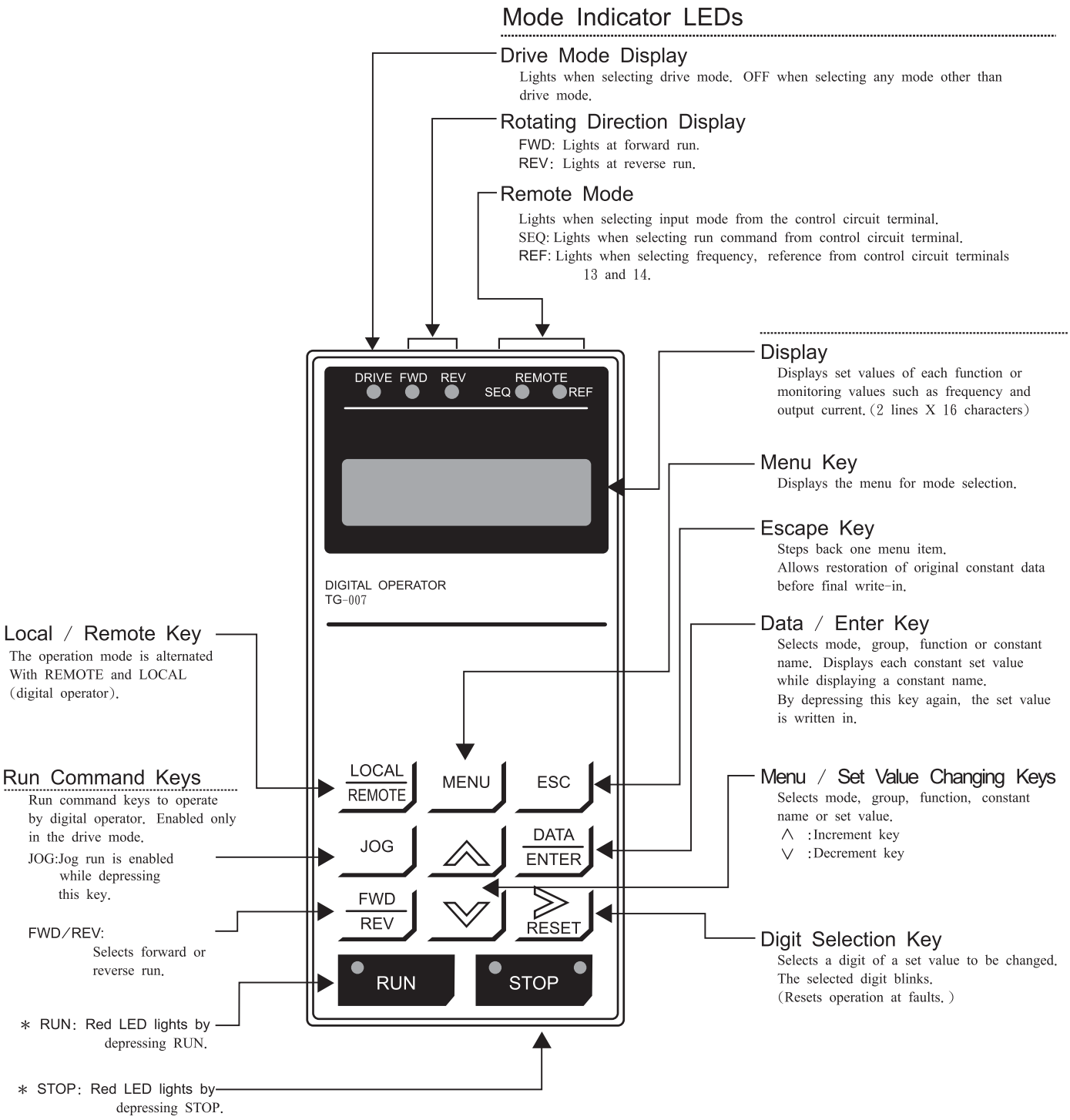


Fig. 13 Digital Operator Key Description

5 .2 DIGITAL OPERATOR MODE SELECTION

The digital operator of the TG-600 has the following four modes.

Table 12 Digital Operator Modes

Modes	Description
Opetation	Inverter operation is enabled. Displays monitor value, fault trace or faults that occurred previously.
Initialize	Sets and reads language displayed on the digital operator, level to set/read constants and control method.
Programming	Sets/reads constants.
Auto-tuning	Motor-related constants necessary for vector control are automatically set. This modes is not displayed at V/f control with PG feedback.
Modified Constants	Sets/reads constants changed from the values preset at the factory in programming mode or auto-tuning mode. The constants changed in initialize mode are not displayed.

Depressing the [MENU] key displays “Operation”. Change the mode display by using [^] or [v] key and select a mode by the [DATA/ENTER] key. Table 13 shows typical operation.

Table 13 Typical Operation of Mode Selection

Description	Key Sequence	Digital Operator Display	Remarks
• Displays Operation.	MENU	**Main Menu** Operation	
• Change the mode. (Displays Initialize.)	^	**Main Menu** Initialize	
• Change the mode. (Displays Programming.)	^	**Main Menu** Programming	
• Change the mode. (Displays Auto-Tuning.)	^	**Main Menu** Auto-Tuning	
• Change the mode. (Displays Modified Consts.)	^	**Main Menu** Modified Consts	
• Select Modified Consts.	DATA / ENTER	Accel Time 1 C1-01= 20.0 Sec	Displays accel time and its setting when accel time (C1-01) has been changed.
• Return the display to Modified Consts.	ESC	**Main Menu** Modified Consts	
• Change the mode. (Displays Operation.)	^	**Main Menu** Operation	

The mode can be changed even during operation. Even if the mode is changed to the programming mode to set/read constants during operation, the inverter continues operation. The inverter does not operate even if the run command is input, when the programming mode is selected and the inverter is stopped.

When the constants are set/read during operation, depress [MENU] key and then [DATA/ENTER] key to return to the frequency reference value display (the same as power-ON display).

5 .3 OPERATION MODE

The inverter can operate in this mode. Operation data or faults can be displayed. Each time when depressing [^] or [v] key, an item to be monitored is changed. If any fault occurs,the digital operator changes to the fault display automatically and returns to the previous display by the [>RESET] key.

Table 14 Typical Operation in Operation Modes

Description	Key Sequence	Digital Operator Display	Remarks
POWER ON*1			
Displays Operation.	MENU	**Main Menu** Operation	
Select Operation.	DATA ENTER		
Displays frequency reference value setting. *1		Frequency Ref U1-01=60.00HZ	To set frequency reference, depress the [DATA/ENTER] key. The value to be set blinks. (This setting is enabled at frequency reference from the digital operator or when using multi-step speed commands d1-01 to 09.)
Displays output frequency.*1	^	Output Freq U1-02=60.00HZ	
Displays output current.*1	^	Output Current U1-03=12.3A	
Displays output voltage.*1*2	^	Output Voltage U1-06 =200.0 VAC	
U2-□□*3	^	Function U2 Fault Trace	
U3-□□*3	^	Function U3 Fault History	
U1-□□*3	^	Function U1 Monitor	

*1 : Data to be displayed after the power supply ON can be selected by setting constant o1-02 (monitor selection after power up) among frequency reference value, output frequency, output current or selected monitor. (Initial setting is set to the output voltage monitor.)

*2 : Another item to be displayed instead of output voltage can be selected by setting constant o1-01 (monitor selection).

*3 : For items to be displayed such as U1-□□,U2-□□and U3-□□,refer to Table A-4 “Monitor Constants List”.

(1) Changing Frequency Reference Value

(Example)

Frequency reference value is changed from 0.00Hz to 60.00Hz using the digital operator

Table 15 Changing Frequency Reference Value

Description	Key Sequence	Digital Operator Display	Remarks
The inverter is in the LOCAL mod. (Can be operated from the keypad.)			
• Displays Operation.	MENU	**Main Menu** Operation	
• Select Operation. (Displays frequency reference.)	DATA/ENTER	Frequency Ref U1-01= 0.00HZ	
• Depress [DATA/ENTER] key. The value to be set blinks.	DATA/ENTER	Frequency Ref 0 00.00HZ	
• Change the value to 60.00HZ	▽ △ RESET	Frequency Ref 0 60.00HZ	
• Write-in the constant	DATA/ENTER	Entry Accepted	
		Frequency Ref 0 60.00HZ	Returns to the frequency reference value display after Entry Accepted is displayed for 1.5 seconds.
	ESC	Frequency Ref U1-01=60.00HZ	

Note : Only the digit that is blinking can be changed.

(2) Monitor Display

(Example)

Monitoring DC bus voltage (U1-07) during frequency reference display.

Table 16 Typical Display Operation.

Description	Key Sequence	Digital Operator Display	Remarks
• Displaying frequency reference.		Frequency Ref U1-01=60.00HZ	
• Displays U1-□□ monitor.		Function U1 Monitor	
• Select U1-□□ .		Frequency Ref U1-01=60.00HZ	
• Displays U1-07		DC Bus Voltage U1-07=303VDC	
• Returns to U1-□□ display.		Function U1 Monitor	
• Returns to frequency reference display.		Frequency Ref U1-01=60.00HZ	

(3) Fault Display

When detecting a fault,the TG-600 displays the fault contents on the digital operator and activates fault contact output, the motor coasts to a stop. For the display at fault occurrence or troubleshooting, refer to Table27"Fault Diagnosis and Corrective Actions". Since the TG-600 stores the information obtained at fault occurrence in the inverter, the information can be verified. For details, refer to Table A-4 "Monitor Constants List".

(Example)
Verifying the status at fault occurrence and resetting the fault when overcurrent occurs during operation at 60.00Hz.

Table 17 Typical Operation of Fault Display

Description	Key Sequence	Digital Operator Display	Remarks
• Displaying frequency reference.		Frequency Ref U1-01 = 60.00Hz	
• Overcurrent occurs.		OC Over Current	Display the fault
• Verify the status at fault occurrence.	^	Last Fault Over Current	Displays the status immediately before the fault occurred.
	^	Frequency Ref U2-03 = 60.00HZ	
	^	Output Freq U2-04 = 60.00Hz	
	^	Output Current U2-05 = 12.3A	
• Reset the fault.	RESET	Frequency Ref U1-01=60.00HZ	By resetting the fault, the display entered just prior to the fault occurrence is returned

NOTE

Fault reset cannot be activated while forward/reverse run signal from control circuit terminal is ON. Turn OFF the signal and check the safety of the safety to the sorrounding area, then reset the inverter.

5 .4 INITIALIZE MODE

As described below, the language displayed on the digital operator, the access level to set/read constants or control method (V/f control, vector control) can be selected. Set constants A1-01 and A1-02 before use of the TG-600 The following table shows the main constants for initialize mode.

Table 18 Initialize Mode

Con-stant No.	Digital Operator Display	Name	Description
A1-00	Select Language	Language selection (change enable during run)	0 : English
A1-01	Access Level	Access level (change enable during run)	0 : Exclusive for monitoring 1 : Constants for user selection (Constants to be set/read can be programmed by operator.) 2 : QUICK-START (Constants required for test run are set/read) 3 : BASIC (Normally-used constants are set/read.) 4 : ADVANCED (All constants are set/read.)
A1-02	Control Method.	Control method selection.	0 : V/f control 1 : V/f control with PG feedback 2 : Open loop vector 3 : Flux vector
* A1-03	Init Parameters	Reset to factory defaults.	0 : No Initialization 1110 : Initialization of user setting 2220 : 2-wire initialization 3330 : 3-wire initialization
* A1-04	Enter Password	Password.	Password setting.
A2-01 or A2-32	User Param 1 to 32	User setting constant.	When A1-01 = 1 (user program) is selected, selects the constants that can be set/read by digital operator.

*Do not set the constants unnecessarily, or the constants are initialized (A1-03) or some constants cannot be changed (A1-04)

(1) Changing Control Method

(Example)

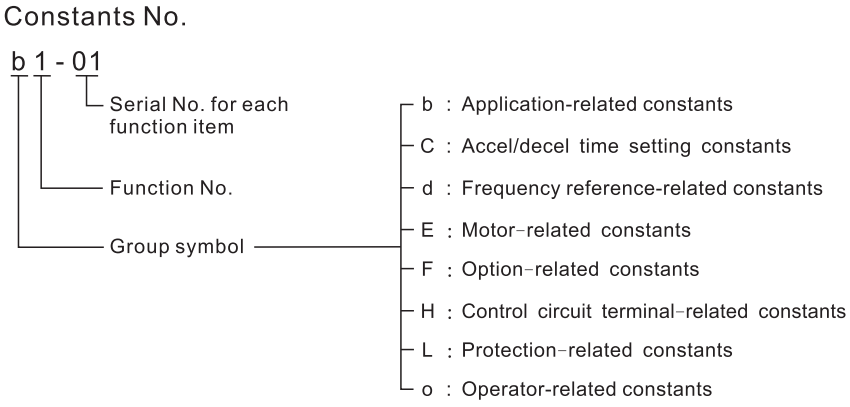
The control method is changed from open loop vector to V/f control.

Table 19 Changing Control Method

Description	Key Sequence	Digital Operator Display	Remarks
• Displaying frequency reference.		Frequency Ref U1-01=60.00HZ	
• Displays Operation.	MENU	**Main Menu** Operation	
• Displays Initialize.	∨ ∧	**Main Menu** Initialize	
• Select Initialize.	DATA/ENTER	Select Language English	When selecting Initialize, Select Language is displayed
• Change the constant name. (Displays Control Method.)	∨ ∧	Control Method Open Loop Vector	
• By depressing DATA/ENTER key, constant No. and set value are displayed.	DATA/ENTER	A1-02 = 02 *** Open Loop Vector	
• Change the control method. (Displays V/F Control.)	∨ ∧	A1-02 = 00 V/F Control	
• Select V/F Control.	DATA/ENTER	Entry Accepted	After displaying Entry Accepted for 1.5 seconds , returns to the control method display.
• Return to Operation	MENU	**Main Menu** Operation	
• Select Operation to display frequency reference.	DATA/ENTER	Frequency Ref U1-01=60.00HZ	

5 .5 PROGRAMMING MODE

The constants of the TG-600 are composed of group symbols, function Nos. and serial Nos. for each function item as shown below. Use [^] or [v] key to change the group, function or name display and select one by[DATA/ENTER] key.



Constants to be set/read by digital operator can be selected by setting the access level (constant A1-01) as described below.

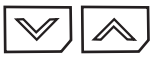
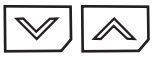
Table 20 Constant Access Level

A1-01	Name	Description
0	Exclusive for monitoring	Constants can be set/read in operation mode or initialize mode. Constants cannot be set/read in programming mode or modified constants mode.
1	User selected constants	• Up to 32 constants to be set/read by digital operator can be selected. • When A1-01 = 01 is selected, constants specified by A2-01 to 32 can be set/read by digital operator. Set the constant numbers in A2-01 to 32. • When constant numbers are not set in A2-01 to 32, user selected constants by A1-01 cannot be set/read.
2	QUICK-START	Constants required for quick-start operation are set/read. For details, refer to Descriptive Manual for Constants.
3	BASIC	Constants required for basic operation are set/read. For details, refer to Descriptive Manual for Constants.
4	ADVANCED	Constants required for advanced operation are set/read. For details, refer to Descriptive Manual for Constants.

