VF66

TOYO INTELLIGENT INVERTER

PBUS66-Z

Communication Protocol

Manual

ToyoDenki
r/min
Hz
A
V
FNC
REV
RUN
DIR
ALM
JOG
SET
MONI FNC
FOR REV
START
JOG
STOP RESET
VF66B
VF66B-3R722
TYPE VF66B 3R722 W1
APPL QA1
INPUT 3Φ 200~220V 50/60Hz
OUTPUT 3.7kW 17A
WEIGHT kg
QC No. QC1234567
危 険
けが、感電のおそれあり
注 意
火災のおそれあり
DANGER
Risk of injury or electric shock
To avoid serious injury or shock
Read the manual prior to installation and follow safety instructions.
Never remove the safety cover at power on and during 10 minutes after turning off the power.
Must be grounded.
Risk of fire
Fix on nonflammable materials such as metal.

Foreword

We thank you for choosing a Toyo inverter product.

This instruction manual contains information regarding the PBUS66-Z Optional Circuit Board communication protocols for the VF66B Inverter. For correct communication protocol use, please carefully read this instruction manual prior to using the PBUS66-Z.

This instruction manual explains the workings of the PBUS66-Z PROFIBUS-DP communication function. For more information about the PBUS66-Z terminal block functions, wiring procedures, switch configuration and setting up the VF66B inverter, please refer to the “**PBUS66-Z Operating Manual**”.

In order to accommodate the many special functions to a wide variety of applications in addition to the basic VF66B inverter functions, please thoroughly read the VF66B inverter manual as well as any other applicable specialized instruction manuals.

Read Prior To Use

Safety Precautions

Before installing, operating, maintaining and inspecting the PBUS66-Z unit, carefully read this instruction manual and all other appendices and handle the unit as instructed. Before operation, be sure to become acquainted with all the component's details, safety information and precautions. For safe operation, be sure to also thoroughly read the VF66B Inverter operating manual.

In this instruction manual, the safety instructions are classified into two levels: DANGER and CAUTION.

DANGER	Indicates a hazardous situation which may result in death or serious injury if the unit is handled improperly.
CAUTION	Indicates a hazardous situation which may result in moderate or minor injury or property damage if the unit is handled improperly. However, depending on circumstances, such a situation may lead to serious consequences. These precautions indicate important instructions and must be followed without fail.

CAUTION [Installation]

- Do not use equipment if you discover damage or deformation during unpacking.
  Doing so may cause equipment failure or malfunction.
- Do not place any flammable materials near the device.
  Doing so may cause a fire.
- Do not allow the unit to drop, fall over or sustain severe impacts.
  Doing so may cause equipment failure or damage.
- Do not install or operate the optional circuit board if it is damaged or has missing parts.
  Doing so may lead to personal injury.

DANGER [Wiring]

- Before wiring up the unit, make sure the power is OFF.
  Failure to do so may cause an electric shock or fire.
- Wait more than 10 minutes after turning the power OFF before opening the unit case lid.
- Make sure that the unit is correctly earthed.
  Failure to do so may cause an electric shock or fire.
- Wiring must only be performed by a skilled electrical technician.
  Failure to do so may cause an electric shock or fire.
- Always wire up the unit after it has been installed.
  Failure to do so may cause an electric shock or fire.

⚠ CAUTION [Wiring]

- Make sure that communication cables and connectors are properly installed and locked in place.
  Failure to do so may cause equipment failure or malfunction.

⚠ DANGER [Operation]

- Turn the power ON only after fitting the inverter front cover.
  Do not remove the cover while the power is ON.
  Doing so may cause an electric shock.
- Do not operate any switch with wet hands.
  Doing so may cause an electric shock.
- Do not touch the inverter terminal while the power is ON, even if it is not in a state of operation.
  Doing so may cause an electric shock.
- If the alarm is reset while an operation signal remains input, the unit can suddenly restart. Confirm that the operation signal is off before resetting the alarm.
  Failure to do so may lead to personal injury.
- The inverter can be configured to operate at a wide range of speeds. Operate the inverter only after thoroughly checking the allowable range of the motor and machine.
  Failure to do so may cause personal injury, equipment failure or damage.

