

General Purpose Full Vector Inverter



VDI100

■ ■ ■ ■ Start-up and Installation Manual

GEFRAN

Information about this manual

The VDI100 product is an inverter designed to control a three-phase induction motor and permanent magnet. Please read this manual carefully to ensure correct operation, safety and to become familiar with the inverter functions.

The VDI100 inverter is an electrical / electronic product and must be installed and handled by qualified service personnel.

Improper handling may result in incorrect operation, shorter life cycle, or failure of this product as well as the motor.

All VDI100 documentation is subject to change without notice. Be sure to obtain the latest editions for use or visit our website at http://www.gefran.com/en/product_categories/93-motion-control

Available Documentation:

1. VDI100 Start-up and Installation Manual
2. VDI100 Instruction Manual

Ensure you have sound knowledge of the device and familiarize yourself with all safety information and precautions before proceeding to operate the inverter.

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Software version

This manual is updated according to the software version V 1.20

The identification number of the software version is indicated on the identification plate of the drive or can be checked with the **par. 13.01**.

General information

Note !

In industry, the terms "Inverter", "Regulator" and "Drive" are sometimes interchanged. In this document, the term "Drive" will be used.

PG (Pulse Generator) = Encoder

Before using the product, read the safety instruction section carefully.

Keep the manual in a safe place and available to engineering and installation personnel during the product functioning period.

Gefran S.p.A has the right to modify products, data and dimensions without notice. The data can only be used for the product description and they can not be understood as legally stated properties.

Thank you for choosing this Gefran product.

We will be glad to receive any possible information which could help us improving this manual. The e-mail address is the following: techdoc@gefran.com.

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1. Safety Precautions

Preface

- Ensure you have sound knowledge of the device and familiarize yourself with all safety information and precautions before proceeding to operate the inverter.
- Please pay close attention to the safety precautions indicated by the warning and caution symbol.

Préface

- Vérifiez que vous avez une bonne connaissance de l'entraînement et de vous familiariser avec les consignes de sécurité et les précautions avant de procéder à fonctionner le lecteur.
- Prêter attention aux consignes de sécurité indiquées par l'avertissement (Warning) et symbole Attention (Caution).

1.1. Symbols used in the manual



Warning

Indicates a procedure, condition, or statement that, if not strictly observed, could result in personal injury or death.

Indique le mode d'utilisation, la procédure et la condition d'exploitation. Si ces consignes ne sont pas strictement respectées, il y a des risques de blessures corporelles ou de mort.



Caution

Indicates a procedure, condition, or statement that, if not strictly observed, could result in damage to or destruction of equipment.

Indique et le mode d'utilisation, la procédure et la condition d'exploitation. Si ces consignes ne sont pas strictement respectées, il y a des risques de détérioration ou de destruction des appareils.



Indicates that the presence of electrostatic discharge could damage the appliance. When handling the boards, always wear a grounded bracelet.

Indique que la présence de décharges électrostatiques est susceptible d'endommager l'appareil. Toujours porter un bracelet de mise à la terre lors de la manipulation des cartes.



Important

Indicates a procedure, condition, or statement that should be strictly followed in order to optimize these applications.

Indique le mode d'utilisation, la procédure et la condition d'exploitation. Ces consignes doivent être rigoureusement respectées pour optimiser ces applications.

Note !

Indicates an essential or important procedure, condition, or statement.

Indique un mode d'utilisation, de procédure et de condition d'exploitation essentiels ou importants

1.2. Before Supplying Power to the Inverter / Avant d'alimenter le variateur



Warning

The main circuit must be correctly wired. For three phase supply use input terminals (R/L1, S/L2, T/L3). Terminals U/T1, V/T2, W/T3 must only be used to connect the motor. Connecting the input supply to any of the U/T1, V/T2 or W/T3 terminals will cause damage to the inverter.

Avertissement !

Le circuit principal doit être correctement câblée. Pour l'alimentation triphasée, utiliser les bornes d'entrée (R/L1, S/L2, T/L3). Les bornes U/T1, V/T2, W/T3 doivent être exclusivement utilisés pour raccorder le moteur. Le fait de brancher l'alimentation sur l'un des bornes U/T1, V/T2 ou W/T3 endommagera le variateur.



Caution

- To avoid the front cover from disengaging or other physical damage, do not carry the inverter by its cover. Support the unit by its heat sink when transporting. Improper handling can damage the inverter or injure personnel, and should be avoided.
- To avoid the risk of fire, do not install the inverter on or near flammable objects. Install on nonflammable objects such as metal surfaces.

- If several inverters are placed inside the same control panel, provide adequate ventilation to maintain the temperature below 40°C/104°F (50°C/122°F) without a dust cover) to avoid overheating or fire.
- When removing or installing the digital operator, turn off the power first, and then follow the instructions in this manual to avoid operator error or loss of display caused by faulty connections.

Attention !

- *Pour éviter que le couvercle ne se désengage ou de tout autre dommage physique, ne portez pas le lecteur par son couverture. Soutenir le groupe par son dissipateur de chaleur lors du transport. Une mauvaise manipulation peut endommager le lecteur ou blesser le personnel, et doit être évitée.*
- *Pour éviter que les risques d'incendie, ne pas installer le lecteur sur ou à proximité d'objets inflammables. Installer sur des objets ininflammables comme les surfaces métalliques.*
- *Si plusieurs variateurs sont logés à l'intérieur d'une même armoire, assurer une bonne ventilation pour maintenir une température inférieure à 40°C/104°F (50°C/122°F) (sans cache-poussière), pour éviter tout risque de surchauffe et d'incendie.*
- *Lors de la dépose/repose de l'opérateur numérique, couper d'abord l'alimentation puis suivre les instructions ci-contenues pour éviter toute erreur ou perte d'affichage due à des connexions défectueuses..*

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Warning

- This product is sold subject to IEC 61800-3. In a domestic environment this product may cause radio interference in which case the user may need to apply corrective measures.
- Motor over temperature protection is not provided.

Avertissement !

- *Ces produit est commercialisé conformément à la norme IEC 61800-3. En milieu résidentiel, ce produit peut provoquer des interférences radio ; dans ce cas, l'utilisateur devra entreprendre des actions correctives.*
- *La protection contre la sur-température du moteur n'est pas prévue.*

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1.3. Wiring / Câblage

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Warning

- Always turn OFF the power supply before attempting inverter installation and wiring of the user terminals.
- Wiring must be performed by a qualified personnel / certified electrician.
- Make sure the inverter is properly grounded. Grounding impedance shall be less than 10Ω.
- Make sure the inverter is properly grounded. It is required to disconnect the ground wire in the control board to avoid the sudden surge causing damage on electronic parts if it is improperly grounded.
- RCD is required to be in compliance with the protection norm of B-type leakage current.
- Please check and test emergency stop circuits after wiring. (Installer is responsible for the correct wiring.)
- Never touch any of the input or output power lines directly or allow any input of output power lines to come in contact with the inverter case.
- Do not perform a dielectric voltage withstand test (megger) on the inverter this will result in inverter damage to the semiconductor components.

Avertissement !

- *Coupez toujours l'alimentation électrique avant de procéder à l'installation d'entraînement et le câblage des terminaux utilisateurs.*
- *Le câblage doit être effectué par un personnel qualifié / électricien certifié.*
- *Assurez-vous que le lecteur est correctement mis à la terre. Impédance de mise à la terre doit être inférieure à 10Ω.*
- *Vérifier et tester mes circuits d'arrêt d'urgence après le câblage. (L'Installateur est responsable du câblage.)*
- *Ne touchez jamais de l'entrée ou de lignes électriques de sortie permettant directement ou toute entrée ou de lignes de puissance de sortie à venir en contact avec le boîtier d'entraînement.*
- *Ne pas effectuer un test de tenue en tension diélectrique (mégohmmètre) sur le disque dur ou cela va entraîner des dommages de lecture pour les composants semi-conducteurs.*

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Caution

- The line voltage applied must comply with the inverter's specified input voltage. (See product nameplate section 2.1)
- Connect braking resistor and braking unit to the designated terminals. (See section 3.10)
- Do not connect a braking resistor directly to the DC terminals P (+) and N (-), otherwise fire may result.
- Use wire gauge recommendations and torque specifications. (See Wire Gauge and Torque Specification in section 3.6)
- Never connect input power to the inverter output terminals U/T1, V/T2, W/T3.
- Do not connect a contactor or switch in series with the inverter and the motor.
- Do not connect a power factor correction capacitor or surge suppressor to the inverter output.
- Ensure the interference generated by the inverter and motor does not affect peripheral devices.

Attention !

- *La tension d'alimentation appliquée doit se conformer à la tension d'entrée spécifiée par le lecteur. (Voir la section signalétique du produit, ch. 2.1)*
- *Raccorder la résistance de freinage et de l'unité de freinage sur les bornes assignées (Voir ch. 3.10).*
- *Ne pas brancher une résistance de freinage directement sur les bornes CC P (+) et N (-), sinon risque d'incendie.*
- *Utilisez des recommandations de la jauge de fil et les spécifications de couple. (Voir Wire Gauge et la section de spécification de couple, ch. 3.6).*
- *Ne jamais brancher l'alimentation d'entrée aux bornes onduleur de sortie U/T1, V/T2, W/T3.*
- *Ne pas brancher un contacteur ou interrupteur en série avec le variateur et le moteur.*
- *Ne branchez pas un facteur condensateur de correction de puissance ou supprimeur de tension à la sortie du variateur.*
- *S'assurer que l'interférence générée par l'entraînement et le moteur n'a pas d'incidence sur les périphériques.*

1.4. Before Operation / Avant l'opération



Warning

- Make sure the inverter model matches the parameters 13-00.
- Reduce the carrier frequency (parameter 11-01) if the cable from the inverter to the motor is greater than 80 ft (25m). A high-frequency current can be generated by stray capacitance between the cables and result in an overcurrent trip of the inverter, an increase in leakage current, or an inaccurate current readout.
- Be sure to install all covers before turning on power. Do not remove any of the covers while power to the inverter is on, otherwise electric shock may occur.
- Do not operate switches with wet hands, otherwise electric shock may result.
- Do not touch inverter terminals when energized even if inverter has stopped, otherwise electric shock may result.

Avertissement !

- *Assurez-vous que le modèle du variateur correspond aux paramètres 13-00 de notation avant d'alimenter.*
- *Réduire le paramètre 11-01 de la fréquence porteuse si le câble du variateur au moteur est supérieure à 80 pi (25 m). Un courant de haute fréquence peut être générée par la capacité parasite entre les câbles et entraîner un déclenchement de surintensité du variateur, une augmentation du courant ou d'une lecture actuelle inexactes.*
- *Veillez à installer tous les couvercles avant de l'allumer. Ne retirez pas les capots pendant que l'alimentation du lecteur est allumé, un choc électrique peut se produire autrement.*
- *Ne pas actionner d'interrupteurs avec les mains mouillées, un choc électrique pourrait survenir autrement.*
- *Ne touchez pas les bornes d'entraînement lorsqu'il est alimenté, même si le lecteur est arrêté, un choc électrique pourrait survenir autrement.*

1.5. Parameters Setting / Configuration Paramètre



- Do not connect a load to the motor while performing a rotational auto-tune.
- Make sure the motor can freely run and there is sufficient space around the motor when performing a rotational auto-tune.

Attention !

- *Ne branchez pas une charge pour le moteur tout en effectuant un auto-tune.*
- *Assurez-vous que le moteur peut fonctionner librement et il y a suffisamment d'espace autour du moteur lors de l'exécution d'un auto-tune rotation.*

1.6. Operation / Opération



- Be sure to install all covers before turning on power. Do not remove any of the covers while power to the inverter is on, otherwise electric shock may occur.
- Do not connect or disconnect the motor during operation. This will cause the inverter to trip and may cause damage to the inverter.
- Operations may start suddenly if an alarm or fault is reset with a run command active. Confirm that no run command is active upon resetting the alarm or fault, otherwise accidents may occur.
- Do not operate switches with wet hands, otherwise electric shock may result.
- It provides an independent external hardware emergency switch, which emergently shuts down the inverter output in the case of danger.
- If automatic restart after power recovery (parameter 07-00) is enabled, the inverter will start automatically after power is restored.
- Make sure it is safe to operate the inverter and motor before performing a rotational auto-tune.
- Do not touch inverter terminals when energized even if inverter has stopped, otherwise electric shock may result.
- Do not check signals on circuit boards while the inverter is running.
- After the power is turned off, the cooling fan may continue to run for some time.

Avertissement !

- *Veillez à installer tous les couvercles avant de l'allumer. Ne retirez pas les capots pendant que l'alimentation du lecteur est allumé, un choc électrique peut se produire autrement.*
- *Ne pas brancher ou débrancher le moteur pendant le fonctionnement. Le variateur pourrait se déclencher et ainsi endommager le lecteur.*
- *Les opérations peuvent commencer soudainement si une alarme ou un défaut est réarmé avec un ordre de marche active. Assurez-vous qu'un ordre de marche est actif lors de la réinitialisation de l'alarme ou de défaut, autrement des accidents peuvent se produire.*
- *Ne pas actionner d'interrupteurs avec les mains mouillées, un choc électrique pourrait survenir.*
- *Un interrupteur d'urgence externe indépendant est fourni, qui s'arrête en urgence vers le bas la sortie de l'onduleur en cas de danger.*
- *Si le redémarrage automatique après une récupération d'énergie est activée (par 07-00), le variateur démarrera automatiquement après le rétablissement du courant.*
- *Assurez-vous qu'il est sûr de faire fonctionner le variateur et le moteur avant d'effectuer un auto-tune rotation.*
- *Ne touchez pas les bornes d'entraînement lorsqu'il est alimenté même si l'onduleur s'est arrêté, un choc électrique pourrait survenir.*
- *Ne pas contrôler les signaux sur les circuits pendant que le lecteur est en marche.*
- *Après la mise hors tension, le ventilateur de refroidissement peut continuer à fonctionner pendant un certain temps.*



- Do not touch heat-generating components such as heat sinks and braking resistors.
- Carefully check the performance of motor or machine before operating at high speed, otherwise Injury may result.
- Note the parameter settings related to the braking unit when applicable.
- Do not use the inverter braking function for mechanical holding, otherwise injury may result.
- Do not check signals on circuit boards while the inverter is running.

Attention !

- *Ne touchez pas les composants générant de la chaleur tels que radiateurs et des résistances de freinage.*
- *Vérifiez soigneusement la performance du moteur ou de la machine avant d'utiliser à grande vitesse, sous peine de blessure.*
- *Notez les réglages des paramètres liés à l'unité de freinage lorsque applicable.*
- *Ne pas utiliser la fonction de freinage d'entraînement pour un maintien mécanique, sous peine de blessure.*
- *Ne pas contrôler les signaux sur les circuits pendant que le lecteur est en marche.*

1.7. Maintenance, Inspection and Replacement / Entretien, Inspection et remplacement



- Wait a minimum of five minutes after power has been turned OFF before starting an inspection. Also confirm that the charge light is OFF and that the DC bus voltage has dropped below 25Vdc.
- Never touch high voltage terminals in the inverter.
- Make sure power to the inverter is disconnected before disassembling the inverter.
- Only authorized personnel should perform maintenance, inspection, and replacement operations. (Take off metal jewelry such as watches and rings and use insulated tools.)

Avertissement !

- *Attendre un minimum de 5 minutes après que l'alimentation a été débranchée avant de commencer une inspection. Vérifiez également que le voyant de charge est éteint et que la tension du bus cc a chuté au-dessous de 25Vdc.*
- *Ne jamais toucher les bornes à haute tension dans le lecteur.*
- *Assurez-vous que l'alimentation du lecteur est débranché avant de démonter le lecteur.*
- *Seul le personnel autorisé peuvent faire l'entretien, l'inspection et les opérations de remplacement. (Enlevez les bijoux en métal tels que les montres et les bagues et utiliser des outils isolés.)*



- The Inverter can be used in an environment with a temperature range from 14°~104 (140) °F (-10~+40 (60) °C) and relative humidity of 95% non-condensing.
- The inverter must be operated in a dust, gas, mist and moisture free environment.

Attention !

- *Le variateur peut être utilisé dans un environnement avec une gamme de température allant de 14 ° -104 ° F (10-40 ° C) et l'humidité relative de 95% sans condensation.*
- *Le variateur doit être utilisé dans un environnement sans poussière, gaz, vapeur et humidité.*

1.8. Disposal of the Inverter / Mise au rebut du variateur

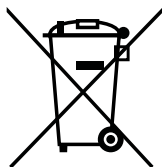


Caution

- Please dispose of this unit with care as an industrial waste and according to your required local regulations.
- The capacitors of inverter main circuit and printed circuit board are considered as hazardous waste and must not be burned.
- The Plastic enclosure and parts of the inverter such as the top cover board will release harmful gases if burned.

Attention !

- *Jeter cet appareil avec soin comme un déchet industriel et selon les réglementations locales nécessaires.*
- *Les condensateurs du circuit principal d'entraînement et circuits imprimés sont considérés comme des déchets dangereux et ne doivent pas être brûlés.*
- *L'enveloppe et d'autres éléments en plastique du variateur, tels la plaque de revêtement supérieure, dégagent des fumées toxiques en cas d'incinération.*



Pursuant to Article 26 of Italian Legislative Decree no. 49 of 14 March 2014 "Implementation of Directive 2012/19/EU on waste electrical and electronic equipment (WEEE)"

The symbol showing a crossed-out wheeled bin on equipment or its packaging indicates that the product must be collected separately from other waste at the end of its useful life.

The manufacturer is responsible for organising and managing the separate collection of this piece of equipment at the end of its useful life.

Users wishing to dispose of the equipment must therefore contact the manufacturer to obtain instructions from the same on how to have the equipment collected separately at the end of its useful life.

By collecting the disused equipment separately, it can be recycled, treated or disposed of in an environmentally friendly manner, thus helping to prevent the environment and public health from being affected negatively and enabling reuse and/or recycling of the materials forming the same equipment

Aux termes de l'art. 26 du D.Lgs. n. 49 du 14 mars 2014, n.49 "Transposition de la Directive 2012/19/UE relative aux déchets d'équipements électriques et électroniques (RAEE)"

Le pictogramme de la poubelle barrée, figurant sur l'équipement ou sur son emballage, indique que le produit en fin de vie doit être traité séparément des autres déchets.

Le ramassage sélectif de cet équipement en fin de vie est organisé et géré par le constructeur.

Tout utilisateur qui souhaiterait se débarrasser de l'équipement devra donc contacter le constructeur pour obtenir des informations concernant la méthode adoptée pour permettre le ramassage sélectif de l'équipement en fin de vie.

Un ramassage sélectif correct, en vue de l'acheminement de l'équipement vers des opérations de recyclage, de traitement et de mise au rebut respectueuses de l'environnement, contribue à réduire les impacts potentiellement néfastes sur l'environnement et la santé, outre à favoriser la réutilisation des matériaux/composants dont l'équipement est constitué.

2. Model Description

2.1. Nameplate Data

It is essential to verify the VDI100 inverter nameplate and make sure that the VDI100 inverter has the correct rating so it can be used in your application with the proper sized AC motor.

Unpack the VDI100 inverter and check the following:

- (1) The VDI100 inverter and start-up and installation manual are contained in the package.
- (2) The VDI100 inverter has not been damaged during transportation there should be no dents or parts missing.
- (3) The VDI100 inverter is the type you ordered. You can check the type and specifications on the main nameplate.
- (4) Check that the input voltage range meets the input power requirements.
- (5) Ensure that the motor kW (HP) matches the motor rating of the inverter.

HD: Heavy Duty (Constant Torque); ND: Normal Duty (Variable Torque) (1HP = 0.746 kW)

Drive model ->

Input and output data ->

Serial number ->

MODEL : VDI100-2055-KBX-4 PW RATING : 5.5 kW/7.5kW-7.5Hp/10Hp

INPUT : AC 3PH 380~480V (+10%,-15%) 50/60Hz 15.5A/18.2A

OUTPUT : AC 3PH 0~480V 0-599Hz 14.8A/17.5A

FW VERSION : V 1.06/V1.0

S6N127 BAR CODE

GEFRAN Gefran S.p.A Via G. Carducci, 24 I-21040-Gerenzano (Va) MADE IN TAIWAN

RoHS **CE**

UL 18KJ IND. CONT. EQ.

<- Power rating

<- Approvals

Model Identification

VDI100-X-XXX-K-XX-X-Y

EMI Filter:	F = included; [Empty] = not included
Rated voltage:	4 = 400 Vac , 3ph
Software:	X = standard
Braking unit:	B = included; X = not included
Keypad:	K = Integrated (LED keypad with 5-digits 7-segment display)
Drive power, in kW	
Mechanical drive sizes	
VDI100 drive series	

2.2. Inverter Models – Motor Power Rating (HD – Heavy Duty)

Voltage	VDI100 Models with filter	VDI100 Models without filter	Motore applicato	
			(HP)	(kW)
3ph, 380~480V +10%/-15% 50/60Hz	VDI100-1007-KBX-4-F	VDI100-1007-KBX-4	1	0.75
	VDI100-1015-KBX-4-F	VDI100-1015-KBX-4	2	1.5
	VDI100-1022-KBX-4-F	VDI100-1022-KBX-4	3	2.2
	VDI100-2037-KBX-4-F	VDI100-2037-KBX-4	5	3.7
	VDI100-2055-KBX-4-F	VDI100-2055-KBX-4	7.5	5.5
	VDI100-3075-KBX-4-F	VDI100-3075-KBX-4	10	7.5
	VDI100-3110-KBX-4-F	VDI100-3110-KBX-4	15	11
	VDI100-4150-KBX-4-F	VDI100-3150-KBX-4	20	15
	VDI100-4185-KBX-4-F	VDI100-4185-KBX-4	25	18.5
	VDI100-4220-KBX-4-F	VDI100-4220-KBX-4	30	22
	VDI100-5300-KBX-4-F	VDI100-5300-KBX-4	40	30
	VDI100-5370-KXX-4-F	VDI100-5370-KXX-4	50	37
	VDI100-5450-KXX-4-F	VDI100-5450-KXX-4	60	45

Short Circuit Rating: 5kA

3. Environment and Installation

3.1. Wire Gauges and Tightening Torque

To comply with UL standards, use UL approved copper wires (rated 75° C) and round crimp terminals (UL Listed products) as shown in table below when connecting to the main circuit terminals. Gefran recommends using crimp terminals manufactured by NICHIFU Terminal Industry Co., Ltd and the terminal crimping tool recommended by the manufacturer for crimping terminals and the insulating sleeve.

Wire size mm ² (AWG)	Terminal screw size	Model of the round crimp terminal	Fastening torque kgf.cm (in.lbs)	Model of insulating sleeve	Model of crimp tool
0.75 (18)	M3.5	R1.25-3.5	8.2 to 10 (7.1 to 8.7)	TIC 1.25	NH 1
	M4	R1.25-4	12.2 to 14 (10.4 to 12.1)	TIC 1.25	NH 1
1.5 (16)	M3.5	R1.25-3.5	8.2 to 10 (7.1 to 8.7)	TIC 1.25	NH 1
	M4	R1.25-4	12.2 to 14 (10.4 to 12.1)	TIC 1.25	NH 1
2.5 (14)	M3.5	R2-3.5	8.2 to 10 (7.1 to 8.7)	TIC 2	NH 1 / 9
	M4	R2-4	12.2 to 14 (10.4 to 12.1)	TIC 2	NH 1 / 9
	M5	R2-5	22.1 to 24 (17.7 to 20.8)	TIC 2	NH 1 / 9
	M6	R2-6	25.5 to 30.0 (22.1 to 26.0)	TIC 2	NH 1 / 9
4.0 / 6.0 (12/10)	M4	R5.5-4	12.2 to 14 (10.4 to 12.1)	TIC 5.5	NH 1 / 9
	M5	R5.5-5	20.4 to 24 (17.7 to 20.8)	TIC 5.5	NH 1 / 9
	M6	R5.5-6	25.5 to 30.0 (22.1 to 26.0)	TIC 5.5	NH 1 / 9
	M8	R5.5-8	61.2 to 66.0 (53.0 to 57.2)	TIC 5.5	NH 1 / 9
10.0 (8)	M4	R8-4	12.2 to 14 (10.4 to 12.1)	TIC 8	NOP 60
	M5	R8-5	20.4 to 24 (17.7 to 20.8)	TIC 8	NOP 60
	M6	R8-6	25.5 to 30.0 (22.1 to 26.0)	TIC 8	NOP 60
	M8	R8-8	61.2 to 66.0 (53.0 to 57.2)	TIC 8	NOP 60
16 (6)	M4	R14-4	12.2 to 14 (10.4 to 12.1)	TIC 14	NH 1 / 9
	M5	R14-5	20.4 to 24 (17.7 to 20.8)	TIC 14	NH 1 / 9
	M6	R14-6	25.5 to 30.0 (22.1 to 26.0)	TIC 14	NH 1 / 9
	M8	R14-8	61.2 to 66.0 (53.0 to 57.2)	TIC 14	NH 1 / 9
25 (4)	M6	R22-6	25.5 to 30.0 (22.1 to 26.0)	TIC 22	NOP 60/ 150H
	M8	R22-8	61.2 to 66.0 (53.0 to 57.2)	TIC 22	NOP 60/ 150H
35 (2)	M6	R38-6	25.5 to 30.0 (22.1 to 26.0)	TIC 38	NOP 60/ 150H
	M8	R38-8	61.2 to 66.0 (53.0 to 57.2)	TIC 38	NOP 60/ 150H
55 (1/0)	M8	R60-8	61.2 to 66.0 (53.0 to 57.2)	TIC 60	NOP 60/ 150H
	M10	R60-10	102 to 120 (88.5 to 104)	TIC 60	NOP 150H
70 (2/0)	M8	R70-8	61.2 to 66.0 (53.0 to 57.2)	TIC 60	NOP 150H
	M10	R70-10	102 to 120 (88.5 to 104)	TIC 60	NOP 150H
95 (3/0)	M10	R80-10	102 to 120 (88.5 to 104)	TIC 80	NOP 150H
	M16	R80-16	255 to 280 (221 to 243)	TIC 80	NOP 150H
120 (4/0)	M10	R100-10	102 to 120 (88.5 to 104)	TIC 100	NOP 150H
	M12	R100-12	143 to 157 (124 to 136)	TIC 100	NOP 150H
	M16	R80-16	255 to 280 (221 to 243)	TIC 80	NOP 150H

3.2. Wiring Peripheral Power Devices



Caution

- After power is shut off to the inverter the capacitors will slowly discharge. Do NOT touch the inverter circuit or replace any components until the "CHARGE" indicator is off.
- Do NOT wire or connect/disconnect internal connectors of the inverter when the inverter is powered up or after power off but the "CHARGE" indicator is on.
- Do NOT connect inverter output U, V and W to the AC power source. This will result in damage to the inverter.
- The inverter must be properly grounded. Use terminal E to connect earth ground and comply with local standards.
- It is required to disconnect the ground wire in the control board if the inverter is not grounded.

- Do NOT perform a dielectric voltage withstand test (Megger) on the inverter this will result in inverter damage to the semiconductor components.
- Do NOT touch any of the components on the inverter control board to prevent damage to the inverter by static electricity.