(Example 1)

Select QUICK-START and change the decel time 1 (C1-02) from 10.0 to 20.0 seconds while frequency reference is displayed.

Table 21 Changing Constant Data when QUICK-START is Selected

Description	Key Sequence	Digital Operator Display	Remarks
• Displaying frequency reference.		Frequency Ref U1-01=60.00HZ	
• Displays Operation.	MENU	**Main Menu** Operation	
• Displays Programming.		**Main Menu** Programming	
• Select Programming	DATA/ENTER	Reference Source Terminal	When selecting Programming, the constant name and setting are displayed..
• Change the constant name display. (Displays Decel Time 1.)		Decel Time 1 C1-02 = 10.0 Sec	
• Depress DATA/ENTER key. The value to be set blinks.	DATA/ENTER	Decel Time 1 0010.0 Sec	
• Change the value to 20.0 seconds.		Decel Time 1 0020.0 Sec	
• Write-in the constant.	DATA/ENTER	Entry Accepted	After displaying Entry Accepted for 1.5 seconds, returns to the decel time 1 display.
• Return to Operation.	MENU	**Main Menu** Operation	
• Select Operation to display frequency reference	DATA/ENTER	Frequency Ref U1-01=60.00HZ	

(Example 2)

Select BASIC and change the decal time 1 (C1-02) from 10.0 to 20.0 seconds while frequency reference is displayed.

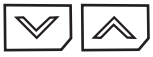
Table 22 Changing Constant Data when BASIC is Selected

Description	Key Sequence	Digital Operator Display	Remarks
• Displaying frequency reference.		Frequency Ref U1-01=60.00HZ	
• Displays Operation.	MENU	**Main Menu** Operation	
• Displays Programming.	∨ ∧	**Main Menu** Programming	
• Select Programming	DATA ENTER	Function b1 Sequence	When selecting Programming. Function b1 is displayed.
• Change the function display. (Displays Accel/Decel.)	∨ ∧	Function C1 Accel/Decel	Searches for C1.
• Select the function .(accel/decel time.)	DATA ENTER	Accel Time 1 C1-01= 10.0 Sec	
• Change the name display. (Displays Decel Time 1.)	∨ ∧	Decel Time 1 C1-02= 10.0 Sec	Displays C1-02.
• Depress DATA/ENTER key. The value to be set blinks.	DATA ENTER	Decel Time 1 0010.0 Sec	
• Change the value to 20.0 seconds.	∨ ∧ RESET	Decel Time 1 0020.0 Sec	
• Write-in the constant.	DATA ENTER	Entry Accepted	After displaying Entry Accepted for 1.5 seconds, returns to decel time display.
• Return to Operation.	MENU	**Main Menu** Operation	
• Select Operation to display frequency reference	DATA ENTER	Frequency Ref U1-01=60.00HZ	

(Example 3)

Select ADVANCED and change the decel time 1（C1-02）from 10.0 to 20.0 seconds while frequency reference is displayed.

Table 23 Changing Constant Data when ADVANCED is Selected

Description	Key Sequence	Digital Operator Display	Remarks
• Displaying frequency reference.		Frequency Ref U1-01=60.00HZ	
• Displays Operation.	MENU	**Main Menu** Operation	
• Displays Programming.		**Main Menu** Programming	
• Select Programming	DATA ENTER	Group b Application	When selecting Programming mode, the group menu is displayed.
• Change the group name. (Displays Tuning.)		Group C Tuning	
• Select the group. (Select Tuning group.)	DATA ENTER	Function C1 Accel/Decel	When selecting the group,the function menu is displayed. Select a function name using ∧ or ∨ key if necessary.
• Select the function . (Select accel/decel time.)	DATA ENTER	Accel Time 1 C1-01= 10.0 Sec	When selecting the function,the constant name is displayed.
• Change the constant name. (Displays Decel Time 1.)		Decel Time 1 C1-02= 10.0 Sec	Displays C1-02.
• Depress DATA/ENTER key. The value to be set blinks.	DATA ENTER	Decel Time 1 0010.0 Sec	
• Change the value to 20.0 seconds.		Decel Time 1 0020.0 Sec	
• Write-in the constant.	DATA ENTER	Entry Accepted	After displaying Entry Accepted for 1.5 seconds, returns to decel time 1 display.
• Return to Operation. (Displays Operation)	MENU	**Main Menu** Operation	
• Select Operation to display frequency reference	DATA ENTER	Frequency Ref U1-01=60.00HZ	

5 .6 MODIFIED CONSTANTS MODE

Compares the constant values preset at the factory with the values changed by the user, and displays the constants changed from the preset constants automatically. In the modified constants mode, constants can be read; in addition, they can also be set or changed.

(Example)

Read the constants C1-01 (accel time 1) and E1-01 (input voltage) when the factory settings have been changed. In addition, change the setting of E1-01 (input voltage) from 210V to 230V in this mode.

Table 24 Typical Operation in Modified Constants Mode

Description	Key Sequence	Digital Operator Display	Remarks
• Displaying frequency reference.		Frequency Ref U1-01=60.00HZ	
• Displays Operation.	MENU	**Main Menu** Operation	
• Displays Modified Consts.	∨ ∧	**Main Menu** Modified Consts	
• Select the Modified Consts.	DATA/ENTER	Accel Time 1 C1-01= 20.0 Sec	When selecting Modified Consts the constants which have been changed from factory settings are displayed.
• Displays the next-to-be-changed constant. (Displays input voltage.)	∨ ∧	Input Voltage E1-01= 210 VAC	
• Depress DATA/ENTER key. The value to be set blinks.	DATA/ENTER	Input Voltage 210 VAC	
• Change the value to 230V.	∨ ∧ RESET	Input Voltage 230 VAC	
• Write-in the constant.	DATA/ENTER	Entry Accepted	After displaying Entry Accepted for 1.5 seconds, returns to input voltage display.
• Displays the next-to-be-changed constant.	∨ ∧	Accel Time 1 C1-01= 20.0 Sec	
• Return to Main Menu. (Displays Operation)	MENU	**Main Menu** Operation	
• Select Operation to display frequency reference	DATA/ENTER	Frequency Ref U1-01=60.00HZ	

6 MAINTENANCE AND INSPECTION

⚠ WARNING

- Never touch high-voltage terminals in the inverter.
  Failure to observe this warning can result in an electrical shock.
- Replace all protective covers before powering up the inverter. To remove the cover, make sure to shut OFF the molded-case circuit breaker.
  Failure to observe this warning can result in an electrical shock.
- Perform maintenance or inspection only after verifying that the CHARGE LED goes OFF, after the main circuit power supply is turned OFF.
  The capacitors are still charged and can be dangerous.
- Only authorized personnel should be permitted to perform maintenance, inspections or parts replacement.
  [Remove all metal objects (watches, bracelets, etc.) before operation.]
  (Use tools which are insulated against electrical shock.)
  Failure to observe this warning can result in an electrical shock.

⚠ CAUTION

- The control PC board employs CMOS ICs. Do not touch the CMOS elements.
  They are easily damaged by static electricity.
- Do not connect or disconnect wires or connectors while power is applied to the circuit.
  Failure to observe this caution can result in personal injury.

This chapter describes basic maintenance and inspection procedures for the TG-600.

6 .1 PERIODIC INSPECTION

The TG-600 will function longer if it is kept clean, cool and dry, while observing the precautions listed in Par. 2.1. Check for tightness of electrical connections, discoloration or other signs of overheating or aging. Use Table 25 as your inspection guide, Before servicing, turn OFF AC main circuit power and be sure that the CHARGE LED is OFF.

Table 25 Periodic Inspection

Component	Check	Corrective Action
External Terminals, Unit Mounting Bolts, Connectors, etc.	Loose screws	Tighten.
	Loose connectors	Tighten.
Heatsink	Build-up of dust and dirt	Blow with dry compressed air of 39.2×10^4 to 58.8×10^4 Pa (4 to 6kg · cm^2) pressure.
Printed Circuit Board	Accumulation of conductive dust or oil.	Blow with dry compressed air of 39.2×10^4 to 58.8×10^4 Pa (4 to 6kg · cm^2) pressure. If dust and oil cannot be removed, replace the board.
Cooling Fan	For abnormal noise and vibration. Whether the cumulative operation time exceeds 20,000 hours or not.	Replace the cooling fan.
Power Elements	Accumulation of dust and dirt	Blow with dry compressed air of 39.2×10^4 to 58.8×10^4 Pa (4 to 6kg · cm^2) pressure.
Smoothing Capacitor	Discoloration or odor.	Replace the capacitor or inverter unit.

6 .2 PARTS REPLACEMENT SCHEDULE (GUIDELINES)

Replace the following parts periodically, for a long, safe, trouble free working life of TG-600

Table 26 Parts Replacement Schedule

Parts	Interval (Approx.)	Remarks
Cooling Fan	2 to 3 years	Replace with new one.
Smoothing Capacitor	5 years	Replace with new one. (Decided after inspection.)
Breakers or Relays	——	Decided after inspection.
Fuse	10 years	Replace with new one.
Aluminum Electrolytic Capacitor on PC Board	5 years	Replace with new one. (Decided after inspection.)

NOTE

Operating conditions are as follows:
Ambient temperature : 30 °C yearly average
Load factor : 80% or below
Operation rate : 12hours or below /day

7 TROUBLESHOOTING

This chapter describes the inverter fault display and the fault contents caused by motor / machine malfunctions and the corrective actions to be taken.

7 .1 FAULT DIAGNOSIS AND CORRECTIVE ACTIONS

(1) When the TG-600 detects a fault, the fault is displayed on the digital operator and activates the fault contact output and the motor coasts to a stop. Check the cause in the table below and take the corrective actions.

(2) If the inspections or corrective actions described cannot solve the problem, contact your SHANGCHIN representative immebiately.

(3) To restart, turn ON the reset input signal or depress [>RESET] key or shut OFF the main circuit power supply once, to reset the stop status.

Table 27 Fault Diagnosis and Corrective Actions

Fault Display	Description	Details	Corrective Action	Rank* (Standard Value)
UV1 DC Bus Undervolt	Main circuit undervoltage (PUV)	Undervoltage in the direct current main circuit during running. Detection level 200 V class: Approx. 190 V or less 400 V class: Approx. 380 V or less	• Check the power supply wiring. • Correct the line voltage	A
UV2 CTL PS Undervolt	Control circuit undervoltage (CUV)	Undervoltage in the control circuit during running.		A
UV3 MC Answerback	MC fault	The pre-charge contactor opened during running.		A
UV Under Voltage	Momentary power loss	• The main circuit direct current voltage fell below the PUV level. • The control power source fell below the CUV level. • The pre-charge contactor opened.	———	B
OC Overcurrent	Overcurrent (OC)	The inverter output current exceeded the OC level.	·Check the motor coil resistance. ·Extend the accel/decel time. ·Check the motor insulation. ·Multi-meter check.	A
GF Ground Fault	Grounding(GF) (Earth fault)	Inverter output grounding current exceeded 50% of inverter rated current.	·Check that motor insulation has not deteriorated. ·Check that connection between inverter and motor is not damaged.	A
OV DC Bus Overvolt	Overvoltage(OV)	The main circuit direct current voltage exceeded the OV level. Detection level 200 V class: Approx. 400 V 400 V class: Approx. 800 V	Extend the deceleration time,add braking circuit.	A
SC Short Circuit	Load short-circuit (SC)	Inverter output (load) is short-circuited.	Check the motor coil resistance. Check the motor insulation.	A
PUF DC Bus Fuse Open	Fuse blown (FU)	• The direct current circuit fuse is blown. • The output transistors were damaged.	Check for damaged transistor, load side short circuit, grounding, etc.	A
OHI Heatsnk MAX tmp	Heatsink overheat (OH1)	The transistor heatsink temperature exceeded the allowable value.	Check the fan and ambient temperature.	A
OL1 Motor Overloaded	Motor overload (OL1)	Inverter output exceeded the motor overload level.	Reduce the load.	A
OL2 Inv Overloaded	Inverter overload (OL2)	Inverter output exceeded the inverter overload level.	Reduce the load, extend the acceleration time.	A
OL3	Overtorque detection 1	When torque detection selection 1 is enabled (L6-01=1 to 4), inverter output current (in V/f control) or inverter torque reference (in vector control) exceeded torque detection level 1(L6-02) for the time set by torque detection time 1 (L6-03) or longer.	———	A (when L6-01 =3 or 4) B (when L6-01 =1 or 2)
OL4	Overtorque detection 2	When torque detection selection 2 is enabled (L6-01 = 1 to 4), inverter output current (in V/f control) or inverter torque reference (in vector control) exceeded torque detection level 2 (L6-05) for the time set by torque detection time 2 (L6-06) or longer.	———	A (when L6-04 =3 or 4) B (when L6-04 =1 or 2)

Table 27 Fault Diagnosis and Corrective Actions (Cont' d)

Fault Display	Description	Details	Corrective Action	Rank* (Standard Value)
PF Input Pha Loss	Input open-phase	·Inverter input power supply has open-phase. ·Large unbalance in input voltage.	Check the line voltage. Re-tighten the input terminal screws.	A
LF Output Pha Loss	Output open-phase	Inverter output has open-phase.	Check the output wiring. Check the motor impedance. Re-tighten the output terminal screws.	A
RR Dyn Brk Transistr	Braking transistor failure	The braking transistor has failed.	Replace the inverter.	A
RH Dyn Brk Resistor	Braking resistor unit overheat.	The braking resistor unit temperature has exceeded the allowable value. (Protects only inverter built-in type)	Reduce the regenerative load.	A
OS Overspeed Det	Overspeed (OS)	The motor speed exceeded the overspeed level.	——	A
PGO PG open	PG open circuit (PGO)	The PG line is broken.	·Check the PG line. ·Check the condition of the motor lock or the load.	A
DEV Speed Deviation	Speed deviation (DEV)	The deviation of the speed reference and speed feedback exceeded the regulation level.	Check the load.	B
OPR Oper Disconnect	Digital operator connection fault	The digital operator was disconnected during operation by run command from the digital operator.	Check the operator connection.	A
ERR EEPROM R/W Err	EEPROM writing fault (ERR)	EEPROM internal data did not match when initializing the constant.	Replace the control card.	A
CALL Serial Com Call	SI-B transmission error	Control data was not received normally when power supply is turned ON.	Check transmission devices and transmission signals.	C
CE Memobus Com Err	Transmission error	Control data was not received normally when power supply is turned ON.	Check transmission devices and transmission signals.	A
CF Out of Control	Control fault	In open loop vector control, it took 3 seconds or more for torque limit during deceleration to stop.	Check the motor-related constants.	A
SVE Zero Servo Fault	Zero-servo fault	The rotation position deviated by 10000 r/min or more during zero-servo operation.	·Check that the torque limit value is not too low. ·Check that the load torque is not excessive. ·Check the noise of PG signals.	A
EF External Fault	Operation reference fault (External)	Both FWD and REV run commands were closed for 500 ms or more.	Check sequence circuit.	B
EF 3 External Fault 3	External fault at terminal 3	Fault occurred in the external control circuit.	Check the condition of the input terminal. If the fault is displayed when terminal is not connected, replace the inverter.	A
EF 4 External Fault 4	External fault at terminal 4			B
EF5 External Fault 5	External fault at terminal 5			B
EF 6 External Fault 6	External fault at terminal 6			B

Table 27 Fault Diagnosis and Corrective Actions (Cont' d)