⚠ CAUTION [Operation]

- The inverter radiating fins and radiating resistors can be hot and should never be touched.
  Failure to follow this warning may cause burns.

⚠ DANGER [Maintenance, Inspection and Parts Replacement]

- Always turn the power OFF before inspecting the unit.
  Failure to do so may cause an electric shock, personal injury or fire.
- Unauthorized persons must not perform maintenance, inspection or parts replacement.
  Use insulated tools for maintenance and inspection.
  Failure to do so may cause electric shock or personal injury.

⚠ CAUTION [Other]

- Never modify the unit.
  Doing so may cause electric shock or personal injury.

⚠ CAUTION [General Precautions]

Some illustrations contained within this manual show the unit with its covers or safety shields removed in order to illustrate the details. Before operation, reinstall all covers and shields to their original positions as specified, and operate in accordance with the guidelines contained within this manual.

These safety precautions, and specifications stated in each manual are subject to change without notice.

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Chapter 1 Outline of Functions

The PBUS66-Z Optional Circuit Board has been designed to connect to the VF66B Inverter's internal VFC66-Z circuit board connector.
In addition to the PROFIBUS-DP slave station communication function, the PBU66-Z is also equipped with analogue input/output, multifunction input and PG input/output functions.

Through PROFIBUS-DP communication, the PBUS66-Z can input operation, speed and torque commands to the VF66B Inverter as well as monitor factors such as operating conditions, protection conditions, current and voltage. It can also read and rewrite the inverter configuration data as well as read the trace-back data, protection history and monitor data. Furthermore, it can be used as the input/output signal of the VF66B Inverter built-in PLC function. For information about the built-in PLC function, please refer to the VF66B PCTool manual.

In order to reduce environmental impact, the PBUS66-Z has been designed to contain levels of lead, mercury, cadmium, hexavalent chromium, PBB and PBDE that conform to the RoHS directive issued by the EU.

⚠ **CAUTION** [Safety Precautions]

Be sure to thoroughly read the operating manual prior to use and always operate in a correct manner.

The inverter and optional circuit board made by our company have not been designed or manufactured to be used with equipment or part of systems that are used to maintain or affect human life.

If you intend to use the product described in this manual for specific applications such as passenger transportation, medical, aerospace, nuclear control, submarine relay equipment or other special uses, please contact us.

This product is manufactured under strict quality control. However, when this inverter or optional circuit board is used in critical systems where a failure may affect the lives of humans or cause great loss, safety measures must be taken in order to prevent serious accidents.

If you wish to use this inverter with loads other than three-phase alternating current motors, please contact us.

This product requires electrical work. This must only be performed by a skilled electrical technician.

Chapter 2 Basic Specifications

2.1 PROFIBUS-DP Communication Terminal Specifications

Table 2.1 PROFIBUS-DP Communication Terminal Specifications

	Terminal Name	Application	Description
PBUS66-Z Terminal Block TB1	N. A	Communication Signal Terminal	- A-line (RxD/TxD-N) connection terminal.
	P. B		- B-line (RxD/TxD-P) connection terminal.
	RTS	Request To Send	- Used when connecting to equipment where the communication direction must be clearly defined. Output is Hi (+5V) during PBUS66-Z data transmission and Low (0V) for all other times.
	P5	+5V Power Supply Terminal	- Outputs a +5V DC voltage.
	G3	Communication Earth Terminal	- Signal line data earth terminal.
	E	Protective Earth Terminal	- Connects to the connection-cable shielded wire.

2.2 PROFIBUS-DP Communication Specifications

Table 2.2 PROFIBUS-DP Communication Specifications

Communication Protocol	PROFIBUS-DP compliant	
International Standard	EN 50 170 (IEC61158)	
Physical Layer	RS-485 compliant	
Connection Type	Bus type	
Transmission Speed and Transmission Distance	9.6K, 19.2K, 45.45K, 93.75Kbps 187.5Kbps 500Kbps 1.5Mbps 3M, 6M, 12Mbps	→ Less than 1,200m → Less than 1,000m → Less than 400m → Less than 200m → Less than 100m
Transmission Method	Half Duplex	
Synchronization Method	Start-Stop Synchronization	
Communication Control Method	Polling/Selecting Method	
Error Check Method	FCS (Frame Check Sequence)	
Data Format	Start bit (1 bit) Data (8 bits) Parity check (1 bit, even number) Stop bit length (1 bit)	
Connection, Wiring Method	Terminal block → Two-wire system	
Connection Cable	Shielded twisted-pair cable (PROFIBUS-DP dedicated cable).	
Number Of Connection Stations	A maximum of 32 stations, combining master and slaves (without repeater) A maximum of 126 stations (with repeater)	
Station Number Setting	Configuration via the VF66B inverter internal console	
Transmission Speed	Automatic configuration by the transmission data received from the master	
GSD File	TOYO0BE7. GSD	