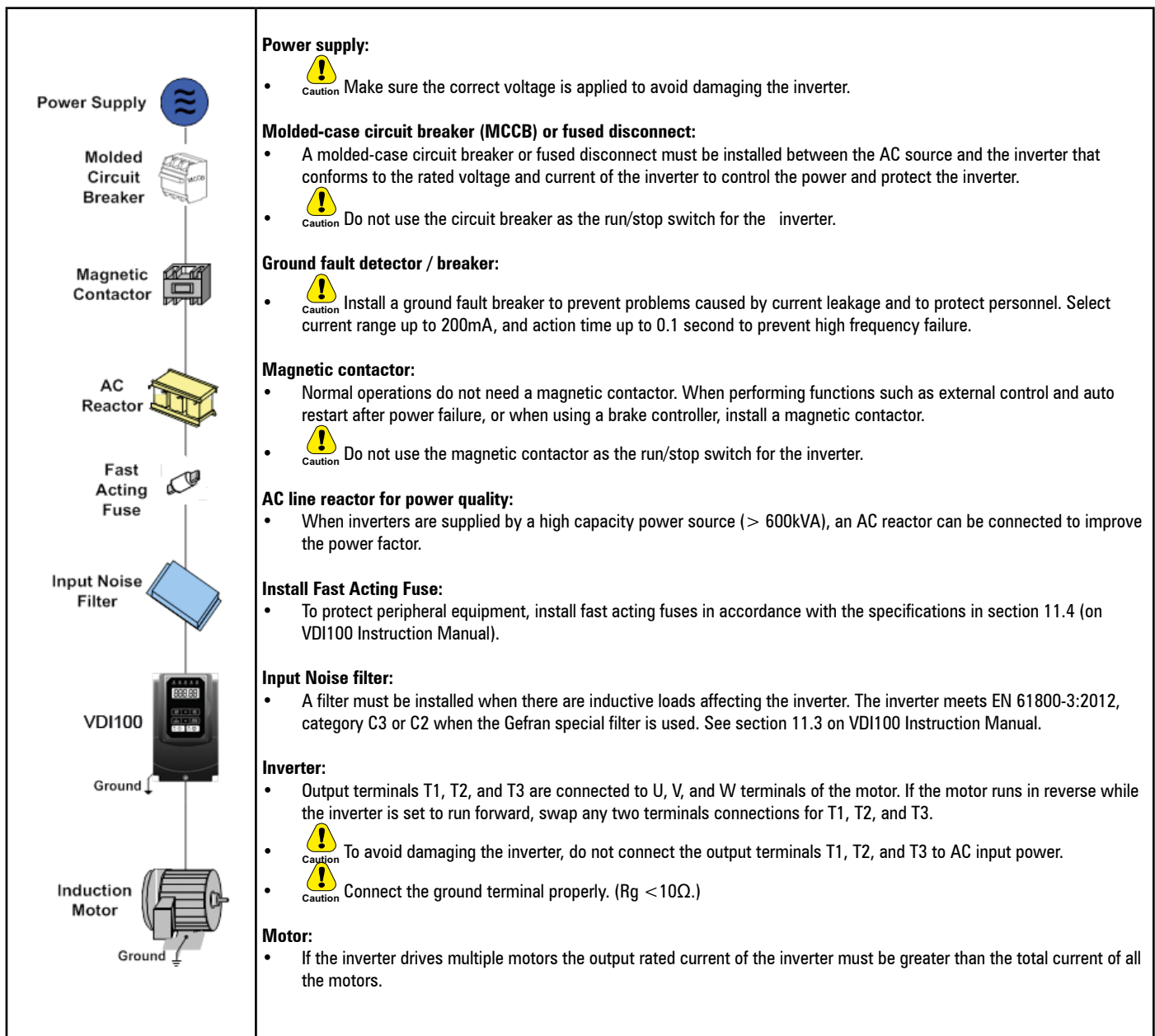


Caution

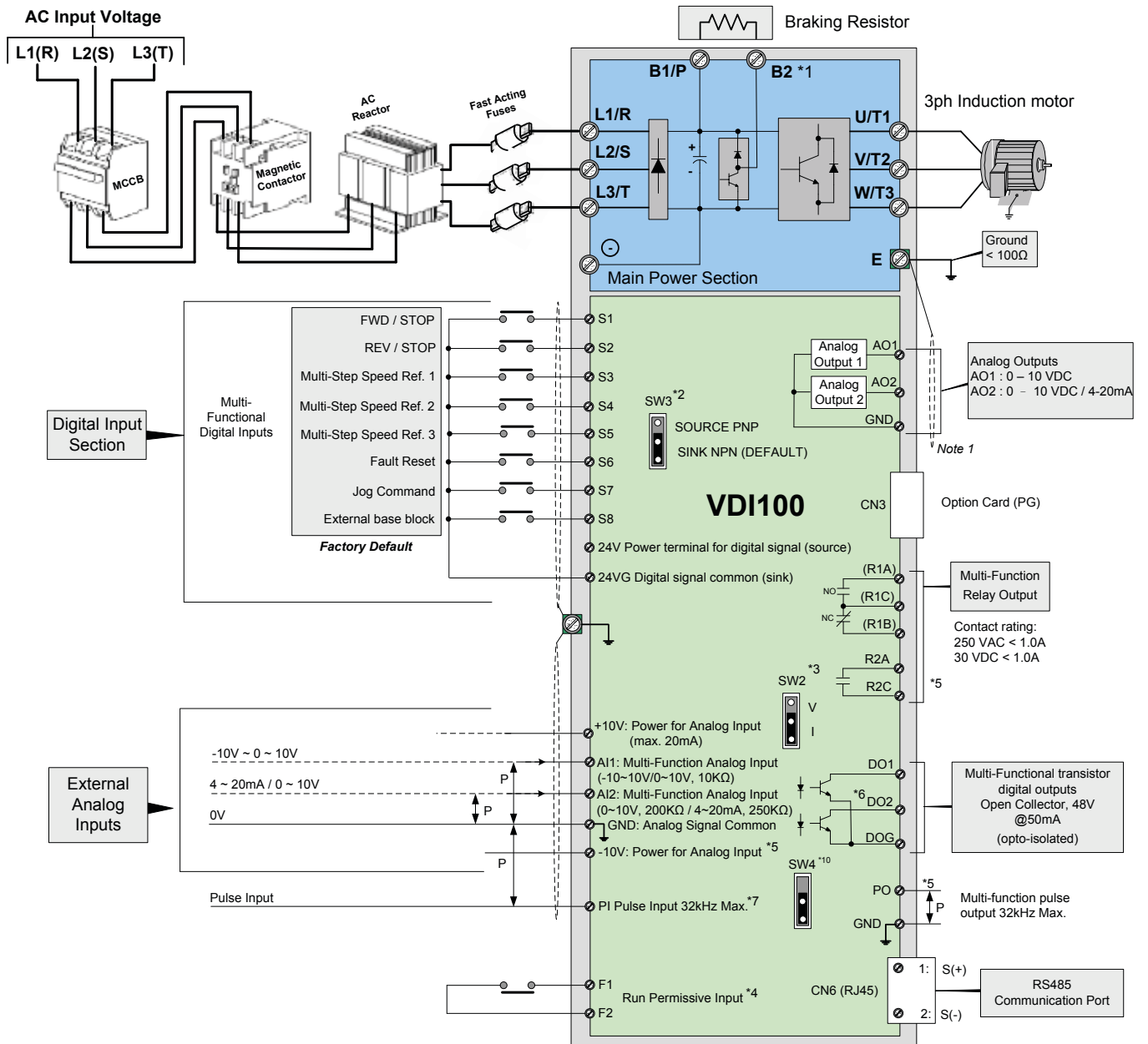
- Refer to the recommended wire size table for the appropriate wire to use. The voltage between the power supply and the input terminals of the inverter may not exceed 2%.

Phase-to-phase voltage drop (V) = $\sqrt{3} \times \text{resistance of wire } (\Omega/\text{km}) \times \text{length of line m} \times \text{current} \times 10^{-3}$.
(km=3280 x feet) / (m=3.28 x feet)

- Reduce the carrier frequency (parameter 11-01) If the cable from the inverter to the motor is over 25m (82ft). A high-frequency current can be generated by stray capacitance between the cables and result in an overcurrent trip of the inverter, an increase in leakage current, or an inaccurate current readout.
- To protect peripheral equipment, install fast acting fuses on the input side of the inverter. Refer to section 11.4 for additional information (on VDI100 Instruction Manual).



3.3. General Wiring Diagram



*1: Models 0.75 ~ 30kW or lower ratings have a built-in braking transistor. To use this braking transistor a braking resistor can be connected between B1 and B2.

*2: Use SW3 to select between Sink (NPN, with 24VG common) or Source (PNP, with +24V common) for multi-function digital input terminals S1~S8.

*3: Use SW2 to switch between voltage (0~10V/-10~10V) and current (4~20mA) input for Multi-function analog input 2 (AI2). Besides please also check parameter 04-00 for proper setting.

*4: Run Permissive input F1 and F2 is a normally closed input. This input should be closed to enable the inverter output. To activate this input remove the jumper wire between F1 and F2.

*5: Models 3.7kW and higher ratings include terminals -10V, S(+), S(-), R2A-R2C and PO-GND.

*6. Models 2.2kW and lower ratings include terminal DO2.

*7: When using the open collector for pulse input, it doesn't need resistance because of built-in pull-up resistance.

*8: AO2 default setting is 0~+10V.

*9: It need turn on the switch for the terminal resistor RS485 in the last inverter when many inverters in parallel connection. Please refer to Appendix A

3.4. Input / Output Power Section Block Diagram

The following diagrams 1 - 5 show the basic configuration of the power sections for the range of horsepower and input voltages. This is shown for reference only and is not a detailed description.

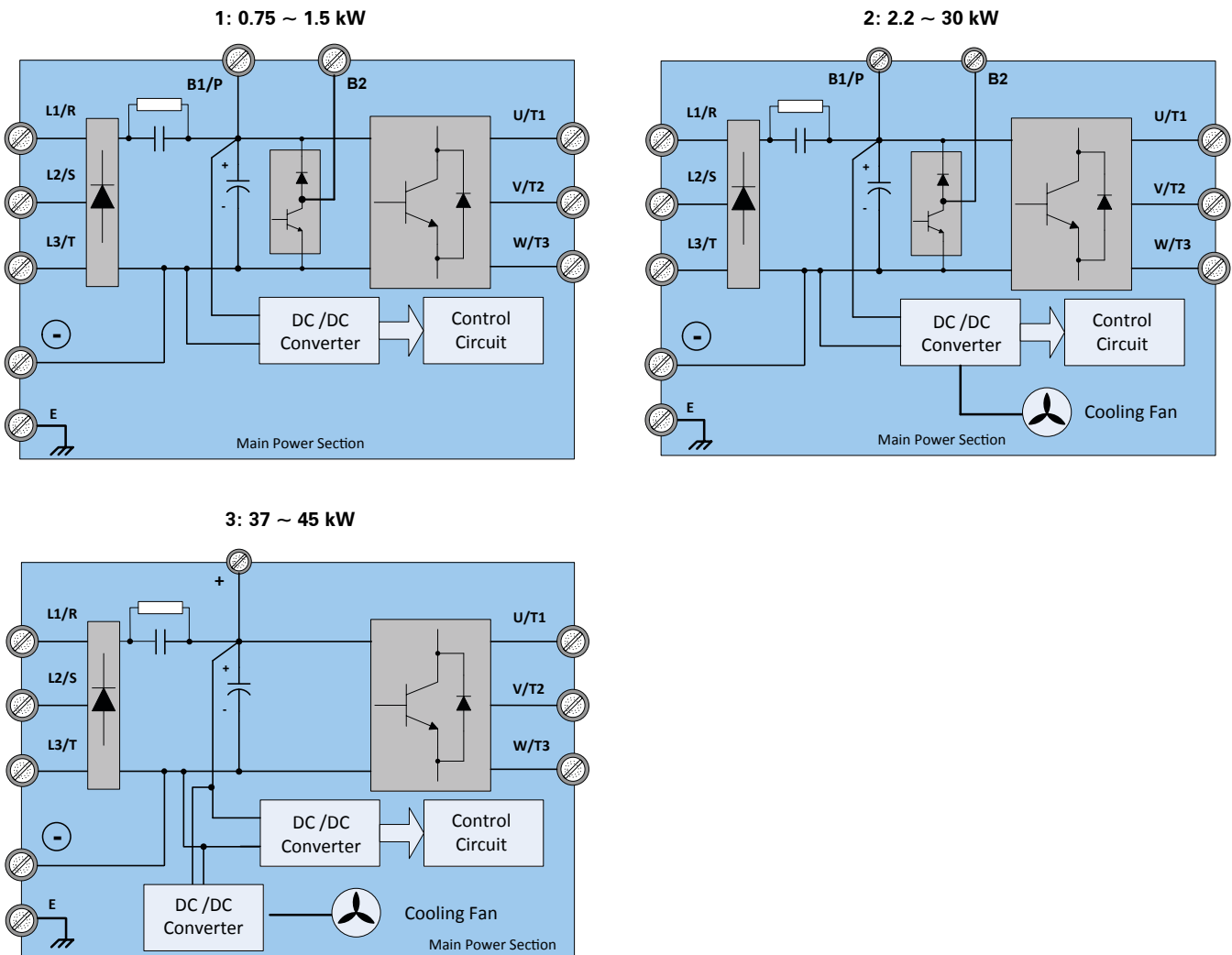
DC power supply

All the VDI100 ranges can be power supply from **DC link**.

DC link connection terminals:

Range	Terminals	Diagrams
up to 30kW	B1/P and (-)	1 and 2
37-45kW	(+) and (-)	3

Note ! For DC power supply, fuses and DC pre-charge circuit must be provided externally.



3.4.1. Cooling Fan Supply Voltage Selection (400V class)

The inverter input voltage ranges from 380 to 480Vac.

3.5. User Terminals (Control Circuit Terminals)

0.75 ~ 2.2kW

R1A	R1B	R1C												
			E	DO2	24VG	S2	S4	S6	S8	24V	+10V	GND	AI1	AI2
RJ45			DO1	DOG	S1	S3	S5	S7	F1	F2	PI	AO1	AO2	E

3.7~45kW

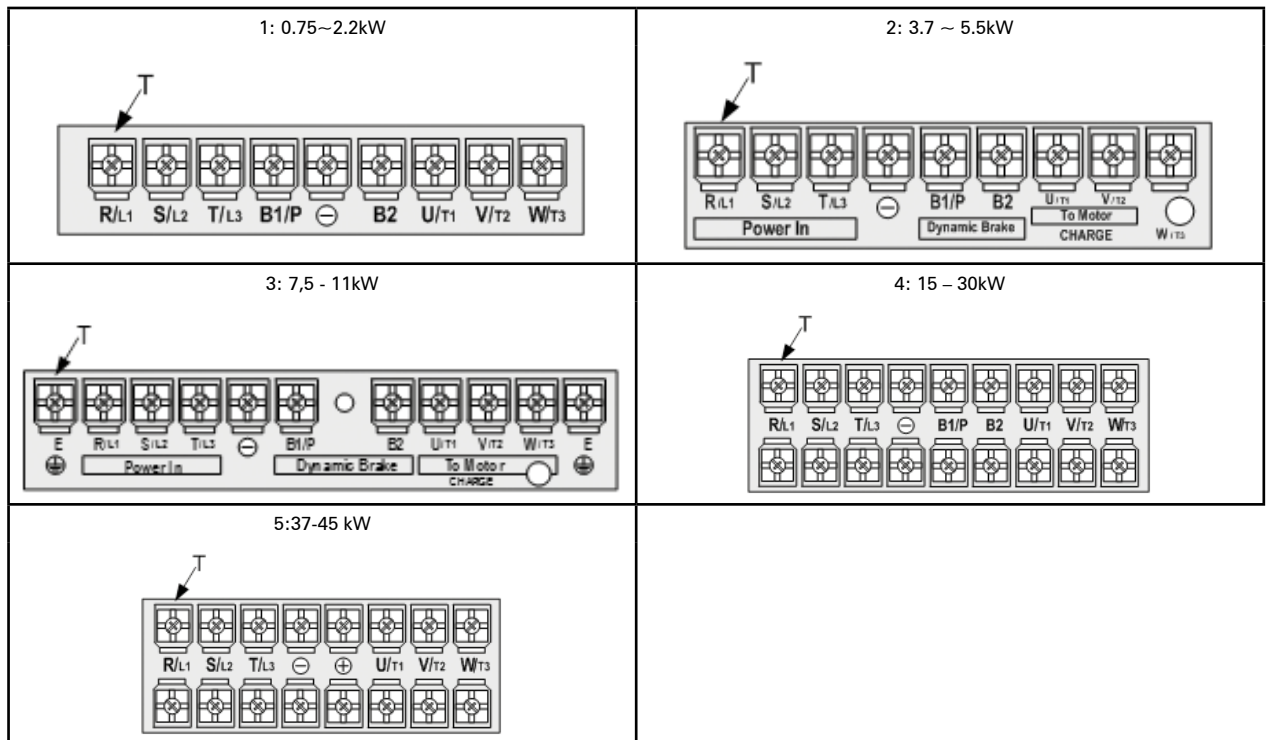
R1A	R1B	R1C	R2A	R2C		S(+)	S(-)	S1	S3	S5	S7	24V	+10V	GND	-10V	GND	GND	AI1	AI2
				RJ45		DO1	DOG	S2	S4	S6	S8	24VG	F1	F2	PO	PI	AO1	AO2	E

Description of User Terminals

Type	Terminal	Terminal Function	Signal Level / Information
Digital input signal	S1	2-wire forward/ stop (default) * 1	Signal Level 24 VDC (photo isolated) Maximum current: 8mA Maximum voltage: 30 Vdc Input impedance: 4.22kΩ
	S2	2-wire reversal/ stop (default) * 1	
	S3	Multi-speed/ position setting command 1 (default) * 1	
	S4	Multi-speed/ position setting command 2 (default) * 1	
	S5	Multi-speed/ position setting command 3 (default) * 1	
	S6	Fault reset (default) * 1	
	S7	JOG frequency command (default) * 1	
	S8	External B.B.(Base Block) stop (coast to stop) (default) * 1	
24V Power supply	24V	Digital signal SOURCE point (SW3 switched to SOURCE)	±15%, Max. output current: 250mA (The sum of all loads connected)
	24VG	Common terminal of Digital signals Common point of digital signal SINK (SW3 switched to SINK)	
Analog input signal	+10V	Power for external speed potentiometer	+10V (Max. current , 20mA)
	-10V	Only above 3.7kW (include) support this terminal function	-10V (Max. current , 20mA)
	AI1	Multi-function analog input for speed reference (0-10V input)/ (-10V~10V input)	From 0 to +10V, From -10V to +10V Input impedance : 20KΩ Resolution: 11bit + 1
	AI2	Multi-function analog input terminals *2, can use SW2 to switch voltage or current input (0~10V)/(4-20mA)	From 0 to +10V, From -10V to +10V Input impedance: 200KΩ From 4 to 20 mA Input impedance: 250KΩ Resolution: 11bit + 1
	GND	Analog signal ground terminal	----
	E	Shielding wire's connecting terminal (Ground)	----
Analog output signal	AO1	Multi-function analog output terminals *2 (0~10V output)	From 0 to 10V, From 4 to 20mA (Load < 500Ω) PWM Frequency: 10KHz
	AO2	Multi-function analog output terminals *2. can use SW6 to switch voltage or current input (0~10V / 4-20mA output)	
	GND	Analog signals ground terminal	
Pulse output signal	PO	Pulse output, Band width 32KHz, only above 3.7kW (include) support this terminal function.	Max. Frequency: 32KHz Open Collector output
	GND	Analog signals ground terminal	----
Pulse input signal	PI	Pulse command input, Bandwidth: 32KHz	L: from 0.0 to 0.5V H: from 4.0 to 13.2V Max. Frequency: 0 - 32KHz Built-in pull-up resistance. When open collector input is used, it is not required to connect resistance.
	GND	Analog signals ground terminal	----
Digital output	DO1	Multi-function(open collector transistor) output *1	48Vdc, 2~50mA Open-collector output
	DO2 (Frame one only)		
	DOG	Open collector transistor digital ground	
Relay output	R1A	Relay A contact (multi-function output terminal) Relay B contact (multi-function output terminal)	Rating: 250Vac, 10 mA ~ 1A 30Vdc, 10 mA ~ 1A
	R1B	Relay contact common terminal,	
	R1C	With the same functions as DO1/DO2	
	R2A-R2C (Frame 2 and above)	With the same functions as DO1/DO2	Rating: 250Vac, 10 mA ~ 1A 30Vdc, 10 mA ~ 1A
Run Permissive Input	F1	On: normal operation. Off: stop. (Jumper wired between F1 and F2 has to be removed by using external contact to stop.)	24Vdc, 8mA, pull-up
	F2	Activation of this input will switch off the inverter output causing the motor to coast to stop.	24V Ground

3.6. Power Terminals

Terminal	0.75 ~ 30kW	37 ~45kW
R/L1 - S/L2 - T/L3	Input Power Supply	
B1/P	- B1/P- ⊖ : DC power supply - B1/P-B2: external braking resistor	-
B2		-
⊖		DC power supply or connect braking module
⊕		
U/T1 - V/T2 - W/T3	Inverter output	
E	Ground terminal	



	Terminal screw size						
	1: 0.75~2.2kW	2: 3.7 ~ 5.5kW	3: 7,5 - 11kW	4: 15kW (size 3)	4: 15 ~ 22kW	4: 30kW	5: 37-45 kW
T	M4	M4	M6	M6	M6	M6	M8
⊕	M4	M4	M6	M5	M6	M8	M8

Note ! For wire gauges and screw torques, please refer to the table in section 3.6

3.7. Inverter Specifications

Sizes VDI100			1007	1015	1022	2037	2055	3075	3110	3150 4150-F	4185	4220	5300	5370	5450		
Output Rating ⁽²⁾	HD ⁽³⁾	Rated Output Capacity	kVA	2.6	3.2	4.2	7	11.3	13.7	18.3	23.6	29.7	34.3	45.7	57.2	69.3	
		Rated Output Current	A	3.4	4.2	5.5	9.2	14.8	18	24	31	39	45	60	75	91	
		Maximum Applicable Motor ⁽¹⁾	HP	1	2	3	5	7.5	10	15	20	25	30	40	50	60	
			kW	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	
	ND ⁽⁴⁾	Rated Output Capacity	kVA	3.1	4.1	5.3	9.2	13.3	17.5	23.6	29.0	33.5	44.2	55.6	67.1	78.5	
		Rated Output Current	A	4.1	5.4	6.9	12.1	17.5	23	31	38	44	58	73	88	103	
		Maximum Applicable Motor ⁽¹⁾	HP	2	3	5	7.5	10	15	20	25	30	40	50	60	75	
			kW	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	
	Maximum Output Voltage		V	Three-Phase, 380V to 480V													
	Maximum Output Frequency		Hz	0.1～599 (Based on parameter setting)													
Input Power	Rated Voltage, Frequency		Three-Phase, 380V to 480V, 50/60Hz														
	HD	Rated Input Current	A	3.7	5.3	6.0	9.6	15.5	18.7	25.0	33.7	42.4	48.9	65.2	81.5	98.9	
	ND		A	4.5	5.9	7.5	11.6	18.2	24.0	32.3	41.3	47.8	58.7	78.3	95.7	112	
	Allowable Voltage Fluctuation		-15% ～ +10%														
	Allowable Frequency Fluctuation		±5%														
Braking Transistor			Built-in												Option (External Braking Module)		

(1) Based on the standard 4-pole induction motor. The selected inverter must have a higher output current rating than the motor.

(2) The default setting of VDI100 is HD (heavy duty mode). To switch VDI100 to ND (normal duty mode) set parameter (00-27) to 1. When switching to ND (normal duty mode), the frequency will change to 2kHz.

(3) The default setting of carrier frequency in HD mode is shown into the table below, if the setting value is higher than default setting, derating may be required.

(4) The default setting of carrier frequency in ND mode is 2kHz, if the setting value is higher than default setting, de-rating may be required.

(5) If control mode is set to SLV mode and maximum frequency is larger than 80Hz, the carrier frequency range is 2~8kHz.

(6) Option (External Braking Module)

Inverter Voltage and Power	HD mode carrier freq range	HD mode carrier freq default setting
0.75 ~ 22 kW	2~16 kHz	8 kHz
30 ~ 37 kW	2~12 kHz ⁽⁵⁾	5 kHz
45 kW	2~10 kHz ⁽⁵⁾	5 kHz

The following table shows maximum output frequency for each control mode.

Duty Cycle	Control mode (*)	Other settings	Maximum output frequency
Heavy Duty (00-27=0)	V/f V/f + PG, SLV2	maximum frequency set to 599Hz	599Hz
	SLV	0.75~11 kW	150Hz
		15 kW	110Hz
		18.5 ~ 22 kW	100Hz
		30~45kW carrier (11-01) is set as 8K or below 8K	100Hz
		30~45kW carrier (11-01) is above 8K	80Hz
	SV	Full range	599Hz
	PMSV	Full range	Twice of Base frequency
Normal Duty (00-27=1)	PMSLV	Full range	Base frequency
	V/f V/f + PG	maximum frequency set to 120Hz	120Hz
	SLV /SV PMSV/ PMSLV SLV2	No normal duty mode	

(*) See PAR 00-00 Control mode selection (ch. "4.4. Description of Parameters" a pagina 89 of VDI100 UM manual).