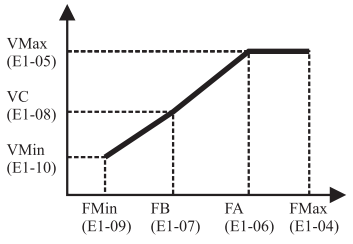
Fault Display	Description	Details	Corrective Action	Rank* (Standard Value)
EF 7 External Fault 7	External fault at terminal 7	Fault occurred in the external control circuit.	Check the condition of the input terminal. If the fault is displayed when terminal is not connected replace the inverter.	B
EF 8 External Fault 8	External fault at terminal 8			B
OPE01 kVA Selection	kVA selection fault (OPE01)	kVA selection fault	Check and set the constant data.	C
OPE 02 Limit	Constant setting range fault (OPE02)	Constant data is out of range.	Check the constant data settings.	C
OPE 03 Terminal	Multi-function contact input selection fault (OPE03)	·In H1-01 to H1-06 settings: ·The same values are set except for F, FF and 20 to 2F. ·Both UP/DOWN and HOLD commands are set. ·UP and DOWN commands are not set at the same time. ·Two or more HOLD,UP/DOWN, sample/hold commands are set. ·Two or more speed search 1,2,3 commands are set. ·In B5-01 setting, both PID control and UP/DOWN commands are set. ·In H3-09 setting, terminal 13/14 selection and the value other than "Not used"are set at the same time.	Check the constants.	C
OPE 05 Sequence Select	Option reference selection fault(OPE05)	·In B1-01 setting, C-option is not connected although frequency reference from C-option is selected. ·In B1-02 setting, C-option is not connected although run command from C-option is selected.	Check the constants.	C
OPE 06 PG Opt Missing	Control method selection fault(OPE06)	In A1-02 setting, ·PG is not connecetd although V/f control with PG feedback is selected. ·PG- B is not connecetd although flux vector control;is selected.	Check the constants.	C
OPE 07 Analog Selection	Multi-function analog input selection fault (OPE07)	·In H3-05 and H3-09 setting, the same values are set except for 0 and 1F ·While AI-14B is connected, "0"is set in F2-01 and option/inverter selection is set in multi-function contact input.	Check the constants.	C
OPE 10 V/f Ptrn Setting.	V/f data setting fault (E1-04 to E1-10)	When the settings of E1-04 to E1-10 do not satisfy the following conditions: · FMax. ≧FA>FB ≧F Min. (E1-04)(E1-06)(E1-07)(E1-09)  	Check the constants.	C

Table 27 Fault Diagnosis and Corrective Actions (Cont' d)

Fault Display	Description	Details	Corrective Action	Rank* (Standard Value)
OPE11 Carr Frq/On-Delay	Constant setting fault	When one of the following setting fault occurs: ·Carrier frequency upper limit. (C6-01)>5kHz, and Carrier. frequency lower limit (C6-02) ≦5kHz. ·Carrier frequency proportional gain (C6-03)>6 and (C6-01)<(C6-02) ·Setting error of upper/lower limit of C6-01 to 03 and C8-15.	Check the constants.	C
CPF00 COM-ERR(OP&INV)	Control circuit fault 1 (CPF00) (Digital operator transmission fault)	·Transmission between the inverter and digital operator cannot be established 5 seconds after supplying power. ·MPU peripheral element check fault (initial)	·Insert the digital operator connector again. ·Check the control circuit wiring. ·Replace the control card.	A
CPF01 COM-ERR(OP&INV)	Control circuit fault 2 (CPF01) (Digital operator transmission fault)	·Transmission between the inverter and digital operator is established once after supplying power, but later transmission fault continues for more than 2 seconds. ·MPU peripheral element check fault (online)	·Insert the digital operator connector again. ·Check the control circuit wiring. ·Replace the control card.	A
CPF02 BB Circuit Err	Baseblock circuit fault (CPF02)	Inverter control unit fault.	Replace the control card.	A
CPF03 EEPROM Error	EEPROM fault (CPF03)			A
CPF04 Internal A/D Err	CPU internal A/D converter fault (CPF04)			A
CPF05 External A/D Err	CPU external A/D converter fault (CPF05)			A
CPF06 Option Error	Option connection fault (CPF06)	The option card is not installed correctly.	Install the option card again.	A
CPF20 Option A/D Error	A/D converter fault in analog speed reference card(CPF20)	Option card (AI-14B) A/D converter fault.	Replace the option card.	A

*The ranks are classified as follows:

Rank A: Major fault (Motor coasts to a stop, operator indication lights, and fault contact is output.)

Rank B: Fault [Operation continues, operator indication blinks, no fault contact is output,and minor fault contact is output (when multi-function output is selected.)

Rank C: Warning (Operation cannot be performed, operator indication lights, no fault contact is output, no minor fault contact is output.)

7.2 MOTOR FAULTS AND CORRECTIVE ACTIONS

(1) If any of the following faults occurs in the motor, check the cause and provide the relevant corrective action.

(2) If these inspection and corrective action cannot, solve the problem, contact your SHANGCHIN representative immebiately.

Table 28 Motor Faults and Corrective Actions.

Fault	Check	Corrective Action
Motor does not rotate.	Power supply voltage applied to power supply terminals L1,L2,L3 ? CHARGE LED is ON?	·Turn ON power supply ·Turn OFF power supply,and then ON again ·Check power supply voltage. ·Make sure terminal screws are tight.
	Use rectifier type voltmeter to test. Voltage output to output terminals U(T1),V(T2),W(T3) correct?	Turn OFF power supply,and then turn ON again .
	Motor locks due to excessive load?	Reduce the load and release the lock.
	Fault displayed in operator display?	Check troubleshooting table.
	FWD or REV run command entered?	Check the wiring.
	Frequency setting voltage entered?	·Correct the wiring. ·Check frequency setting voltage.
	Reference selection (b1-01), operation method selection (b1-02) correct?	Input the correct set value.
Motor rotation reverses.	Wiring of terminals U(T1), V(T2), W(T3) correct?	Match wiring to the phase order the motor leads U(T1), V(T2), W(T3)
	FWD or REV wiring run signals entered?	Correct the wiring.
Motor rotates, but variable speed not available.	Wiring of frequency setting circuit correct?	Correct the wiring.
	Reference selection (b1-01), operation method selection (b1-02) correct?	With the digital operator, check the reference selection or operation method selection.
	Load excessively large?	Reduce the load.
Motor r/min too high or too low.	Motor ratings (number of poles, voltage) correct?	Check motor nameplate specifications.
	Accel/decel speed change ratio for gears, etc. correct?	Check speed changer (gears, etc.)
	Maximum frequency set value correct?	Check the maximum frequency set value.
	Use rectifier voltmeter. Voltage between motor terminals not excessively reduced?	Check V/f characteristics values.
Motor r/min not stable during operation.	Load excessively large?	Reduce the load.
	Load variation excessively large?	·Reduce the load variation. ·Increase inverter motor capacity.
	3-phase or single-phase power supply used? For 3-phase power supply, open phase?	·For 3-phase power supply, check the wiring if power supply is open phase. ·For single-phase power supply, connect AC reactor to the power supply.

APPENDIX 1 SPECIFICATIONS

220V Series:

Model TG-600		L15	L30	L50	L75	L100	L150	L200	L250	L300	L400	L500	L600	L750	L1000
Max. Applicable Motor Output* kW		0.75	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75
Output Characteristics	Inverter Capacity (kVA)	2.3	4.3	6.8	9.9	13.5	19.5	24.5	31	37.5	51	62	70	85	110
	Rated Output Current (A)	6	11	18	26	34	50	65	82	96	132	163	183	224	330
	Max. Output Voltage	3-Phase, 200 / 208 / 220 / 230V (Proportional to input voltage)													
	Rated Output Frequency	Up to 400Hz available by programming													
Power Supply	Rated Input Voltage and Frequency	3-Phase, 200 / 208 / 220 / 230V 50 / 60Hz													
	Allowable Voltage Fluctuation	±10% , -15%													
	Allowable Frequency Fluctuation	±5%													

440V Series:

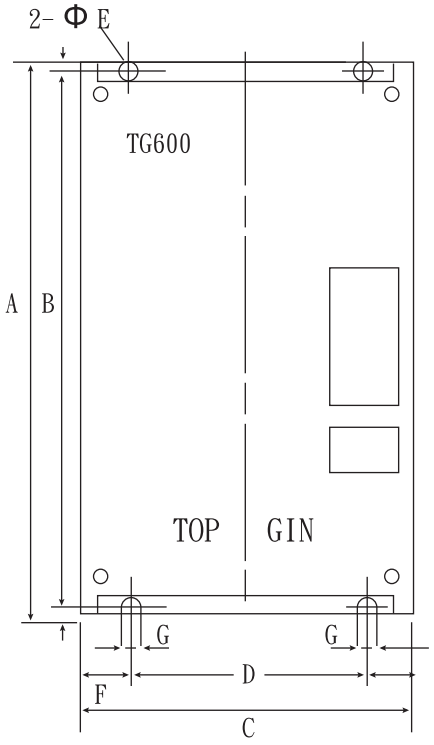
Model TG-600		H30	H50	H75	H100	H150	H200	H250	H300	H400	H500	H600	H750	H1000	H1500	H2000	H2500	H3000	H4000
Max. Applicable Motor Output* kW		2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	110	160	185	220	300
Output Characteristics	Inverter Capacity (kVA)	4.7	6.7	12	16	21.5	26	32	41.5	52	62	75	98	130	170	230	260	340	460
	Rated Output Current (A)	6.2	8	14.5	21	28	34	43	54	67	80	98	128	165	224	300	340	450	600
	Max. Output Voltage	3-Phase, 380 / 400 / 415 / 440 / 460V (Proportional to input voltage)																	
	Rated Output Frequency	Up to 400Hz available by programming																	
Power Supply	Rated Input Voltage and Frequency	3-Phase, 380 / 400 / 415 / 440 / 460V 50 / 60Hz																	
	Allowable Voltage Fluctuation	±10% , -15%																	
	Allowable Frequency Fluctuation	±5%																	

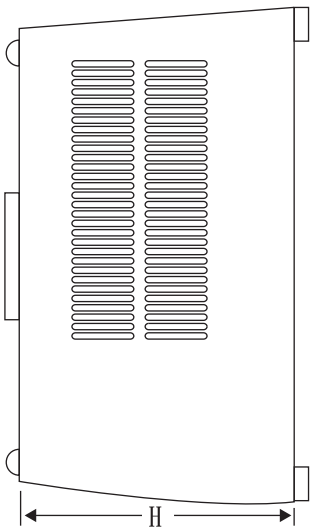
Control Method		Sine wave PWM (Output with a choice of V/f control, V/f with PG feedback, open ioop vector, flux vector)
Control Characteristics	Starting Torque	150% / 0 r/min (150% / 1Hz without PG)
	Speed Control Range	1:1000 (1:100 without PG)
	Speed Control Accuracy	±0.02% (±0.2% without PG)
	Speed Response	30Hz (33ms) [5Hz (200ms) without PG]
	Torque Limit	Available (Parameter setting, 4 steps can be changed)
	Torque Control	Available (torque accuracy: ±5% for fiux vector control)
	Torque Response	40Hz (25ms) (for flux vector control)
	Frequency control Range	0.1 to 400Hz
	Frequency Accuracy	Digital command: ±0.01% (-10℃~ +40℃) Analog command: ±0.1% (25℃±10℃)
	Frequency Resolution	Digital operator reference: ±0.01Hz Anglog reference:0.03Hz / 60Hz* (11 bit+sign)
	Output Frequency Resolution	0.01Hz
	Overload Capacity	150% of rated output current for 1 minute
	Frequency Setting Signal	DC-10 ~ +10V , 0 ~ 10V , (20KΩ) 4 ~ 20mA (250Ω)
	Accel / Decel Time	0.01 to 6000.0 sec (Accel / decel time setting independently, 4 steps available)
	Braking Torque	Approx. 20% (up to 125% with option)
Protective function	Motor protection	Protection by electronic thermal
	Instantaneous overcurrent protection	Stops at approx. 200% of rated output current
	overload protection	Stops in one minute at approx. 150% of rated output current
	overvoltage	Stop when main-circuit DC voltage is approx. 410V (or 820V for 440V class)
	Under voltage protection	Stop when main-circuit DC voltage is approx. 190V (or 380V for 440V class)
	Momentary power interruption compensation (selection)	Stops for 15 ms or more. By selecting the momentary power interruption mode, Operation can be continued if power is restored within 2s.
	Cooling fin overheating	Protection by thermistor
	Stall Prevention	Stall prevention during accel / decel and constant speed operation
	Grounding protection	Protection by electronic circuits
	Charge indicalor (internal LED)	Lit when rated DC voltage is approx. 50V or more

* Based on standard 4-pole motor for max. applicable motor output.

APPENDIX 2 DIMENSIONS（mm）

TG-600/TG-1000										WEIGHT (Kg)	
220	380V / 440V	A	B	C	D	E	F	G	H	220V	380V / 440V
L15	H15	300	290	150	140	5	5	5	180	3.5	3.6
L20	H20									3.7	3.7
L30	H30									3.85	3.7
L50	H50									4.2	4.5
	H55										4.5
L75	H75									4.4	4.5
L100	H100	320	308	200	185	5.5	7.5	5.5	220	12	10
L150	H150	390	373	255	235	7	10	7	240	18	16
L200	H200									20	17
L250	H250	485	467	301	273	8	11.5	8	270	21	22
L300	H300									22	23.2
	H400										27
	H500										27
L400	H600	685	660	420	320	8	52	8	335	58	55
L500	H750									59	70
L600	H1000									65	70
L750	H1250									67	72
	H1500										133
L1000	H1750	900	875	580	459	12	60	12	340	123	135
L1500	H2000									135	138.5
L2000	H2500									140	140
L2500	H3000									170	170
	H4000	1100	1060	760	540	11	105	12	355		225





Side View

◎ Top Gin retains the right to make any dimensional changes without further notice.

1. Parameter List

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Initialize	Initialization	A1-00	Language Selection (Select Language)	0.1	1	1 (Note1)	0: English 1: Japanese 2: Deutsch <1110> 3: Francais <1110> 4: Italiano <1110> 5: Espanol <1110> 6: Portugues <1110>	o	Q	Q	Q	Q	
		A1-01	Access Level (Access Level)	0~4	1	2	0: Operation Only 1: User Level(Note 5) 2: Quick-Start [Q] 3: Basic Level [B] 4: Advanced Level [A]	o	Q	Q	Q	Q	
		A1-02	Control Method Selection (Control method)	0~3	1	0 (Note1)	0: V/F Control 1: V/F w/PG Fdbk 2: Open Loop Vector 3: Flux Vector	x	Q	Q	Q	Q	
		A1-03	Initialize (Init Parameters)	0 1110 2220 3330	N/A	0	0 : No Initialize 1110: User Initialize(Note 7) 2220: 2-Wire Initialize 3330: 3-Wire Initialize	x	Q	Q	Q	Q	
		A1-04	Password 1 * (Enter Password)	0000~ 9999	1	0000	Password protection for: A1-01 Access Level A1-02 Control Method A1-03 Initialization A2-01 to A2-32 User Parameters (If selected)	x	Q	Q	Q	Q	
	User Parameters	A2-01 ~ A2-32	User Setting Parameters (Function A2)	—	—	—	User Parameter 1 to User Parameter 32	x	A	A	A	A	

Note 1 Not initialized. (Domestic standard specifications: A1-01 = 1, A1-02 = 2)
Note 2 Setting range is only 0 and 1 when the control method is set to flux vector control (A1-02 = 3)
Note 5 Selection 1: User Level is only available after selecting setting 4: Advanced Level and then entering a user parameter in A2-01.
Note 7 Setting 1110: User Initialize is only available after setting Parameter No. O2-03 to 1.