2.3 Communication Modes

The PBUS66-Z allows communication mode selection of either the PROFIDRIVE Profile compliant "PROFIDRIVE Compatible Mode" or our company's specially developed "Original Mode".

For more information about communication mode configuration (J-08) and communication frames, please refer to Chapter 3.

Mode 0….PROFIDRIVE Compatible Mode
Mode 1….Original Mode
Mode 2….Special Mode (Disabled)

PROFIDRIVE Profile Version Used

PROFIDRIVE Profile, Order-No: 3.072
Profile Number: 3
Version: 2

2.4 Other

For more information about specifications of other components such as terminal blocks, please refer to the "**PBUS66-Z Operating Manual**".

⚠ DANGER [Wiring]

- Confirm that the power is OFF before performing any wiring.
  Failure to do so may cause an electric shock or fire.

⚠ CAUTION [Wiring]

- Never connect the G or G2 terminal to earth.
  Doing so may cause equipment failure or damage.
- Do not connect or allow contact between the PS and G terminals.
  Doing so may cause equipment failure or damage.

Chapter 3 Communication Function Explanation

3.1 Setting of Parameters

Through PROFIBUS-DP communication, the PBUS66-Z can input operation and speed commands and torque commands into the VF66B Inverter as well as monitor factors such as operating conditions, protection conditions, current and voltage. It can also read and rewrite the inverter configuration data as well as read the trace-back data, protection history and monitor data. Furthermore, it can be used as the input/output signal of the VF66B Inverter built-in PLC function. For information about the built-in PLC function, please refer to the VF66 PCTool manual.

For more information about procedures to connect PROFIBUS-DP transmission lines to the PBUS66-Z terminal block, please refer to the “**PBUS66-Z Operating Manual**”.

In order to communicate with the PROFIBUS master station, the VF66B inverter configuration parameters shown in the following table must be set. Please also refer to the “**PBUS66-Z Operating Manual**”, the VF66B inverter manual and the applicable master station manual.

Table 3.1 PROFIBUS-DP Communication Settings

Console Display	Contents	Configuration Range (Item Selection)	Default Setting	Rewriting During Operation
J-00	Digital communication option selection	0: Communication option not used 4: PBUS66-Z used 1-3, 5-7: Set when using other options	0	×
J-03	PBUS66-Z slave station address	0 to 126	2	×
J-08	PBUS66-Z communication mode selection	0: Mode 0, PROFIDRIVE compatible mode 1: Mode 1, Original mode 2: Mode 2, Special mode (disabled)	0	×

*** Turn the inverter power OFF and then ON again after any of these settings are changed.**

With the PBUS66-Z, the data configuration of the communication frames handled by PROFIBUS-DP communication varies depending on whether the built-in PLC function is used or not. Use or nonuse of the built-in PLC function can be set with the VF66B inverter configuration parameters (i-area) as shown in the following table. For more information, please refer to the VF66B inverter manual. For information about the built-in PLC function, please refer to the VF66 PCTool manual.

Table 3.2 Built-in PLC Function Usage Selection

Console Display	Contents	Item Selection	Default Setting	Rewriting During Operation
i-00	PLCL function usage selection	OFF (Disabled) ON (Enabled)	OFF	×
i-01	PLCH function usage selection	0: OFF (Disabled) 1: PLCH ON 2: LCH ON (Speed command input is set as PLCH output)	0	×

To enable various commands communicated to the VF66B inverter, the inverter configuration parameters shown in the following table must be correctly set. To enable the operation control signal, forward operation terminal “ST-F” on the VFC66-Z terminal block TB1 of the VF66B inverter control circuit board must be turned ON. For more information, please refer to the VF66B inverter manual.