3.7.1. Powerloss

Drive Model	Watt Loss (W)	Heat Loss (kcal/hr)	Carrier Frequency (kHz)
VDI100-1007-...-4-...	127.4	109.6	8
VDI100-1015-...-4-...	134.7	115.8	8
VDI100-1022-...-4-...	171.7	147.7	8
VDI100-2037-...-4-...	241.9	208.0	8
VDI100-2055-...-4-...	294.1	252.9	8
VDI100-3075-...-4-...	697.7	600.0	8
VDI100-3110-...-4-...	829.7	713.5	8
VDI100-3150-...-4-...	880.5	757.2	8
VDI100-4185-...-4-...	1109.4	954.1	8
VDI100-4220-...-4-...	1172.5	1008.4	8
VDI100-5300-...-4-...	1666.5	1433.2	5
VDI100-5370-...-4-...	1965.9	1690.7	5
VDI100-5450-...-4-...	2562.8	2204.0	5

3.7.2. General Specifications

Control Characteristics	Motor type	Asynchronous Motor, Surface Permanent Magnet Motor, Interior Permanent Magnet Motor
	Control Modes	V/f, V/f+Encoder, SLV (vector control open loop), SV (vector control closed loop), PMSLV, PMSV
	Speed control accuracy	$\pm 1\%$ (SLV, overload 200% and control range 1 : 30 (60....2Hz ; 50...1.6Hz)), $\pm 1\%$ (SLV, overload 150% and control range 1 : 50 (60....1.2Hz ; 50...1Hz)), $\pm 1.5\%$ (V/f open-loop, overload 150% and control range 1 : 40 / 60....1.5Hz ; 50...1.25Hz), $\pm 0.1\%$ (SV)
	Output Frequency range	0.1Hz~599Hz
	Output Frequency Resolution	0.01Hz
	Overload Tolerance	Heavy Duty Mode (HD.): 150% rated current for 60sec, 200% rated current for 2 sec. (Factory default) Normal Duty Mode (ND.): 120% rated current for 60sec
	Frequency Setting Signal	0 to +10V, -10V to +10V, 4 to 20mA or pulse train input
	Acceleration / Deceleration Time	0.0 ~ 6000.0 sec (separate acceleration and deceleration time set)
	Voltage / Frequency Characteristics	15 fixed + one customized V/f pattern
	Braking Unit	Built-in braking transistor on 0.75-30kW HD sizes
	Display	LED keypad with 5-digits 7-segment display (LCD keypad option)
	Main Control Functions	Auto-tuning, Zero Servo, Torque Control, Position Control, Droop, Soft-PWM, Over-Voltage Protection, Dynamic Braking, Speed Search, Frequency Traversing, Momentary Power Loss Restart, PID Control, Automatic Torque Compensation, Slip Compensation, RS-485 Communication, Close Loop Control with encoder, Simple PLC Function, 2 Analog Output, Torque-Off function, Application Presets
	Other Functions	Records of Power ON and Operation Time, 30 Fault History Records and Latest Fault State Record, Energy-Saving Function, Phase Loss Protection, DC Braking, Mechanical Brake Control, Dwell, S Curve Acceleration and Deceleration, Pulse input / output, Display of Engineering Unit, NPN / PNP Selection
Protection Functions	Stall Prevention	During Acceleration, Deceleration and continuous run
	Over Current (OC) and Output Short-Circuit (SC) Protection	When the current exceeds 200% of the inverter rated current
	Inverter Overload Protection (OL2)	Inverter stops when the output is higher than below conditions. Heavy Duty Mode (HD.): 150% rated current for 60sec, 200% rated current for 2 sec. (Factory default), Carrier frequency is from 2kHz to 8kHz Normal Duty Mode (ND.): 120% rated current for 60sec, Carrier frequency is 2kHz
	Motor Overload Protection (OL1)	Electrical overload protection curve
	Over Voltage Protection (OV)	OV threshold = 820Vdc
	Under Voltage (UV)	UV threshold = 380Vdc
	Momentary Power Loss Restart	When Power loss exceeds 15ms. This function can be set up to 2 sec
	Overheat Protection (OH)	Thermistor sensor on heatsink
	Ground Fault Protection (GF)	Protection by current detection circuit
	Charge Indicator	When main circuit DC voltage $\geq 50V$, the CHARGE LED is on
	Output Phase Loss Protection (OPL)	If the OPL function acts, the motor stops rotation automatically
Environment Specification	Protection degree	IP20 / NEMA 1, with standard removable anti dust cover
	Operating Temperature	-10~+50°C (Sizes 1 to 5 without anti dust cover; sizes 6 -7) -10~+40°C (Sizes 1 to 5 with anti dust cover; sizes 6 -7 with NEMA 1 kit) Up to +60°C with derating.
	Storage Temperature	-20 ~ +70°C
	Humidity	95% RH or less (no condensation)
	Altitude	Altitude of 1000 meters or lower
	Vibration	1.0G, in compliance with IEC 60068-2-6
	Pollution Degree	Meet IEC 60721-3-3 Class 3C2
Certification	Communication Function	Built-in: RS-485 with Modbus RTU / ASCII (standard RJ45 connection) Optional: Profibus/CANopen/DeviceNet/TCP-IP
	DC choke	no
	EMI filter	Add-on module on -F version In compliance with EN61800-3 standard
	 RoHS	In compliance with EN61800-3 (EMC) and EN61800-5-1(LVD) Conformity to RoHS directive
	 US	UL508C
	Encoder expansion card (optional)	Asynchronous Motor: Digital incremental Line driver and Open collector PM motor: Digital incremental Line driver, Resolver, SinCos

3.8. Capacitor reforming Guide after long storage

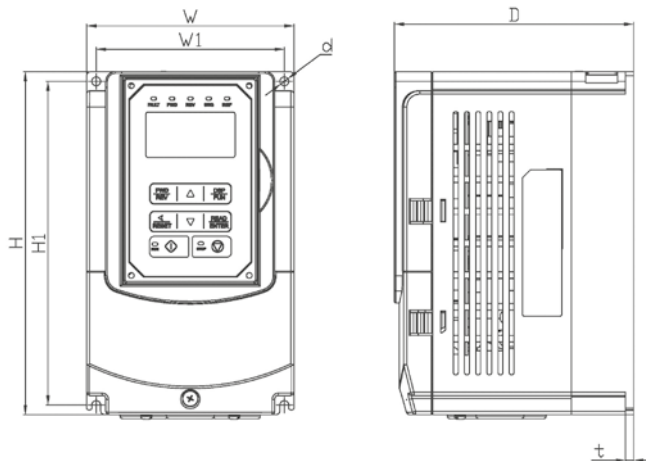
For correct performance of this product after long storage before use it is important that Inverter Capacitors are reformed according to the guide below:

Storage time	Procedure to re-apply voltage
≤ 1 year	Apply rated voltage (1) of inverter in the normal way
Between 1-2 years	Apply rated voltage of inverter to the product for one hour
≥ 2 years	Use a variable AC power supply to 1. Connecting 25% of inverter rated voltage for 30 minutes. 2. Connecting 50% of inverter rated voltage for 30 minutes. 3. Connecting 75% of inverter rated voltage for 30 minutes. 4. Connecting 100% of inverter rated voltage for 210 minutes. Once the procedures completed, inverter just can be used normally.

(1): Please refer the rated voltage according to model label of inverter.

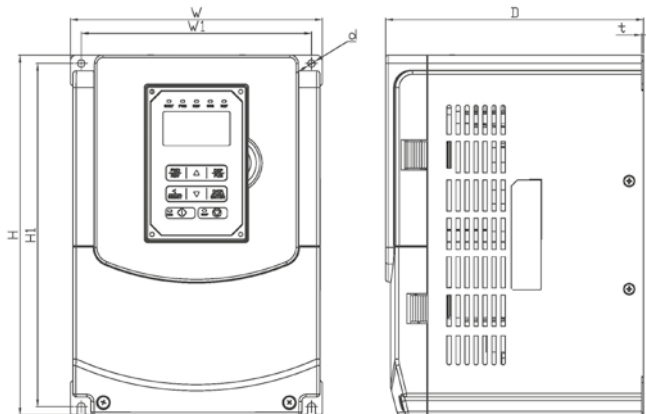
3.9. Inverter Dimensions

Sizes 1 and 2 (IP20/NEMA1)



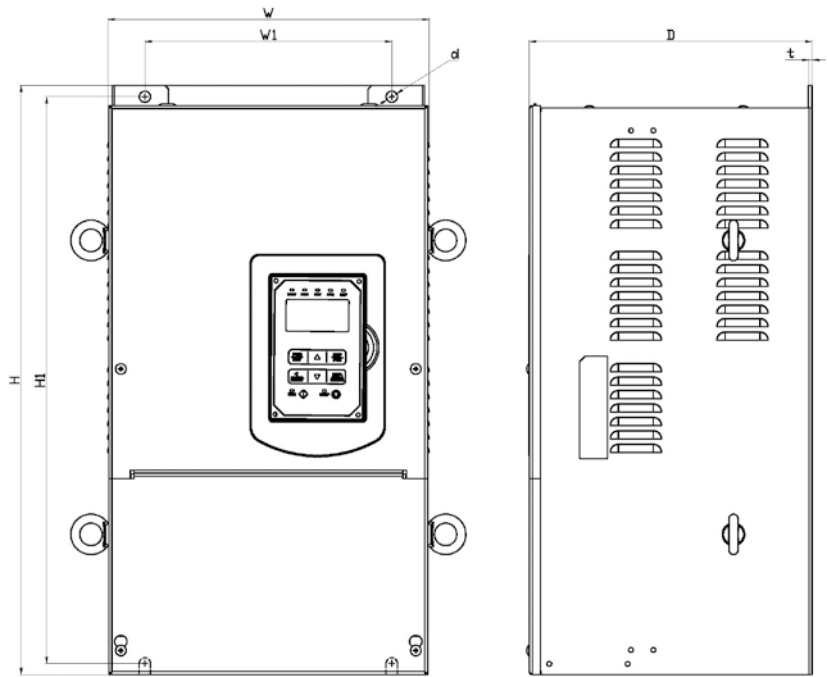
Inverter Model	Dimensions in mm (inch)							Net Weight kg (lbs)
	W	H	D	W1	H1	t	d	
VDI100-1007-KBX-4	130 (5.12)	215 (8.46)	150 (5.91)	118 (4.65)	203 (7.99)	5 (0.20)	M5	2.2 (4.9)
VDI100-1015-KBX-4	130 (5.12)	215 (8.46)	150 (5.91)	118 (4.65)	203 (7.99)	5 (0.20)	M5	2.2 (4.9)
VDI100-1022-KBX-4	130 (5.12)	215 (8.46)	150 (5.91)	118 (4.65)	203 (7.99)	5 (0.20)	M5	2.2 (4.9)
VDI100-2037-KBX-4	140 (5.51)	279 (10.98)	177 (6.97)	122 (4.80)	267 (10.51)	7 (0.28)	M6	3.8 (8.4)
VDI100-2055-KBX-4	140 (5.51)	279 (10.98)	177 (6.97)	122 (4.80)	267 (10.51)	7 (0.28)	M6	3.8 (8.4)

Sizes 3 and 4 (IP20/NEMA1)



Inverter Model	Dimensions in mm (inch)							Net Weight kg (lbs)
	W	H	D	W1	H1	t	d	
VDI100-3075-KBX-4	210 (8.27)	300 (11.81)	215 (8.46)	192 (7.56)	286 (11.26)	1.6 (0.06)	M6	6.2 (13.67)
VDI100-3110-KBX-4	210 (8.27)	300 (11.81)	215 (8.46)	192 (7.56)	286 (11.26)	1.6 (0.06)	M6	6.2 (13.67)
VDI100-3150-KBX-4	210 (8.27)	300 (11.81)	215 (8.46)	192 (7.56)	286 (11.26)	1.6 (0.06)	M6	6.2 (13.67)
VDI100-4185-KBX-4	265 (10.43)	360 (14.17)	225 (8.86)	245 (9.65)	340 (13.39)	1.6 (0.06)	M8	10 (22.05)
VDI100-4220-KBX-4	265 (10.43)	360 (14.17)	225 (8.86)	245 (9.65)	340 (13.39)	1.6 (0.06)	M8	10 (22.05)

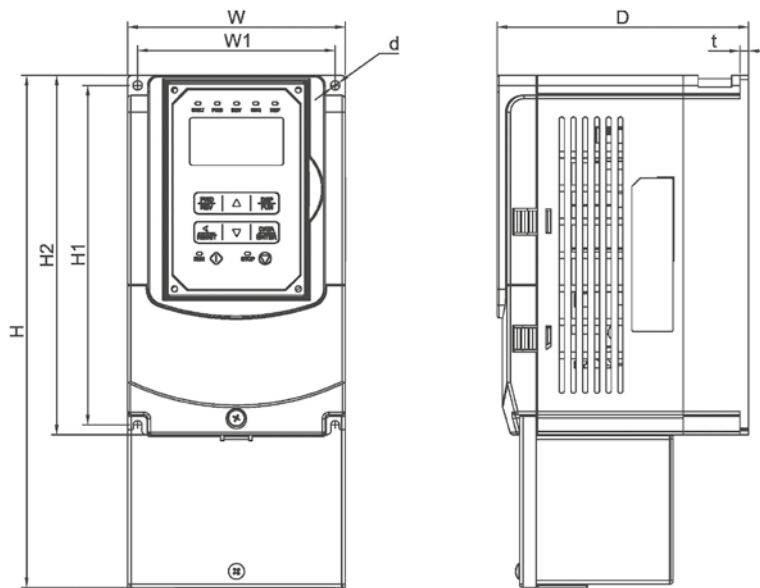
Size 5 (IP20/NEMA1)



Inverter Model	Dimensions in mm (inch)							Net Weight kg (lbs)
	W	H	D	W1	H1	t	d	
VDI100-5300-KBX-4	286.5 (11.29)	525 (20.67)	252 (9.92)	220 (8.66)	505 (19.88)	3.3 (0.13)	M8	24 (52.9)
VDI100-5370-KXX-4	286.5 (11.29)	525 (20.67)	252 (9.92)	220 (8.66)	505 (19.88)	3.3 (0.13)	M8	24 (52.9)
VDI100-5450-KXX-4	286.5 (11.29)	525 (20.67)	252 (9.92)	220 (8.66)	505 (19.88)	3.3 (0.13)	M8	24 (52.9)

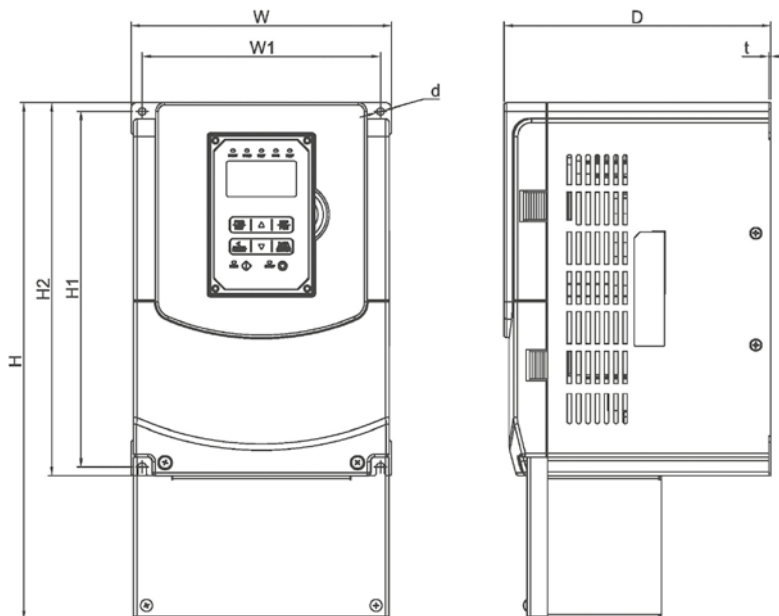
3.10. Dimensions for Models with Add-on filter

Sizes 1 and 2



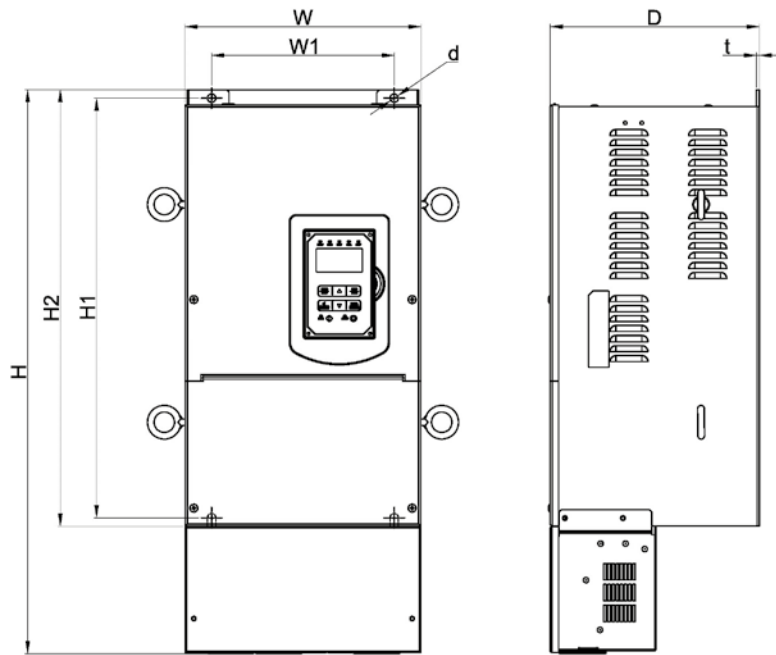
Inverter Model	Dimensions in mm (inch)								Net Weight kg (lbs)
	W	H	D	W1	H1	H2	t	d	
VDI100-1007-KBX-4-F	130 (5.12)	306 (12.05)	150 (5.91)	118 (4.65)	203 (7.99)	215 (8.46)	5	M5	3.5 (7.71)
VDI100-1015-KBX-4-F	130 (5.12)	306 (12.05)	150 (5.91)	118 (4.65)	203 (7.99)	215 (8.46)	5	M5	3.5 (7.71)
VDI100-1022-KBX-4-F	130 (5.12)	306 (12.05)	150 (5.91)	118 (4.65)	203 (7.99)	215 (8.46)	5	M5	3.5 (7.71)
VDI100-2037-KBX-4-F	140 (5.51)	400 (15.75)	177 (6.97)	122 (4.80)	267 (10.51)	279 (10.98)	7	M6	5.5 (12.13)
VDI100-2055-KBX-4-F	140 (5.51)	400 (15.75)	177 (6.97)	122 (4.80)	267 (10.51)	279 (10.98)	7	M6	5.5 (12.13)

Sizes 3 and 4



Inverter Model	Dimensions in mm (inch)								Net Weight kg (lbs)
	W	H	D	W1	H1	H2	t	d	
VDI100-3075-KBX-4-F	210 (8.27)	416.5 (16.40)	215 (8.46)	192 (7.56)	286 (11.26)	300 (11.81)	1.6 (0.06)	M6	8.0 (17.63)
VDI100-3110-KBX-4-F	210 (8.27)	416.5 (16.40)	215 (8.46)	192 (7.56)	286 (11.26)	300 (11.81)	1.6 (0.06)	M6	8.0 (17.63)
VDI100-4150-KBX-4-F	265 (10.43)	500 (19.69)	225 (8.86)	245 (9.65)	340 (13.39)	360 (14.17)	1.6 (0.06)	M8	12.5 (27.56)
VDI100-4185-KBX-4-F	265 (10.43)	500 (19.69)	225 (8.86)	245 (9.65)	340 (13.39)	360 (14.17)	1.6 (0.06)	M8	12.5 (27.56)
VDI100-4220-KBX-4-F	265 (10.43)	500 (19.69)	225 (8.86)	245 (9.65)	340 (13.39)	360 (14.17)	1.6 (0.06)	M8	12.5 (27.56)

Size 5

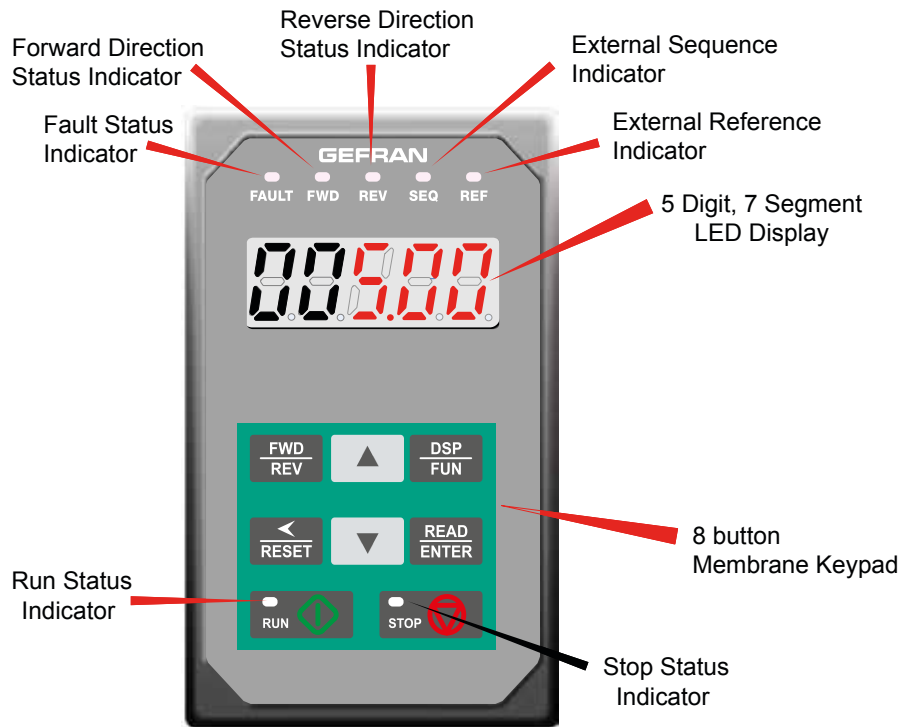


Inverter Model	Dimensions in mm (inch)								Net Weight kg (lbs)
	W	H	D	W1	H1	H2	t	d	
VDI100-5300-KBX-4-F	286.5 (11.28)	679 (26.73)	252 (9.92)	220 (8.66)	505 (19.88)	525 (20.67)	3.3 (0.13)	M8	29.5 (65.04)
VDI100-5370-KXX-4-F	286.5 (11.28)	679 (26.73)	252 (9.92)	220 (8.66)	505 (19.88)	525 (20.67)	3.3 (0.13)	M8	29.5 (65.04)
VDI100-5450-KXX-4-F	286.5 (11.28)	679 (26.73)	252 (9.92)	220 (8.66)	505 (19.88)	525 (20.67)	3.3 (0.13)	M8	29.5 (65.04)

4. Keypad and Programming Functions

4.1. LED Keypad (KB-LED-VDI100)

4.1.1. Keypad Display and Keys



DISPLAY	
5 Digit LED Display	Monitor inverter signals, view / edit parameters, fault / alarm display.
LED INDICATORS	
FAULT	LED ON when a fault or alarm is active.
FWD	LED ON when inverter is running in forward direction, flashing when stopping.
REV	On when inverter is running in reverse direction, flashing when stopping.
SEQ	LED ON when RUN command is from the external control terminals or from serial communication
REF	LED ON when Frequency Reference command is from the external control terminals or from serial communication
KEYS (8)	
RUN	RUN Inverter in Local Mode
STOP	STOP Inverter
▲	Parameter navigation Up, Increase parameter or reference value
▼	Parameter navigation down, decrease parameter or reference value
FWD/REV	Used to switch between Forward and Reverse direction
DSP/FUN	Used to scroll to next screen Frequency screen -> Function selection -> Monitor parameter
◀ / RESET	Selects active seven segment digit for editing with the ▲▼ keys Used to reset fault condition.
READ / ENTER	Used to read and save the value of the active parameter

Auto-Repeat Keys

Holding the ▲UP or ▼DOWN key for a longer period of time will initiate the auto-repeat function resulting in the value of the selected digit to automatically increase or decrease.

4.2. Parameters

Parameter group	Group Name
Group 00	Basic Parameters
Group 01	V/F Control Parameters
Group 02	IM Motor Parameters
Group 03	External Digital Input and Output Parameters
Group 04	External Analog Input and Output Parameters
Group 05	Multi-Speed Parameters
Group 06	Automatic Program Operation Parameters
Group 07	Start /Stop Parameters
Group 08	Protection Parameters
Group 09	Communication Parameters
Group 10	PID Parameters
Group 11	Auxiliary Parameters
Group 12	Monitoring Parameters
Group 13	Maintenance Parameters
Group 14	PLC Parameters
Group 15	PLC Monitoring Parameters
Group 16	LCD Parameters
Group 17	Automatic Tuning Parameters
Group 18	Slip Compensation Parameters
Group 19	Wobble Frequency Parameters
Group 20	Speed Control Parameters
Group 21	Torque And Position Control Parameters
Group 22	PM Motor Parameters

Parameter Attribute	
*1	Parameters can be changed during run operation.
*2	Reserved
*3	Parameter will not reset to default during a factory reset (initialization).
*4	Read-only parameter
*5	Parameter will be displayed in being coupled with the option card.
*6	Parameter will be displayed only in LED keypad.
*7	Parameter will be displayed only in LCD keypad.
*8	When 13-08 setting is changed, the value will be also changed.
Default	
S	Size (set value depending on the size of the device)

Control mode parameter setting:

- 0 = settable
- X = not settable
- = not applicable

Group 00: Basic Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
00-00	Control Mode Selection	0: V/f 1: V/f + PG 2: SLV 3: SV 4: PMSV 5: PMSLV 6: SLV2	0	-	0	0	0	0	0	0	0	*3
00-01	Motor's Rotation Direction	0: Forward 1: Reverse	0	-	0	0	0	0	0	0	0	*1
00-02	Main Run Command Source Selection	0: Keypad 1: External Terminal (Control Circuit) 2: Communication Control (RS-485) 3: PLC	1	-	0	0	0	0	0	0	0	
00-03	Alternative Run Command Selection	0: Keypad 1: External Terminal (Control Circuit) 2: Communication Control (RS-485) 3: PLC	2	-	0	0	0	0	0	0	0	
00-04	Language	0: English 1: Simplified Chinese 2: Traditional Chinese 3: Turkish	0	-	0	0	0	0	0	0	0	* 7
00-05	Main Frequency Command Source Selection	0: Keypad 1: External Terminal (Analog 1) 2: Terminal Command UP/DOWN 3: Communication Control (RS-485) 4: Pulse Input 5: Reserved 6: Reserved 7: AI2 Auxiliary Frequency	1	-	0	0	0	0	0	0	0	
00-06	Alternative Frequency Source Selection	0: Keypad 1: External Terminal (Analog 1) 2: Terminal Command UP/DOWN 3: Communication Control (RS-485) 4: Pulse Input 5: Reserved 6: Reserved 7: AI2 Auxiliary Frequency	3	-	0	0	0	0	0	0	0	
00-07	Main and Alternative Frequency Command Modes	0: Main Frequency 1: Main frequency + Alternative Frequency	0	-	0	0	0	0	0	0	0	
00-08	Communication Frequency Command Range	0.00~599.00	0.00	Hz	0	0	0	0	0	0	0	
00-09	Communication Frequency Command Memory Selection	0: Don't save when power supply is off. (00-08) 1: Save when power is off. (00-08)	0	-	0	0	0	0	0	-		
00-10	Minimum frequency detection	0: Show warning if lower than minimum frequency	0	-	0	0	0	0	0	0	0	
		1: Run as minimum frequency if lower than minimum frequency										
00-11	PID Lower Limit of Frequency Selection	0: PID Sleep Limit is Lower Limit of Frequency 1: PID Sleep Limit is 0Hz	0	-	0	0	0	0	0	0	0	
00-12	Upper Frequency limit	0.1~109.0	100.0	%	0	0	0	0	0	0	0	
00-13	Lower Frequency limit	0.0~109.0	0.0	%	0	0	0	0	0	0	0	
00-14	Acceleration Time 1	0.1~6000.0	*	s	0	0	0	0	0	0	0	*1
00-15	Deceleration Time 1	0.1~6000.0	*	s	0	0	0	0	0	0	0	*1
00-16	Acceleration Time 2	0.1~6000.0	*	s	0	0	0	0	0	0	0	*1
00-17	Deceleration Time 2	0.1~6000.0	*	s	0	0	0	0	0	0	0	*1
00-18	*Jog Frequency	0.00~599.00	6.00	Hz	0	0	0	0	0	0	0	*1
00-19	Jog Acceleration Time	0.1~0600.0	-	s	0	0	0	0	0	0	0	*1
00-20	Jog Deceleration Time	0.1~0600.0	-	s	0	0	0	0	0	0	0	*1

Group 00: Basic Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f +PG	SLV	SV	PM SV	PM SLV	SLV2	
00-21	Acceleration time 3	0.1~6000.0	*	s	0	0	0	0	0	0	0	*1
00-22	Deceleration time 3	0.1~6000.0	*	s	0	0	0	0	0	0	0	*1
00-23	Acceleration time 4	0.1~6000.0	*	s	0	0	0	0	0	0	0	*1
00-24	Deceleration time 4	0.1~6000.0	*	s	0	0	0	0	0	0	0	*1
00-25	Switch-Over Frequency of Acc/Dec Time 1 and Time 4	0.00~599.00	0.0	Hz	0	0	0	0	0	0	0	
00-26	Emergency Stop Time	0.1~6000.0	5.0	s	0	0	0	0	0	0	0	
00-27	HD/ND Mode Selection ***	0: HD (Heavy Duty Mode)	0	-	0	0	0	0	0	0	0	*3
		1: ND (Normal Duty Mode)			0	0	X	X	X	X	X	
00-28	Command Characteris- tic selection of master frequency	0: Positive Characteristic (0~10V/4~- 20mA is corresponding to 0~100%) 1: Negative Characteristic (0~10V/4~- 20mA is corresponding to 100~0%)	0	-	0	0	0	0	0	0	0	
00-29	Zero-Speed Operation Selection	0: Operation Based on Frequency Com- mand 1: Stop 2: Operation Based on the Lowest Frequency 3: Zero-Speed Operation	0	-	X	X	X	0	0	X	X	
00-30	Reserved											
00-31	Reserved											
00-32	Application Selection Presets**	0: General 1: Reserved 2: Conveyor 3: Exhaust Fan 4: Reserved 5: Compressor 6: Hoist** 7: Crane**	0	-	0	0	0	0	0	0	0	
00-33	Modified Parameters (only for LCD keypad)	0:Disable 1:Enable	0	-	0	0	0	0	0	0	0	*7
00-34 ~ 00-40	Reserved											
00-41	User parameter 0	Set 13-06 = 1, start user parameter. The setting range is 01-00 ~24-06 (only for LCD keypad)	00-41	-	0	0	0	0	0	0	0	*7
00-42	User parameter 1		00-42	-	0	0	0	0	0	0	0	*7
00-43	User parameter 2		00-43	-	0	0	0	0	0	0	0	*7
00-44	User parameter 3		00-44	-	0	0	0	0	0	0	0	*7
00-45	User parameter 4		00-45	-	0	0	0	0	0	0	0	*7
00-46	User parameter 5		00-46	-	0	0	0	0	0	0	0	*7
00-47	User parameter 6		00-47	-	0	0	0	0	0	0	0	*7
00-48	User parameter 7		00-48	-	0	0	0	0	0	0	0	*7
00-49	User parameter 8	Set 13-06 = 1, start user parameter. The setting range is 01-00 ~24-06. (only for LCD keypad)	00-49	-	0	0	0	0	0	0	0	*7
00-50	User parameter 9		00-50	-	0	0	0	0	0	0	0	*7
00-51	User parameter 10		00-51	-	0	0	0	0	0	0	0	*7
00-52	User parameter 11		00-52	-	0	0	0	0	0	0	0	*7
00-53	User parameter 12		00-53	-	0	0	0	0	0	0	0	*7
00-54	User parameter 13		00-54	-	0	0	0	0	0	0	0	*7
00-55	User parameter 14		00-55	-	0	0	0	0	0	0	0	*7
00-56	User parameter 15		00-56	-	0	0	0	0	0	0	0	*7
00-57	SV High Speed Mode	0: SV High Speed Mode1 1: SV High Speed Mode2	0	-	X	X	X	0	X	X	X	

*: Refer to the following attachment 1.