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group B Application	Function b1 Sequence	B1-01	Reference Selection (Reference Source)	0 ~ 4	1	1	0: (Operator) 1: (Terminals) 2: Communication (Serial Com) 3: (Option PCB) 4: (EWS) Reference from CP-717<1110>(Note 8)	x	Q	Q	Q	Q	
		B1-02	Operation Method Selection (Run Source)	0 ~ 4	1	1	0: (Operator) 1: (Terminals) 2: Communication(Serial Com) 3: (Option PCB) 4: (EWS) Run from CP-717 <1110>(Note 8)	x	Q	Q	Q	Q	
		B1-03	Stopping Method Selection (Stopping Method)	0 ~ 3 (Note 2)	1	0	0: (Ramp to Stop) 1: (Coast to Stop) 2: DC injection to stop (DCInj to Stop) 3: Coast to stop with timer (Coast w/Timer)	x	Q	Q	Q	Q	
		B1-04	Reverse Operation Prohibit (Reverse Oper)	0, 1	1	0	0: (Reverse Enabled) 1: (Reverse Disabled)	x	B	B	B	B	
		B1-05	Operation Selection for Setting of E1-09 or less (Zero-Speed Oper)	0 ~ 3	1	0	0: Run at frequency reference (Run at Freq Ref) 1: (STOP) 2: Run at minimum frequency (RUN at Min Freq) 3: (RUN at Zero RPM)	x	-	-	-	A	
		B1-06	Digital Input Scan Time (Cntl Input Scans)	0, 1	1	1	0: (2 mS - 2 Scans) 1: (5 mS - 2 Scans)	x	A	A	A	A	
		B1-07	Operation selection after switching to remote mode (LOC/REM RUN Sel)	0, 1	1	0	0: Cycle external run (Cycle Extern RUN) 1: Accept external run (Accept Extern RUN)	x	A	A	A	A	
		B1-08 <1110>	Run command acceptance while being programmed (RUN CMD at PRG)	0, 1	1	0	0: Disabled 1: Enabled	x	A	A	A	A	

Note 2 Setting range is only 0 and 1 when the control method is set to flux vector control (A1-02 = 3)

Note 8 (Tentative) Setting parameter B1-01 or B1-02 to 4 allows reference and/or run source from CP-717 when either CP-916 or CP-216 option cards are installed.

Note 9 Drive can be switched between local and remote mode while continuing to run. When switching from remote to local the last remote speed command will be set as the local speed for a bumpless transition.

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group b Application	Function b2 DC Injection Brake	B2-01	DC Injection Braking Starting Frequency (DCInj Start Freq)	0.0~10.0	0.1Hz	0.5	—	x	B	B	B	B	
		B2-02	DC Injection Current (DCInj Current)	0~100	1%	50	—	x	B	B	B	-	
		B2-03	DC Injection Time at Start (DCInj Time @Start)	0.00~10.00	0.01s	0.00	—	x	B	B	B	B	
		B2-04	DC Injection Braking Time at Stop (DCInj Time @Stop)	0.00~10.00	0.01s	0.50 *	* When 02-09 = 1 (American), the setting is 0.00s. <24>	x	B	B	B	B	
		B2-08 <1110>	Magnetic Flux Compensation Capacity (FieldComp)	0~500	1%	0	100% is no-load current value at Min. frequency (E1-09)	x	-	-	A	A	
	Speed Search	B3-01	Speed Search Selection at Start (SpdSrch at Start)	0,1	1	0*	0: Disabled 1: Enabled * Factory setting defaults to 0: Disabled except when (A1-02=1) (V/F w/PG Fdbk) or 3 (Flux Vector).	x	A	A	A	A	
		B3-02	Speed Search Operation Current (SpdSrch Current)	0~200	1%	150*	* Factory setting defaults to 150 when A1-02=0 (V/F Control). When A1-02=2 (Open Loop Vector), the default is 100.	x	A	-	A	-	
		B3-03	Speed Search Deceleration Time (SpdSrch Dec Time)	0.1~10.0	0.1s	2.0	—	x	A	-	A	-	
	Delay Timers Brake Sequence	B4-01	Timer Function On-delay Time (Delay-ON Timer)	0.0~300.0	0.1s	0.0	—	x	A	A	A	A	
		B4-02	Timer Function Off-delay Time (Delay-OFF Timer)	0.0~300.0	0.1s	0.0	—	x	A	A	A	A	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group b Application	Function b5 PID Control	B5-01	PID Control Mode Selection (PID Mode)	0 ~ 4	1	0	0: (Disabled) 1: (Enabled D = Fdbk) 2: Enabled D = Feed - Forward (Enabled D=Fdfwd) 3: Reference = Frequency Reference + PID Output (Fref +PID D=Fdbk) 4: Reference = Frequency Reference + PID Output D is feed-forward (Fref +PID D=Fdfwd)	x	A	A	A	A	
		B5-02	Proportional Gain (P) (PID Gain)	0.00~ 25.00	0.01	1.00	—	o	A	A	A	A	
		B5-03	Integral (I) Time (PID I Time)	0.0~ 360.0	0.1s	1.0	—	o	A	A	A	A	
		B5-04	Integral (I) Limit (PID I Limit)	0.0~ 100.0	0.1%	100	—	o	A	A	A	A	
		B5-05	Derivative (D) Time (PID D Time)	0.00~ 10.00	0.01s	0.00	—	o	A	A	A	A	
		B5-06	PID Limit (PID Limit)	0.00~ 100.0	0.1%	100.0	—	o	A	A	A	A	
		B5-07	PID Offset Adjustment (PID Offset)	-100.0 ~ +100.0	0.1%	0.0	—	o	A	A	A	A	
		B5-08	PID Primary Delay Time (PID Delay Time)	0.00~ 10.00	0.01s	0.00	—	o	A	A	A	A	
		B5-09 <1110>	PID Output Selection (Output Level Sel)	0, 1	1	0	0: PID Forward Output [X 1] (Normal Character) 1: PID Reverse Output [X-1] (Rev Character)	x	A	A	A	A	
		B5-10 <1110>	PID Output Gain (Output Gain)	0.0 ~ 25.0	.1	1.0	—	x	A	A	A	A	
		B5-11 <1110>	PID Output Reverse Selection (Output Rev Sel)	0, 1	1	0	0: When PID output is negative, motor direction is not changed, PID output is limited to 0. (0 limit) 1: When PID output is negative, motor reverses direction. (Reverse)	x	A	A	A	A	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group b Application	PID Control	B5-12 <1110>	PID Feedback Reference Missing Detection Selection (Fb Los Det Sel)	0~2	1	0	0: PID feedback missing detection disabled. (Disabled) 1: PID feedback missing detection enabled. (Alarm) Operation continues after detection, "Fbl" alarm is displayed. 2: PID feedback missing detection enabled. (Fault) Inverter output is shut off after detection, "Fbl" is displayed.	x	A	A	A	A	
		B5-13 <1110>	PID Feedback Reference Missing Detection Level (Fb los Det Lvl)	0~100	1%	0	—	x	A	A	A	A	
		B5-14 <1110>	PID Feedback Reference Missing Detection Time (Fb los Det Time)	0.0~25.5	0.1s	1.0	—	x	A	A	A	A	
	Function b6 Reference Hold	B6-01	Dwell Frequency at Start (Dwell Ref @Start)	0.0~400.0	0.1Hz	0.0	—	x	A	A	A	A	
		B6-02	Dwell Time at Start (Dwell Time @ Start)	0.0~10.0	0.1s	0.0	—	x	A	A	A	A	
		B6-03	Dwell Frequency at Stop (Dwell Ref @ Stop)	0.0~400.0	0.1Hz	0.0	—	x	A	A	A	A	
		B6-04	Dwell Time at Stop (Dwell Time @ Stop)	0.0~10.0	0.1s	0.0	—	x	A	A	A	A	
	Function b7 Droop Control Droop Control	B7-01	Droop Control Gain (Droop Quantity)	0.0~100.0	0.1%	0.0	—	o	-	-	-	A	
		B7-02	Droop Control Delay Time (Droop Delay Time)	0.03~2.00	0.01s	0.05	—	o	-	-	-	A	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group b Application	Function b8 Energy Saving	B8-01	Energy-saving Gain (Energy Save Gain)	0~100	1%	80	-	x	A	A	-	-	
		B8-02	Energy-saving Frequency (Energy Save Freq)	0.0~400.0	0.1Hz	0.0	-	x	A	A	-	-	
		B8-03 <1110>	Energy -saving Mode Selection	0, 1	1	0	0: (Disabled) 1: (Enabled)	x	-	-	F (A) Note	F (A) Note	
		B8-04 <1110>	Energy-saving Control Gain (Energy Save Gain)	0.0~10.0	0.1	0.7*	*When control mode A1-02 = 3, default factory setting becomes1.0	o	-	-	F (A) Note	F (A) Note	
		B8-05 <1110>	Energy-saving Control Time Constant (Energy Save F .T)	0.00~10.00	0.01s	0.50*	*When control mode A1-02 = 3, default factory setting becomes.01	o	-	-	F (A) Note	F (A) Note	
	Zero Servo	B9-01	Zero-servo gain (Zero Servo Gain)	0~100	1	5	-	x	-	-	-	A	
		B9-02	Zero-servo Completion Width (Zero Servo Count)	0~16383	1	10	-	x	-	-	-	A	
								Note: USA (02x09=1) and EUR. (02x09=2)are Advanced, others are Factory setting.					
Group C Tuning	Function C1 Accel / Decel	C1-01	Acceleration Time 1 (Accel Time 1)	Depends on C1-10 0.00~600.00 or 0.0~6000.0	Depends on C1-10 0.01s or 0.1s	10.0	-	o	Q	Q	Q	Q	
		C1-02	Deceleration Time 1 (Decel Time 1)			10.0	-	o	Q	Q	Q	Q	
		C1-03	Acceleration Time 2 (Accel Time 2)			10.0	-	o	B	B	B	B	
		C1-04	Deceleration Time 2 (Decel Time 2)			10.0	-	o	B	B	B	B	
		C1-05	Acceleration Time 3 (Accel Time 3)			10.0	-	x	A	A	A	A	
		C1-06	Deceleration Time 3 (Decel Time 3)			10.0	-	x	A	A	A	A	
		C1-07	Acceleration Time 4 (Accel Time 4)			10.0	-	x	A	A	A	A	
		C1-08	Deceleration Time 4 (Decel Time 4)			10.0	-	x	A	A	A	A	
		C1-09	Emergency Stop Time (Fast Stop Time)			10.0	-	x	B	B	B	B	
		C1-10	Accel/Decel Time Set Unit (Acc/Dec Units)	0.1	1	1	0:Set unit of accel/decel time is 0.01s. (0.01 Seconds) 1:Set unit of accel/decel time is 0.1s. (0.1 Seconds)	x	A	A	A	A	
		C1-11	Accel/Decel Time Switching Frequency (Acc/Dec SW Freq)	0.0~400.0	0.1Hz	0.0	-	x	A	A	A	A	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group C Tuning	Function C2 S-Curve Acc/Dec	C2-01	S-Curve Characteristic Time at Acceleration Start (SCrv Acc@ Start)	0.00~2.50	0.01s	0.20	——	x	A	A	A	A	
		C2-02	S-Curve Characteristic Time at Acceleration End (SCrv Acc@ End)	0.00~2.50	0.01s	0.20	——	x	A	A	A	A	
		C2-03	S-Curve Characteristic Time at Deceleration Start (Scrv Dec @ Start)	0.00~2.50	0.01s	0.20	——	x	A	A	A	A	
	Function C3 Motor Slip Compensation	C3-01	Slip Compensation Gain (Slip Comp Gain)	0.0~2.5	0.1	1.0*	* Default factory setting is 0.0 when A1-02=0 [V/F mode]. When A1-02=2 [Open Loop Vector] or 3 [Flux Vector] default factory setting is 1.0	o	B	-	B	B	
		C3-02	Slip Compensation Primary Delay Time (Slip Comp Time)	0~10000	1 ms	200*	* Default factory setting is 2000ms when A1-02=0 [V/F mode]. When A1-02=2 [Open Loop Vector] default factory setting is 200ms.	x	A	-	A	-	
		C3-03	Slip Compensation Limit (Slip Comp Limt)	0~250	1%	200	——	x	A	-	A	-	
		C3-04	Slip Compensation Selection during Regeneration (Slip Comp Regen)	0, 1	1	0	0 : Disabled 1 : Enabled	x	A	-	A	-	
		C3-05 <1110>	Flux Calculation Method (Flux Select)	0, 1	1	0	0 : Magnetic flux is calculated by output frequency after compensation. (Slip Included) 1 : Magnetic flux is calculated by output frequency before compensation. (Slip Excluded)	x	-	-	A	-	
		C3-06 <1110>	Output Voltage Limit Operation Selection (Output V limit)	0, 1	1	0	0 : Disabled (Note 10) 1 : Enabled (Note 11)	x	-	-	A	A	

Note 10 When this parameter is "0" slip compensation will be disabled when the motor is operating above its base speed. The motor voltage will not be reduced above base speed.

Note 11 Open Loop Vector: When this parameter is set to "1" the motor voltage will be reduced slightly when the motor is operating above 90% base speed. Slip Compensation is enabled. Speed control accuracy is improved. This may prevent speed instabilities due to motor voltage saturation. This setting may improve speed regulation however motor torque/amp will be reduced by up to 10% due to motor voltage reduction above base speed. Flux Vector: Torque linearity is improved.