Table 3.3 Input Position Selection Settings For Various Commands

Console Display	Contents	Configuration Range (Item Selection)	Default Setting	Rewriting During Operation
b-09	Command input position selection for interlocking	0: Terminal block 1: Console (SET66-Z) 2: Digital communication option	1	×
b-10	Rotation speed command input position selection(*1)	0: Interlocking 1: Analog Input (1) [Terminal block] (AIN1) 2: Console (SET66-Z) 3: Digital communication option 4: Analog Input (2) [IO66-Z option or digital communication optional terminal block] (AIN2) 5: (For external optional expansions) 6: Analog Input (3) [IO66-Z optional terminal block] (AIN3) 7: Built-in PLC	0	×
b-11	Operation command input position selection	0: Interlocking 1: Terminal block 2: Console (SET66-Z) 3: Digital communication option	0	×
b-12	Jog command input position selection	0: Interlocking 1: Terminal block 2: Console (SET66-Z) 3: Digital communication option	0	×
i-07	Operation mode selection(*2)	0: Speed control (ASR) mode 1: Torque command minus (-) direction priority 2: Torque command plus (+) direction priority 3: Torque control (ATR) mode 4: Speed/torque control contact switching	0	×
i-08	Torque command input position selection(*2)	0: Analog Input (1) [VFC66-Z terminal block] (AIN1) 1: Analog Input (2) [IO66-Z, digital communication optional terminal block] (AIN2) 2: Digital communication option 3: Built-in PLC output	1	×
J-14	Time/date data selection from communication	0: Without time/date data 1: With time/date data	0	×

(*1) If the inverter is in V/f mode, this becomes “Frequency command input position selection”.

(*2) If the inverter is in V/f mode, this is disabled.

To enable multifunction input by communication, the PLCL function must be disabled and the multifunction input position selection parameter must be set to the “digital communication option” as shown in the following table. For more information, please refer to the VF66B inverter manual.

Table 3.4 Multifunction Input Position Selection

Console Display	Contents	Item Selection	Default Setting	Rewriting During Operation
c-00	Multifunction input position selection	0: Terminal block (Multifunction input via terminal block) 1: Digital communication option (Multifunction input via communication option)	0	×

3.2 PROFIDRIVE Compatible Mode

PROFIDRIVE compatible mode conforms to PPO-Type 1 to 5 defined in the PROFIDRIVE Profile.
An outline of each type is provided as follows.
In this mode, each master input and output data has the same number of words.

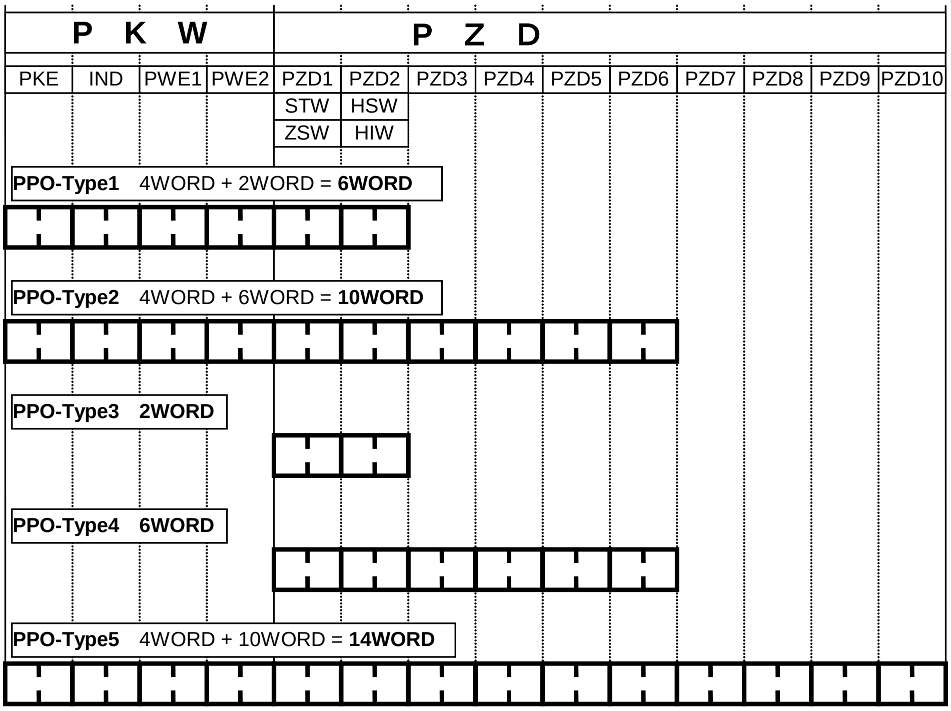
P K W
P Z D
PKE
IND
PWE1
PWE2
PZD1
PZD2
PZD3
PZD4
PZD5
PZD6
PZD7
PZD8
PZD9
PZD10
STW
HSW
ZSW
HIW
PPO-Type1 4WORD + 2WORD = 6WORD
PPO-Type2 4WORD + 6WORD = 10WORD
PPO-Type3 2WORD
PPO-Type4 6WORD
PPO-Type5 4WORD + 10WORD = 14WORD