**: Before to set up 00-32 Application, it should do initialized setting (parameter 13-08) first. When setting 00-32, the I/O port function changed automatically. To avoid accident, be sure to confirm the I/O port signal of inverter and external terminal control.

*** If parameter 00-27 is set to ND mode, group 02 motor 1 parameter will automatically adjust to more than 1 class of it.

If parameter 00-27 is set to HD mode, group 02 motor 1 parameter will automatically adjust to the same class of it.

It is suggested that parameter 00-27 be set first before motor performs auto-tuning because the parameter will make the motor parameter automatically be changed.

***** If the maximum output frequency of motor is over 300HZ, the frequency resolution is changed to 0.1Hz

Group 01: V/f Control Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f +PG	SLV	SV	PM SV	PM SLV	SLV2	
01-00	V/f Curve Selection	0~FF	F	-	0	0	X	X	X	X	0	*3
01-01	Reserved											
01-02	Maximum Output Frequency of Motor 1	4.8~599.0	50.0/60.0	Hz	0	0	0	0	0	0	0	*8
01-03	Maximum Output Voltage of Motor 1	0.2~510.0	400.0	V	0	0	X	X	X	X	0	*8
01-04	Middle Output Frequency 2 of Motor 1	0.0~599.0	0.0	Hz	0	0	X	X	X	X	0	
01-05	Middle Output Voltage 2 of Motor 1	0.0~510.0	0.0	V	0	0	X	X	X	X	0	*8
01-06	Middle Output Frequency 1 of Motor 1	0.0~599.0	3.0	Hz	0	0	X	X	X	X	0	
01-07	Middle Output Voltage 1 of Motor 1	0.0~510.0	*	V	0	0	X	X	X	X	0	*8
01-08	Minimum Output Frequency of Motor 1	0.0~599.0	VF:1.5	Hz	0	0	0	0	0	0	0	
			VF+PG: 1.5									
			SLV: 0.6									
			SV:0.1									
			PM SV:0.1									
			PM SLV:9.0									
			SLV2: 1.0									
01-09	Minimum Output Voltage of Motor 1 (for 2.2~22kW)	0.0~510.0	7.5	V	0	0	X	X	X	X	0	
01-10	Torque Compensation Gain	0.0~2.0	0.5	-	0	0	X	X	X	X	0	*1
01-11	Selection of Torque Compensation Mode	0: Torque Compensation Mode 0 1: Torque Compensation Mode 1	0	-	0	0	X	X	X	X	X	
01-12	Base Frequency of Motor 1	4.8~599.0	50.0/60.0	Hz	0	0	0	0	0	0	0	
01-13	Base Output Voltage of Motor 1	0.0~510.0	400.0	V	0	0	X	X	X	X	0	
01-14	Input Voltage Setting	310.0~510.0	400.0	V	0	0	0	0	0	0	0	
01-15	Torque Compensation Time	0~10000	200	ms	0	0	X	X	X	X	0	
01-16	Maximum Output Frequency of Motor 2	4.8~599.0	50.0/60.0	Hz	0	X	X	X	X	X	X	
01-17	Maximum Output Voltage of Motor 2	0.2~510.0	400.0	V	0	X	X	X	X	X	X	
01-18	Middle Output Frequency 2 of Motor 2	0.0~599.0	0.0	Hz	0	X	X	X	X	X	X	
01-19	Middle Output Voltage 2 of Motor 2	0.0~510.0	0.0	V	0	X	X	X	X	X	X	
01-20	Middle Output Frequency 1 of Motor 2	0.0~599.0	3.0	Hz	0	X	X	X	X	X	X	
01-21	Middle Output Voltage 1 of Motor 2 (for 2.2~22kW)	0.0~510.0	S	V	0	X	X	X	X	X	X	
01-22	Minimum Output Frequency of Motor 2	0.0~599.0	1.5	Hz	0	X	X	X	X	X	X	
01-23	Minimum Output Voltage of Motor 2 (for 2.2~22kW)	0.0~510.0	S	V	0	X	X	X	X	X	X	
01-24	Base Frequency of Motor 2	4.8~599.0	50.0/60.0	Hz	0	X	X	X	X	X	X	
01-25	Base Output Voltage of Motor 2	0.0~510.0	400.0	V	0	X	X	X	X	X	X	
01-26	V/f Curve Selection of Motor 2	0~FF	F	-	0	X	X	X	X	X	X	*3

*: Refer to the attachment 1.

Group 02: IM Motor Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
02-00	Control mode selection	0.01~600.00	-	A	0	X	X	X	X	X	0	
02-01	Rated Current of Motor1	Modes of V/f, V/f+PG are 10%~200% of inverter's rated current. Modes of SLV, SV are 25%~200% of inverter's rated current.	-	A	0	0	0	0	X	X	0	
02-02	Reserved											
02-03	Rated Rotation Speed of Motor1	0~60000	-	rpm	0	0	0	0	X	X	0	
02-04	Rated Voltage of Motor1	100.0~480.0	400.0	V	0	0	0	0	X	X	0	*8
02-05	Rated Power of Motor1	0.01~600.00	-	kW	0	0	0	0	X	X	0	
02-06	Rated Frequency of Motor1	4.8~599.0	50.0/60.0	Hz	0	0	0	0	X	X	0	*8
02-07	Poles of Motor 1	2~16(Even)	4	-	0	0	0	0	X	X	0	
02-08	Reserved											
02-09	Excitation Current of Motor 1	15%~70% of Motor Rated Current	-	%	X	X	0	0	X	X	X	
02-10	Core Saturation Coefficient 1 of Motor 1	1~100	-	%	X	X	0	0	X	X	X	
02-11	Core Saturation Coefficient 2 Motor 1	1~100	-	%	X	X	0	0	X	X	X	
02-12	Core Saturation Coefficient 3 of Motor 1	80~300	-	%	X	X	0	0	X	X	X	
02-13	Core loss of Motor 1	0.0~15.0	-	%	0	0	X	X	X	X	0	
02-14	Reserved											
02-15	Resistance between Wires of Motor 1	0.001~60.000	-	Ω	0	0	0	0	X	X	0	
02-16 02-17 02-18	Reserved											
02-19	No-Load Voltage of Motor 1	100.0~480.0	-	V	X	X	0	0	X	X	X	
02-20	No-Load Current of Motor 2	0.01~600.00	-	A	0	X	X	X	X	X	X	
02-21	Rated Current of Motor 2	10%~200% of inverter's rated current	-	A	0	X	X	X	X	X	X	
02-22	Rated Rotation Speed of Motor 2	0~60000	-	rpm	0	X	X	X	X	X	X	
02-23	Rated Voltage of Motor 2	100.0~480.0	400.0	V	0	X	X	X	X	X	X	
02-24	Rated Power of Motor 2	0.01~600.00	-	kW	0	X	X	X	X	X	X	
02-25	Rated Frequency of Motor 2	4.8~599.0	50.0/60.0	Hz	0	X	X	X	X	X	X	
02-26	Poles of Motor 2	2~16 (Even)	4	-	0	X	X	X	X	X	X	
02-27 ~ 02-31	Reserved											
02-32	Resistance between Wires of Motor 2	0.001~60.000	-	Ω	0	X	X	X	X	X	X	
02-33	Proportion of Motor 1 Leakage Inductance	0.1~15.0	S	%	X	X	0	0	X	X	X	
02-34	Motor Slip 1 Frequency	0.10~20.00	1.78	Hz	X	X	0	0	X	X	X	
02-35 ~ 02-36	Reserved											
02-37	Motor Mechanical Loss	0.0~10.0	4.0	%	X	X	X	0	0	X	X	

Group 03: External Digital Input and Output Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f +PG	SLV	SV	PM SV	PM SLV	SLV2	
03-00	Multi-Function Terminal Function Setting-S1	0: 2-Wire Sequence (ON: Forward Run Command).	0	-	0	0	0	0	0	0	0	
		1: 2-Wire Sequence (ON: Reverse Run Command).			0	0	0	0	0	0	0	
		2: Multi-Speed/Position Setting Command 1			0	0	0	0	0	0	0	
		3: Multi-Speed/Position Setting Command 2			0	0	0	0	0	0	0	
		4: Multi-Speed/Position Setting Command 3			0	0	0	0	0	0	0	
		5: Multi-Speed/Position Setting Command 4			0	0	0	0	0	0	0	
		6: Forward Jog Run Command			0	0	0	0	0	0	0	
03-01	Multi-Function Terminal Function Setting-S2	7: Reverse Jog Run Command	1	-	0	0	0	0	0	0	0	
		8: UP Frequency Increasing Command			0	0	0	0	0	0	0	
		9: DOWN Frequency Decreasing Command			0	0	0	0	0	0	0	
		10: Acceleration/Deceleration Time Selection 1			0	0	0	0	0	0	0	
		11: Inhibit Acceleration/ Deceleration Command			0	0	0	0	0	0	0	
		12: Main/ Alternative Run Switch Function			0	0	0	0	0	0	0	
		13: Main/ Alternative Frequency Switch Function			0	0	0	0	0	0	0	
03-02	Multi-Function Terminal Function Setting-S3	14: Emergency Stop (decelerate to zero and stop)	2	-	0	0	0	0	0	0	0	
		15: External Baseblock Command (rotation freely to stop)			0	0	0	0	0	0	0	
		16: PID Control Disable			0	0	0	0	0	0	0	
		17: Fault Reset (RESET)			0	0	0	0	0	0	0	
		18: Reserved			-	-	-	-	-	-	-	
		19: Speed Search 1 (from the maximum frequency)			0	0	0	0	0	X	0	
		20: Manual Energy Saving Function			0	0	X	X	X	X	X	
03-03	Multi-Function Terminal Function Setting-S4	21: PID Integral Reset	3	-	0	0	0	0	0	0	0	
		22~23 : Reserved			-	-	-	-	-	-	-	
		24: PLC Input			0	0	0	0	0	0	0	
		25: External Fault			0	0	0	0	0	0	0	
		26: 3-Wire Sequence (Forward/Reverse command).			0	0	0	0	0	0	0	
		27: Local/ Remote Selection			0	0	0	0	0	0	0	
					0	0	0	0	0	0	0	
03-04	Multi-Function Terminal Function Setting-S5	28: Remote Mode Selection	4	-	0	0	0	0	0	0	0	
		29: Jog Frequency Selection			0	0	0	0	0	0	0	
		30: Acceleration/ Deceleration Time Selection 2			0	0	0	0	0	0	0	
		31: Inverter Overheating Warning			0	0	0	0	0	0	0	
		32: Sync Command			0	0	0	0	0	0	0	
		33: DC Braking			0	0	0	0	X	X	0	
		34: Speed Search 2 (from the frequency command)			0	0	0	0	0	X	0	
		35: Timing Function Input			0	0	0	0	0	0	0	
		36: PID Soft Start Disable			0	0	0	0	0	0	0	
					0	0	0	0	0	0	0	
03-05	Multi-Function Terminal Function Setting-S6	37: Traversing Operation	17	-	0	0	X	X	X	X	0	
		38: Upper Deviation of Traverse Operation			0	0	X	X	X	X	0	
		39: Lower Deviation of Traverse Operation			0	0	X	X	X	X	0	
		40: Switching between Motor 1/Motor 2			0	0	X	X	X	X	0	
		41: PID Sleep			0	0	0	0	0	0	0	
		42: PG Disable			X	0	X	X	X	X	X	
		43: PG Integral Reset			X	0	X	0	0	X	X	
03-06	Multi-Function Terminal Function Setting-S7	44: Mode Switching between Speed and Torque	29* (26)*	-	X	X	X	0	0	X	X	
		45: Negative Torque Command			X	X	X	0	0	X	X	
		46: Zero-Servo Command			X	X	X	0	0	X	X	
		47: Fire mode(Forced Operation mode)			0	0	0	0	0	0	0	
		48: KEB Acceleration			0	0	X	X	X	X	0	
		49: Parameters Writing Allowable			0	0	0	0	0	0	0	
		50: Unattended Start Protection (USP)			0	0	0	0	0	0	0	

Group 03: External Digital Input and Output Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute		
					V/f	V/f +PG	SLV	SV	PM SV	PM SLV	SLV2			
03-07	Multi-Function Terminal Function Setting-S8	51: Mode Switching between Speed and Position	15	-	X	X	X	0	0	X	X			
		52: Multi Position Reference Enable			X	X	X	0	0	X	X			
		53: 2-Wire Self Holding Mode (Stop Com- mand)			0	0	0	0	0	0	0			
		54: Reserved			-	-	-	-	-	-	-			
		55: Reserved			-	-	-	-	-	-	-			
		56: Reserved			-	-	-	-	-	-	-			
		57: Reserved			-	-	-	-	-	-	-			
		58: Digital Input Stop Command			0	0	0	0	0	0	0			
		59: Reserved			-	-	-	-	-	-	-			
		60: Reserved			-	-	-	-	-	-	-			
		61: Reserved			-	-	-	-	-	-	-			
		62: EPS Function			0	0	0	0	0	0	0			
		63: Reserved			-	-	-	-	-	-	-			
		64: Reserved			-	-	-	-	-	-	-			
		65: Short-circuit braking			X	X	X	X	X	0	X			
		03-08			(S1~S8) DI Scan Time	0: Scan Time 4ms 1: Scan Time 8ms	1	-	0	0	0	0	0	0
03-09	Multi-Function Terminal S1-S4 Type Selection	xxx0b: S1 A Contact xxx1b: S1 B Contact xx0xb: S2 A Contact xx1xb: S2 B Contact x0xxb: S3 A Contact x1xxb: S3 B Contact 0xxxb: S4 A Contact 1xxxb: S4 B Contact	0000b	-	0	0	0	0	0	0	0			
03-10	Multi-Function Terminal S5-S8 Type Selection	xxx0b: S5 A Contact xxx1b: S5 B Contact xx0xb: S6 A Contact xx1xb: S6 B Contact x0xxb: S7 A Contact x1xxb: S7 B Contact 0xxxb: S8 A Contact 1xxxb: S8 B Contact	0000b	-	0	0	0	0	0	0	0			
03-11	Relay (R1A-R1C) Output	0: During Running	0	-	0	0	0	0	0	0	0	0		
		1: Fault Contact Output			0	0	0	0	0	0	0	0		
		2: Frequency Agree			0	0	0	0	0	0	0	0		
		3: Setting Frequency Agree			0	0	0	0	0	0	0	0		
		4: Frequency Detection 1 (≥ 03-13+03-14)			0	0	0	0	0	0	0	0		
		5: Frequency Detection 2 (≤ 03-13+03-14)			0	0	0	0	0	0	0	0		
		6: Automatic Restart			0	0	0	0	0	0	0	0		
		7: Reserved			-	-	-	-	-	-	-	-		
		8: Reserved			-	-	-	-	-	-	-	-		
		9: Baseblock			0	0	0	0	0	0	0	0		
		10: Reserved			-	-	-	-	-	-	-	-		
		11: Reserved			-	-	-	-	-	-	-	-		
		12: Over-Torque Detection			0	0	0	0	0	0	0	0		
		13: Current Agree			0	0	0	0	0	0	0	0		
		14: Mechanical Braking Control (03-17~18)			0	0	0	0	0	0	0	0		
		15: Reserved			-	-	-	-	-	-	-	-		
		16: Reserved			-	-	-	-	-	-	-	-		
		17: Reserved			-	-	-	-	-	-	-	-		
		18: PLC status			0	0	0	0	0	0	0	0	0	
		19: PLC Control Contact			0	0	0	0	0	0	0	0	0	
03-12	Relay (R2A-R2C) Output	20: Zero Speed	1	-	0	0	0	0	0	0	0	0		
		21: Inverter Ready			0	0	0	0	0	0	0	0		
		22: Under Voltage Detection			0	0	0	0	0	0	0	0		
		23: Source of Operation Command			0	0	0	0	0	0	0	0		
		24: Source of Frequency Command			0	0	0	0	0	0	0	0		
		25: Low Torque Detection			0	0	0	0	0	0	0	0		
		26: Frequency Reference Missing			0	0	0	0	0	0	0	0		
		27: Timing Function Output			0	0	0	0	0	0	0	0		
		28: Traverse Operation UP Status			0	0	X	X	X	X	X	0		

Group 03: External Digital Input and Output Parameters											
Code	Parameter Name	Setting Range	Default	Unit	Control mode						Attribute
					V/f	V/f +PG	SLV	SV	PM SV	PM SLV	
		29 : During Traverse Operation Status			0	0	X	X	X	X	0
		30 : Motor 2 Selection			0	0	0	0	0	0	0
		31: Zero Speed Servo Status (Position Mode)			X	X	X	0	0	X	X
		32: Communication Control Contacts			0	0	0	0	0	0	0
		33: Reserved			-	-	-	-	-	-	-
		34: Reserved			-	-	-	-	-	-	-
		35: Reserved			-	-	-	-	-	-	-
		36: Reserved			-	-	-	-	-	-	-
		37: PID Feedback Loss Detection Output			0	0	0	0	0	0	0
		38: Brake Release			X	X	0	0	0	X	X
		39: Frequency Detection 1 (dedicated for Crane)			0	0	0	X	X	X	X
		40: Frequency Output			0	0	0	0	0	X	X
		41: Position Agree (Position Mode)			0	0	0	0	0	X	X
		42: Reserved			-	-	-	-	-	-	-
		43: Reserved			-	-	-	-	-	-	-
		44: Reserved			-	-	-	-	-	-	-
		45: PID sleep			0	0	0	0	0	0	0
		46: Reserved			-	-	-	-	-	-	-
		47: Reserved			-	-	-	-	-	-	-
		48: Reserved			-	-	-	-	-	-	-
		49: Reserved			-	-	-	-	-	-	-
		50: Frequency Detection 3 ($\geq$ 03-44+03-45)			0	0	0	0	0	0	0
		51: Frequency Detection 4 ($\leq$ 03-44+03-45)			0	0	0	0	0	0	0
		52: Frequency Detection 5 ($\geq$ 03-46+03-47)			0	0	0	0	0	0	0
		53: Frequency Detection 6 ($\leq$ 03-46+03-47)			0	0	0	0	0	0	0
		54: Turn on short-circuit braking			X	X	X	X	X	0	X
		57: Low Current Detection			0	0	0	0	0	0	0
03-13	Frequency Detection Level	0.0~599.0	0.0	Hz	0	0	0	0	0	0	Note 1
03-14	Frequency Detection Width	0.1~25.5	2.0	Hz	0	0	0	0	0	0	0
03-15	Current Agree Level	0.1~999.9	0.1	A	0	0	0	0	0	0	0
03-16	Delay Time of Current Agree Detection	0.1~10.0	0.1	s	0	0	0	0	0	0	0
03-17	**Mechanical Braking Release Level	0.00~599.00	0.00	Hz	0	0	0	0	0	0	0
03-18	**Mechanical Braking Level Set	0.00~599.00	0.00	Hz	0	0	0	0	0	0	0
03-19	Relay (R1A-R2A) Type	xxx0b: R1 A Contact xxx1b: R1 B Contact xx0xb: R2 A Contact (D02 for F1) xx1xb: R2 C Contact	0000b	-	0	0	0	0	0	0	0
03-20	Reserved										
03-21	Reserved										
03-22	Reserved										
03-23	Reserved										
03-24	Reserved										
03-25	Reserved										
03-26	Reserved										
03-27	UP/DOWN Frequency Hold/Adjust Selection	0: Hold last set frequency when stopped 1: Set frequency to 0 when stopped 2: Allow speed changes from last set frequency when stopped 3: Refresh frequency at acceleration.	0	-	0	0	0	0	0	0	0
03-28	Photo-coupler Output	Range and definition are the same as those of 03-11, 03-12	0	-	0	0	0	0	0	0	0
03-29	Photo-coupler Output Selection	xxx0b: Photo-coupler A Contact xxx1b: Photo-coupler B Contact	0000b	-	0	0	0	0	0	0	0
03-30	Selection of Pulse Input	0: General Pulse Input 1: PWM	0	-	0	0	0	0	0	0	0
03-31	Scale of Pulse Input	Depending on the setting of 03-30 03-30 = 0: 50~32000Hz 03-30 = 1: 10~1000Hz	1000	Hz	0	0	0	0	0	0	*1

Group 03: External Digital Input and Output Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
03-32	Pulse Input Gain	0.0~1000.0	100	%	0	0	0	0	0	0	0	*1
03-33	Pulse Input Bias	-100.0~100.0	0.0	%	0	0	0	0	0	0	0	*1
03-34	Filter Time of Pulse Input	0.00~2.00	0.1	s	0	0	0	0	0	0	0	*1
03-35	Function Setting of Pulse Output	1: Frequency Command 2: Output Frequency 3: Output Frequency after Soft-Start 4: Motor Speed 5: PID Feedback 6: PID Input 7: PG Output (with PG card)	2	-	0	0	0	0	0	0	0	*1
03-36	Scale of Pulse Output	1~32000	1000	Hz	0	0	0	0	0	0	0	*1
03-37	Timer ON Delay (DIO)	0.0~6000.0	0.0	s	0	0	0	0	0	0	0	
03-38	Timer OFF Delay (DIO)	0.0~6000.0	0.0	s	0	0	0	0	0	0	0	
03-39	Reserved											
03-40	Up/Down Frequency Width Setting	0.00~5.00	0.00	Hz	0	0	0	0	0	0	0	
03-41	Torque Detection Level	0~150	10	%	X	X	0	0	0	X	X	
03-42	Brake Release Delay Time	0.00~65.00	0.00	s	X	X	0	0	0	X	X	
03-43	UP/DOWN Acceleration/ Deceleration Selection	0: Acceleration/ Deceleration Time 1 1: Acceleration/ Deceleration Time 2	0	-	0	0	0	0	0	0	0	
03-44	Frequency Detection Level 2	0.0~599.0	0.0	Hz	0	0	0	0	0	0	0	
03-45	Frequency Detection Width 2	0.1~25.5	2.0	Hz	0	0	0	0	0	0	0	
03-46	Frequency Detection Level 3	0.0~599.0	0.0	Hz	0	0	0	0	0	0	0	
03-47	Frequency Detection Width 3	0.1~25.5	2.0	Hz	0	0	0	0	0	0	0	
03-48	Low Current Detection Level	0.0~999.9	0.1	A	0	0	0	0	0	0	0	Note 1
03-49	Low Current Detection Delay Time	0.00~655.35	0.01	s	0	0	0	0	0	0	0	Note 1
03-50	Frequency Detection Level 4	0.0~599.0	0.0	Hz	0	0	0	0	0	0	0	Note 1
03-51	Frequency Detection Level 5	0.0~599.0	0.0	Hz	0	0	0	0	0	0	0	Note 1
03-52	Frequency Detection Level 6	0.0~599.0	0.0	Hz	0	0	0	0	0	0	0	Note 1

* 2-wire operation mode: 29; 3-wire operation mode: 26.

** If the maximum output frequency of motor is over 300Hz, the frequency resolution is changed to 0.1Hz

Note: For frame 1, the DO2 function is setting by 03-12.