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group C Tuning	Function C4 Torque Compensation	C4-01	Torque Compensation Gain (Torq Comp Gain)	0.00~2.50	0.01	1.00	—	o	B	B	B	-	
		C4-02	Torque Compensation Time (Torq Comp Time)	0~10000	1 ms	20*	* When A1-02=2 [Open Loop Vector] factory default setting is 20 ms. When A1-02=1or 3 [V/F or V/F w/PG] factory default setting is 200 ms.	x	A	A	A	-	
		C4-03 <1110>	Forward Torque Compensation Value @ Start (F TorqCmp @start)	0.0~200.0	0.1%	0.0	Functions only when starting a motor. Torque reference and motor flux can be ramped up quickly to improve speed response during start. A setting of 0.0 disables this feature.	x	-	-	A	-	
		C4-04 <1110>	Reverse Torque Compensation Value @ Start. (R TorqCmp @ start)	200.0~0.0	0.1%	0.0	Functions only when starting a motor. Torque reference and motor flux can be ramped up quickly to improve speed response during start. A setting of 0.0 disables this feature.	x	-	-	A	-	
		C4-05 <1110>	Torque Compensation Time Constant (TorqCmp Delay T)	0~200	1ms	10	When 0~4ms is set, it is operated without filter. Functions with C4-03 and C4-04.	x	-	-	A	-	
	Function C5 ASR Tuning	C5-01	ASR Proportional (P) Gain 1 (ASR P Gain 1)	0.00~300.00	0.01	20.00*	When A1-02=1 [V/f w/PG] factory default setting is .20. When A1-02=3 factory default setting is 20.00.	o	-	B	-	B	
		C5-02	ASR Integral (I) Time 1 (ASR 1 Time 1)	0.000~10.000	0.001s	0.500*	When A1-02=1 [V/f w/PG] factory default setting is .200. When A1-02=3 factory default setting is .500	o	-	B	-	B	
		C5-03	ASR Proportional (P) Gain 2 (ASR P Gain 2)	0.00~300.00	0.01	20.00*	When A1-02=1 [V/f w/PG] factory default setting is .02 When A1-02=3 factory default setting is 20.00.	o	-	B	-	B	
		C5-04	ASR Integral (I) Time 2 (ASR 1 Time 2)	0.000~10.000	0.001s	0.500*	When A1-02=1 [V/f w/PG] factory default setting is .050. When A1-02=3 factory default setting is .500.	o	-	B	-	B	
		C5-05	ASR Limit (ASR Limt)	0.0~20.0	0.1%	5.0	—	x	-	A	-	-	
		C5-06	ASR Primary Delay Time (ASR Delay Time)	0.000~0.500	0.001s	0.004	—	x	-	-	-	A	
		C5-07	ASR Switching Frequency (ASR Gain SW Freq)	0.0~400.0	0.1Hz	0.0	—	x	-	-	-	A	
		C5-08	ASR Integral Limit (ASR I Limit)	0~400	1	400%	—	x	-	-	-	A	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group C Tuning	Function C6 Carrier Frequency	C6-01	Carrier Frequency Upper Limit (Carrier Freq Max)	0.4~15.0**	0.1 kHz	15.0**	When control mode is vector control (A1-02=2, 3), the setting range of C6-01 and C6-02 is 2.0 ~15.0. ** Setting range and factory setting differ depending on inverter capacity.	x	B	B	B	B	
		C6-02	Carrier Frequency Lower Limit (Carrier Freq Min)	0.4~15.0	0.1 kHz	15.0**		x	A	A	–	–	
		C6-03	Carrier Frequency Proportional Gain (Carrier Freq Gain)	00~99**	1	00**		x	A	A	–	–	
	Function C7 Hunting Prevention	C7-01	Hunting Prevention Selection (Hunt Prev Select)	0, 1	1	1	0:Disabled 1:Enabled	x	A	A	–	–	
		C7-02	Hunting Prevention Gain (Hunt Prev Gain)	0.00~2.50	0.01	1.00	–	x	A	A	–	–	
Group C Tuning	Function C8 Factory Tuning	C8-08	AFR Gain (AFR Gain)	0.00~10.00	0.01	1.00	–	x	–	–	A	–	
		C8-09	AFR Time Constant (AFR Time)	0~2000	1 ms	50	–	x	–	–	A	–	
		C8-30 <1110>	Carrier Frequency Selection during Auto-tuning (Carrier in tune)	0~2	1	0	0: Carrier frequency is 2 kHz. 1: Carrier frequency depends on C6-01. 2: Carrier frequency is 5 kHz. (185~300 kW: 2.5 kHz)	x	–	–	A	A	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group d Reference	Function d1 Preset Reference	D1-01	Frequency Reference 1 (Reference 1)	0.00~400.00	0.01Hz	0.00	——	o	Q	Q	Q	Q	
		D1-02	Frequency Reference 2 (Reference 2)	0.00~400.00	0.01Hz	0.00	——	o	Q	Q	Q	Q	
		D1-03	Frequency Reference 3 (Reference 3)	0.00~400.00	0.01Hz	0.00	——	o	Q	Q	Q	Q	
		D1-04	Frequency Reference 4 (Reference 4)	0.00~400.00	0.01Hz	0.00	——	o	Q	Q	Q	Q	
		D1-05	Frequency Reference 5 (Reference 5)	000~400.00	0.01Hz	0.00	——	o	B	B	B	B	
		D1-06	Frequency Reference 6 (Reference 6)	0.00~400.00	0.01Hz	0.00	——	o	B	B	B	B	
		D1-07	Frequency Reference 7 (Reference 7)	0.00~400.00	0.01Hz	0.00	——	o	B	B	B	B	
		D1-08	Frequency Reference 8 (Reference 8)	0.00~400.00	0.01Hz	0.00	——	o	B	B	B	B	
		D1-09	Jog Frequency Reference (Jog Reference)	0.00~400.00	0.01Hz	6.00	——	o	Q	Q	Q	Q	
	Function d2 Reference Limits	D2-01	Frequency Reference Upper Limit (Ref Upper Limit)	0.0~110.0	0.1%	100.0	——	x	B	B	B	B	
		D2-02	Frequency Reference Lower Limit (Ref Lower Limit)	0.0~109.0	0.1%	0.0	——	x	B	B	B	B	
	Function d3 Jump Frequencies	D3-01	Jump Frequency 1 (Jump Freq 1)	0.0~400.0	0.1Hz	0.0	——	x	B	B	B	B	
		D3-02	Jump Frequency 2 (Jump Freq 2)	0.0~400.0	0.1Hz	0.0	——	x	B	B	B	B	
		D3-03	Jump Frequency 3 (Jump Freq 3)	0.0~400.0	0.1Hz	0.0	——	x	B	B	B	B	
		D3-04	Jump Frequency Width (Jump Bandwidth)	0.0~20.0	0.1Hz	1.0	——	x	B	B	B	B	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group d Reference	Function d4 Sequence	D4-01	Frequency Reference Hold Function Selection (MOP Ref Memory)	0, 1	1	0	0: (Disabled) No hold frequency is memorized. 1: (Enabled) Hold frequency is memorized.	x	A	A	A	A	
		D4-02	±Speed Limits (Trim Control Lvl)	0~100	1%	25*	*When 02-09=1 [USA], the unit is 10%. <24>	x	A	A	A	A	
	Function d5 Torque Control	D5-01	Torque Control Selection (Torq Control Sel)	0, 1	1	0	0: (Speed Control) 1: (Torque Control)	x	-	-	-	A	
		D5-02	Torque Reference Delay Time (Torque Ref Filter)	0~1000	1 ms	0	-	x	-	-	-	A	
		D5-03	Speed Limit Selection (Speed Limit Sel)	1, 2	1	1	1: (Analog Input) terminal 13, 14 2: (Program Setting)	x	-	-	-	A	
		D5-04	Speed Limit (Speed Lmt Value)	-120 ~ +120	1%	0	-	x	-	-	-	A	
		D5-05	Speed Limit Bias (Speed Lmt Bias)	0~120	1%	10	-	x	-	-	-	A	
		D5-06	Speed/torque Control Switching Timer (Ref Hold Time)	0~1000	1 ms	0	-	x	-	-	-	A	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group E Motor	Function E1 V/F Pattern	E1-01	Input Voltage Setting (Input Voltage)	155~255 (Note 13)	1 V	200 (Note 13)	1When 02-09=1 [USA], the value is 1.15 times of Japanese spec., which is 230/200	x	Q	Q	Q	Q	
		E1-02	Motor Selection (Motor Selection)	0, 1, 2	1	0	0: (Std Fan-Cooled) 1: (Std Blower-Cooled) 2: (Vector Motor)<1110>	x	Q	Q	Q	Q	
		E1-03	V/f Pattern Selection (V/F Selection)	00~0F	1	0F	V/f pattern selection 0: 50Hz 1: 60Hz Saturation 2: 50Hz Saturation 3: 72Hz 4: 50Hz Variable Torque 1 5: 50Hz Variable Torque 1 6: 60Hz Variable Torque 1 7: 60Hz Variable Torque 2 8: 50Hz High Starting Torque 1 9: 50Hz High Starting Torque 2 A: 60Hz High Starting Torque 1 B: 60Hz High Starting Torque 2 C: 90Hz D: 120Hz E: 180Hz F: User-defined V/f pattern	x	Q	Q	Q	Q	
		E1-04	Max. Output Frequency (Max Frequency)	40.0~400.0	0.1Hz	60.0* (Note 13)	*Factory setting differs depending on the inverter capacity 02-04. When 02-09=2 [EUR.], the value is 50.0Hz.	x	Q	Q	Q	Q	
		E1-05	Max. Voltage (Max Voltage)	0.0~255.0 (Note 13)	0.1 V	200.0 (Note 13)*	*Factory setting differs depending on the inverter capacity (02-04). When 02-09=1 (USA), the value is 1.15 times of Japanese spec., which is 230/200	x	Q	Q	Q	Q	

Note 13: This value is for the 200V class. For 400V class, the value is twice that of 200V class. For 575V class, then modify the values by 575/200

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group E Motor	Torque Control	E1-06	Max. Voltage Frequency (Base Frequency)	0.0~400.0	0.1Hz	60.0* (Note 13)	*Factory setting differs depending on the inverter capacity (02-04). When 02-09=2 (EUR.), the value is 50.0Hz.	x	Q	Q	Q	Q	
		E1-07	Mid. Output Frequency (Mid Frequency A)	0.0~400.0	0.1Hz	3.0* (Note 13)	*Factory setting differs depending on the inverter capacity (02-04). When 02-09=2 (EUR.), A1-02=0, and E1-03=OF, the value is 5/6 times that of Japan spec. [for a V/F pattern with a 50Hz base frequency]	x	Q	Q	A	F	
		E1-08	Mid. Output Frequency Voltage (Mid Voltage A)	0.00~255.0 (Note 13)	0.1 V	11.0 (Note 13)*	*Factory setting differs depending on the inverter capacity (02-04). When 02-09=1 (USA), the value is 1.15 times of Japanese spec., which is 230/200 .	x	Q	Q	A	F	
		E1-09	Min. Output Frequency (Min Frequency)	0.0~400.0	0.1Hz	0.5* (Note 13)	*Factory setting differs depending on the inverter capacity (02-04). When 02-09=2 (EUR.), A1-02=0, and E1-03=OF, the value is 5~6 times of Japan.	x	Q	Q	Q	A	
		E1-10	Min. Output Frequency Voltage (Min Voltage)	0.0~255.0 (Note 13)	0.1V	2.0 (Note 13)*	*Factory setting differs depending on the inverter capacity (02-04). When 02-09=1 (USA), the value is 1.15 times of Japanese spec., which is 230/200.	x	Q	Q	A	F	
		E1-11	Mid. Output Frequency 2 (Mid Frequency B)	0.0~400.0	0.1Hz	0.0	———	x	A	A	A	A	
		E1-12	Mid. Output Frequency Voltage 2 (Mid Voltage B)	0.0~255.0 (Note 13) *	0.1V	0.0	*When 02-09=1 (USA), the value is 1.15 times of Japanese spec., which is 230/200.	x	A	A	A	A	
		E1-13	Base Voltage (Base Voltage)	0.0~255.0 (Note 13)	0.1V	200.0 (Note 13) *	*When 02-09=1 (USA), the value is 1.15 times of Japanese spec., which is 230/200.	x	A	A	Q	Q	

Note 13: This value is for the 200V class. For 400V class, the value is twice that of 200V class. For 575V class, then modify the values by 575/200

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group E Motor	Function E2 Motor Setup	E2-00	Motor Rated (Motor Rated)	-	-	-	* When inverter capacity is 7.5 kW or less, min. setting unit becomes 0.01 A. **Factory setting differs depending on inverter capacity (02-04).	x	-	-	-	-	
		E2-01	Motor Rated Current (Motor Rated FLA)	0.1~1500.0	0.1A*	1.9**		x	Q	Q	Q	Q	
		E2-02	Motor Rated Slip (Motor Rated Slip)	0.00~20.00	0.01Hz	2.90**		x	A	A	Q	Q	
		E2-03	Motor No-load Current (No-Load Current)	0.00~1500.0	0.01A*	1.20**		x	A	A	Q	Q	
		E2-04	Number of Motor Poles (Number of Poles)	2~48	1 pole	4		x	-	Q	-	Q	
		E2-05	Motor Line-to-line Resistance (Term Resistance)	0.000~65.000	0.001 W	9.842**		x	A	A	A	A	
		E2-06	Motor Leak Inductance (Leak Inductance)	0.0~30.0	0.1%	18.2**		x	-	-	A	A	
		E2-07	Motor Iron-core Saturation Coeffi-cient 1 (Saturation Comp 1)	0.00~0.50	0.01	0.50	-	x	-	-	A	A	
		E2-08	Motor Iron-core Saturation Coeffi-cient 2 (Saturation Comp 2)	0.00~0.75	0.01	0.75	-	x	-	-	A	A	
		E2-09	Motor Mechanical Loss (Mechanical Loss)	0.0~10.0	0.1%	0.0	-	x	-	-	-	A	
		E2-10	Motor Iron Loss of Torque Compensa-tion (Tcomp Iron Loss)	0~65535	1W	14	Access level is changed from F to A.<1110>	x	A	A	-	-	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group E Motor	Function E3 Control Method	E3-01	Motor 2 Control Method Selection (Control Method)	0~3	1	2	0:(V/F Control) 1:(V/F w/PG Fdbk) 2:(Open Loop Vector) 3:(Flux Vector)	x	A	A	A	A	
	Function E4 V/F Pattern 2	E4-01	Motor 2 Max. Output Frequency (Max Frequency)	40.0~400.0	0.1Hz	60.0	—	x	A (Note 14)	A (Note 14)	A (Note 14)	A (Note 14)	
		E4-02	Motor 2 Max. Voltage (Max Voltage)	0.0~255.0 (Note 13)	0.1V	200.0 (Note 13)	—	x	A (Note 14)	A (Note 14)	A (Note 14)	A (Note 14)	
		E4-03	Motor 2 Max. Voltage Frequency (Base Frequency)	0.0~400.0	0.1Hz	60.0	—	x	A (Note 14)	A (Note 14)	A (Note 14)	A (Note 14)	
		E4-04	Motor 2 Mid. Output Frequency 1 (Mid Frequency)	0.00~400.0	0.1Hz	3.0*	* Factory setting differs depending on the control method [E3-01]	x	A (Note 14)	A (Note 14)	A (Note 14)	F (Note 14)	
		E4-05	Motor 2 Mid. Output Frequency Voltage 1 (Mid Voltage)	0.0~255.0 (Note 13)	0.1V	11.0 (Note 13)*	* Factory setting differs depending on the control method [E3-01]	x	A (Note 14)	A (Note 14)	A (Note 14)	F (Note 14)	
		E4-06	Motor 2 Min. Output Frequency (Min Frequency)	0.0~400.0	0.1Hz	0.5*	* Factory setting differs depending on the control method [E3-01]	x	A (Note 14)	A (Note 14)	A (Note 14)	A (Note 14)	
		E4-07	Motor 2 Min. Output Frequency Voltage (Min Voltage)	0.0~255.0 (Note 13)	0.1V	2.0* (Note13)	* Factory setting differs depending on the control method [E3-01]	x	A (Note 14)	A (Note 14)	A (Note 14)	F (Note 14)	

Note 13: This value is for the 200V class. For 400V class, the value is twice that of 200V class. For 575V class, then modify the values by 575/200
Note 14: Control mode is determined by E3-01.