Figure 3.1 PPO–Type Configurations

PPO–Type settings are determined from configuration data sent from the master.

With the PBUS66-Z, in order to change a pre-set PPO–Type, it is necessary to turn off the inverter power supply, turn the power back on, and set up with new configuration data sent from the master.

In the above frame configuration table, PKW is used for reading and writing of the inverter internal parameter data.
The data length for the PKW part is fixed at 4 words. (For more information, please refer to Section 3.7.)
Since PPO–Type 3 and 4 do not have a PKW part, reading and writing of inverter internal parameter data cannot be performed using communication.
The PZD part consists of communication data cyclically exchanged between the master and slave.
PZD1 and 2 carry special meanings. PZD1 is bit data called “control word” or “status word”. PZD2 indicates a set value or actual value.
For example, with the above mentioned PPO–Type 1, PKW = 4 words + PZD = 2 words for a total of 6 words are exchanged between the master and slave.

	P K W (ParameterID/Value)				P Z D (Process data)									
	PKE	IND	PWE1	PWE2	PZD1 STW ZSW	PZD2 HSW HIW	PZD3	PZD4	PZD5	PZD6	PZD7	PZD8	PZD9	PZD10
PPO-Type1 6WORD														
Master Output	ID+PNU	Sub index	Not used	Parameter value	Control word	Speed Command (Input Register 1)								
Master Input	ID+PNU	Sub index	Not used	Parameter value	Status word	Motor Speed (Output Register 1)								
PPO-Type2 10WORD														
Master Output	ID+PNU	Sub index	Not used	Parameter value	Control word	Speed Command (Input Register 1)	Torque Command (Input Register 2)	Month, Day (Input Register 3)	Hour, Minute (Input Register 4)	Not Used (Input Register 5)				
Master Input	ID+PNU	Sub index	Not used	Parameter value	Status word	Motor Speed (Output Register 1)	ARC Output (Output Register 2)	Actual Current (Output Register 3)	Torque Command Value (Output Register 4)	DC Voltage (Output Register 5)				
PPO-Type3 2WORD														
Master Output					Control word	Speed Command (Input Register 1)								
Master Input					Status word	Motor Speed (Output Register 1)								
PPO-Type4 6WORD														
Master Output					Control word	Speed Command (Input Register 1)	Torque Command (Input Register 2)	Month, Day (Input Register 3)	Hour, Minute (Input Register 4)	Not Used (Input Register 5)				
Master Input					Status word	Motor Speed (Output Register 1)	ARC Output (Output Register 2)	Actual Current (Output Register 3)	Torque Command Value (Output Register 4)	DC Voltage (Output Register 5)				
PPO-Type5 14WORD														
Master Output	ID+PNU	Sub index	Not used	Parameter value	Control word	Speed Command (Input Register 1)	Torque Command (Input Register 2)	Month, Day (Input Register 3)	Hour, Minute (Input Register 4)	Not Used (Input Register 5)	Not Used (Input Register 6)	Not Used (Input Register 7)	Control, Multifunction Input 1	Multifunction Input 2
Master Input	ID+PNU	Sub index	Not used	Parameter value	Status word	Motor Speed (Output Register 1)	ARC Output (Output Register 2)	Actual Current (Output Register 3)	Torque Command Value (Output Register 4)	DC Voltage (Output Register 5)	Status Flag	Fault Flag 1	Fault Flag 2	Multifunction Output

Items contained within parentheses are used when the built-in PLC function is enabled.