Note 1: New added parameter in software V1.20

Group 04: External Analog Input and Output Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
04-00	AI Input Signal Type	0: AI1:0~10V AI2: 0~10V / 0~20mA 1: AI1:0~10V AI2: 4~20mA/ 2~10V 2: AI1: -10~10V AI2: 0~10V/ 0~20mA 3: AI1: -10~10V AI2: 4~20mA/ 2~10V	1	-	0	0	0	0	0	0	0	
04-01	AI1 Signal Scanning and Filtering Time	0.00~2.00	0.03	s	0	0	0	0	0	0	0	
04-02	AI1 Gain	0.0~1000.0	100.0	%	0	0	0	0	0	0	0	*1
04-03	AI1 Bias	-100.0~100.0	0	%	0	0	0	0	0	0	0	*1
04-04	Reserved											
04-05	AI2 Function Setting	0: Auxiliary Frequency	0	-	0	0	0	0	0	0	0	
		1: Frequency Reference Gain			0	0	0	0	0	0	0	
		2: Frequency Reference Bias			0	0	0	0	0	0	0	
		3: Output Voltage Bias			0	0	X	X	0	0	0	
		4: Coefficient of Acceleration and Deceleration Reduction			0	0	0	0	0	0	0	
		5: DC Braking Current			0	0	0	0	X	X	0	

Group 04: External Analog Input and Output Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f +PG	SLV	SV	PM SV	PM SLV	SLV2	
		6: Over-Torque Detection Level			0	0	0	0	0	0	0	
		7: Stall Prevention Level During Running			0	0	X	X	X	X	0	
		8: Frequency Lower Limit			0	0	0	0	0	0	0	
		9: Jump Frequency 4			0	0	0	0	0	0	0	
		10: Added to AI1			0	0	0	0	0	0	0	
		11: Positive torque limit			X	X	0	0	0	0	X	
		12: Negative torque limit			X	X	0	0	0	0	X	
		13: Regenerative Torque Limit			X	X	0	0	0	0	X	
		14: Positive / Negative Torque Limit			X	X	0	0	0	0	X	
		15: Torque Reference/ Torque Limit (in Speed Control)			X	X	X	0	0	X	X	
		16: Torque Compensation			X	X	0	0	0	X	X	
		17: PTC Overheat Protection			0	0	0	0	0	0	0	
04-06	AI2 Signal Scanning and Filtering Time	0.00~2.00	0.03	s	0	0	0	0	0	0	0	
04-07	AI2 Gain	0.0~1000.0	100.0	%	0	0	0	0	0	0	0	*1
04-08	AI2 Bias	-100.0~100.0	0	%	0	0	0	0	0	0	0	*1
04-09 ~ 04-10	Reserved											
04-11	AO1 Function Setting	0: Output Frequency	0	-	0	0	0	0	0	0	0	
		1: Frequency Command			0	0	0	0	0	0	0	
		2: Output Voltage			0	0	0	0	0	0	0	
		3: DC Voltage			0	0	0	0	0	0	0	
		4: Output Current			0	0	0	0	0	0	0	
		5: Output Power			0	0	0	0	0	0	0	
		6: Motor Speed			0	0	0	0	0	0	0	
		7: Output Power Factor			0	0	0	0	0	0	0	
		8: AI1 Input			0	0	0	0	0	0	0	
		9: AI2 Input			0	0	0	0	0	0	0	
		10: Torque Command			X	X	0	0	0	0	X	
		11: q-axis Current			X	X	0	0	0	0	X	
		12: d-axis Current			X	X	0	0	0	0	X	
		13: Speed Deviation			X	X	X	0	0	X	X	
		14: Reserved			-	-	-	-	-	-	-	
		15: ASR Output			X	0	X	0	0	X	X	
		16: Reserved			-	-	-	-	-	-	-	
		17: q-axis Voltage			X	X	0	0	0	0	X	
		18: d-axis Voltage			X	X	0	0	0	0	X	
		19: Reserved			-	-	-	-	-	-	-	
		20: Reserved			-	-	-	-	-	-	-	
		21: PID Input			0	0	0	0	0	0	0	
		22: PID Output			0	0	0	0	0	0	0	
		23: PID Target Value			0	0	0	0	0	0	0	
		24: PID Feedback Value			0	0	0	0	0	0	0	
		25: Output Frequency of the Soft Starter			0	0	0	0	0	0	0	
		26: PG Feedback			X	0	X	0	0	X	X	
		27: Reserved			-	-	-	-	-	-	-	
		28: Communication control			0	0	0	0	0	0	0	
04-12	AO1 Gain	0.0~1000.0	100.0	%	0	0	0	0	0	0	0	*1
04-13	AO1 Bias	-100.0~100.0	0	%	0	0	0	0	0	0	0	*1
04-14	Reserved											
04-15	Reserved											
04-16	AO2 Function Setting	Range and definition are the same as those of 04-11.	3	-	0	0	0	0	0	0	0	
04-17	AO2 Gain	0.0~1000.0	100.0	%	0	0	0	0	0	0	0	*1
04-18	AO2 Bias	-100.0~100.0	0	%	0	0	0	0	0	-		*1

Group 04: External Analog Input and Output Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
04-19	A02 Output Signal Type	0: A02 0~10V 1: A02 4~20mA	0	-	0	0	0	0	0	0	0	
04-20	Filter Time of AO Signal Scan	0.00~0.50	0.00	s	0	0	0	0	0	0	0	*1

Group 05: Multi-Speed Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
05-00	Acceleration and Deceleration Selection of Multi-Speed	0: Acceleration and deceleration time are set by 00-14 ~ 00-24 1: Acceleration and Deceleration Time are set by 05-17 ~ 05-48	0	-	0	0	0	0	0	0	0	
05-01	*Frequency Setting of Speed-Stage 0	0.00~599.00	5.00	Hz	0	0	0	0	0	0	0	*1
05-02	*Frequency Setting of Speed-Stage 1	0.00~599.00	5.00	Hz	0	0	0	0	0	0	0	*1
05-03	*Frequency Setting of Speed-Stage 2	0.00~599.00	10.00	Hz	0	0	0	0	0	0	0	*1
05-04	*Frequency Setting of Speed-Stage 3	0.00~599.00	20.00	Hz	0	0	0	0	0	0	0	*1
05-05	*Frequency Setting of Speed-Stage 4	0.00~599.00	30.00	Hz	0	0	0	0	0	0	0	*1
05-06	*Frequency Setting of Speed-Stage 5	0.00~599.00	40.00	Hz	0	0	0	0	0	0	0	*1
05-07	*Frequency Setting of Speed-Stage 6	0.00~599.00	50.00	Hz	0	0	0	0	0	0	0	*1
05-08	*Frequency Setting of Speed-Stage 7	0.00~599.00	50.00	Hz	0	0	0	0	0	0	0	*1
05-09	*Frequency Setting of Speed-Stage 8	0.00~599.00	5.00	Hz	0	0	0	0	0	0	0	*1
05-10	*Frequency Setting of Speed-Stage 9	0.00~599.00	5.00	Hz	0	0	0	0	0	0	0	*1
05-11	*Frequency Setting of Speed-Stage 10	0.00~599.00	5.00	Hz	0	0	0	0	0	0	0	*1
05-12	*Frequency Setting of Speed-Stage 11	0.00~599.00	5.00	Hz	0	0	0	0	0	0	0	*1
05-13	*Frequency Setting of Speed-Stage 12	0.00~599.00	5.00	Hz	0	0	0	0	0	0	0	*1
05-14	*Frequency Setting of Speed-Stage 13	0.00~599.00	5.00	Hz	0	0	0	0	0	0	0	*1
05-15	*Frequency Setting of Speed-Stage 14	0.00~599.00	5.00	Hz	0	0	0	0	0	0	0	*1
05-16	*Frequency Setting of Speed-Stage 15	0.00~599.00	5.00	Hz	0	0	0	0	0	0	0	*1
05-17	Acceleration Time Setting of Multi Speed 0	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-18	Deceleration Time Setting of Multi Speed 0	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-19	Acceleration Time Setting of Multi Speed 1	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-20	Deceleration Time Setting of Multi Speed 1	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-21	Acceleration Time Setting of Multi Speed 2	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-22	Deceleration Time Setting of Multi Speed 2	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-23	Acceleration Time Setting of Multi Speed 3	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	

Group 05: Multi-Speed Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
05-24	Deceleration Time Setting of Multi Speed 3	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-25	Acceleration Time Setting of Multi Speed 4	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-26	Deceleration Time Setting of Multi Speed 4	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-27	Acceleration Time Setting of Multi Speed 5	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-28	Deceleration Time Setting of Multi Speed 5	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-29	Acceleration Time Setting of Multi Speed 6	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-30	Deceleration Time Setting of Multi Speed 6	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-31	Acceleration Time Setting of Multi Speed 7	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-32	Deceleration Time Setting of Multi Speed 7	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-33	Acceleration Time Setting of Multi Speed 8	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-34	Deceleration Time Setting of Multi Speed 8	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-35	Acceleration Time Setting of Multi Speed 9	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-36	Deceleration Time Setting of Multi Speed 9	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-37	Acceleration Time Setting of Multi Speed 10	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-38	Deceleration Time Setting of Multi Speed 10	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-39	Acceleration Time Setting of Multi Speed 11	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-40	Deceleration Time Setting of Multi Speed 11	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-41	Acceleration Time Setting of Multi Speed 12	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-42	Deceleration Time Setting of Multi Speed 12	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-43	Acceleration Time Setting of Multi Speed 13	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-44	Deceleration Time Setting of Multi Speed 13	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-45	Acceleration Time Setting of Multi Speed 14	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-46	Deceleration Time Setting of Multi Speed 14	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-47	Acceleration Time Setting of Multi Speed 15	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	
05-48	Deceleration Time Setting of Multi Speed 15	0.1~6000.0	10.0	s	0	0	0	0	0	0	0	

* If the maximum output frequency of motor is over 300HZ, the frequency resolution is changed to 0.1Hz

Group 06: Automatic Program Operation Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
06-00	Auto Run (sequencer) mode selection	0: Disabled	0	-	0	0	0	X	X	X	0	

Group 06: Automatic Program Operation Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
		1: Execute a single cycle operation mode. Restart speed is based on the previous stopped speed. 2: Execute continuous cycle operation. Restart speed is based on the previous stopped speed. 3: After the completion of a single cycle, the on-going operation speed is based on the speed of the last stage. Restart speed is based on the previous stopped speed. 4: Execute a single cycle operation. Restart speed is based on the Speed-Stage 0. 5: Execute continuous cycle operation. Restart speed is based on the Speed-Stage 0. 6: After completion of a single cycle, the on-going operation speed is based on the speed of the last stage. Restart speed is based on the Speed-Stage 0										
06-01	*Frequency Setting of Operation-Stage 1	0.00~599.00	5.00	Hz	0	0	0	X	X	X	0	*1
06-02	*Frequency Setting of Operation-Stage 2	0.00~599.00	10.00	Hz	0	0	0	X	X	X	0	*1
06-03	*Frequency Setting of Operation-Stage 3	0.00~599.00	20.00	Hz	0	0	0	X	X	X	0	*1
06-04	*Frequency Setting of Operation-Stage 4	0.00~599.00	30.00	Hz	0	0	0	X	X	X	0	*1
06-05	*Frequency Setting of Operation-Stage 5	0.00~599.00	40.00	Hz	0	0	0	X	X	X	0	*1
06-06	*Frequency Setting of Operation-Stage 6	0.00~599.00	50.00	Hz	0	0	0	X	X	X	0	*1
06-07	*Frequency Setting of Operation-Stage 7	0.00~599.00	50.00	Hz	0	0	0	X	X	X	0	*1
06-08	*Frequency Setting of Operation-Stage 8	0.00~599.00	5.00	Hz	0	0	0	X	X	X	0	*1
06-09	*Frequency Setting of Operation-Stage 9	0.00~599.00	5.00	Hz	0	0	0	X	X	X	0	*1
06-10	*Frequency Setting of Operation-Stage 10	0.00~599.00	5.00	Hz	0	0	0	X	X	X	0	*1
06-11	*Frequency Setting of Operation-Stage 11	0.00~599.00	5.00	Hz	0	0	0	X	X	X	0	*1
06-12	*Frequency Setting of Operation-Stage 12	0.00~599.00	5.00	Hz	0	0	0	X	X	X	0	*1
06-13	*Frequency Setting of Operation-Stage 13	0.00~599.00	5.00	Hz	0	0	0	X	X	X	0	*1
06-14	*Frequency Setting of Operation-Stage 14	0.00~599.00	5.00	Hz	0	0	0	X	X	X	0	*1
06-15	*Frequency Setting of Operation-Stage 15	0.00~599.00	5.00	Hz	0	0	0	X	X	X	0	*1
06-16	Operation Time Setting of Speed-Stage 0	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1
06-17	Operation Time Setting of Speed-Stage 1	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1
06-18	Operation Time Setting of Speed-Stage 2	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1
06-19	Operation Time Setting of Speed-Stage 3	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1
06-20	Operation Time Setting of Speed-Stage 4	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1
06-21	Operation Time Setting of Speed-Stage 5	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1

Group 06: Automatic Program Operation Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f +PG	SLV	SV	PM SV	PM SLV	SLV2	
06-22	Operation Time Setting of Speed-Stage 6	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1
06-23	Operation Time Setting of Speed-Stage 7	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1
06-24	Operation Time Setting of Speed-Stage 8	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1
06-25	Operation Time Setting of Speed-Stage 9	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1
06-26	Operation Time Setting of Speed-Stage 10	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1
06-27	Operation Time Setting of Speed-Stage 11	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1
06-28	Operation Time Setting of Speed-Stage 12	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1
06-29	Operation Time Setting of Speed-Stage 13	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1
06-30	Operation Time Setting of Speed-Stage 14	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1
06-31	Operation Time Setting of Speed-Stage 15	0.0~6000.0	0.0	s	0	0	0	X	X	X	0	*1
06-32	Operation Direction Selection of Speed-Stage 0	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	
06-33	Operation Direction Selection of Speed-Stage 1	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	
06-34	Operation Direction Selection of Speed-Stage 2	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	
06-35	Operation Direction Selection of Speed-Stage 3	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	
06-36	Operation Direction Selection of Speed-Stage 4	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	
06-37	Operation Direction Selection of Speed-Stage 5	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	
06-38	Operation Direction Selection of Speed-Stage 6	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	
06-39	Operation Direction Selection of Speed-Stage 7	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	
06-40	Operation Direction Selection of Speed-Stage 8	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	
06-41	Operation Direction Selection of Speed-Stage 9	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	
06-42	Operation Direction Selection of Speed-Stage 10	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	
06-43	Operation Direction Selection of Speed-Stage 11	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	

Group 06: Automatic Program Operation Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
06-44	Operation Direction Selection of Speed-Stage 12	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	
06-45	Operation Direction Selection of Speed-Stage 13	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	
06-46	Operation Direction Selection of Speed-Stage 14	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	
06-47	Operation Direction Selection of Speed-Stage 15	0: Stop 1: Forward 2: Reverse	0	-	0	0	0	X	X	X	0	

* If the maximum output frequency of motor is over 300Hz, the frequency resolution is changed to 0.1Hz

Group 07: Start /Stop Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
07-00	Momentary Power Loss/Fault Restart Selection	0: Disable 1: Enable	0	-	0	0	0	0	X	0	0	
07-01	Fault Auto-Restart Time	0~7200	0	s	0	0	0	0	0	0	0	
07-02	Number of Fault Auto-Restart Attempts	0~10	0	-	0	0	0	0	0	0	0	
07-03	Reserved											
07-04	Direct Start at Power on	0: When the external run command is enabled, direct start at power up 1: When the external run command is enabled, unable to direct start at power-up.	1	-	0	0	0	0	0	0	0	
07-05	Delay of Direct Start at Power on	1.0~300.0	3.5	s	0	0	0	0	0	0	0	
07-06	DC Injection Braking Starting Frequency	0.0~10.0	0.5	Hz	0	0	0	0	0	0	0	
07-07	DC Injection Braking Current	0~100	50	%	0	0	0	X	X	0	0	
07-08	DC Injection Braking Time at Stop	0.00~100.00	0.50	s	0	0	0	0	0	0	0	
07-09	Stop Mode Selection	0: Deceleration to Stop 1: Coast to Stop 2: DC Braking Stop in All Fields 3: Coast to Stop with Timer	0	-	0	0	0	0	0	0	0	
07-10 ~ 07-12	Reserved											
07-13	Low Voltage Detection Level	250~600	380	V	0	0	0	0	0	0	0	
07-14	Pre-excitation Time	0.00~10.00	2.00	s	X	X	0	X	X	X	X	
07-15	Pre-excitation Level	50~200	100	%	X	X	0	X	X	X	X	
07-16	DC Injection Braking Time at Start	0.00~100.00	0.00	s	0	0	0	0	0	0	0	
07-17	Reserved											
07-18	Minimum Base block Time	0.1~5.0	-	s	0	0	0	0	X	0	0	
07-19	Direction-Detection Speed Search Operating Current	0~100	50	%	0	X	0	X	X	X	0	
07-20	Speed Search Operating Current	0~100	20	%	0	X	0	X	X	X	0	
07-21	Integral Time of Speed Searching	0.1~10.0	2.0	s	0	X	0	X	X	X	0	
07-22	Delay Time of Speed Searching	0.0~20.0	0.2	s	0	0	0	0	0	X	0	

Group 07: Start /Stop Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f +PG	SLV	SV	PM SV	PM SLV	SLV2	
07-23	Voltage Recovery Time	0.1~5.0	2.0	s	0	0	0	X	X	X	0	
07-24	Direction-Detection Speed Search Selection	0: Disable 1: Enable	1	-	0	0	0	X	X	X	0	
07-25	Low Voltage Detection Time	0.00~1.00	0.02	s	0	0	0	0	0	0	0	
07-26	Start-up Mode Selection of SLV Coast to Stop	0: Start with speed search 1: Normal start	0	-	X	X	0	X	X	X	X	
07-27	Start Selection after Fault during SLV Mode	0: Start with speed search 1: Normal start	0	-	X	X	0	X	X	X	X	
07-28	Start after External Base Block	0: Start with speed search 1: Normal start	0	-	0	X	0	X	X	X	0	
07-29	Run Command Selection at the Action of DC Braking	0: Not Allowable to Run 1: Allowable to Run	0	-	0	0	X	X	X	X	X	
07-30	Low Voltage Level Selection	0: Disable 1: Enable	0	-	0	0	0	0	0	0	0	
07-31	**Low Voltage Run Frequency	0.00~599.00	10.00	Hz	X	X	X	0	0	X	X	
07-32	Speed Search Mode Selection	0: Disable 1: Execute a Speed Search at Power On 2: Execute a Speed Search each time	0	-	0	0	0	0	X	0	X	
07-33	Start Frequency of Speed Search Selection	0: Maximum Output Frequency of Motor 1: Frequency Command	0	-	0	0	0	0	X	X	X	
07-34	Short-circuit braking time at start	0.00~100.00	0.00	s	X	X	X	X	X	0	X	
07-35	Short-circuit braking time at stop	0.00~100.00	0.50	s	X	X	X	X	X	0	X	
07-36	Short-circuit braking current limited	0.0~200.0	100.0	%	X	X	X	X	X	0	X	
07-37 ~ 07-41	Reserved											
07-42	Voltage Limit Gain	0.0~50.0	0	%	X	X	0	0	X	X	X	Note 1
07-43	Short-circuit Braking Time of PM Speed Search	0.00~100.00	0.0	s	X	X	X	X	X	0	X	Note 1
07-44	DC Braking Time of PM Speed Search	0.00~100.00	0.0	s	X	X	X	X	X	0	X	Note 1

*07-13 Low Voltage Detection Level, it is enable when 07-30 Low Voltage Level Selection set 0 (Enable) and lower frequency limit set to 250V.This application is for Emergency power supply (EPS)

* *If the maximum output frequency of motor is over 300HZ,the frequency resolution is changed to 0.1Hz

Group 08: Protection Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f +PG	SLV	SV	PM SV	PM SLV	SLV2	
08-00	Stall Prevention Function	xxx0b: Stall prevention is enabled in acceleration. xxx1b: Stall prevention is disabled in acceleration. xx0xb: Stall prevention is enabled in deceleration. xx1xb: Stall prevention is disabled in deceleration. x0xxb: Stall prevention is enabled in operation x1xxb: Stall prevention is disabled in operation 0xxxb: Stall prevention in operation is based on deceleration time of speed-stage 1. 1xxxb: Stall prevention in operation is based on deceleration time of speed-stage 2.	0000b	-	0	0	0	0	0	0	0	

Group 08: Protection Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f +PG	SLV	SV	PM SV	PM SLV	SLV2	
08-01	Stall Prevention Level in Acceleration	20~200	HD:150 ND:120	%	0	0	0	X	X	0	0	
08-02	Stall Prevention Level in Deceleration	660V~820V	770V	V	0	0	0	0	X	0	0	
08-03	Stall Prevention Level in Operation	30~200	HD:160 ND:120	%	0	0	X	X	X	X	0	
08-04	Reserved											
08-05	Selection for Motor Overload Protection (OL1)	xxx0b: Overload Protection is disabled. xxx1b: Overload Protection is enabled. xx0xb: Cold Start of Motor Overload xx1xb: Hot Start of Motor Overload x0xxb: Standard Motor x1xxb: Inverter Duty Motor 0xxxb: Reserved 1xxxb: Reserved	0001b	-	0	0	0	0	0	0	0	
08-06	Start-up Mode of Overload Protection Operation (OL1)	0: Stop Output after Overload Protection 1: Continuous Operation after Overload Protection.	0	-	0	0	0	0	0	0	0	
08-07	Motor Overload (OL1) Protection Level	0: Motor Overload (OL1) Protection 0 1: Motor Overload (OL1) Protection 1 2: Motor Overload (OL1) Protection 2	0	-	0	0	0	0	0	0	0	Note 1
08-08	Automatic Voltage Regulation (AVR)	0: Enable 1: Disable	0	-	0	0	0	0	0	0	0	
08-09	Selection of Input Phase Loss Protection	0: Enable 1: Disable	0	-	0	0	0	0	0	0	0	
08-10	Selection of Output Phase Loss Protection	0: Enable 1: Disable	0	-	0	0	0	0	0	0	0	
08-11 ~ 08-12	Reserved											
08-13	Selection of Over-Torque Detection	0: Over-Torque Detection is Disabled. 1: Start to Detect when Reaching the Set Frequency. 2: Start to Detect when the Operation is Begun.	0	-	0	0	0	0	0	0	0	
08-14	Selection of Over-Torque Operation	0: Deceleration to Stop when Over Torque is Detected. 1: Display Warning when Over Torque is Detected. Go on Operation. 2: Coast to Stop when Over Torque is Detected	0	-	0	0	0	0	0	0	0	
08-15	Level of Over-Torque Detection	0~300	150	%	0	0	0	0	0	0	0	
08-16	Time of Over-Torque Detection	0.0~10.0	0.1	s	0	0	0	0	0	0	0	
08-17	Selection of Low-Torque Detection	0: Low-Torque Detection is Disabled. 1: Start to Detect when Reaching the Set Frequency. 2: Start to Detect when the Operation is Begun.	0	-	0	0	0	0	0	0	0	
08-18	Selection of Low-Torque Operation	0: Deceleration to Stop when Low Torque is Detected. 1: Display Warning when Low Torque is Detected. Go on Operation. 2: Coast to Stop when Low Torque is Detected	0	-	0	0	0	0	0	0	0	

Group 08: Protection Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
08-19	Level of Low-Torque Detection	0~300	30	%	0	0	0	0	0	0	0	
08-20	Time of Low-Torque Detection	0.0~10.0	0.1	s	0	0	0	0	0	0	0	
08-21	Limit of Stall Prevention in Acc over Base Speed	1~100	50	%	0	0	0	X	X	0	0	
08-22	Stall Prevention Detection Time in Operation	2~100	100	ms	0	0	0	X	X	0	0	
08-23	Ground Fault (GF) Selection	0: Disable 1: Enable	0	-	0	0	0	0	0	0	0	
08-24	External Fault Operation Selection	0: Deceleration to Stop 1: Coast to Stop 2: Continuous Operation	0	-	0	0	0	0	0	0	0	
08-25	Detection Selection of External Fault	0: Immediately Detect when the Power is Supplied. 1: Start to Detect when the Operation is Started.	0	-	0	0	0	0	0	0	0	
08-26 ~ 08-29	Reserved											
08-30	Digital Input Stop Command Selection	0: Deceleration to Stop 1: Coast to Stop	0	-	0	0	0	0	0	0	0	
08-31 ~ 08-34	Reserved											
08-35	Motor Overheat Fault Selection	0: Disable 1: Deceleration to Stop 2: Free Run to top 3: Continue Running	0	-	0	0	0	0	0	0	0	
08-36	PTC Input Filter Time Constant	0.00 ~ 10.00	2	s	0	0	0	0	0	0	0	
08-37	Fan Control Function	0: Start in operation 1: Permanent Start 2: Start in high temperature (Note)	0		0	0	0	0	0	0	0	
08-38	Delay Time of Fan Off	0~600	60	s	0	0	0	0	0	0	0	
08-39	Delay Time of Motor Overheat Protection	1~300	60	sec	0	0	0	0	0	0	0	
08-40	Motor2 Acceleration Stall Prevention Level	20~200	HD:150 ND:120	%	0	0	0	X	X	0	0	
08-41	Motor2 Acceleration Stall Prevention Limit	1~100	50	%	0	0	0	X	X	0	0	
08-42	PTC Protection Level	0.1~10.0V	0.7	V	0	0	0	0	0	0	0	
08-43	PTC Restart Level	0.1~10.0V	0.3	V	0	0	0	0	0	0	0	
08-44	PTC Warning Level	0.1~10.0V	0.5	V	0	0	0	0	0	0	0	

Note 1: New added parameter in software V1.20.

Group 09: Communication Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
09-00	INV Communication Station Address	1~31	1	-	0	0	0	0	0	0	0	*3
09-01	Communication Mode Selection	0: MODBUS 1: Reserved 2: Reserved	0		0	0	0	0	0	0	0	*3 *5

Group 09: Communication Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
		3: Reserved 4: PROFIBUS*										
09-02	Baud Rate Setting (bps)	0: 1200 1: 2400 2: 4800 3: 9600 4: 19200 5: 38400	4	-	0	0	0	0	0	0	0	*3
09-03	Stop Bit Selection	0: 1 Stop Bit 1: 2 Stop Bit	0	-	0	0	0	0	0	0	0	*3
09-04	Parity Selection	0: No Parity 1: Even Bit 2: Odd Bit	0	-	0	0	0	0	0	0	0	*3
09-05	Communication Data Bit Selection	0: 8 Bit Data 1: 7 Bit Data	0	-	0	0	0	0	0	0	0	*3
09-06	Communication Error Detection Time	0.0~25.5	0.0	S	0	0	0	0	0	0	0	
09-07	Fault Stop Selection	0: Deceleration to Stop Based on Deceleration Time 1 when Communication Fault Occurs. 1: Coast to Stop when Communication Fault Occurs. 2: Deceleration to Stop Based on Deceleration Time 2 when Communication Fault Occurs. 3: Keep Operating when Communication Fault Occurs.	3	-	0	0	0	0	0	0	0	*3
09-08	Comm. Fault Tolerance Count	1~20	1	-	0	0	0	0	0	0	0	*3
09-09	Waiting Time	5~65	5	ms	0	0	0	0	0	0	0	*3
09-10	Reserved											

* Selection of item 4 in parameter 09-01 is required to be coupled with the Profibus card.

* Parameter 09 does not be influenced by 13-08 (Restore Factory Setting)

Group 10: PID Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
10-00	PID Target Value Source Setting	1: AI1 given 2: AI2 given 3: PI given 4: 10-02 given 5: Reserved 6: Frequency Command (00-05)	1	-	0	0	0	0	0	0	0	
10-01	PID Feedback Value Source Setting	1: AI1 given 2: AI2 given 3: PI given	2	-	0	0	0	0	0	0	0	
10-02	PID Target Value	0.00~100.00	0.00	%	0	0	0	0	0	0	0	*1
10-03	PID Control Mode	xxx0b: PID Disable xxx1b: PID Enable xx0xb: PID Positive Characteristic xx1xb: PID Negative Characteristic x0xxb: PID Error Value of D Control x1xxb: PID Feedback Value of D Ctrl	0000b	-	0	0	0	0	0	0	0	

Group 10: PID Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
		0xxxb: PID Output 1xxxb: PID Output + Frequency Command										
10-04	Feedback Gain	0.01~10.00	1.00	-	0	0	0	0	0	0	0	*1
10-05	Proportional Gain (P)	0.00~10.00	1.00	-	0	0	0	0	0	0	0	*1
10-06	Integral Time (I)	0.00~100.00	1.00	s	0	0	0	0	0	0	0	*1
10-07	Differential Time (D)	0.00~10.00	0.00	s	0	0	0	0	0	0	0	*1
10-08	AI1 Frequency Limit	0.00~599.00	0	Hz	0	0	0	0	0	0	0	Note 1
10-09	PID Bias	-100.0~100.0	0	%	0	0	0	0	0	0	0	*1
10-10	PID Output Delay Time	0.00~10.00	0.00	s	0	0	0	0	0	0	0	*1
10-11	PID Feedback Loss Detection Selection	0: Disable 1: Warning 2: Fault	0	-	0	0	0	0	0	0	0	
10-12	PID Feedback Loss Det. Lev.	0~100	0	%	0	0	0	0	0	0	0	
10-13	PID Feedback Loss Det. Time	0.0~10.0	1.0	s	0	0	0	0	0	0	0	
10-14	PID Integral Limit	0.0~100.0	100.0	%	0	0	0	0	0	0	0	*1
10-15	PID Trim Mode	0~2	0	-	0	0	0	0	0	0	0	Note 1
10-16	PID Trim Scale	0~100	0	%	0	0	0	0	0	0	0	Note 1
10-17	*Start Frequency of PID Sleep	0.00~599.00	0.00	Hz	0	0	0	0	0	0	0	
10-18	Delay Time of PID Sleep	0.0~255.5	0.0	s	0	0	0	0	0	0	0	
10-19	*Frequency of PID Waking up	0.00~599.00	0.00	Hz	0	0	0	0	0	0	0	
10-20	Delay Time of PID Waking up	0.0~255.5	0.0	s	0	0	0	0	0	0	0	
10-21 ~ 10-22	Reserved											
10-23	PID Output Limit	0.00~100.0	100.0	%	0	0	0	0	0	0	0	*1
10-24	PID Output Gain	0.0~25.0	1.0	-	0	0	0	0	0	0	0	
10-25	PID Reversal Output Selection	0: No Allowing Reversal Output 1: Allow Reversal Output	0	-	0	0	0	0	0	0	0	
10-26	PID Target Acceleration/Deceleration Time	0.0~25.5	0.0	s	0	0	0	0	0	0	0	
10-27	PID Feedback Display Bias	0~9999	0	-	0	0	0	0	0	0	0	
10-28	Reserved											
10-29	PID Sleep Selection	0: Disable 1: Enable 2: set by DI	1	-	0	0	0	0	0	0	0	
10-30	Upper Limit of PID Target	0.0 ~ 100.0	100.0	%	0	0	0	0	0	0	0	
10-31	Lower Limit of PID Target	0.0 ~ 100.0	0.0	%	0	0	0	0	0	0	0	
10-32	Reserved											
10-33	Maximum Value of PID Feedback	1 ~ 10000	999	-	0	0	0	0	0	0	0	
10-34	PID Decimal Width	0 ~ 4	1		0	0	0	0	0	0	0	
10-35	PID Unit	0: % 1: FPM 2: CFM 3: SPI 4: GPH 5: GPM 6: IN 7: FT 8: /s 9: /m 10: /h	0		0	0	0	0	0	0	0	*7

Group 10: PID Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
		11: °F 12: inW 13: HP 14: m/s 15: MPM 16: CMM 17: W 18: kW 19: m 20: °C 21: rpm 22: Bar 23: Pa 24: kPa										
10-36	Proportional Gain 2 (P)	0.00~10.00	3.00		0	0	0	0	0	0	0	Note 1
10-37	Integral Time 2 (I)	0.00~100.00	0.50	s	0	0	0	0	0	0	0	Note 1
10-38	Differential Time 2 (D)	0.00~10.00	0.00	s	0	0	0	0	0	0	0	Note 1
10-39	*Output Frequency Setting of PID Disconnection	00.00~599.00	30.00	Hz	0	0	0	0	0	0	0	
10-40	Selection of PID Sleep Compensation Frequency	0: Disable 1: Enable	0		0	0	0	0	0	0	0	
10-41	PID Mode Switch	0: General PID 1: D Type PID	0	-	0	0	0	0	0	0	0	Note 1

* If the maximum output frequency of motor is over 300Hz, the frequency resolution is changed to 0.1Hz

Note 1: New added parameter in software V1.20.