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o:Enabled x:Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group E Motor	Function E5 Motor Setup 2	E5-01	Motor 2 Rated Current (Motor Rated FLA)	0.00~1500.0	0.1A*	1.9**	*Setting unit is 0.01 A for models of 7.5 kW or less. ** Factory setting differs depending on inverter capacity (02-04).	x	A (Note 14)	A (Note 14)	A (Note 14)	A (Note 14)	
		E5-02	Motor 2 Rated Slip (Motor Rated Slip)	0.00~20.00	0.01Hz	2.90**		x	A (Note 14)	A (Note 14)	A (Note 14)	A (Note 14)	
		E5-03	Motor 2 No-load Current (No-Load Current)	0.00~1500.0	0.01A*	1.20**		x	A (Note 14)	A (Note 14)	A (Note 14)	A (Note 14)	
		E5-04	Motor 2 Number of poles (Motor 2 # Poles)	2~48	1 pole	4		x	- (Note 14)	A (Note 14)	- (Note 14)	A (Note 14)	
		E5-05	Motor 2 Line-to-line Resistor (Motor 2 term Ohms)	0.000~65.000	0.001 W	9.842**		x	A (Note 14)	A (Note 14)	A (Note 14)	A (Note 14)	
		E5-06	Motor 2 Leak Inductance (Motor 2 Leak)	0.0~30.0	0.1%	18.2**		x	A (Note 14)	- (Note 41)	A (Note 14)	A (Note 14)	
Note 13: This value is for the 200V class. For 400V class, the value is twice that of 200V class. For 575V class, modify the values by 575/200 Note 14: Control mode is determined by E3-01.													
Group F Options *	Function F1 PG Option Setup	F1-01	PG Constant (PG Pulses/Rev)	0~60000	1	600*	*When 02-09=1 (USA), 2 (EUR.), factory setting is 1024	x	-	Q	-	Q	
		F1-02	Operation Selection at PG Open Circuit (PG Fdbk Loss Sel)	0~3	1	1	0: (Ramp to Stop) 1: (Coast to Stop) 2: (Fast-Stop) 3: (Alarm Only)	x	-	B	-	B	
		F1-03	Operation Selection at Overspeed (PG Overspeed Sel)	0~3	1	1	0: (Ramp to Stop) 1: (Coast to Stop) 2: (Fast-Stop) 3: (Alarm Only)	x	-	B	-	B	
		F1-04	Operation Selection at Deviation (PG Deviation Sel)	0~3	1	3	0: (Ramp to Stop) 1: (Coast to Stop) 2: (Fast-Stop) 3: (Alarm Only)	x	-	B	-	B	
		F1-05	PG Rotation (PG Rotation Sel)	0, 1	1	0	0: Counter-clockwise (Fwd = C.C.W.) 1: Clockwise (Fwd = C.W.)	x	-	B	-	B	
		F1-06	PG Division Rate PG --Pulse monitor (PG Output Ratio)	1~132	1	1	Effective only when control circuit board PG-B2 is used.	x	-	B	-	B	
		F1-07	Integral Value during Accel/decel Enable/disable (PG Ramp PI/I Sel)	0, 1	1	0	0: (Disabled) 1: (Enabled)	x	-	B	-	-	
		F1-08	Overspeed Detection Level (PG Overspd Level)	0~120	1%	115	-	x	-	A	-	A	
* When access level is BASIC (A1-03), constant is not displayed unless the option is connected.													

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group F Options *	Function F1 PG Option Setup	F1-09	Overspeed Detection Delay Time (PG Overspd Time)	0.0~2.0	0.1s	0.0*	* When A1-02=1 [V/f w/PG] factory setting is 1.0. When A1-02=3 [Flux Vector] factory setting is 0.0.	x	-	A	-	A	
		F1-10	Excessive Speed Deviation Detection Level (PG Deviate Level)	0~50	1%	10	-	x	-	A	-	A	
		F1-11	Excessive Speed Deviation detection Delay Time (PG Deviate Time)	0.0~10.0	0.1s	0.5	-	x	-	A	-	A	
		F1-12	Number of PG Gear Teeth 1 (PG # Gear Teeth 1)	0~1000	1	0	-	x	-	A	-	-	
		F1-13	Number of PG Gear Teeth 2 (PG # Gear Teeth 2)	0~1000	1	0	-	x	-	A	-	-	
		F1-14	PGO Detection Time (PGO Detect Time)	0~10.0	0.1s	2.0	-	x	-	A	-	A	
	Function F2 AI-14 Setup	F2-01	AI-14B Card Input Selection (AI-14 Input Sel)	0, 1	1	0	0:(3-ch Individual) 1:(3ch Addition)	x	A	A	A	A	
* When access level is BASIC (A1-03), constant is not displayed unless the option is connected.													

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group F Options *	Function F3 DI-08, 16 Setup	F3-01	Digital Input Selection (DI Input)	0~7	1	0	0: (BCD 1%) 1: (BCD 0.1%) 2: (BCD 0.01%) 3: (BCD 1Hz) 4: (BCD 0.1Hz) 5: (BCD 0.01Hz) 6: BCD Special setting 5 digit input, Binary 255/100% (BCD (5DG) 0.01Hz) 7: (Binary)* *Set value is displayed as decimal.	x	A	A	A	A	
	Function F4 AO-08, 12	F4-01	Channel 1 Monitor Selection (AO Ch1 Select)	1~38	1	2	Analog Output option Channel 1 1: Frequency reference 2: Output frequency 3: Inverter output current 5: Motor speed 6: Output voltage 7: DC bus voltage 8: Output power 9: Torque reference (internal) 15: External terminal 13 input voltage 16: External terminal 14 input voltage 17: External terminal 16 input voltage 18: Motor secondary current (Iq) 19: Motor excitation current (Id) 20: Primary frequency after SFS 21: Speed controller ASR input 22: Speed controller ASR output 23: Speed deviation 24: PID feedback 26: Voltage reference (Vq output) 27: Voltage reference (Vd output) 32: ACR (q) Output 33: ACR (d) Output 36: PID Input <1110> 37: PID Output <1110> 38: PID Reference <1110>	x	A	A	A	A	
		F4-02	Channel 1 Gain (AO Ch1 Gain)	0.00~2.50	0.01	1.00	——	o	A	A	A	A	
		F4-03	Channel 2 Monitor Selection (AO Ch2 Select)	1~38	1	3	Analog Output option Channel 2 selection (*same as F4-01*)	x	A	A	A	A	
		F4-04	Channel 2 Gain (AO Ch2 Gain)	0.00~2.50	0.01	0.50	——	o	A	A	A	A	
		F4-05 <1110>	CH1 Output Bias (AO Ch1 Bias)	-10.0~10.0	0, 1	0.0	——	o	A	A	A	A	
		F4-06 <1110>	CH2 Output Bias	-10.0~10.0	0, 1	0.0	——	o	A	A	A	A	
* When access level is BASIC (A1-03), constant is not displayed unless the option is connected.													

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group F Options	Function F5 DO - 02 Setup	F5-01	Channel 1 Output Selection (DO-02 Ch1 Select)	00~37	1	0	-	x	A	A	A	A	
		F5-02	Channel 2 Output Selection (DO-02 Ch2 Select)	00~37 <26>	1	1	-	x	A	A	A	A	
	Function F6 DO - 08 Setup	F6-01	Output Mode Selection (DO-08 Selection)	0, 1	1	0	0: (8ch Individual) 1: (Binary Output)	x	A	A	A	A	
	Function F7 PO - 36F Setup	F7-01	Frequency Multiple Selection (PO-36F Selection)	0~4	1	1	0: (1 X Output Freq) 1: (6 X Output Freq) 2: (10 X Output Freq) 3: (12 X Output Freq) 4: (36 X Output Freq)	x	A	A	A	A	
	Function F8 SI - F/G Setup	F8-01	SI-F/G Communication Error Detection Operation Selection (E-15 Det Sel)	0~3	1	1	0: (Ramp to Stop) 1: (Coast to Stop) 2: (Fast - Stop) 3: (Alarm Only)	x	A	A	A	A	
	Function F9 CP-916 Setup / DDS SI-B	F9-01	Option External Fault Selection (EFO Selection)	0, 1	1	0	0: When 1 is shown, EFO occurs (Normally Open) 1: When 0 is shown, EFO occurs. (Normally Closed)	x	A	A	A	A	
		F9-02	Option External Fault Detection Selection (EFO Detection)	0, 1	1	0	0: (Always Detected) 1: (Only During Run)	x	A	A	A	A	
		F9-03	Option External Fault Detection Operation Selection (EFO Fault Action)	0~3	1	1	0: (Ramp to Stop) 1: (Coast to Stop) 2: (Fast - Stop) 3: (Alarm Only)	x	A	A	A	A	
		F9-04	Trace Sampling Time (Trace Sample Tim)	0~ 60000	1	0	-	x	A	A	A	A	
		F9-05	Torque Reference/ Torque Limit Selection through DP-RAM communication (Torq Ref /Lmt Sel)	0, 1	1	1	0: (Disabled) 1: (Enabled)	x	-	-	-	A	
		F9-06	DP-RAM Communication Error Detection Operation Selection (BUS Fault Sel)	0~3	1	1	0: (Ramp to Stop) 1: (Coast to Stop) 2: (Fast - Stop) 3: (Alarm Only)	x	A	A	A	A	

Function	Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
								V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Terminal Function Function H1 Digital Inputs	H1-01	Terminal 3 Selection (Terminal 3 Sel)	00~77	1	24	Multi-function input (terminal 3) 0: 3-Wire Control 1: Local/Remote Selection 2: Option/Inverter Selection 3: Multi-Step Reference 1 4: Multi-Step Reference 2 5: Multi-Step Reference 3 6: Jog Frequency Reference 7: Multi-Accel/Decel 1 8: External Baseblock N.O. 9: External Baseblock N.C. A: Accel/Decel Ramp Hold B: OH2 Alarm Signal C: Terminal 16 Enable D: V/F Mode Select E: ASR Integral Reset F: Terminal Not Used 10: MOP Increase 11: MOP Decrease 12: Forward Jog 13: Reverse Jog 14: Fault Reset 15: Fast-Stop N.O. 16: Motor 2 Select 17: Fast Stop N.C. input <1110> 18: Timer Function 19: PID Disable 1A: Multi-Accel/Decel 2 1B: Program Lockout 1C: Trim Control Increase 1D: Trim Control Decrease 1E: Ref Sample Hold 1F: Terminal 13/14 Switch 24: External Fault 30: PID Integral Reset 31: PID Control Integral Hold <1110> 60: DC Injection Activate 61: Speed Search 1 62: Speed Search 2 63: Energy Save Mode 64: Speed Search 3 65: KEB Ridethrough N.C. 66: KEB Ridethrough N.O 71: Speed/Torque Control Change 72: Zero Servo Command 77: ASR Gain Switch	x	B	B	B	B	
	H1-02	Terminal 4 Selection (Terminal 4 Sel)	00~77	1	14	Multi-function input (terminal 4) (*same as H1-01*)	x	B	B	B	B	
	H1-03	Terminal 5 Selection (Terminal 5 Sel)	00~77	1	3 (0) (Note 15)	Multi-function input (terminal 5) (*same as H1-01*)	x	B	B	B	B	

Function	Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
								V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
	H1-04	Terminal 6 Selection (Terminal 6 Sel)	00~77	1	4 (3) (Note 15)	——	x	B	B	B	B	
	H1-05	Terminal 7 Selection (Terminal 7 Sel)	00~77	1	6 (4) (Note 15)	——	x	B	B	B	B	
	H1-06	Terminal 8 Selection (Terminal 8 Sel)	00~77	1	8 (6) (Note 15)	——	x	B	B	B	B	
Note 15: Factory settings in the parentheses are values obtained at 3-wire initialization.												