Figure 3.2 Each PPO–Type Communication Frame (Mode 0)

3.2.1 Mode 0 PPO–Type 1 Communication Frame

PPO–Type1 configuration data: 0xF3, 0xF1 (4 + 2 words IN/OUT)

■ Built-in PLC Function Not Used

Master Transmitting Data (Master → Slave) 6 words

Byte	Contents (PPO-Type 1, PLCH: OFF)
+0	PKE (L)
+1	PKE (H)
+2	IND (L)
+3	IND (H)
+4	PWE1 (L)
+5	PWE1 (H)
+6	PWE2 (L)
+7	PWE2 (H)
+8	Control Word (L)
+9	Control Word (H)
+10	Speed Command (L)
+11	Speed Command (H)

The leading 4WORD is the PKW part.
It is used for reading and writing the inverter internal parameters.
This is further explained in Section 3.7.

←More information can be found in Section 3.4.

←20000/Maximum rotation speed (A-00)
(Frequency command when in V/f mode)

Master Receiving Data (Slave → Master) 6 words

Byte	Contents (PPO-Type 1, PLCH: OFF)
+0	PKE (L)
+1	PKE (H)
+2	IND (L)
+3	IND (H)
+4	PWE1 (L)
+5	PWE1 (H)
+6	PWE2 (L)
+7	PWE2 (H)
+8	Status Word (L)
+9	Status Word (H)
+10	Motor Speed (L)
+11	Motor Speed (H)

The leading 4WORD is the PKW part.
It is used for reading and writing the inverter internal parameters.
This is further explained in Section 3.7.

←More information can be found in Section 3.4.

←20000/Maximum rotation speed (A-00)
(Frequency command when in V/f mode)

3.2.1 Mode 0 PPO–Type 1 Communication Frame (Continued)

■ Built-in PLC Function Used

Master Transmitting Data (Master → Slave) 6 words

Relative Byte	Contents (PPO-Type 1, PLCH: ON)
+0	PKE (L)
+1	PKE (H)
+2	IND (L)
+3	IND (H)
+4	PWE1 (L)
+5	PWE1 (H)
+6	PWE2 (L)
+7	PWE2 (H)
+8	Control Word (L)
+9	Control Word (H)
+10	i00010 (L)
+11	i00010 (H)

The leading 4WORD is the PKW part.
It is used for reading and writing the inverter internal parameters.
This is further explained in Section 3.7.

← More information can be found in Section 3.4.

← Communication input register 1*

* CAUTION: There may be cases where i00010 is cleared to zero by the control word.
For more information, please refer to the CAUTION notes on Page 31.

Master Receiving Data (Slave → Master) 6 words

Relative Byte	Contents (PPO-Type 1, PLCH: ON)
+0	PKE (L)
+1	PKE (H)
+2	IND (L)
+3	IND (H)
+4	PWE1 (L)
+5	PWE1 (H)
+6	PWE2 (L)
+7	PWE2 (H)
+8	Status Word (L)
+9	Status Word (H)
+10	o00010 (L)
+11	o00010 (H)

The leading 4WORD is the PKW part.
It is used for reading and writing the inverter internal parameters.
This is further explained in Section 3.7.

← More information can be found in Section 3.4.

← Communication output register 1

3.2.2 Mode 0 PPO–Type 2 Communication Frame

PPO–Type2 configuration data: 0xF3, 0xF5 (4 + 6 words IN/OUT)

■ Built-in PLC Function Not Used

Master Transmitting Data (Master → Slave) 10 words

Relative Byte	Contents (PPO-Type 2, PLCH: OFF)	
+0	PKE (L)	The leading 4 words are the PKW part. It is used for reading and writing the inverter internal parameters. This is further explained in Section 3.7.
+1	PKE (H)	
+2	IND (L)	
+3	IND (H)	
+4	PWE1 (L)	
+5	PWE1 (H)	
+6	PWE2 (L)	
+7	PWE2 (H)	
+8	Control Word (L)	← More information can be found in Section 3.4.
+9	Control Word (H)	
+10	Speed Command (L)	← 20000/Maximum rotation speed (A-00)
+11	Speed Command (H)	(Frequency command when in V/f mode)
+12	Torque Command (L)	← 5000/Rated torque
+13	Torque Command (H)	
+14	Month – Day (L)	← Day setting 1-31 [Day]
+15	Month – Day (H)	← Month setting 1-12 [Month]
+16	Hour - Minute (L)	← Minute setting 0-59 [Minute]
+17	Hour - Minute (H)	← Hour setting 0-23 [Hour]
+18	–	← Not used
+19	–	