Group 11: Auxiliary Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
11-00	Direction Lock Selection	0: Allow Forward and Reverse Rotation 1: Only Allow Forward Rotation 2: Only Allow Reverse Rotation	0	-	0	0	0	0	0	0	0	
11-01	Carrier frequency	0: Carrier Output Frequency Tuning 1~16: 1~16kHz	*	-	0	0	0	0	0	0	0	*1
11-02	Soft PWM Function Selection	0: Disable 1: Soft PWM 1 enables 2: Soft PWM 2 enables	0	-	0	0	0	0	0	0	0	
11-03	Automatic carrier lowering selection	0: Disable 1: Enable	0	-	0	0	X	X	X	X	0	
11-04	S-curve Time Setting at the Start of Acceleration	0.00~2.50	0.20	s	0	0	0	0	0	0	0	
11-05	S-curve Time Setting at the Stop of Acceleration	0.00~2.50	0.20	s	0	0	0	0	0	0	0	
11-06	S-curve Time Setting at the Start of Deceleration	0.00~2.50	0.20	s	0	0	0	0	0	0	0	
11-07	S-curve Time Setting at the Stop of Deceleration	0.00~2.50	0.20	s	0	0	0	0	0	0	0	
11-08	Jump Frequency 1	0.0~599.0	0.0	Hz	0	0	0	0	0	0	0	
11-09	Jump Frequency 2	0.0~599.0	0.0	Hz	0	0	0	0	0	0	0	
11-10	Jump Frequency 3	0.0~599.0	0.0	Hz	0	0	0	0	0	0	0	
11-11	Jump Frequency Width	0.0~25.5	1.0	Hz	0	0	0	0	0	0	0	
11-12	Manual Energy Saving Gain	0~100	80	%	0	0	X	X	X	X	X	
11-13	Automatic Return Time	0~120	60	s	0	0	0	0	0	0	0	*1
11-14 ~ 11-17	Reserved											

Group 11: Auxiliary Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f +PG	SLV	SV	PM SV	PM SLV	SLV2	
11-18	Manual Energy Saving Frequency	0.0~599.0	0.00	Hz	0	0	X	X	X	X	X	
11-19	Automatic Energy Saving Function	0: Automatic energy saving is disabled. 1: Automatic energy saving is enabled.	0	-	0	X	X	X	X	X	X	
11-20	Filter Time of Automatic Energy Saving	0~200	140	ms	0	X	X	X	X	X	X	
11-21	Voltage Upper Limit of Energy Saving Tuning	0~100	100	%	0	X	X	X	X	X	X	
11-22	Adjustment Time of Automatic Energy Saving	0~5000	20	ms	0	X	X	X	X	X	X	*1
11-23	Detection Level of Automatic Energy Saving	0~100	10	%	0	X	X	X	X	X	X	
11-24	Coefficient of Automatic Energy Saving	0.00~655.35	S	-	0	X	X	X	X	X	X	
11-25 ~ 11-27	Reserved											
11-28	Frequency Gain of Over Voltage Prevention 2	1~200	100	%	0	0	X	X	X	X	X	
11-29	Auto De-rating Selection	0: Disable 1: Enable	0	-	0	X	X	X	X	X	0	
11-30	Variable Carrier Frequency Max. Limit	2~16	-	kHz	0	0	X	X	X	X	0	
11-31	Variable Carrier Frequency Min. Limit	1~16	-	kHz	0	0	X	X	X	X	0	
11-32	Variable Carrier Frequency Proportional Gain	00~99	00	-	0	0	X	X	X	X	0	
11-33	DC Voltage Filter Rise Amount	0.1~10.0	0.1	Vdc	0	0	X	X	X	X	X	*1
11-34	DC Voltage Filter Fall Amount	0.1~10.0	5.0	Vdc	0	0	X	X	X	X	X	*1
11-35	DC Voltage Filter Dead band Level	0.0~99.0	10.0	Vdc	0	0	X	X	X	X	X	*1
11-36	Frequency Gain of OV Prevention	0.000~1.000	0.050	-	0	0	X	X	X	X	X	*1
11-37	**Frequency Limit of OV Prevention	0.00~599.00	5.00	Hz	0	0	X	X	X	X	X	
11-38	Deceleration Start Voltage of OV Prevention	400~800V	700	V	0	0	X	X	X	X	X	
11-39	Deceleration Stop Voltage of OV Prevention	600~800V	750	V	0	0	X	X	X	X	X	
11-40	OV Prevention Selection	0: Disable 1: OV Prevention Mode 1 2: OV Prevention Mode 2 3: OV Prevention Mode 3	0	-	0	0	X	X	X	X	X	
11-41	Selection of Reference Frequency Disappearance Detection	0: Decelerate to Stop when Reference Frequency Disappears 1: Operation is set by Parameter 11-42 when Reference Frequency Disappears	0	-	0	0	0	0	0	0	0	
11-42	Disappearance Level of Reference Frequency	0.0~100.0	80.0	%	0	0	0	0	0	0	0	
11-43	Hold Frequency at Start	0.0~599.0	0.0	Hz	0	0	0	0	0	0	0	
11-44	Frequency Hold Time at Start	0.0~10.0	0.0	s	0	0	0	0	0	0	0	
11-45	Hold Frequency at Stop	0.0~599.0	0.0	Hz	0	0	0	0	0	0	0	
11-46	Frequency Hold Time at Stop	0.0~10.0	0.0	s	0	0	0	0	0	0	0	
11-47	KEB Deceleration Time	0.0~25.5	0.0	s	0	0	X	X	X	X	0	*1
11-48	KEB Detection Level	380~420	400	V	0	0	X	X	X	X	0	
11-49	Zero-servo Gain	0.01~5.00	1.00	-	X	X	X	0	0	X	X	
11-50	Zero-servo Count	0~4096	12	-	X	X	X	0	0	X	X	
11-51	Braking Selection of Zero Speed	0: Disable 1: Enable	0	-	0	X	X	X	X	X	0	
11-52	Droop Control Level	0.0~100.0%	0.0	%	X	X	X	0	0	X	X	*1

Group 11: Auxiliary Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
11-53	Droop Control Delay	0.01~2.00	0.2	s	X	X	X	0	0	X	X	*1
11-54	Initialization of Cumulative Energy	0: Do not Clear Cumulative Energy 1: Clear Cumulative Energy	0	-	0	0	0	0	0	0	0	*1
11-55	STOP Key Selection	0: Stop Key is Disabled when the Operation Command is not Provided by Operator. 1: Stop Key is Enabled when the Operation Command is not Provided by Operator.	1	-	0	0	0	0	0	0	0	
11-56	UP/DOWN Selection	0: When UP/DOWN in Keypad is Disabled, it will be Enabled if Pressing ENTER after Frequency Modification. 1: When UP/DOWN in Keypad is Enabled, it will be Enabled upon Frequency Modification.	0	-	0	0	0	0	0	0	0	
11-57	Reserved											
11-58	Record Reference Frequency	0: Disable 1: Enable	0	-	0	0	0	0	0	0	0	*1
11-59	Gain of Preventing Oscillation	0.00~2.50	*		0	0	X	X	X	X	0	
11-60	Upper Limit of Preventing Oscillation	0~100	*	%	0	0	X	X	X	X	0	
11-61	Time Parameter of Preventing Oscillation	0~100	0		0	0	X	X	X	X	0	
11-62	Selection of Preventing Oscillation	0: Mode1 1: Mode2 2: Mode3	1		0	0	X	X	X	X	0	
11-63	Strong Magnetic Selection	0: Disable 1: Enable	1		X	X	0	0	X	X	X	
11-64	Acceleration Speed Gain Adjustment	0.1~10.0	1.0	-	0	X	X	X	X	X	0	
11-65	Target Main Circuit Voltage	400V~800V	740	-	0	X	X	X	X	X	0	
11-66	2 Phase/ 3 Phase PWM Switch Frequency	6.00~60.00	20	Hz	X	X	0	0	X	X	0	Note 1
11-67	Soft PWM 2 Frequency Range	0~12000	0	Hz	X	X	0	0	0	0	X	Note 1
11-68	Soft PWM 2 Switch Frequency	6.00~60.00	20	Hz	X	X	0	0	0	0	X	Note 1
11-69	Gain of Preventing Oscillation 3	0.00~200.00	5.00	%	0	0	X	X	X	X	X	
11-70	Upper Limit of Preventing Oscillation 3	0.01~100.00	5.00	%	0	0	X	X	X	X	X	
11-71	Time Parameter of Preventing Oscillation 3	0~30000	100	ms	0	0	X	X	X	X	X	
11-72	Gain of Preventing Oscillation for switch frequency 1	0.01~300.00	30.00	Hz	0	0	X	X	X	X	X	
11-73	Gain of Preventing Oscillation for switch frequency 2	0.01~300.00	50.00	Hz	0	0	X	X	X	X	X	

*: Refer to the attachment 1.

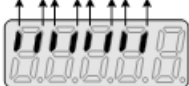
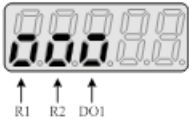
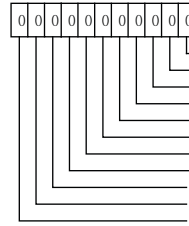
** If the maximum output frequency of motor is over 300Hz, the frequency resolution is changed to 0.1Hz

Note 1: New added parameter in software V1.20

Note: The parameter of 11-01 can be changed during run operation, the range is 1~16KHz.

Group 12: Monitoring Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
12-00	Extended Display Mode (LED)	00000 ~77777. Each digit can be set to 0 to 7 as listed: 0: Default display (frequency¶meters)	00000	-	0	0	0	0	0	0	0	*1 *6

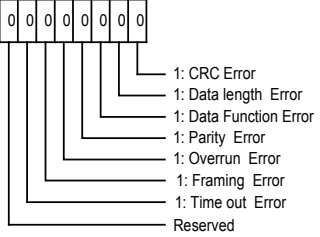
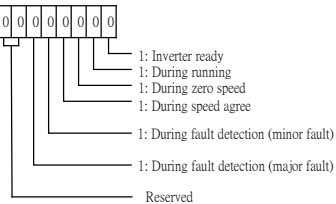
Group 12: Monitoring Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f +PG	SLV	SV	PM SV	PM SLV	SLV2	
		1: Output Current 2: Output Voltage 3: DC voltage 4: Temperature 5: PID feedback 6: Analog Signal Input. (AVI) 7: Analog Signal Input. (ACI)										
12-01	PID Feedback Display Mode (LED)	0: Display the Feedback Value by Integer (xxx) 1: Display the Feedback Value by the Value with One Decimal Place (xx.x) 2: Display the Feedback Value by the Value with Two Decimal Places (x.xx)	0		0	0	0	0	0	0	0	*6
12-02	PID Feedback Display Unit Setting (LED)	0: xxxxx (no unit) 1: xxxPb (pressure) 2: xxxFL (flow)	0		0	0	0	0	0	0	0	*6
12-03	Line Speed Display (LED)	0~60000	1500/ 1800	rpm	0	0	0	0	0	0	0	*6
12-04	Modes of Line Speed Display (LED)	0: Display Inverter Output Frequency 1: Display Line Speed with integer (xxxxx) 2: Display Line Speed with the First Decimal Place (xxxx.x) 3: Display Line Speed with the Second Decimal Place (xxx.xx) 4: Display Line Speed with the Third Decimal Place (xx.xxx)	0	-	0	0	0	0	0	0	0	*1 *6
12-05	Status Display of Digital Input & Output Terminal (LED / LCD)	LED display is shown as below: <i>no input</i>  <i>correspondences to input and output</i> S1 S2 S3 S4 S5 S6 S7 S8   <i>LCD display is shown as below</i>  0 : OPEN 1 : CLOSE Input Terminal(S8) Input Terminal(S7) Input Terminal(S6) Input Terminal(S5) Input Terminal(S4) Input Terminal(S3) Input Terminal(S2) Input Terminal(S1) Output Terminal(DO1) Output Terminal(R2) Output Terminal(R1)		-	0	0	0	0	0	0	0	
12-06 ~ 12-10	Reserved											
12-11	Output Current of Current Fault	Display the output current of current fault	-	A	0	0	0	0	0	0	0	

Group 12: Monitoring Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
12-12	Output Voltage of Current Fault	Display the output voltage of current fault	-	V	0	0	0	0	0	0	0	
12-13	Output Frequency of Current Fault	Display the output frequency of current fault	-	Hz	0	0	0	0	0	0	0	
12-14	DC Voltage of Current Fault	Display the DC voltage of current fault	-	V	0	0	0	0	0	0	0	
12-15	Frequency Command of Current Fault	Display the frequency command of current fault	-	Hz	0	0	0	0	0	0	0	
12-16	Frequency Command	If LED enters this parameter, it only allows monitoring frequency command.	-	Hz	0	0	0	0	0	0	0	
12-17	Output Frequency	Display the current output frequency	-	Hz	0	0	0	0	0	0	0	
12-18	Output Current	Display the current output current	-	A	0	0	0	0	0	0	0	
12-19	Output Voltage	Display the current output voltage	-	V	0	0	0	0	0	0	0	
12-20	DC Voltage (Vdc)	Display the current DC voltage	-	V	0	0	0	0	0	0	0	
12-21	Output Power (kw)	Display the current output power	-	kW	0	0	0	0	0	0	0	
12-22	Motor's Rotation Speed (rpm)	Display motor's current rotation speed. In VF/SLV mode the speed is estimated by output power In PG/SV mode, motor's rotation speed is calculated by feedback frequency. Max limit is 65535	-	rpm	0	0	0	0	0	0	0	
12-23	Output Power Factor (Pfo)	Display the current output power factor	-	-	0	0	0	0	0	0	0	
12-24	Control Mode	Display control mode 0: VF 1: PG 2: SLV 3: SV 4: PSV 5: PMSLV 6: SLV2	-	-	0	0	0	0	0	0	0	
12-25	AI1 Input	Display the current AI1 input (-10V corresponds to -100%, 10V corresponds to 100%,)	-	%	0	0	0	0	0	0	0	
12-26	AI2 Input	Display the current AI2 input (0V or 4mA corresponds to 0%, 10V or 20mA corresponds to 100%)	-	%	0	0	0	0	0	0	0	
12-27	Motor Torque	Display the current torque command (100% corresponds to motor torque)	-	%	X	X	0	0	0	0	X	
12-28	Motor Torque Current (Iq)	Display the current q-axis current	-	%	X	X	0	0	0	0	X	
12-29	Motor Excitation Current (Id)	Display the current d-axis current	-	%	X	X	0	0	0	0	X	
12-30	ASR Deviation	Display deviation of speed controller (speed command - speed feedback) (100% corresponds to the maximum frequency set by 01-02)	-	%	X	0	X	0	0	X	X	
12-31	Reserved											
12-32	ASR Output	Display output value of speed controller (100% corresponds to the maximum frequency set by 01-02)	-	%	X	0	X	0	0	X	X	
12-33	PG Feedback	Display feedback's speed value of speed controller (100% corresponds to the maximum frequency set by 01-02)	-	%	X	0	X	0	0	X	X	
12-34	Reserved											
12-35	Zero-servo Pulse	When display SV position mode, the position error pulse number of the zero speed servo (the pulse number of a circle is four times of set values of 20-27)	-	Pulse	X	X	X	0	0	X	X	

Group 12: Monitoring Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
12-36	PID Input	Display input error of the PID controller (PID target value - PID feedback) (100% corresponds to the maximum frequency set by 01-02 or 01-16)	-	%	0	0	0	0	0	0	0	
12-37	PID Output	Display output of the PID controller	-	%	0	0	0	0	0	0	0	
12-38	PID Setting	Display the target value of the PID controller (100% corresponds to the maximum frequency set by 01-02 or 01-16)	-	%	0	0	0	0	0	0	0	
12-39	PID Feedback	Display the feedback value of the PID controller (100% corresponds to the maximum frequency set by 01-02 or 01-16)	-	%	0	0	0	0	0	0	0	
12-40	Reserved											
12-41	Heatsink Temperature*	Display the heatsink temperature of IGBT temperature	*	°C	0	0	0	0	0	0	0	
12-42	RS-485 Error Code		-	-	0	0	0	0	0	0	0	
12-43	Inverter Status		-	-	0	0	0	0	0	0	0	
12-44	Pulse Input Frequency	Display the frequency value of pulse input	-	Hz	0	0	0	0	0	0	0	
12-45	Recent Fault Message	Display current fault message	-	-	0	0	0	0	0	0	0	
12-46	Previous Fault Message	Display previous fault message	-	-	0	0	0	0	0	0	0	
12-47	Previous Two Fault Messages	Display previous two fault messages	-	-	0	0	0	0	0	0	0	
12-48	Previous Three Fault Messages	Display previous three fault messages	-	-	0	0	0	0	0	0	0	
12-49	Previous Four Fault Messages	Display previous four fault messages	-	-	0	0	0	0	0	0	0	
12-50	DIO Status of Current Fault	Display the DI/DO status of current fault Description is similar to 12-05	-	-	0	0	0	0	0	0	0	
12-51	Inverter Status of Current Fault	Display the inverter status of current fault Description is similar to 12-43	-	-	0	0	0	0	0	0	0	
12-52	Trip Time 1 of Current Fault	Display the operation time of current fault, 12-53 is the days, while 12-52 is the remaining hours.	-	Hr	0	0	0	0	0	0	0	
12-53	Trip Time 2 of Current Fault		-	day	0	0	0	0	0	0	0	
12-54	Frequency Command of Previous Fault	Display frequency command of previous fault	-	Hz	0	0	0	0	0	0	0	
12-55	Output Frequency of Previous Fault	Display output frequency of previous fault	-	Hz	0	0	0	0	0	0	0	
12-56	Output Current of Previous Fault	Display output current of previous fault	-	A	0	0	0	0	0	0	0	
12-57	Output Voltage of Previous Fault	Display output voltage of previous fault	-	V	0	0	0	0	0	0	0	
12-58	DC Voltage of Previous Fault	Display DC voltage of previous fault	-	V	0	0	0	0	0	0	0	
12-59	DIO Status of Previous Fault	Display DI/DO status of previous fault Description is similar to 12-05	-	-	0	0	0	0	0	0	0	

Group 12: Monitoring Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
12-60	Inverter Status of Previous Fault	Display inverter status of previous fault Description is similar to 12-43	-	-	0	0	0	0	0	0	0	
12-61	Trip Time 1 of Last Fault	Display the operation time of last time's fault, 12-62 is the days, while 12-61 is the remaining hours .	-	Hr	0	0	0	0	0	0	0	
12-62	Trip Time 2 of Last Fault		-	day	0	0	0	0	0	0	0	
12-63	Recent Warning Messages	Display the recent warning messages	-	-	0	0	0	0	0	0	0	
12-64	Previous Warning Message	Display the previous warning message	-	-	0	0	0	0	0	0	0	
12-65	Motor Start Angle	0~360	-	-	X	X	X	X	0	X	X	
12-66	Encoder Angle	0~360	-	-	X	0	X	0	0	X	X	
12-67	Cumulative Energy (kWhr)	0.0 ~ 999.9		kWhr	0	0	0	0	0	0	0	
12-68	Cumulative Energy (MWhr)	0 ~ 60000		MWhr	0	0	0	0	0	0	0	
12-69 ~ 12-75	Reserved											
12-76	No-Load Voltage Output	0.0~600.0	-	V	X	X	0	X	X	X	X	
12-77	Reserved											
12-78	Z-Phase Bias Value	-9999~9999	-	Pulse	X	X	X	0	0	X	X	
12-79	Pulse Input Percentage	0.0~100.0	-	%	0	0	0	0	0	0	0	
12-80	AI1 Frequency Command	0.0~599.0	0	Hz	0	0	0	0	0	0	0	Note 1

*: Refer to the following attachment 1.

Note 1: New added parameter in software V1.20.

Group 13: Maintenance Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
13-00	Inverter model Selection	----	-	-	0	0	0	0	0	0	0	*4
13-01	Software Version	0.00-9.99	-	-	0	0	0	0	0	0	0	*4
13-02	Clear Cumulative Operation Hours	0: Disable to Clear Cumulative Operation Hours 1: Clear Cumulative Operation Hours	0	-	0	0	0	0	0	0	0	*1
13-03	Cumulative Operation Hours 1	0~23	-	hr	0	0	0	0	0	0	0	*4
13-04	Cumulative Operation Hours 2	0~65535	-	day	0	0	0	0	0	0	0	*4
13-05	Selection of Cumulative Operation Time	0: Cumulative time in power on 1: Cumulative time in operation	0	-	0	0	0	0	0	0	0	*1
13-06	Parameters Locked	0: Parameters are read-only except 13-06 and main frequency 1: User defined parameters 2: All Parameters are Writable	2	-	0	0	0	0	0	0	0	*1
13-07	Parameter Lock key Code	00000~65534	00000	-	0	0	0	0	0	0	0	Note 1
13-08	Restore Factory Setting	0: No initialization 2: 2 wire initialization (440V-60Hz) 3: 3 wire initialization (440V-60Hz) 4: 2 wire initialization (415V-50Hz) 5: 3 wire initialization (415V-50Hz) 6: 2 wire initialization (380V-50Hz) 7: 3 wire initialization (380V-50Hz) 8: PLC initialization 9: 2 wire Initialization (460V-60Hz) 10: 3 wire Initialization (460V-60Hz) 11: 2 wire Initialization (400V-60Hz) 12: 3 wire Initialization (400V-60Hz) 13: 2 wire Initialization (400V-50Hz) 14: 3 wire Initialization (400V-50Hz) Others: Reserved	-	-	0	0	0	0	0	0	0	

Group 13: Maintenance Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
13-09	Fault History Clearance Function	0: No Clearing Fault History 1: Clear Fault History	0	-	0	0	0	0	0	0	0	*1
13-10	Parameter Password Function 2	0 ~ 9999	0		0	0	0	0	0	0	0	
13-11	C/B CPLD Ver.	0.00~9.99	-		0	0	0	0	0	0	0	
13-12	PG Card Id	0~255	0		0	0	0	0	0	0	0	*5
13-13	PG Card Ver.	0.00~9.99	-		0	0	0	0	0	0	0	*5
13-14	Fault Storage Selections	0: Fault Messages of Auto Restart are not saved. 1: Fault Messages of Auto Restart are saved.	0		0	0	0	0	0	0	0	
13-15	Reserved											
13-21	Last time Fault History	Exhibit Last time Fault History	-	-	0	0	0	0	0	0	0	
13-22	Previous 2 Fault History	Exhibit Previous 2 Fault History	-	-	0	0	0	0	0	0	0	
13-23	Previous 3 Fault History	Exhibit Previous 3 Fault History	-	-	0	0	0	0	0	0	0	
13-24	Previous 4 Fault History	Exhibit Previous 4 Fault History	-	-	0	0	0	0	0	0	0	
13-25	Previous 5 Fault History	Exhibit Previous 5 Fault History	-	-	0	0	0	0	0	0	0	
13-26	Previous 6 Fault History	Exhibit Previous 6 Fault History	-	-	0	0	0	0	0	0	0	
13-27	Previous 7 Fault History	Exhibit Previous 7 Fault History	-	-	0	0	0	0	0	0	0	
13-28	Previous 8 Fault History	Exhibit Previous 8 Fault History	-	-	0	0	0	0	0	0	0	
13-29	Previous 9 Fault History	Exhibit Previous 9 Fault History	-	-	0	0	0	0	0	0	0	
13-30	Previous 10 Fault History	Exhibit Previous 10 Fault History	-	-	0	0	0	0	0	0	0	
13-31	Previous 11 Fault History	Exhibit Previous 11 Fault History	-	-	0	0	0	0	0	0	0	
13-32	Previous 12 Fault History	Exhibit Previous 12 Fault History	-	-	0	0	0	0	0	0	0	
13-33	Previous 13 Fault History	Exhibit Previous 13 Fault History	-	-	0	0	0	0	0	0	0	
13-34	Previous 14 Fault History	Exhibit Previous 14 Fault History	-	-	0	0	0	0	0	0	0	
13-35	Previous 15 Fault History	Exhibit Previous 15 Fault History	-	-	0	0	0	0	0	0	0	
13-36	Previous 16 Fault History	Exhibit Previous 16 Fault History	-	-	0	0	0	0	0	0	0	
13-37	Previous 17 Fault History	Exhibit Previous 17 Fault History	-	-	0	0	0	0	0	0	0	
13-38	Previous 18 Fault History	Exhibit Previous 18 Fault History	-	-	0	0	0	0	0	0	0	
13-39	Previous 19 Fault History	Exhibit Previous 19 Fault History	-	-	0	0	0	0	0	0	0	
13-40	Previous 20 Fault History	Exhibit Previous 20 Fault History	-	-	0	0	0	0	0	0	0	
13-41	Previous 21 Fault History	Exhibit Previous 21 Fault History	-	-	0	0	0	0	0	0	0	
13-42	Previous 22 Fault History	Exhibit Previous 22 Fault History	-	-	0	0	0	0	0	0	0	
13-43	Previous 23 Fault History	Exhibit Previous 23 Fault History	-	-	0	0	0	0	0	0	0	
13-44	Previous 24 Fault History	Exhibit Previous 24 Fault History	-	-	0	0	0	0	0	0	0	
13-45	Previous 25 Fault History	Exhibit Previous 25 Fault History	-	-	0	0	0	0	0	0	0	
13-46	Previous 26 Fault History	Exhibit Previous 26 Fault History	-	-	0	0	0	0	0	0	0	
13-47	Previous 27 Fault History	Exhibit Previous 27 Fault History	-	-	0	0	0	0	0	0	0	
13-48	Previous 28 Fault History	Exhibit Previous 28 Fault History	-	-	0	0	0	0	0	0	0	
13-49	Previous 29 Fault History	Exhibit Previous 29 Fault History	-	-	0	0	0	0	0	0	0	
13-50	Previous 30 Fault History	Exhibit Previous 30 Fault History	-	-	0	0	0	0	0	0	0	

Note: Main frequency setting is 12-16 in LCD. It's equal to Frequency Setting of Speed-Stage 0 (05-01)