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Terminal	Function H2 Digital Outputs	H2-01	Multi-function Input Terminal 9-10 (Terminal 9 Sel)	00~37	1	0	Multi-function output 1 (terminal 9, terminal 10) (*same as F5-01*)	x	B	B	B	B	
		H2-02	Multi-function Input Terminal 25 (Terminal 25 Sel)	00~37	1	1	Multi-function output 2 (terminal 25, terminal 27) (*same as F5-01*)	x	B	B	B	B	
		H2-03	Multi-function Input Terminal 26 (Terminal 26 Sel)	00~37	1	2	Multi-function output 3 (terminal 26, terminal 27) (*same as F5-01*)	x	B	B	B	B	
	Function H3 Analog Inputs	H3-01	Signal Level Selection Terminal 13 (Term 13 Signal)	0, 1	1	0	0: (0 - 10 VDC) 1: (-10 +10 VDC)	x	B	B	B	B	
		H3-02	(Terminal 13 Gain)	0.0~1000.0	0.1%	100.0	Frequency reference gain of AI-14U, AI-14B (3ch addition input), DI-08, and DI-16 is common.	o	B	B	B	B	
		H3-03	(Terminal 13 Bias)	-100.0 ~ +100.0	0.1%	0.0	Frequency reference gain of AI-14U, AI-14B (3ch addition input), DI-08, and DI-16 is common.	o	B	B	B	B	
		H3-04	Terminal 16 Signal Level Selection (Term 16 Signal)	0, 1	1	0	0: (0 - 10 VDC) 1: (-10 +10 VDC)	x	B	B	B	B	
		H3-05	Terminal 16 Multi-function Analog Input (Terminal 16 Sel)	0~1F	1	0	Multi-function analog input selection (terminal 16) 0: Auxiliary Reference 1: Frequency Gain 2: Frequency Bias 4: Voltage Bias 5: Accel/Decel Change 6: DC Brake Current 7: Overtorque Level 8: Stall Prevention Level 9: Reference Lower Limit A: Jump Frequency B: PID Feedback C: PID Setpoint D: Frequency Bias 2 10: Forward Torque Limit 11: Reverse Torque Limit 12: Regenerative Torque Limit 13: Torque reference 14: Torque Compensation 15: Forward/Reverse Torque Limit 1F: Not Used	x	B	B	B	B	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Terminal	Analog Inputs	H3-06	(Terminal 16 Gain)	0.0~1000.0	0.1%	100.0	—	o	B	B	B	B	
		H3-07	(Terminal 16 Bias)	-100.0 ~ +100.0	0.1%	0.0	—	o	B	B	B	B	
		H3-08	Signal Level Selection Terminal 14 (Term 14 Signal)	0, 1, 2	1	2	0:(0 - 10 VDC) 1:(-10 + 10 VDC) 2:(4 - 20 mA)	x	A	A	A	A	
		H3-09	Multi-function Analog Input Terminal 14 (Terminal 14 Sel)	1~1F	1	1F	The function choices for terminal 14 are the same as the choices for terminal 16 [see H3-05], except that [setting 0] "Auxiliary Reference" is not available.	x	A	A	A	A	
		H3-10	Terminal 14 Gain (Terminal 14 Gain)	0.0~1000.0	0.1%	100.0	—	o	A	A	A	A	
		H3-11	Terminal 14 Bias (Terminal 14 Bias)	-100.0 ~ +100.0	0.1%	0.0	—	o	A	A	A	A	
		H3-12	Analog Input Filter Time Constant (Filter Avg Time)	0.00~2.00	0.01s	0.00	—	x	A	A	A	A	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group H Terminal Function	Function H4 Analog Outputs	H4-01	Monitor Selection Terminal 21 (Terminal 21 Sel)	1~38	1	2	Analog output selection (terminal 21 (same as F4-01) 1: Frequency reference 2: Output frequency 3: Inverter output current 5: Motor speed 6: Output voltage 7: DC bus voltage 8: Output power 9: Torque reference (internal) 15: External terminal 13 input voltage 16: External terminal 14 input voltage 17: External terminal 16 input voltage 18: Motor secondary current (Iq) 19: Motor excitation current (Id) 20: Primary frequency after SFS 21: Speed controller ASR input 22: Speed controller ASR output 23: Speed deviation 24: PID feedback 26: Voltage reference (Vq output) 27: Voltage reference (Vd output) 31: Not Used 32: ACR (q) Output 33: ACR (d) Output 36: PID Input <1110> 37: PID Output<1110> 38: PID Reference <1110>	x	B	B	B	B	
		H4-02	Terminal 21 Output Gain (Terminal 21 Gain)	0.00~ 2.50	0.01	1.00	——	o	B	B	B	B	
		H4-03	Terminal 21Output Bias (Terminal 21 Bias)	-10.0~ +10.0	0.0%	0.0	——	o	B	B	B	B	
		H4-04	Terminal 23 Monitor (Terminal 23 Sel)	1~38	1	3	Analog output selection (terminal 23) (same as H4-01)	x	B	B	B	B	
		H4-05	Terminal 23 Output Gain (Terminal 23 Gain)	0.00~ 2.50	0.01	0.50	——	o	B	B	B	B	
		H4-06	Terminal 23 Output Bias (Terminal 23 Bias)	-10.0~ +10.0	0.1%	0.0	——	o	B	B	B	B	
		H4-07	Analog Output Signal Selection (AO Level Select)	0, 1	1	0	0: (0 - +10 VDC) 1: (-10V +10 VDC)	x	B	B	B	B	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Group H Terminal Function	Function H5 Serial Com Setup MODBUS Communication	H5-01	Station Address (Serial Comm Adr)	0~20	1	1F	—	x	A	A	A	A	
		H5-02	Communication Speed Selection (Serial Baud Rate)	0~4	0	3	0 : (1200 Baud) 1 : (2400 Baud) 2 : (4800 Baud) 3 : (9600 Baud) 4 : (19200 Baud)<1110>	x	A	A	A	A	
		H5-03	Communication Parity Selection (Serial Com Sel)	0, 1, 2	1	0	0 : (No Parity) 1 : (Even Parity) 2 : (Odd Parity)	x	A	A	A	A	
		H5-04	Stopping Method After Communication Error (Serial Fault Sel)	0~3	1	3	0:(Ramp to Stop) 1:(Coast to Stop) 2:(Fast - Stop) 3:(Alarm Only)	x	A	A	A	A	
		H5-05	Timeover Detection (Serial Flt Dtct)	0, 1	1	1	0 : (Disabled) 1 : (Enabled)	x	A	A	A	A	
Protection	Function L1 Motor Overload	L1-01	Motor Protection Selection (MOL Fault Select)	0, 1	1	1	0:(Disabled) 1:(Coast to Stop)	x	B	B	B	B	
		L1-02	Motor Protection Time Constant (MOL Time Const)	0.1~5.0 min.	0.1 min.	1.0	When O2-09=1 [American Spec] the setting range is 0.1~20min. The factory default setting then becomes 8 min. 8 min. is the operation time from a cold start.	x	B	B	B	B	
Protection	Function L2 Power Loss Ride Through	L2-01	Momentary Power Loss Detection (PwrL Selection)	0, 1, 2	1	0	0 : (Disabled) 1 : Power loss ride through (PwrL RideThru t) 2 : (CPU Power Active)	x	B	B	B	B	
		L2--02	Momentary Power Loss Ride Through (PwrL Ridethru t)	0.0~2.0	0.1s	0.7**	** Factory setting differs depending on inverter capacity (02-04).	x	B	B	B	B	
		L2-03	Min. Baseblock Time (PwrL Baseblock t)	0.1~5.0	0.1s	0.5*	* Factory setting differs depending on inverter capacity. Lower limit of setting range is changed from 0 to 0.1<1110>	x	B	B	B	B	
		L2-04	Voltage Recovery Time (PwrL V/F Ramp t)	0.0~5.0	0.1s	0.3*	* Factory setting differs depending on inverter capacity (02-04).	x	A	A	A	A	
		L2-05	Undervoltage Detection Level (PUV Det Level)	150~210	1V	190*	*Voltage Class 200V class=190V Det level 400V class=190V x 2= 380V level 575V class=190x575/200=546 level	x	A	A	A	A	
		L2-06	KEB Deceleration Rate (KEB Frequency)	0.0~100.0	0.1%	0.0	————	x	A	A	A	A	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Protection	Function L3 Stall Prevention Function	L3-01	Stall Prevention During Acceleration (StallP Accel Sel)	0, 1, 2	1	1	0: (Disabled) 1: (General Purpose) 2: (Intelligent)	x	B	B	B	-	
		L3-02	Stall Prevention Level During Accel-eration (StallP Accel Lvl)	0~200	1%	150	-	x	B	B	B	-	
		L3-03	Stall Prevention Limit During Accel-eration (StallP CHP Lvl)	0~100	1%	50	-	x	A	A	A	-	
		L3-04	Stall Prevention During Deceleration (StallP Decel Sel)	0, 1, 2, 3	1	1	0: (Disabled) 1: (General Purpose) 2: (Intelligent) <1110> can use setting 2 for all control modes A102=0, 1, 2, 3 3: With braking resistor (Stall prev w/R) When in Vector w/PG A1-02=3 setting 3 cannot be set with braking resistor and with stall prevention.	x	B	B	B	B	
		L3-05	Stall Prevention Selection during Running (StallP Run Sel)	0, 1, 2	1	1	0: (Disabled) 1: (Decel Time 1) C1-02 2: (Decel Time 2) C1-04	x	B	B	-	-	
		L3-06	Stall Prevention Level during Running (StallP Run Level)	30~200	1%	160	-	x	B	B	-	-	
		L3-07	Stall Prevention Function P Gain (StallP Gain)	0.10~2.00	0.01	1.00	-	x	F	F	-	-	
		L3-08	Stall Prevention Function Integral Time (StallP Intg Time)	10~250	1 ms	100	-	x	F	F	-	-	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Protection	Function L4 Reference Detection	L4-01	Frequency Detection Level (Spd Agree Level)	0.0~ 400.0	0.1Hz	0.0	—	x	B	B	B	B	
		L4-02	Frequency Detection Width (Spd Agree Width)	0.0~ 20.0	0.1Hz	2.0	—	x	B	B	B	B	
		L4-03	Frequency Detection Level ± (Spd Agree Lvl ±)	-400.0 ~ +400.0	0.1Hz	0.0	—	x	A	A	A	A	
		L4-04	Frequency Detection Width ± (Spd Agree Wdth ±)	0.0~ 20.0	0.1Hz	2.0	—	x	A	A	A	A	
		L4-05	Frequency Loss Detection Selection (Ref Loss Sel)	0, 1	1	0	0: (Stop) 1: (Run @ 80% PrevRef)	x	A	A	A	A	
	Function L5 Fault Restart	L5-01	Number of Auto Restart Attempts (Num of Restarts)	0~10	1	0	—	x	B	B	B	B	
		L5-02	Auto Restart Operation Selection (Restart Sel)	0, 1	1	0	0: (No Flt Relay) 1: (Flt Relay Active)	x	B	B	B	B	
	Function L6 Torque Detection	L6-01	Overtorque Detection Selection 1 (Torq Det 1 Sel)	0~4	1	0	0: (Disabled) 1: (@ SpdAgree - Alm) Detected during speed agree only. Operation continues after detection and OL3 flashes on display. 2: (At RUN - Alarm) Overtorque detection during running. Operation continues after detection and OL3 flashes on the display. 3: (@ SpdAgree - Flt) Detected during the speed agree only. Inverter trips on OL3, output is shut OFF. 4: (At RUN - Fault) Detected during running, and the inverter trips on OL3. Output is shut OFF.	x	B	B	B	B	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Protection	Function L6 Torque Detection	L6-02	Overtorque Detection Level 1 (Torq Det 1 Lvl)	0~300	1%	150	-	x	B	B	B	B	
		L6-03	Overtorque Detection Time 1 (Torq Det 1 Time)	0.0~10.0	0.1s	0.1	-	x	B	B	B	B	
		L6-04	Overtorque Detection Selection 2 (Torq Det 2 Sel)	0~4	1	0	0: (Disabled) 1: (@SpdAgree - Alm) Detected during speed agree only. Operation continues after detection and OL4 flashes on display. 2: (At RUN - Alarm) Overtorque detection during running. Operation continues after detection and OL4 flashes on the display. 3: (@SpdAgree - Flt) Detected during the speed agree only. Inverter trips on OL4, output is shut OFF. 4: (At RUN - Fault) Detected during running, and the inverter trips on OL4. Output is shut OFF.	x	A	A	A	A	
		L6-05	Overtorque Detection Level 2 (Torq Det 2 Lvl)	0~300	1%	150	-	x	A	A	A	A	
		L6-06	Overtorque Detection Time 2 (Torq Det 2 Time)	0.0~10.0	0.1s	0.1	-	x	A	A	A	A	
	Function L7 Torque Limit	L7-01	Forward Torque Limit (Torq Limit Fwd)	0~300	1%	200	-	x	-	-	B	B	
		L7-02	Reverse Torque Limit (Torq Limit Rev)	0~300	1%	200	-	x	-	-	B	B	
		L7-03	Forward Regenerative Torque Limit (Torq Lmt Fwd Rgn)	0~300	1%	200	-	x	-	-	B	B	
		L7-04	Reverse Regenerative Torque Limit (Torq Lmt Rev Rgn)	0~300	1%	200	-	x	-	-	B	B	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Protection	Function L8 Hardware Protection	L8-01	Internal DB Resistor Protection Selection (DB Resistor Prot)	0, 1	1	0	0: (Not Provided) 1: (Provided)	x	B	B	B	B	
		L8-02	Overheat Pre-alarm Level (OH Pre-Alarm Lvl)	50~130	1 deg C	95 C*	*Factory setting depends on inverter model [02-04].	x	A	A	A	A	
		L8-03	Operation Selection after OH Pre-alarm (OH Pre-Alarm Sel)	0~3	1	3	0: (Ramp to Stop) using C1-02 1: (Coast to Stop) 2: (Fast-Stop) using C1-09 3: (Alarm Only) display flashes OH Heatsink Ovrtemp	x	A	A	A	A	
		L8-05	Input Phase Loss Protection (PH Loss In Sel)	0, 1	1	0	0: (Disabled) 1: (Enabled)	x	A	A	A	A	
		L8-07	Output Phase Loss Protection (PH Loss Out Sel)	0, 1	1	0*	0: (Disabled) 1: (Enabled) *When 02-09=1, the factory default setting is 1.	x	A	A	A	A	
Protection	Function L8 Hardware Protection	L8-10	Short-circuit Protection Selection (Ground Fault Sel)	0, 1	1	1	0: (Disabled) 1: (Enabled)	x	A	A	A	A	
		L8-17	IGBT Protection Selection at Low Frequency (Prtct@L - Spd)	0, 1	1	1*	0: Conventional 1: (Lower fc) Carrier frequency is decreased when fout ≤ 10Hz and the load is > 100% iac. 2: (Short term OL2) OL occurs after 2 seconds during low speed [fout £ 6Hz] current limit. 3: (I-Limit=150%) Current limit is set to 150% of the inverter rated current. < G5 plus > Addition * When 02-09=1 factory setting is 1. * When 02-09=2 factory setting is 2.	x	A	A	A	-	
		L8-19 <1110>	OL2 Characteristics Selection at Low Speed (OL2 Chara@L-Spd)	0, 1	1	0	0: (Disabled) Low frequency OL disabled 1: (Enabled) Low frequency OL enabled	x	A	A	A	A	

Function		Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
									V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Operator	Function o1 Monitor Selection	o1-01	Monitor Selection (User Monitor Sel)	4~39	1	6	Monitor selection 4: Control method 5: Motor speed 6: Output voltage 7: DC bus voltage 8: Output power 9: Torque reference (internal) 10: Input terminal status 11: Output terminal status 12: Internal Control Status 1 13: Elapsed time 14: Flash software ID number 15: External terminal 13 input voltage 16: External terminal 14 input voltage 17: External terminal 16 input voltage 18: Motor secondary current (Iq) 19: Motor excitation current (Id) 20: Primary frequency after SFS 21: Speed controller ASR input 22: Speed controller ASR output 23: Speed deviation 24: PID feedback 25: DI-16 reference 26: Voltage reference (Vq output) 27: Voltage reference (Vd output) 28: CPU ID number	o	B	B	B	B	
	Function o2 Key Selections	o1-02	Monitor Selection after Power Up (Power- On Monitor)	1~4	1	1	1: (Frequency Ref) 2: (Output Freq) 3: (Output Current) 4: (User Monitor)	o	B	B	B	B	
		o1-03	Frequency Units of Reference Setting and Monitor (Display Scaling)	0~39999	1	0	-	x	B	B	B	B	
		o1-04	(Display Units)	0, 1	1	0	0: (Hertz) 1: (RPM)	x	-	-	-	B	
		o1-05	Parameter No. Display Selection (Address Display)	0, 1	1	0	0: (Parameter Number) 1: (Memobus Address)	x	A	A	A	A	
		o2-01	LOCAL/REMOTE Key Enable/Disable (Local/Remote Key)	0, 1	1	1	0: (Disabled) 1: (Enabled)	x	B	B	B	B	
		o2-02	STOP Key Function Selection (Oper STOP Key)	0, 1	1	1	0: (Disabled) When the inverter is operated from the digital operator. 1: (Enabled) Always enabled.	x	B	B	B	B	

Function	Parameter No.	Name (Digital Operator Display)	Setting Range	Setting Unit	Factory Setting	Remarks (Digital Operator Display)	Change during Operation o: Enabled x: Disabled	Parameter Access Level				User Setting
								V/f	V/f w/ PG	Open Loop Vector	Flux Vector	
Operator Function o2 Key Selection	O2-03	User Parameter Initialization Selection (User Defaults)	0, 1, 2	1	0	0: (No Change) TOP GIN default values used 1: (Set Defaults) Sets user specified value as default. 2: (Clear All) Clears user defaults	x	B	B	B	B	
	O2-04	kVA Selection (Inverter Model #)	0~FF	1	-*	* Not initialized. Sets the inverter capacity according to the model number.	x	B	B	B	B	
	O2-05	Frequency Reference Setting Method Selection (Operator M. O. P.)	0, 1	1	0	0: (Disabled) 1: (Enabled)	x	A	A	A	A	
	O2-06	Operation Selection When Digital Operator is Disconnected (Oper Detection)	0, 1	1	0*	0: (Disabled) Operation continues even if the digital operator is disconnected. 1: (Enabled) Inverter fault when the digital operator is disconnected. * When 02-09=1, the value is1.	x	A	A	A	A	
	O2-07	Elapsed Timer Setting (Elapsed Time Set)	0~65535	1 hour	—	—	x	A	A	A	A	
	O2-08	Elapsed Timer Selection (Elapsed Time Run)	0, 1	1	0	0: (Power - On Time) 1: (Running Time)	x	A	A	A	A	
	O2-09	Initialization Mode Selection (Init Mode Sel)	0~3	1	0	0: (Japanese spec) 1: (American spec) 2: (European spec) 3: (OMRON spec) When 02-09 = 1 or 2, it is added by <1032> When 02-09 = 0 or 3, it is added by <1040>	x	A	A	A	A	