Master Receiving Data (Slave → Master) 10 words

Relative Byte	Contents (PPO-Type 2, PLCH: OFF)	
+0	PKE (L)	The leading 4 words are the PKW part. It is used for reading and writing the inverter internal parameters. This is further explained in Section 3.7.
+1	PKE (H)	
+2	IND (L)	
+3	IND (H)	
+4	PWE1 (L)	
+5	PWE1 (H)	
+6	PWE2 (L)	
+7	PWE2 (H)	
+8	Status Word (L)	← More information can be found in Section 3.4.
+9	Status Word (H)	
+10	Motor Speed (L)	← 20000/Maximum rotation speed (A-00)
+11	Motor Speed (H)	(Output Frequency when in V/f mode)
+12	ARC Output (L)	← 20000/Maximum rotation speed (A-00)
+13	ARC Output (H)	
+14	Actual Current Value (L)	← 10000/100%
+15	Actual Current Value (H)	
+16	Torque Command Value (L)	← 5000/Rated value
+17	Torque Command Value (H)	(Operation torque when in V/f mode)
+18	DC Voltage (L)	← 200V system: Vdc × 10, 400V system: Vdc × 5
+19	DC Voltage (H)	

* The 100% value is the value of the inverter rated current (A) multiplied by the gain shown in Table 3.15.

3.2.2 Mode 0 PPO–Type 2 Communication Frame (Continued)

■ Built-in PLC Function Used

Master Transmitting Data (Master → Slave) 10 words

Relative Byte	Contents (PPO-Type 2, PLCH: ON)	
+0	PKE (L)	The leading 4 words are the PKW part. It is used for reading and writing the inverter internal parameters. This is further explained in Section 3.7.
+1	PKE (H)	
+2	IND (L)	
+3	IND (H)	
+4	PWE1 (L)	
+5	PWE1 (H)	
+6	PWE2 (L)	
+7	PWE2 (H)	
+8	Control Word (L)	← More information can be found in Section 3.4.
+9	Control Word (H)	
+10	i00010 (L)	← Communication input register 1*
+11	i00010 (H)	
+12	i00011 (L)	← Communication input register 2
+13	i00011 (H)	
+14	i00012 (L)	← Communication input register 3
+15	i00012 (H)	
+16	i00013 (L)	← Communication input register 4
+17	i00013 (H)	
+18	i00014 (L)	← Communication input register 5
+19	i00014 (H)	

* CAUTION: There may be cases where i00010 is cleared to zero by the control word.
For more information, please refer to the CAUTION notes on Page 31.

Master Receiving Data (Slave → Master) 10 words

Relative Byte	Contents (PPO-Type 2, PLCH: ON)	
+0	PKE (L)	The leading 4 words are the PKW part. It is used for reading and writing the inverter internal parameters. This is further explained in Section 3.7.
+1	PKE (H)	
+2	IND (L)	
+3	IND (H)	
+4	PWE1 (L)	
+5	PWE1 (H)	
+6	PWE2 (L)	
+7	PWE2 (H)	
+8	Status Word (L)	← More information can be found in Section 3.4.
+9	Status Word (H)	
+10	o00010 (L)	← Communication output register 1*
+11	o00010 (H)	
+12	o00011 (L)	← Communication output register 2
+13	o00011 (H)	
+14	o00012 (L)	← Communication output register 3
+15	o00012 (H)	
+16	o00013 (L)	← Communication output register 4
+17	o00013 (H)	
+18	o00014 (L)	← Communication output register 5
+19	o00014 (H)	

3.2.3 Mode 0 PPO–Type 3 Communication Frame

PPO–Type3 configuration data: 0xF1 (2 words IN/OUT)

■ Built-in PLC Function Not Used

Master Transmitting Data (Master → Slave) 2 words

Relative Byte	Contents (PPO-Type 3, PLCH: OFF)
+0	Control Word (L)
+1	Control Word (H)
+2	Speed Command (L)
+3	Speed Command (H)

← More information can be found in Section 3.4.