Note 1: New added parameter in software V1.20

Group 14: PLC Setting Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
14-00	T1 Set Value 1	0~9999	0	-	0	0	0	0	0	0	0	
14-01	T1 Set Value 2 (Mode 7)	0~9999	0	-	0	0	0	0	0	0	0	
14-02	T2 Set Value 1	0~9999	0	-	0	0	0	0	0	0	0	
14-03	T2 Set Value 2 (Mode 7)	0~9999	0	-	0	0	0	0	0	0	0	
14-04	T3 Set Value 1	0~9999	0	-	0	0	0	0	0	0	0	

Group 14: PLC Setting Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
14-05	T3 Set Value 2 (Mode 7)	0~9999	0	-	0	0	0	0	0	0	0	
14-06	T4 Set Value 1	0~9999	0	-	0	0	0	0	0	0	0	
14-07	T4 Set Value 2 (Mode 7)	0~9999	0	-	0	0	0	0	0	0	0	
14-08	T5 Set Value 1	0~9999	0	-	0	0	0	0	0	0	0	
14-09	T5 Set Value 2 (Mode 7)	0~9999	0	-	0	0	0	0	0	0	0	
14-10	T6 Set Value 1	0~9999	0	-	0	0	0	0	0	0	0	
14-11	T6 Set Value 2 (Mode 7)	0~9999	0	-	0	0	0	0	0	0	0	
14-12	T7 Set Value 1	0~9999	0	-	0	0	0	0	0	0	0	
14-13	T7 Set Value 2 (Mode 7)	0~9999	0	-	0	0	0	0	0	0	0	
14-14	T8 Set Value 1	0~9999	0	-	0	0	0	0	0	0	0	
14-15	T8 Set Value 2 (Mode 7)	0~9999	0	-	0	0	0	0	0	0	0	
14-16	C1 Set Value	0~65535	0	-	0	0	0	0	0	0	0	
14-17	C2 Set Value	0~65535	0	-	0	0	0	0	0	0	0	
14-18	C3 Set Value	0~65535	0	-	0	0	0	0	0	0	0	
14-19	C4 Set Value	0~65535	0	-	0	0	0	0	0	0	0	
14-20	C5 Set Value	0~65535	0	-	0	0	0	0	0	0	0	
14-21	C6 Set Value	0~65535	0	-	0	0	0	0	0	0	0	
14-22	C7 Set Value	0~65535	0	-	0	0	0	0	0	0	0	
14-23	C8 Set Value	0~65535	0	-	0	0	0	0	0	0	0	
14-24	AS1 Set Value 1	0~65535	0	-	0	0	0	0	0	0	0	
14-25	AS1 Set Value 2	0~65535	0	-	0	0	0	0	0	0	0	
14-26	AS1 Set Value 3	0~65535	0	-	0	0	0	0	0	0	0	
14-27	AS2 Set Value 1	0~65535	0	-	0	0	0	0	0	0	0	
14-28	AS2 Set Value 2	0~65535	0	-	0	0	0	0	0	0	0	
14-29	AS2 Set Value 3	0~65535	0	-	0	0	0	0	0	0	0	
14-30	AS3 Set Value 1	0~65535	0	-	0	0	0	0	0	0	0	
14-31	AS3 Set Value 2	0~65535	0	-	0	0	0	0	0	0	0	
14-32	AS3 Set Value 3	0~65535	0	-	0	0	0	0	0	0	0	
14-33	AS4 Set Value 1	0~65535	0	-	0	0	0	0	0	0	0	
14-34	AS4 Set Value 2	0~65535	0	-	0	0	0	0	0	0	0	
14-35	AS4 Set Value 3	0~65535	0	-	0	0	0	0	0	0	0	
14-36	MD1 Set Value 1	0~65535	1	-	0	0	0	0	0	0	0	
14-37	MD1 Set Value 2	0~65535	1	-	0	0	0	0	0	0	0	
14-38	MD1 Set Value 3	0~65535	1	-	0	0	0	0	0	0	0	
14-39	MD2 Set Value 1	0~65535	1	-	0	0	0	0	0	0	0	
14-40	MD2 Set Value 2	0~65535	1	-	0	0	0	0	0	0	0	
14-41	MD2 Set Value 3	0~65535	1	-	0	0	0	0	0	0	0	
14-42	MD3 Set Value 1	0~65535	1	-	0	0	0	0	0	0	0	
14-43	MD3 Set Value 2	0~65535	1	-	0	0	0	0	0	0	0	
14-44	MD3 Set Value 3	0~65535	1	-	0	0	0	0	0	0	0	
14-45	MD4 Set Value 1	0~65535	1	-	0	0	0	0	0	0	0	
14-46	MD4 Set Value 2	0~65535	1	-	0	0	0	0	0	0	0	
14-47	MD4 Set Value 3	0~65535	1	-	0	0	0	0	0	0	0	

Group 15: PLC Monitoring Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
15-00	T1 Current Value1	0~9999	0	-	0	0	0	0	0	0	0	
15-01	T1 Current Value 2 (Mode7)	0~9999	0	-	0	0	0	0	0	0	0	
15-02	T2 Current Value 1	0~9999	0	-	0	0	0	0	0	0	0	
15-03	T2 Current Value 2 (Mode7)	0~9999	0	-	0	0	0	0	0	0	0	
15-04	T3 Current Value 1	0~9999	0	-	0	0	0	0	0	0	0	
15-05	T3 Current Value 2 (Mode7)	0~9999	0	-	0	0	0	0	0	0	0	
15-06	T4 Current Value 1	0~9999	0	-	0	0	0	0	0	0	0	

Group 15: PLC Monitoring Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f +PG	SLV	SV	PM SV	PM SLV	SLV2	
15-07	T4 Current Value 2 (Mode7)	0~9999	0	-	0	0	0	0	0	0	0	
15-08	T5 Current Value 1	0~9999	0	-	0	0	0	0	0	0	0	
15-09	T5 Current Value 2 (Mode7)	0~9999	0	-	0	0	0	0	0	0	0	
15-10	T6 Current Value 1	0~9999	0	-	0	0	0	0	0	0	0	
15-11	T6 Current Value 2 (Mode7)	0~9999	0	-	0	0	0	0	0	0	0	
15-12	T7 Current Value 1	0~9999	0	-	0	0	0	0	0	0	0	
15-13	T7 Current Value 2 (Mode7)	0~9999	0	-	0	0	0	0	0	0	0	
15-14	T8 Current Value 1	0~9999	0	-	0	0	0	0	0	0	0	
15-15	T8 Current Value 2 (Mode7)	0~9999	0	-	0	0	0	0	0	0	0	
15-16	C1 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-17	C2 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-18	C3 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-19	C4 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-20	C5 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-21	C6 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-22	C7 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-23	C8 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-24	AS1 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-25	AS2 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-26	AS3 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-27	AS4 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-28	MD1 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-29	MD2 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-30	MD3 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-31	MD4 Current Value	0~65535	0	-	0	0	0	0	0	0	0	
15-32	TD Current Value	0~65535	0	-	0	0	0	0	0	0	0	

Group 16: LCD Function Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f +PG	SLV	SV	PM SV	PM SLV	SLV2	
16-00	Main Screen Monitoring	5~79 when using LCD to operate, the monitored item displays in the first line. (default is frequency command)	16	-	0	0	0	0	0	0	0	*1
16-01	Sub-Screen Monitoring 1	5~79 when using LCD to operate, the monitored item displays in the second line. (default is output frequency)	17	-	0	0	0	0	0	0	0	*1
16-02	Sub-Screen Monitoring 2	5~79 when using LCD to operate, the monitored item displays in the third line. (default is output current)	18	-	0	0	0	0	0	0	0	*1
16-03	Display Unit	0~39999 Determine the display way and unit of frequency command 0: Frequency display unit is 0.01Hz 1: Frequency display unit is 0.01% 2: Frequency display unit is rpm. 3~39: Reserved 40~9999: Users specify the format, Input 0XXXX represents the display of XXXX at 100%. 10001~19999: Users specify the format; Input 1XXXX represents the display of XXX.X at 100%.	0	-	0	0	0	0	0	0	0	

Group 16: LCD Function Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
		20001~29999: Users specify the format, Input 2XXXX represents the display of XX.XX at 100%. 30001~39999: Users specify the format, Input 3XXXX represents the display of X.XXX at 100%.										
16-04	Engineering Unit	0: without using engineering unit 1: FPM 2: CFM 3: PSI 4: GPH 5: GPM 6: IN 7: FT 8: /s 9: /m 10: /h 11: °F 12: inW 13: HP 14: m/s 15: MPM 16: CMM 17: W 18: kW 19: m 20: °C 21: rpm 22: Bar 23: Pa 24: kPa	0	-	0	0	0	0	0	0	0	
16-05	LCD Backlight	0~7	5	-	0	0	0	0	0	0	0	*1
16-06	Reserved											
16-07	Copy Function Selection	0: Do not copy parameters 1: Read inverter parameters and save to the operator. 2: Write the operator parameters to inverter. 3: Compare parameters of inverter and operator.	0	-	0	0	0	0	0	0	0	
16-08	Selection of Allowing Reading	0: Do not allow to read inverter parameters and save to the operator. 1: Allow to read inverter parameters and save to the operator.	0	-	0	0	0	0	0	0	0	
16-09	Selection of Operator Removed (LCD)	0: Keep operating when LCD operator is removed. 1: Display fault when LCD operator is removed	0	-	0	0	0	0	0	0	0	*1

Group 17: Automatic Tuning Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
17-00	Mode Selection of Automatic Tuning*	0: Rotation Auto-tuning 1: Static Auto-tuning 2: Stator Resistance Measurement 3: Reserved 4: Loop Tuning 5: Rotation Auto-tuning Combination (item: 4+2+0) 6: Static Auto-tuning Combination (item: 4+2+1)	VF:2 VF+PG:2 SLV:6 SV:6 SLV2:6	-	0	0	0	0	X	X	0	
17-01	Motor Rated Output Power	0.00~600.00	kVA	kW	0	0	0	0	X	X	0	
17-02	Motor Rated Current	0.1~1200.0	kVA	A	0	0	0	0	X	X	0	
17-03	Motor Rated Voltage	100.0~480.0	440	V	0	0	0	0	X	X	0	
17-04	Motor Rated Frequency	4.8~599.0	60.0	Hz	0	0	0	0	X	X	0	
17-05	Motor Rated Speed	0~24000	kVA	rpm	0	0	0	0	X	X	0	
17-06	Pole Number of Motor	2~16 (Even)	4	Pole	0	0	0	0	X	X	0	
17-07	PG Pulse Number	0~60000	1024	ppr	X	0	X	0	X	X	X	
17-08	Motor no-load Voltage	100~480	-	V	0	0	0	0	X	X	0	
17-09	Motor Excitation Current	0.01~600.00	-	A	X	X	0	0	X	X	X	*1
17-10	Automatic Tuning Start	0: Disable 1: Enable	0	-	0	0	0	0	X	X	0	
17-11	Error History of Automatic Tuning	0: No error 1: Motor data error 2: Stator resistance tuning error 3: Leakage induction tuning error 4: Rotor resistance tuning error 5: Mutual induction tuning error 6: Encoder error 7: DT Error 8: Motor's acceleration error 9: Warning	0	-	0	0	0	0	X	X	0	
17-12	Proportion of Motor Leakage Inductance	0.1~15.0	3.4	%	X	X	0	0	X	X	X	
17-13	Motor Slip Frequency	0.10~20.00	1.78**	Hz	X	X	0	0	X	X	X	
17-14	Selection of Rotation Auto-tuning	0: VF Rotation Auto-tuning 1: Vector Rotation Auto-tuning	0	-	0	0	0	0	X	X	0	

kVA: The default value of this parameter will be changed by different capacities of inverter.

*: The default value is 1 in VF/ VF+PG mode while the default value is 0 in SLV/ SV/ SLV2 mode.

*: It is suggested that HD/ ND mode (00-27) and application presets (00-32) be selected first before motor performs auto-tuning.

Note: The value of mode selection of automatic tuning is 6 (Static Auto-tuning Combination). When do auto-tuning with no-load motor, it suggest select 17-00=5 (Rotation Auto-tuning Combination)

** Displayed when 17-00=2

*1: It can be set when 17-00=1, 2, 6.

Group 18: Slip Compensation Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
18-00	Slip Compensation Gain at Low Speed.	0.00~2.50	VF:0.00 SLV*	-	0	X	0	0	X	X	0	*1
18-01	Slip Compensation Gain at High Speed.	-1.00~1.00	0.0	-	0	X	0	X	X	X	X	*1
18-02	Slip Compensation Limit	0~250	200	%	0	X	X	X	X	X	X	
18-03	Slip Compensation Filter Time	0.0~10.0	1.0	s	0	X	X	X	X	X	X	

Group 18: Slip Compensation Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
18-04	Regenerative Slip Compensation Selection	0: Disable 1: Enable	0	-	0	X	X	X	X	X	X	
18-05	FOC Delay Time	1~1000	100	ms	X	X	0	X	X	X	X	
18-06	FOC Gain	0.00~2.00	0.1	-	X	X	0	X	X	X	X	

*: Refer to the following attachment 1

Group 19: Wobble Frequency Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
19-00	Center Frequency of Wobble Frequency	5.00~100.00	20.00	%	0	0	X	X	X	X	0	*1
19-01	Amplitude of Wobble Frequency	0.1~20.0	10.0	%	0	0	X	X	X	X	0	*1
19-02	Jump Frequency of Wobble Frequency	0.0~50.0	0.0	%	0	0	X	X	X	X	0	*1
19-03	Jump Time of Wobble Frequency	0~50	0	ms	0	0	X	X	X	X	0	*1
19-04	Wobble Frequency Cycle	0.0~1000.0	10.0	s	0	0	X	X	X	X	0	*1
19-05	Wobble Frequency Ratio	0.1~10.0	1.0		0	0	X	X	X	X	0	*1
19-06	Upper Offset Amplitude of Wobble Frequency	0.0~20.0	0.0	%	0	0	X	X	X	X	0	*1
19-07	Lower Offset Amplitude of Wobble Frequency	0.0~20.0	0.0	%	0	0	X	X	X	X	0	*1

Group 20: Speed Control Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
20-00	ASR Gain 1	0.00~250.00	S	-	X	0	0	0	0	0	X	*1
20-01	ASR Integral Time 1	0.001~10.000	S	s	X	0	0	0	0	0	X	*1
20-02	ASR Gain 2	0.00~250.00	S	-	X	0	0	0	0	0	X	*1
20-03	ASR Integral Time 2	0.001~10.000	S	s	X	0	0	0	0	0	X	*1
20-04	ASR Integral Time Limit	0~300	200	%	X	X	0	0	0	0	X	
20-05	ASR Positive Limit	0.1 ~ 10.0	5.0 ⁽¹⁾	%	X	0	X	X	X	X	X	
20-06	ASR Negative Limit	0.1 ~ 10.0	1.0 ⁽¹⁾	%	X	0	X	X	X	X	X	
20-07	Selection of Acceleration and Deceleration of P/PI	0: PI speed control will be enabled only in constant speed. For the speed acceleration and deceleration, only use P control. 1: Speed control is enabled either in acceleration or deceleration.	0	-	X	0	0	0	0	X	X	
20-08	ASR Delay Time	0.000~0.500	0.004	s	X	X	0	0	0	0	X	
20-09	Speed Observer Proportional (P) Gain1	0.00~2.55	0.61	-	X	X	0	X	X	X	X	*1
20-10	Speed Observer Integral(I) Time 1	0.01~10.00	0.05	s	X	X	0	X	X	X	X	*1
20-11	Speed Observer Proportional (P) Gain2	0.00~2.55	0.61	-	X	X	0	X	X	X	X	*1
20-12	Speed Observer Integral(I) Time 2	0.01~10.00	0.06	s	X	X	0	X	X	X	X	*1
20-13	Low-pass Filter Time Constant of Speed Feedback 1	1~1000	4	ms	X	X	0	X	X	X	X	
20-14	Low-pass Filter Time Constant of Speed Feedback 2	1~1000	30	ms	X	X	0	X	X	X	X	

Group 20: Speed Control Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
20-15	ASR Gain Change Frequency 1	0.0~599.0	4.0	Hz	X	0	0	0	0	X	0	
20-16	ASR Gain Change Frequency 2	0.0~599.0	8.0	Hz	X	X	0	0	0	X	0	
20-17	Torque Compensation Gain at Low Speed	0.00~2.50	1.00	-	X	X	0	X	X	X	X	*1
20-18	Torque Compensation Gain at High Speed	-10~10	0	%	X	X	0	X	X	X	X	*1
20-19	Over Speed (OS) Selection	0: Deceleration to stop 1: Coast to stop 2: Continue to operate	1		X	0	X	0	0	X	X	
20-20	Over Speed (OS) Detection Level	0~120	115	%	X	0	X	0	0	X	X	
20-21	Over Speed (OS) Detection Time	0.0~2.0	0.5	s	X	0	X	0	0	X	X	
20-22	Speed Deviation (DEV) Selection	0: Deceleration to Stop 1: Coast to Stop 2: Continue to Operate	2		X	0	X	0	0	X	X	
20-23	Speed Deviation (DEV) Detection Level	0~50	10	%	X	0	X	0	0	X	X	
20-24	Speed Deviation (DEV) Detection Time	0.0~10.0	0.5	s	X	0	X	0	0	X	X	
20-25	Selection of PG Open	0: Deceleration to Stop 1: Coast to Stop 2: Continue to Operate	1	-	X	0	X	0	0	X	X	
20-26	Detection Time of PG Open	0.0~10.0	2.0	s	X	0	X	0	0	X	X	
20-27	PG Pulse Number	0~9999	1024	ppr	X	0	X	0	0	X	X	
20-28	Selection of PG Rotation Direction	0: Forward as Counter -Clockwise Rotation 1: Forward as Clockwise Rotation	0	-	X	0	X	0	0	X	X	
20-29	PG Pulse Dividing Ratio	001~132	1	-	X	0	X	0	0	X	X	
20-30	PG Gear Ratio 1	1~1000	1	-	X	0	X	0	X	X	X	
20-31	PG Gear Ratio 2	1~1000	1	-	X	0	X	0	X	X	X	
20-32	Selection of Specific Encoder	0: None 1: Resolver	0		X	X	X	0	0	X	X	
20-33	Detection Level at Constant Speed	0.1~5.0	1.0		X	0	0	0	0	0	X	*1
20-34	Compensation Gain of Derating	0~25600	0		X	X	0	0	0	X	X	*1
20-35	Compensation Time of Derating	0~30000	100	ms	X	X	0	0	0	X	X	*1

(1) For VF+PG control mode.

Group 21: Torque And Position Control Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
21-00	Torque Control Selection	0: Speed Control 1: Torque Control	0	-	X	X	X	0	0	X	X	
21-01	Filter Time of Torque Reference	0~1000	0	ms	X	X	X	0	0	X	X	
21-02	Speed Limit Selection	0: According to AI Input 1: According to the Set Value of 21-03 2: According to communication position input (2502H)	0	-	X	X	X	0	0	X	X	
21-03	Speed Limit Value	-120~120	0	%	X	X	X	0	0	X	X	*1
21-04	Speed Limit Bias	0~120	10	%	X	X	X	0	0	X	X	*1
21-05	Positive Torque Limit	0~300	*	%	X	X	0	0	0	0	X	

Group 21: Torque And Position Control Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
21-06	Negative Torque Limit	0~300	*	%	X	X	0	0	0	0	X	
21-07	Forward Regenerative Torque Limit	0~300	*	%	X	X	0	0	0	0	X	
21-08	Reversal Regenerative Torque Limit	0~300	*	%	X	X	0	0	0	0	X	
21-09	Maximum Frequency of Position Control	0.1~100.0	20.0	Hz	X	X	X	0	0	X	X	
21-10	The Command of Rotation Cycle Number of Section 0	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-11	The Command of the Pulse Number of Section 0	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-12	The Command of Rotation Cycle Number of Section 1	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-13	The Command of the Pulse Number of Section 1	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-14	The Command of Rotation Cycle Number of Section 2	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-15	The Command of the Pulse Number of Section 2	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-16	The Command of Rotation Cycle Number of Section 3	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-17	The Command of the Pulse Number of Section 3	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-18	The Command of Rotation Cycle Number of Section 4	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-19	The Command of the Pulse Number of Section 4	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-20	The Command of Rotation Cycle Number of Section 5	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-21	The Command of the Pulse Number of Section 5	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-22	The Command of Rotation Cycle Number of Section 6	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-23	The Command of the Pulse Number of Section 6	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-24	The Command of Rotation Cycle Number of Section 7	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-25	The Command of the Pulse Number of Section 7	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-26	The Command of the Pulse Number of Section 8	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-27	The Command of Rotation Cycle Number of Section 8	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-28	The Command of the Pulse Number of Section 9	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-29	The Command of Rotation Cycle Number of Section 9	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-30	The Command of Rotation Cycle Number of Section 10	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-31	The Command of the Pulse Number of Section 10	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-32	The Command of Rotation Cycle Number of Section 11	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-33	The Command of the Pulse Number of Section 11	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-34	The Command of Rotation Cycle Number of Section 12	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-35	The Command of the Pulse Number of Section 12	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-36	The Command of Rotation Cycle Number of Section 13	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	

Group 21: Torque And Position Control Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
21-37	The Command of the Pulse Number of Section 13	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-38	The Command of Rotation Cycle Number of Section 14	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-39	The Command of the Pulse Number of Section 14	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-40	The Command of Rotation Cycle Number of Section 15	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-41	The Command of the Pulse Number of Section 15	-9999 ~ 9999	0	-	X	X	X	0	0	X	X	
21-42	Pos. Mode Sel	0: Switch to position mode when output frequency < 01-08. 1: Z Phase Locked Function	0		X	X	X	0	0	X	X	
21-43	Offset Angle	0 ~ 9999	0	Pulse	X	X	X	0	0	X	X	

* Refer to the following attachment 1.

Group 22: PM Motor Parameters

Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
22-00	PM Motor Rated Power	0.00~600.00	S	kW	X	X	X	X	0	0	X	
22-01	Reserved											
22-02	PM Motor Rated Current	25%~200% inverter's rated current	S	A	X	X	X	X	0	0	X	
22-03	PM Motor's Pole Number	2~96	6	poles	X	X	X	X	0	0	X	
22-04	PM Motor's Rotation Speed	6~60000	1500	rpm	X	X	X	X	0	0	X	
22-05	PM Motor's Maximum Rotation Speed	6~60000	1500	rpm	X	X	X	X	0	0	X	
22-06	PM Motor Rated Frequency	4.8~599.0	75.0	Hz	X	X	X	X	0	0	X	
22-07	Reserved											
22-08	PM Encoder Type	0: TAMAGAWA Non Wire-Saving Encoder 1: TAMAGAWA Wire-Saving Encoder 2: SUMTAK Wire-Saving Encoder 3: General Incremental Encoder 4: Sine Wave	0		X	X	X	X	0	X	X	
22-09	Reserved											
22-10	PM SLV Start Current	20 ~ 200% Motor Rated Current	80	%	X	X	X	X	X	0	X	
22-11	I/F Mode Start Frequency Switching Point	1.0 ~ 20	10	%	X	X	X	X	X	0	X	
22-12	KP Value of Speed Estimation	1~10000	3000	-	X	X	X	X	X	0	X	
22-13	KI Value of Speed Estimation	1~1024	40	-	X	X	X	X	X	0	X	
22-14	Armature Resistance of PM Motor	0.001 ~ 30.000	1.000	Ω	X	X	X	X	0	0	X	
22-15	D-axis Inductance of PM Motor	0.01 ~ 300.00	10.00	mH	X	X	X	X	0	0	X	
22-16	Q-axis Inductance of PM Motor	0.01 ~ 300.00	10.00	mH	X	X	X	X	0	0	X	
22-17	Reserved											
22-18	Flux-Weakening Limit	0~100	0	%	X	X	X	X	0	0	X	
22-19	Reserved											
22-20	Offset Angle of the Magnetic Pole and PG Origin	0~360	0	deg	X	X	X	X	0	X	X	*4
22-21	PM Motor Tuning	0: PM Motor Tuning is not Active 1: Parameter Auto-tune (for PMSLV Tuning) 2: Magnetic Pole Alignment and Loop Adjustment (for PMSV Tuning)	0	-	X	X	X	X	0	0	X	

Group 22: PM Motor Parameters												
Code	Parameter Name	Setting Range	Default	Unit	Control mode							Attribute
					V/f	V/f + PG	SLV	SV	PM SV	PM SLV	SLV2	
		3: Magnetic Pole Alignment										
22-22	Fault History of PM Motor Tuning	0. No Error 1. Static Magnetic Alignment Fault 2. Without PG Option Card 3. Rotation Pole Alignment is Forced to Stop 4. Error of Encoder Feedback Direction 5. Loop Adjustment is Time out 6. Encoder Error 7. Other Errors of Motor Tuning 8. Current Abnormity Occurs when Aligning Rotation Magnetic Pole 9. Current Abnormity Occurs while Loop Adjustment 10. Reserved 11. Stator Resistance Measurement Timeout	0	-	X	X	X	X	0	0	X	*4
22-23	Reserved											
22-25	Detection Mode Selection of Initial Magnetic Pole	0: Upon the angle before stopping 1: Mode 1 2: Mode 2 3: Mode 3	1	-	X	X	X	X	0	0	X	Note 1
22-26	Estimator Mode	0~1 (in PMSLV mode)	0	-	X	X	X	X	X	0	X	Note 1
22-27	Voltage Command of Mode 2	5~100 (22-25=2 or 22-26=1 is enabled)	50	%	X	X	X	X	0	0	X	Note 1
22-28	Divider Ratio of Mode 2	0~4 (22-25=2 or 22-26=1 is enabled)	2	-	X	X	X	X	0	0	X	Note 1
22-29	Flux-weakening Voltage Command Restriction	80~100 (related to parameter 22-18)	95	%	X	X	X	X	0	0	X	Note 1

Note 1: New added parameter in software V1.20

4.2.1. Attachment 1: Parameters' default value and upper limit value are adjusted by different capacities of inverter

Models	Size	Max. frequency in SLV when carrier frequency ≤ 8 kHz 11-01	Max. frequency (Hz) in SLV when carrier frequency > 8 kHz 11-01	Display parameter 12-41 (Inverter temperature)	The initial value of parameter 18-00 in SLV/ SV (Slip compensation at low speed)
		(Hz)	(Hz)		
1007 1015 1022	1	150	150	Yes	1.00
2037 2055	2	150	150	Yes	1.00
3075 3110	3	150	150	Yes	1.00
3150 4150	4	110	110	Yes	1.00
4185 4220		100	100	Yes	1.00
5300 5370 5450	5	100	80	Yes	0.70

Models	The initial value of parameters 21-05 ~ 21-08	The initial value (s) of parameter 20-08	The initial value (V) of parameter 08-02	The initial value of Accel. & Decel 00-14~00-17 & 00-23~00-27	Default carrier in HD 11-01	Max. carrier in HD 11-01	Max. carrier in HD 11-01
	(Torque Limit)	(ASR Filter Time)	(Stall Level in Deceleration)	(s)	kHz	kHz (SLV, Max. > 80 Hz)	kHz (others)
1007	200%	0.001	770	10.0	8	8	16
1015					8	8	16
1022					8	8	16
2037	200%	0.001	770	10.0	8	8	16
2055					8	8	16
3075	200%	0.001	770	10.0	8	8	16
3110					8	8	16
3150 4150	200%	0.002	770	15.0	8	8	16
4185					8	8	16
4220					8	8	16
5300	160%	0.002	770	20.0	5	8	12
5370					5	8	12
5450					5	8	10

Model	01-09 Minimum Output Voltage 1 of Motor 1	01-07 Middle Output Voltage 1 of Motor 1	01-23 Minimum Output Voltage 1 of Motor 2	01-21 Middle Output Voltage 1 of Motor 2	11-59 Gain of Preventing Oscillation	11-60 Upper Limit of Preventing Oscillation
1007 1015	15.8V	25.6V	15.8V	25.6V	0.05	100
1022	15.0V	28.0V	15.0V	28.0V	0.05	100
2037 2055	15.0V	28.0V	15.0V	28.0V	0.05	100
3075	15.0V	28.0V	15.0V	28.0V	0.05	100
3110	15.0V	28.0V	15.0V	28.0V	0.05	10
3150 4150 4185 4220	15.0V	28.0V	15.0V	28.0V	0.01	10
5300 5370 5450	17.0V	30.0V	17.0V	30.0V	0.01	10

5. Troubleshooting and Fault Diagnostics

5.1. General

Inverter fault detection and early warning / self-diagnosis function. When the inverter detects a fault, a fault message is displayed on the keypad. The fault contact output energizes and the motor will coast to stop (The stop method can be selected for specific faults).