2. **Monitor Display (Un-XX)**

Function	Parameter No.	Name (Digital Operator Display)	Min. Unit	Description	Analog Monitor Output Level	Parameter Access Level			
						V/f	V/f w/ PG	Vector w/o PG	Vector w/ PG
Monitor	U1-01	Frequency Reference (Frequency Ref)	0.01Hz	The unit differs depending on O1-03 setting.	10V/Max. output frequency	Q	Q	Q	Q
	U1-02	Output Frequency (Output Freq)	0.01Hz	The unit differs depending on O1-03 setting.	10V/Max. output frequency	Q	Q	Q	Q
	U1-03	Output Current (Output Current)	0.1A	Minimum unit is 0.01 A for 7.5 kW or less.	10V/Inverter rated current	Q	Q	Q	Q
	U1-04	Control Method* (Control Method)		0: V/f control 1: V/f control with PG 2: Vector control without PG 3: Vector control with PG	—	Q	Q	Q	Q
	U1-05	Motor Speed (Motor Speed)	0.01Hz	The unit differs depending on O1-03 setting.	10V/Max. output fre-quency	x	Q	Q	Q
	U1-06	Output Voltage (Output Voltage)	0.1V	—	10V/200V or 400V ?575	Q	Q	Q	Q
	U1-07	DC Bus Voltage V (DC Bus Voltage)	1V	—	10V/400V or 800V	Q	Q	Q	Q
Monitor	U1-08	Output Power (Output kWatts)	0.1kW	—	10V/Inverter capacity (kW)	Q	Q	Q	Q
	U1-09	Torque Reference (Torque Reference)	0.1%	—	10V/Motor rated torque	x	x	Q	Q
	U1-10	Input Terminal Status* (Input Term Sts)	—	0 0 0 0 0 0 0 0 1: T1 "Closed" 1: T2 "Closed" 1: T3 "Closed" 1: T4 "Closed" 1: T5 "Closed" 1: T6 "Closed" 1: T7 "Closed" 1: T8 "Closed"	—	Q	Q	Q	Q
	U1-11	Output Terminal Status* (Output Term Sts)	—	0 0 0 0 0 0 0 0 1: T9~ 10 "Closed" 1: T25 "Closed" 1: T26 "Closed" 0: Not used 0: Not used 0: Not used 0: Not used 1: Fault	—	Q	Q	Q	Q

*Cannot be changed by U1-04

Function	Parameter No.	Name (Digital Operator Display)	Min. Unit	Description	Analog Monitor Output Level	Parameter Access Level			
						V/f	V/f w/ PG	Vector w/o PG	Vector w/ PG
Monitor	U1-12	Operation Status* (Int Ctl Sts 1)	—	0 0 0 0 0 0 0 0 1: During running 1: During zero speed 1: During reverse 1: During reset signal input 1: During speed agree 1: Inverter operation ready 1: Minor fault 1: Major fault	—	Q	Q	Q	Q
	U1-13	Elapsed Time* (Elapsed Time)	1 hour	—	—	Q	Q	Q	Q
	U1-14	Software No. at FLASH Side* (FLASH ID)	—	—	—	Q	Q	Q	Q
	U1-15	Control Circuit Terminal 13 (Term 13 Level)	0.1%	—	10V/10V	B	B	B	B
	U1-16	Control Circuit Terminal 14 Input Voltage (Term 14 Level)	0.1%	—	10V/10V or 20 mA	B	B	B	B
	U1-17	Control Circuit Terminal 16 Input (Terminal 16 Level)	0.1%	—	10V/10V	B	B	B	B
	U1-18	Motor Secondary Current (Iq) (Mot SEC Current)	0.1%	—	10V/Motor rated primary current	B	B	B	B
	U1-19	Motor Excitation Current (Mot EXC Current)	0.1%	—	10V/Motor rated primary current	x	x	B	B
	U1-20	Output Frequency after Soft-start (SFS Output)	0.01Hz	—	10V/Max. output frequency	A	A	A	A
	U1-21	ASR Input (ASR Input)	0.01%	—	10V/Max. output frequency	x	A	x	A
	U1-22	ASR Output (ASR Output)	0.01%	Analog monitor output level becomes 10V/Max. output frequency for V/f control mode with PG.	10V/Motor rated primary current	x	A	x	A
	U1-23	Speed Deviation (Speed Deviation)	0.01%	—	10V/Max. output Frequency	x	A	x	A
	U1-24	PID Feedback Capacity (PID Feedback)	0.01%	—	10V/Max. output Frequency	A	A	A	A

* Cannot be changed by U1-04

Function	Parameter No.	Name (Digital Operator Display)	Min. Unit	Description	Analog Monitor Output Level	Parameter Access Level			
						V/f	V/f w/ PG	Vector w/o PG	Vector w/ PG
Monitor	U1-25	D1-16H Input Status* (DI-16 Reference)	—	Displays input value according to F3-01 setting. For example: When lower 8 bit is ON, Binary selection: 256, BCD selection: 99	—	A	A	A	A
	U1-26	Output Voltage Reference Vq (Voltage Ref (Vq))	0.1V	—	10V/200V or 400V	x	x	A	A
	U1-27	Output Voltage Reference Vd (Voltage Ref (Vd))	0.1V	—	10V/200V or 400V	x	x	A	A
	U1-28	Software No. at CPU Side* (CPU ID)	—	—	—	A	A	A	A
	U1-32	ACR (q) Output (ACR (q) Output)	0.1%	—	—	x	x	A	A
	U1-33	ACR (d) Output (ACR (d) Output)	0.1%	—	—	x	x	A	A
	U1-34	OPE Detection Parameter* (OPE Detected)	—	—	—	A	A	A	A
	U1-35	No. of O Servo Moving Pulses (Zero Servo Pulse)	1	—	—	x	x	x	A
	U1-36 <1110>	PID Deviation (PID Input)	0.01%	PID reference + PID reference bias - PID feedback capacity	10V/Max. Output Frequency	A	A	A	A
	U1-37 <1110>	PID Output Capacity (PID Output)	0.01%	PID output capacity	10V/Max. Output Frequency	A	A	A	A
	U1-38 <1110>	PID Reference (PID Setpoint)	0.01%	PID reference + PID reference bias	10V/Max. Output Frequency	A	A	A	A
	U1-39 <1110>	Temperature for Cooling Fin (Heatsink Temp)	1°C	—	—	F	F	F	F

* Cannot be changed by U1-04

Function	Parameter No.	Name (Digital Operator Display)	Min. Unit	Description	Analog Monitor Output Level	Parameter Access Level			
						V/f	V/f w/ PG	Vector w/o PG	Vector w/ PG
Function U2 Fault Trace	U2-01	Current Fault (Current Fault)	—	—	—	Q	Q	Q	Q
	U2-02	Last Fault (Last Fault)	—	—	—	Q	Q	Q	Q
	U2-03	Frequency Reference at Fault (Frequency Ref)	0.01Hz	—	—	Q	Q	Q	Q
	U2-04	Output Frequency at Fault (Output Freq)	0.01Hz	—	—	Q	Q	Q	Q
	U2-05	Output Current at Fault (Output Current)	0.1A	—	—	Q	Q	Q	Q
	U2-06	Motor Speed at Fault (Motor Speed)	0.01Hz	—	—	x	Q	Q	Q
	U2-07	Output Voltage Reference at Fault (Output Voltages)	0.1V	—	—	Q	Q	Q	Q
	U2-08	DC Bus Voltage at Fault (DC Bus Voltage)	1V	—	—	Q	Q	Q	Q
	U2-09	Output Power at Fault (Output kWatts)	0.1kW	—	—	Q	Q	Q	Q
	U2-10	Torque Reference at Fault (Torque Reference)	0.1%	—	—	x	x	Q	Q
	U2-11	Input Terminal Status at Fault (Input Term Sts)	—	Displays the same status as the U1-10.	—	Q	Q	Q	Q
	U2-12	Output Terminal Status at Fault (Output Term Sts)	—	Displays the same status as the U1-11.	—	Q	Q	Q	Q
	U2-13	Operation Status at Fault (Inverter Status)	—	Displays the same status as the U1-12.	—	Q	Q	Q	Q
	U2-14	Elapsed Operation Time at Fault (Elapsed Time)	1 hour	—	—	Q	Q	Q	Q

Function	Parameter No.	Name (Digital Operator Display)	Min. Unit	Description	Analog Monitor Output Level	Parameter Access Level			
						V/f	V/f w/ PG	Vector w/o PG	Vector w/ PG
Function U3 Fault History	U3-01	Most Recent Fault (Last Fault)	—	—	—	Q	Q	Q	Q
	U3-02	Second Most Recent Fault (Fault Message 2)	—	—	—	Q	Q	Q	Q
	U3-03	Third Most Recent Fault (Fault Message 3)	—	—	—	Q	Q	Q	Q
	U3-04	Fourth/oldest Fault (Fault Message 4)	—	—	—	Q	Q	Q	Q
	U3-05	Elapsed Operation Time at Fault (Elapsed Time 1)	1 hour	—	—	Q	Q	Q	Q
	U3-06	Elapsed Time of Second Fault (Elapsed Time 2)	1 hour	—	—	Q	Q	Q	Q
	U3-07	Elapsed Time of Third Fault (Elapsed Time 3)	1 hour	—	—	Q	Q	Q	Q
	U3-08	Elapsed Time of Fourth/ oldest Fault (Elapsed Time 4)	1 hour	—	—	Q	Q	Q	Q

PG Speed Control Card Terminal Blocks

The terminal specifications for each PG Speed Control Card are given in the following tables:

PG-B2 (For Flux Vector Control Mode Only)

PG-B2 Terminal Specifications

Terminal	No.	Contents	Specifications
TA1	1	Power Supply for pulse generator	12 VDC(±5%), 200 mA maximum
	2		0 VDC (GND for power supply)
	3	A-Phase pulse input terminal	H: +8 to 12 V L: +1 V maximum (maximum response frequency: 30 kHz)
	4		Pulse input common
	5	B-Phase pulse input terminal	H: +8 to 12 V L: +1 V maximum (maximum response frequency: 30 kHz)
	6		Pulse input common
TA2	1	A-Phase monitor output terminal	Open collector output, 24 VDC, 30mA maximum
	2		A-Phase monitor output common
	3	B-Phase monitor output terminal	Open collector output, 24 VDC, 30mA maximum
	4		B-Phase monitor output common
TA3	(E)	Shield connection terminal	—

PG-X2 (For Flux Vector Control Mode Only)

PG-X2 Terminal Specifications

Terminal	No.	Contents	Specifications
TA1	1	Power Supply for pulse generator	12 VDC(±5%), 200 mA maximum (see note)
	2		0 VDC (GND for power supply)
	3		5 VDC (±5%), 200 mA maximum (see note)
	4	A-Phase + input terminal	Line driver input (RS-422 level input) (maximum response frequency: 300 kHz)
	5	A-Phase - input terminal	
	6	B-Phase + input terminal	
	7	B-Phase - input terminal	
	8	Z-Phase + input terminal	
	9	Z-Phase - input terminal	
	10	Common terminal	0 VDC (GND for power supply)
TA2	1	A-Phase + output terminal	Line driver output (RS-422 level output)
	2	A-Phase - output terminal	
	3	B-Phase + output terminal	
	4	B-Phase - output terminal	
	5	Z-Phase + input terminal	
	6	Z-Phase - input terminal	
	7	Control circuit common	Control circuit GND
TA3	(E)	Shield connection terminal	—

NOTE: 5 VDC and 12 VDC cannot be used at the same time.

APPENDIX 5 CONSTANTS LIST

Multi-digital Output (H2-01,H2-02,H2-03)

Set Value	Function Name	Set Value	Function Name
00	During RUN 1	10	Minor Fault
01	Zero Speed	11	Reset Cmd Active
02	Fref/Fout Agree 1	12	Timer Output
03	Fref/Set Agree 1	13	Fref/Fout Agree 2
04	Freq Detect 1	14	Fref/Set Agree 2
05	Freq Detect 2	15	Freq Detect 3
06	Inverter Ready	16	Freq Detect 4
07	DC Bus undervolt	17	Trq Det 1 N.C
08	BaseBlk 1	18	Trq Det 2 N.O
09	Option Reference	19	Trq Det 2 N.C
0A	Remote Operation	1A	Reverse Dir
0B	Trq Det 1 N.O.	1B	BaseBlk 2
0C	Loss of Ref	1C	Motor 2 Selected
0D	DB Overheat	1D	Regenerating
0E	Fault	1E	Restart Enabled
0F	Not Used	1F	Overload(OL1)
—		20	OH Prealarm
		21-2F	Not Used
		30	Current/Trq LIM
		31	Speed Limit
		32	Not Used
		33	Zero Servo End
		34	During RUN 2
		35-3F	Not Used

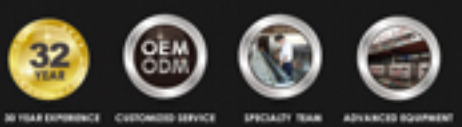
Constants Array

MENU

- Operation
  - U Monitor
- A Initialize
- Programming
  - b Application
  - C Tuning
  - d Reference
  - E Motor
  - F Option
  - H Terminal
  - L Protection
  - o Operator
- Modified constants
- Auto-tuning

Group	Function	Constant No.			
		Q	B	A	F
U1	Monitor	01-14	15-19	20-29	
U2	Fault trace	01-14			
U3	Fault history	01-08			
A1	Initialize	00-04			
A2	User constants			01-32	
b1	Sequence	01-03	04	05-07	
b2	DC braking		01-04		05-07
b3	Speed search			01-03	04
b4	Delay timers			01,02	
b5	PID control			01-08	
b6	Reference hold			01-04	
b7	Droop control			01,02	
b8	Energy saving			01,02	
b9	Zero servo			01,02	
C1	Accel/decel	01,02	03,04,09	05-08,10,11	
C2	S-curve accel/decel			01-04	
C3	Motor-slip compensation		01	02-04	04
C4	Torque compensation		01	02	
C5	ASR tuning		01-04	05-07	
C6	Carrier frequency		01	02,03	
C7	Hunting prevention			01	02-04
C8	Factory tuning				01-28
d1	Preset reference	01-04,09	05-08		
d2	Reference limit		01,02		
d3	Jump frequence		01-04		
d4	Sequence			01,02	
d5	Torque control			01-04	
E1	V/f pattern 1	01-10		11-13	
E2	Motor setup 1	01-04		05-09	
E3	Motor 2 control method			01	
E4	V/f pattern 2			01-07	
E5	Motor setup 2			01-05	
F1	PG option setup	01	02-07	08-13	
F2	AI-14 setup		01		
F3	DI-08,16 setup		01		
F4	AO-08 setup		01-04		
F5	DO-02 setup		01,02		
F6	DO-08 setup		01		
F7	PO-36F setup		01		
H1	Digital inputs		01-06		
H2	Digital outputs		01-03		
H3	Analog inputs		01-07	08-12	
H4	Analog outputs		01-06		
H5	Serial commumication setup			01-04	
L1	Motor overload		01,02		
L2	Power loss ride-thru		01-03	04,05	
L3	Stall prevention		01,02,04-06	03	07,08
L4	Reference detection		01,02	03-05	
L5	Fault restart		01,02		
L6	Torque detection		01-03	04-06	
L7	Torque limit	01-04			05,06
L8	Hardware protection		01	02,03,05,07	04,06,07-13
o1	Monitor select		01-04	05	
o2	Key select		01-04	05-08	

TOP GIN



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