When the inverter detects a warning / self-diagnostics error, the digital operator will display a warning or self-diagnostic code, the fault output does not energize in this case. Once the warning is removed, the system will automatically return to its original state.

5.2. Fault Detection Function

When a fault occurs, please refer to Table 10.2.1 for possible causes and take appropriate measures.

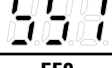
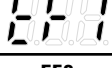
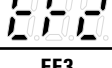
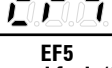
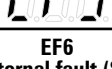
Use one of the following methods to restart:

1. Set one of multi-function digital input terminals (03-00, 03-07) to 17 (Fault reset); activate input
2. Press the reset button on the keypad.
3. Power down inverter wait until keypad goes blank and power-up the inverter again.

When a fault occurs, the fault message is stored in the fault history (see group 12 parameters).

LED display	Description	Cause	Possible solutions
OC over current 	The inverter output current exceeds the overcurrent level (200% of the inverter rated current).	• Acceleration / Deceleration time is too short. • Contactor at the inverter output side. • A special motor or applicable size is greater than the inverter rated value. • Short circuit or ground fault.	• Extend acceleration / deceleration time. • Check the motor wiring. • Disconnect motor and try running inverter.
OCA over current 			
OCC over current 	The inverter output current exceeds the overcurrent level in acceleration time.	• Acceleration time is too short. • Size of motor is bigger than inverter. • Short circuit between winding and shell of motor. • Short circuit between wire and ground of motor. • IGBT broken module.	• Set the longer acceleration time. • Change to bigger size of inverter. • Examine motor. • Check the wire. • Replace IGBT module (Please contact Gefran Technical Assistance).
OCd over current 			
SC short circuit 	The inverter output current exceeds the overcurrent level in deceleration time.	• Deceleration time is too short.	• Set the longer acceleration time.
GF Ground fault 			
OV Over voltage 	The inverter output short circuit or ground fault.	• Short circuit or ground fault (08-23 = 1). • Motor damaged (insulation). • Wire damage or deterioration.	• Check the motor wiring. • Disconnect motor and try running inverter.
	The current to ground exceeds 50% of the inverter rated output current (08-23 = 1, GF function is enabled).	• Motor damaged (insulation). • Wire damage or deterioration. • Inverter DCCT sensors defect.	• Replace motor. • Check the motor wiring. • Disconnect motor and try running inverter. • Check resistance between cables and ground. • Reduce carrier frequency
	DC bus voltage exceeds the OV detection level (820Vdc).	• Deceleration time set too short, resulting in regenerative energy flowing back from motor to the inverter. • The inverter input voltage is too high. • Use of power factor correction capacitors. • Excessive braking load. • Braking transistor or resistor defective. • Speed search parameters set incorrectly.	• Increase deceleration time • Reduce input voltage to comply with the input voltage requirements or install an AC line reactor to lower the input voltage. • Remove the power factor correction capacitor. • Use dynamic braking unit. • Replace braking transistor or resistor. • Adjust speed search parameters.
	(If input voltage 01-14 is set lower than 400V, the OV detection value will be decreased to 700Vdc).		

LED display	Description	Cause	Possible solutions
UV Under voltage	DC bus voltage is lower than the UV detection level (380Vdc) or the pre-charge contactor is not active while the inverter is running.	- The input voltage is too low. - Input phase loss. - Acceleration time set too short. - Input voltage fluctuation. - Pre-charge contactor damaged. - DC bus voltage feedback signal value not incorrect.	- Check the input voltage. - Check input wiring. - Increase acceleration time. - Check power source - Replace pre-charge contactor - Replace control board or complete inverter.
	(The detection value can be adjusted by 07-13).		
IPL input phase loss	Phase loss at the input side of the inverter or input voltage imbalance, active when 08-09 = 1 (enabled)	- Wiring loose in inverter input terminal. - Momentary power loss. - Input voltage imbalance.	- Check input wiring / faster screws. - Check power supply
			
OPL output phase loss	Phase loss at the output side of the inverter, active when 08-10 = 1 (enabled).	- Wiring loose in inverter output terminal. - Motor rated current is less than 10% of the inverter rated current.	- Check output wiring / faster screws. - Check motor & inverter rating.
			
OH1 Heatsink overheat	The temperature of the heat sink is too high. Note: when OH1 fault occurs three times within five minutes, it is required to wait 10 minutes before resetting the fault.	- Ambient temperature too high. - cooling fan failed - Carrier frequency set too high. - Load too heavy.	- Install fan or AC to cool surroundings. - Replace cooling fan. - Reduce carrier frequency. - Reduce load / Measure output current
			
OL1 Motor overload	Internal motor overload protection tripped, active when protection curve 08-05 = xxx1.	- Voltage setting V/f mode too high, resulting in over-excitation of the motor. - Motor rated current (02-01) set incorrectly. - Load too heavy.	- Check V/f curve. - Check motor rated current - Check and reduce motor load, check and operation duty cycle.
			
OL2 Inverter overload	Inverter thermal overload protection tripped. If an inverter overload occurs 4 times in five minutes, it is required to wait 4 minutes before resetting the fault.	- Voltage setting V/f mode too high, resulting in over-excitation of the motor. - Inverter rating too small. - Load too heavy.	- Check V/f curve. - Replace inverter with larger rating. - Check and reduce motor load, check and operation duty cycle.
			
OT Over torque detection	Inverter output torque is higher than 08-15 (over torque detection level) for the time specified in 08-16. Parameter 08-14 = 0 to activate.	Load too heavy.	- Check over torque detection parameters (08-15 / 08-16). - Check and reduce motor load, check and operation duty cycle.
			
UT Under torque detection	Inverter output torque is lower than 08-19 (under torque detection level) for the time specified in 08-20. Parameter 08-18 = 0 to activate.	- Sudden drop in load. - Belt break.	- Check under torque detection parameters (08-19 / 08-20). - Check load / application.
			
run Switch for Motor1/ Motor2	Switch for Motor1/Motor2 in running time	- Execute command for switching motor2 in running time - Execute command for switching motor in running time	Revise the sequence control and switch motor in top time.
			
OS Over speed	Motor speed exceeds level set in 20-20 (PG Over speed Level) for the time set in 20-21 (PG over speed time). Active when 20-19 (= 0 or 1). This fault is active V/f + PG and SV control mode (00-00 = 1 or 3 or 4). Motor speed can be monitored by 12-22	- Motor speed overshoot (ASR) - PG ppr set incorrectly. - Overspeed parameters set incorrectly.	- Check ASR parameters group 21. - Check PG parameters - Check overspeed parameters 20-20/20-12
			
PG0 PG Open circuit	PG pulses are not received by the inverter for the time specified in 20-26 (PG open circuit detection time). This fault is active V/f + PG and SV control mode (00-00 = 1 or 3 or 4).	- PG cable disconnected. - PG has no power. - Mechanical brake active preventing motor from turning.	- Check PG wiring. - Check PG power-supply. - Make sure brake is released.
			

LED display	Description	Cause	Possible solutions
DEV Speed deviation 	Motor speed rises above 20-23 level (PG speed deviation level) for the time specified in 20-24 (PG deviation time)...Active when parameter 20-22(=0 or 1). This fault is active V/f + PG and SV control mode (00-00 = 1 or 3 or 4).	• Load too heavy • Mechanical brake active preventing motor from turning. • PG wiring error. • PG parameters (group 20) set incorrectly. • Acceleration / deceleration time set to short.	• Check load • Make sure brake is released. • Check PG wiring. • Check PG parameters 20-23/20-24. • Increase Acceleration / deceleration time.
CE communication error 	No Modbus communication received in for the time specified in 09-06 (communication error detection time). Active when 09-07(= 0 to 2).	• Connection lost or wire broken. • Host stopped communicating.	• Check connection • Check host computer / software.
FB PID feedback loss 	PID feedback signal falls below level specified in 10-12 (PID feedback loss detection level) for the time specified in 10-13 (Feedback loss detection time). Active when parameter (10-11 = 2).	• Feedback signal wire broken • Feedback sensor broken.	• Check feedback wiring • Replace feedback sensor.
STO Run Permissive 	Run permissive input open (F1, F2).	• Terminal board Input F1 and F2 are not connected	• Check F1 and F2 connection
SS1 Digital input Stop command 	Digital input Stop command enabled	• 08-30 = 0 and 03-00~03-07=58	• Check if 08-30 = 0 and 03-00~03-07=58
EF0 External fault 0 	External fault (Modbus)	Modbus communication 0x2501 bit 2 = "1"	• Reset Modbus communication 0x2501 bit 2 = "1"
EF1 External fault (S1) 	External fault (Terminal S1) Active when 03-00= 25, and Inverter external fault selection 08-24=0 or 1.	• Multifunction digital input external fault active.	• Multi-function input function set incorrectly. • Check wiring
EF2 External fault (S2) 	External fault (Terminal S2) Active when 03-01= 25, and Inverter external fault selection 08-24=0 or 1.		
EF3 External fault (S3) 	External fault (Terminal S3) Active when 03-02= 25, and Inverter external fault selection 08-24=0 or 1.		
EF4 External fault (S4) 	External fault (Terminal S4) Active when 03-03= 25, and Inverter external fault selection 08-24=0 or 1.		
EF5 External fault (S5) 	External fault (Terminal S5) Active when 03-04= 25, and Inverter external fault selection 08-24=0 or 1.		
EF6 External fault (S6) 	External fault (Terminal S6) Active when 03-05= 25, and Inverter external fault selection 08-24=0 or 1.		
EF7 External fault (S7) 	External fault (Terminal S7) Active when 03-06= 25, and Inverter external fault selection 08-24=0 or 1.		

LED display	Description	Cause	Possible solutions
EF8 External fault (S8) 	External fault (Terminal S8) Active when 03-07 = 25, and Inverter external fault selection 08-24=0 or 1.	• Multifunction digital input external fault active.	• Multi-function input function set incorrectly. • Check wiring
CF07 Motor control fault 	Motor control fault	• SLV mode is unable to run motor	• Perform rotational or stationary auto-tune • Increase minimum output frequency (01-08)
CF08 Motor control fault 	Motor control fault	• Start or Run fault in PMSLV mode	• Increase the value of 22-10 properly. • Re auto-tune (22-21). • Check if the load is too heavy to raise torque output limit.
FU fuse open 	DC bus fuse blown	• IGBT damaged. • Short circuit output terminals.	• Check IGBTs • Check for short circuit at inverter output. • Replace inverter.
CF00 Operator Communication Error <i>LCD display only *</i>	Errors of data transmission occur in LCD keypad	• LCD keypad and inverter cannot transmit data after power on 5 seconds	• Disconnect the operator and then reconnect. • Replace the control board
CF01 Operator Communication Error 2 <i>LCD display only *</i>	Errors of data transmission occur in LCD keypad	• LCD keypad and inverter can transmit data but transmission error occurs for more than 2 seconds	• Disconnect the operator and then reconnect. • Replace the control board
CTER CT Failure 	Errors of detecting voltages from three phase's current transformer to detect output current.	• Errors of detecting voltages • Noises too much • Control board failure	• Check current transformer signal and the voltage on the control board.
CF20 Communication Failure 	Use Profibus & Modbus Communication at the same time.	• Maybe use two kind of communication type at the same time.	• Check only use one kind of communication type.

* When the communication errors occur in LED keypad (KB-LED-VD1100), the LED will stay the screen and stop action.

5.3. Warning / Self-diagnosis Detection Function

When the inverter detects a warning, the keypad displays a warning code (flash).

Note: The fault contact output does not energize on a warning and the inverter continues operation. When the warning is no longer active the keypad will return to its original state.

When the inverter detected a programming error (for example two parameters contradict each other or are set to an invalid setting), the keypad displays a self-diagnostics code.

Note: The fault contact output does not energize on a self-diagnostics error. While a self-diagnostics code is active the inverter does not accept a run command until the programming error is corrected.

Note: When a warning or self- diagnostic error is active the warning or error code will flash on the keypad.

When the RESET key is pressed, the warning message (flash) disappears and returns after 5 sec. If the warning or self-diagnostic error still exists.

Refer to Table 10.3.1 for an overview, cause and corrective action for inverter warnings and self-diagnostic errors.

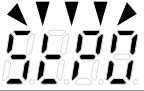
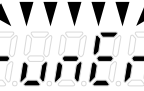
Table 10.3.1 warning / self-diagnosis and corrective actions

LED display	Description	Possible causes	Corrective action
OV (flash) Over voltage	DC bus voltage exceeds the OV detection level (820Vdc).	- Deceleration time set too short, resulting in regenerative energy flowing back from motor to the inverter. - The inverter input voltage is too high. - Use of power factor correction capacitors. - Excessive braking load. - Braking transistor or resistor defective. - Speed search parameters set incorrectly.	- Increase deceleration time - Reduce input voltage to comply with the input voltage requirements or install an AC line reactor to lower the input voltage. - Remove the power factor correction capacitor. - Use dynamic braking unit. - Replace braking transistor or resistor. - Adjust speed search parameters.
	(If input voltage 01-14 is set lower than 400V, the OV detection value will be decreased to 700Vdc)		
UV (flash) under voltage	DC bus voltage is lower than the UV detection level (380Vdc) or the pre-charge contactor is not active while the inverter is running.	- The input voltage is too low. - Input phase loss. - Acceleration time set too short. - Input voltage fluctuation. - Pre-charge contactor damaged. - DC bus voltage feedback signal value not incorrect.	- Check the input voltage. - Check input wiring. - Increase acceleration time. - Check power source - Replace pre-charge contactor - Replace control board or complete inverter
	(the detection value can be adjusted by 07-13)		
OH1 Heatsink overheat	The temperature of the heat sink is too high.	- Ambient temperature too high. - cooling fan failed - Carrier frequency set too high. - Load too heavy.	- Install fan or AC to cool surroundings. - Replace cooling fan. - Reduce carrier frequency. - Reduce load / Measure output current
	Note: when OH1 fault occurs three times within five minutes, it is required to wait 10 minutes before resetting the fault.		
OH2 (flash) Inverter over heating warning	Inverter overheat warning Multi-function digital input set to 31. (Terminal S1 ~ S8) Active when 03-00 ~ 03-07 = 31).	Multifunction digital input overheat warning active.	- Multi-function input function set incorrectly. - Check wiring
			
OT (flash) over torque detection	Inverter output torque is higher than 08-15 (over torque detection level) for the time specified in 08-16. Parameter 08-14 = 0 to activate.	Load too heavy.	- Check over torque detection parameters (08-15 / 08-16). - Check and reduce motor load, check and operation duty cycle.
			
UT (flash) under torque detection	Inverter output torque is lower than 08-19 (under torque detection level) for the time specified in 08-20. Parameter 08-18 = 0 to activate.	- Sudden drop in load. - Belt break.	- Check under torque detection parameters (08-19 / 08-20). - Check load / application.
			
bb1 (flash) External baseblock	External base block (Terminal S1)	Multifunction digital input external baseblock active	- Multi-function input function set incorrectly. - Check wiring
			
bb2 (flash) External baseblock	External base block (Terminal S2)		
			
bb3 (flash) External baseblock	External base block (Terminal S3)		
			

LED display	Description	Possible causes	Corrective action
bb4 (flash) External baseblock	External base block (Terminal S4)	•Multifunction digital input external baseblock active	•Multi-function input function set incorrectly. •Check wiring
			
bb5 (flash) External baseblock	External base block (Terminal S5)		
			
bb6 (flash) External baseblock	External base block (Terminal S6)		
			
bb7 (flash) External baseblock	External base block (Terminal S7)		
			
bb8 (flash) External baseblock	External base block (Terminal S8)	•Multifunction digital input external baseblock active	•Multi-function input function set incorrectly. •Check wiring
			
OS (flash) Motor over speed	Motor speed exceeds level set in 20-20 (PG Over speed Level) for the time set in 20-21 (PG over speed time). Active when 20-19 (= 0 or 1). This fault is active V/f + PG and SV control mode (00-00 = 1 or 3 or 4). Motor speed can be monitored by 12-22	•Motor speed overshoot (ASR) •PG ppr set incorrectly. •Overspeed parameters set incorrectly.	•Check ASR parameters group 21. •Check PG parameters •Check overspeed parameters 20-20/20-12.
			
PG0 (flash) PG open circuit	PG pulses are not received by the inverter for the time specified in 20-26 (PG open circuit detection time). This fault is active V/f + PG and SV control mode (00-00 = 1 or 3 or 4).	•PG cable disconnected. •PG has no power. •Mechanical brake active preventing motor from turning.	•Check PG wiring. •Check PG power-supply. •Make sure brake is released.
			
DEV (flash) Speed deviation	Motor speed rises above 20-23 level (PG speed deviation level) for the time specified in 20-24 (PG deviation time).Active when parameter 20-22(=0 or 1). This fault is active V/f + PG and SV control mode (00-00 = 1 or 3 or 4).	•Load too heavy •Mechanical brake active preventing motor from turning. •PG wiring error. •PG parameters (group 20) set incorrectly. •Acceleration / deceleration time set to short.	•Check load •Make sure brake is released. •Check PG wiring. •Check PG parameters 20-23/20-24. •Increase Acceleration / deceleration time.
			
OL1 Motor overload	Internal motor overload protection tripped, active when protection curve 08-05 = xxx1.	•Voltage setting V/f mode too high, resulting in over-excitation of the motor. •Motor rated current (02-01) set incorrectly. •Load too heavy	•Check V/f curve. •Check motor rated current •Check and reduce motor load, check and operation duty cycle.
			
OL2 Inverter overload	Inverter thermal overload protection tripped. If an inverter overload occurs 4 times in five minutes, it is required to wait 4 minutes before resetting the fault.	•Voltage setting V/f mode too high, resulting in over-excitation of the motor. •Inverter rating too small. •Load too heavy.	•Check V/f curve. •Replace inverter with larger rating. •Check and reduce motor load, check and operation duty cycle.
			

LED display	Description	Possible causes	Corrective action
CE (flash) communication error 	No Modbus communication received for 2 sec. Active when 09-07=3.	• Connection lost or wire broken. • Host stopped communicating.	• Check connection • Check host computer / software
CLA over current protection level A 	Inverter current reaches the current protection level A.	• Inverter current too high. • Load too heavy.	• Check load and duty cycle operation.
CLB over current protection level B 	Inverter current reaches the current protection level B.	• Inverter current too high. • Load too heavy.	• Check load and duty cycle operation.
Retry (flash) retry 	Automatic reset activated, warning is displayed until restart delay time set (07-01) expires.	• Parameter 07-01 set to a value greater than 0. • Parameter 07-02 set to a value greater than 0.	• Warning disappears after automatic reset.
ES (flash) External emergency stop 	External emergency stop Enabled.	• 03-00~03-08 set to 14, and the digital input enabled.	• Turn off run command, and remove external emergency stop command.
EF1 (flash) External fault (S1) 	External fault (Terminal S1) Active when 03-00= 25, and Inverter external fault selection 08-24=2.	• Multifunction digital input external fault active and parameter 08-24 = 2 for operation to continue.	• Multi-function input function set incorrectly. • Check wiring • Multi-function input function set incorrectly. • Check wiring
EF2 (flash) External fault (S2) 	External fault (Terminal S2) Active when 03-01= 25, and Inverter external fault selection 08-24=2.		
EF3 (flash) External fault (S3) 	External fault (Terminal S3) Active when 03-02= 25, and Inverter external fault selection 08-24=2.		
EF4 (flash) External fault (S4) 	External fault (Terminal S4) Active when 03-03= 25, and Inverter external fault selection 08-24=2.		
EF5 (flash) External fault (S5) 	External fault (Terminal S5) Active when 03-04= 25, and Inverter external fault selection 08-24=2.		

LED display	Description	Possible causes	Corrective action
EF6 (flash) External fault (S6) 	External fault (Terminal S6) Active when 03-05 = 25, and Inverter external fault selection 08-24 = 2.	• Multifunction digital input external fault active and parameter 08-24 = 2 for operation to continue.	• Multi-function input function set incorrectly. • Check wiring • Multi-function input function set incorrectly. • Check wiring
EF7 (flash) External fault (S7) 	External fault (Terminal S7) Active when 03-06 = 25, and Inverter external fault selection 08-24 = 2.		
EF8 (flash) External fault (S8) 	External fault (Terminal S8) Active when 03-07 = 25, and Inverter external fault selection 08-24 = 2.		
EF9 (flash) error of forward/reversal rotation 	Forward run and reverse run are active within 0.5 sec of each other. Stop method set by parameter 07-09.	• Forward run and reverse run active (see 2-wire control).	• Check run command wiring
SE01 Rang setting error 	Parameter setting falls outside the allowed range.	• Some parameter ranges are determined by other inverter parameters which could cause an out of range warning when the dependency parameter is adjusted. Example: 1.02-00 > 02-01, or 20 > 02-21 02- 2.00-12 > 00-13, 3.00-07 = 1,00-05 = 00-06 4.02-03 > 02-06 or 02-22 > 02-25 5.20-16 < 20-15	• Check parameter setting.
SE02 Digital input terminal error 			
SE03 V/f curve error 	V/f curve setting error.	• V/f curve setting error. ① 01-02 > 01-12 > 01-06 > 01-08; • (Fmax) (Fbase) (Fmid1) (Fmin) ② 01-16 > 01-24 > 01-20 > 01-22; • (Fmax2) (Fbase2)(Fmid1) (Fmin2)	• Check V/f parameters
SE05 PID selection error 			
HPErr Model selection error 	Inverter size setting error: Inverter size setting 13-00 does not match the rated voltage	• Inverter size setting does not match voltage class (13-00).	• Check inverter size setting 13-00.
SE07 PG card error 	Inverter PG card setting error.	• No PG feedback card installed. • Set wrong type for PM Encoder Type (22-08)	• Install PG feedback card. • Check control mode. • Set right type for PM Encoder Type (22-08) and power on again.

LED display	Description	Possible causes	Corrective action
SE08 PM Motor mode error 	Inverter rating does not support the PM Motor mode.	Inverter rating does not support PM motor control mode.	Check control mode.
SE09 PI setting error 			
FB (flash) PID feedback braking 	PID feedback signal falls below level specified in 10-12 (PID feedback loss detection level) for the time specified in 10-13 (Feedback loss detection time). Active when parameter (10-11 = 1).	- Feedback signal wire broken - Feedback sensor broken	- Check feedback wiring - Replace feedback sensor.
USP (flash) Unattended Start Protection 			
STP0 Zero Speed Stop Error 	Frequency command is smaller than 01-08 without DC brake.	Frequency command is smaller than motor minimum output frequency.	Adjust frequency command
STP1 Direct Start warning 			
STP2 External Terminal Stop Error 	External Terminal is main run command source selection (00-02 = 1) and run command executes but executes stop command from keypad.	Run command executes from external terminal but executes stop command from keypad.	Remove the run command from external terminal
EnC Encoder Error 			
RunEr Wrong running direction Error 	Running direction is different from 11-00	Check the command among 11-00, jog and DI control to see if any difference.	Revise the command among 11-00, jog and DI control to see if any difference
PArEr Parameter setting error 			

LED display	Description	Possible causes	Corrective action
FirE Fire mode enabled 	Fire mode enabled	Fire mode enabled.	Check the environment and confirm the fire status. If no fire, turn off the power and power on again.
AdCEr Voltage on C/B error 			
EPErr EEPROM Save error 	The data save in EEPROM is wrong.	- EEPROM circuit failure - Parameter check error after power on	- Restore factory setting, then cut off the power and power on again. - If warning again, replace control board.
bdErr Control board error 			
LOC Parameter Lock 	Parameter lock key code (password) already locked	Parameter lock key code already enable (13-07)	Lifting the parameter lock key code, to enter the correct parameter for 13-07
Err2 Set password failed 			
Err2 Set password failed 	Parameter lock key code cannot enable	To enable the parameter lock key code (password) function, but the password is not correct	Enter the correct parameter for 13-07 to enable the parameter lock key

5.4. Auto-tuning Error

When a fault occurs during auto-tuning of a standard AC motor, the display will show the “AtErr” fault and the motor stops. The fault information is displayed in parameter 17-11.

Note: The fault contact output does not energize with an auto-tuning fault. Refer to Table 10.4.1, for fault information during tuning, cause and corrective action.

Table 10.4.1 Auto-tuning fault and corrective actions

Error	Description	Cause	Corrective action
01	Motor data input error.	- Motor Input data error during auto-tuning. - Inverter output current does not match motor rated current.	- Check the motor tuning data (17-00 to 17-09). - Check inverter size
02	Motor lead to lead resistance R1 tuning error.	- Auto-tuning is not completed within the specified time - Auto-tuning results fall outside parameter setting range. - Motor rated current exceeded. - Motor was disconnected.	- Check the motor tuning data (17-00 to 17-09). - Check motor connection. - Disconnect motor load. - Check inverter current detection circuit and DCCTs. - Check motor installation
03	Motor leakage inductance tuning error.		
04	Motor rotor resistance R2 tuning error.		
05	Motor mutual inductance Lm tuning error.		
07	Deadtime compensation detection error		
06	Motor encoder error	PG feedback noise	- Check motor rated current. - Check PG card grounding.
08	Motor acceleration error (Rotational type auto-tuning only).	Motor fails to accelerate in the specified time (00-14 = 20sec).	- Increase acceleration time (00-14). - Disconnect motor load
09	Other	- No load current is higher than 70% of the motor rated current. - Torque reference exceeds 100%. - Errors other than ATE01 ~ ATE08.	- Check the motor tuning data (17-00 to 17-09). - Check motor connection.

5.5. PM Motor Auto-tuning Error

When a fault occurs during auto-tuning of a PM motor, the display will show the “IPErr” fault and the motor stops. The fault information is displayed in parameter 22-18.

Note: The fault contact output does not energize with an auto-tuning fault. Refer to Table 10.5.1, for fault information during tuning, cause and corrective action.

Table 10.5.1 Auto-tuning fault and corrective actions for PM motor

Error	Description	Cause	Corrective action
01	Magnetic pole alignment tuning failure (static).	Inverter output current does not match motor current.	- Check the motor tuning data (22-02). - Check inverter size
02	PG option missing.	Magnetic pole cannot be aligned without PG option card.	Install PG feedback card.
03	Magnetic pole alignment auto-tuning abort during rotational auto-tune.	System abnormality during magnetic pole alignment.	Check for active protection functions preventing auto-tuning.
04	Timeout during magnetic pole alignment during rotational auto-tune.	Motor cannot rotate	- Check motor. - Check motor wiring. - Check brake released.
05	Circuit tuning time out.	System abnormality during circuit tuning.	Check for active protection functions preventing auto-tuning.
06	Encoder error	PG feedback noise	- Check motor rated current. - Check PG card grounding.
07	Other motor tuning errors.	Other tuning errors.	- Check the motor tuning data (22-02). - Check motor connection
08	Motor current out of range during magnetic pole alignment (rotational auto-tune).	Motor cannot operate at low speeds.	- Check PG card wiring - Check motor connection.
09	Current out of range during circuit tuning.	Inverter output current does not match motor current.	- Check the motor tuning data (22-02). - Check inverter size
10	Magnetic pole alignment and circuit tuning failed.	Auto-tuning is not successful.	Retry magnetic pole alignment and circuit tuning.

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