← 20000/Maximum rotation speed (A-00)
(Frequency command when in V/f mode)

Master Receiving Data (Slave → Master) 2 words

Relative Byte	Contents (PPO-Type 3, PLCH: OFF)
+0	Status Word (L)
+1	Status Word (H)
+2	Motor Speed (L)
+3	Motor Speed (H)

← More information can be found in Section 3.4.

← 20000/Maximum rotation speed (A-00)
(Output Frequency when in V/f mode)

■ Built-in PLC Function Used

Master Transmitting Data (Master → Slave) 2 words

Relative Byte	Contents (PPO-Type 3, PLCH: ON)
+0	Control Word (L)
+1	Control Word (H)
+2	i00010 (L)
+3	i00010 (H)

← More information can be found in Section 3.4.

← Communication input register 1

* CAUTION: There may be cases where i00010 is cleared to zero by the control word.
For more information, please refer to the CAUTION notes on Page 31.

Master Receiving Data (Slave → Master) 2 words

Relative Byte	Relative Byte
+0	Status Word (L)
+1	Status Word (H)
+2	o00010 (L)
+3	o00010 (H)

← More information can be found in Section 3.4.

← Communication output register 1

3.2.4 Mode 0 PPO–Type 4 Communication Frame

PPO–Type4 configuration data: 0xF5 (6 words IN/OUT)

■ Built-in PLC Function Not Used

Master Transmitting Data (Master → Slave) 6 words

Relative Byte	Contents (PPO-Type 4, PLCH: OFF)	
+0	Control Word (L)	← More information can be found in Section 3.4.
+1	Control Word (H)	
+2	Speed Command (L)	← 20000/Maximum rotation speed (A-00)
+3	Speed Command (H)	(Frequency command when in V/f mode)
+4	Torque Command (L)	← 5000/Rated torque
+5	Torque Command (H)	
+6	Month – Day (L)	← Day setting 1-31 [Day]
+7	Month – Day (H)	← Month setting 1-12 [Month]
+8	Hour - Minute (L)	← Minute setting 0-59 [Minute]
+9	Hour - Minute (H)	← Hour setting 0-23 [Hour]
+10	—	← Not used
+11	—	

Master Receiving Data (Slave → Master) 6 words

Relative Byte	Contents (PPO-Type 4, PLCH: OFF)	
+0	Status Word (L)	← More information can be found in Section 3.4.
+1	Status Word (H)	
+2	Motor Speed (L)	← 20000/Maximum rotation speed (A-00)
+3	Motor Speed (H)	(Output Frequency when in V/f mode)
+4	ARC Output (L)	← 20000/Maximum rotation speed (A-00)
+5	ARC Output (H)	
+6	Actual Current Value (L)	← 10000/100%*
+7	Actual Current Value (H)	
+8	Torque Command Value (L)	← 5000/Rated value
+9	Torque Command Value (H)	(Calculated torque when in V/f mode)
+10	DC Voltage (L)	← 200V system: Vdc × 10, 400V system: Vdc × 5
+11	DC Voltage (H)	

* The 100% value is the value of the inverter rated current (A) multiplied by the gain shown in Table 3.15.

3.2.4 Mode 0 PPO–Type 4 Communication Frame (Continued)

■ Built-in PLC Function Used

Master Transmitting Data (Master → Slave) 6 words

Relative Byte	Contents (PPO-Type 4, PLCH: ON)	
+0	Control Word (L)	← More information can be found in Section 3.4.
+1	Control Word (H)	
+2	i00010 (L)	← Communication input register 1*
+3	i00010 (H)	
+4	i00011 (L)	← Communication input register 2
+5	i00011 (H)	
+6	i00012 (L)	← Communication input register 3
+7	i00012 (H)	
+8	i00013 (L)	← Communication input register 4
+9	i00013 (H)	
+10	i00014 (L)	← Communication input register 5
+11	i00014 (H)	

* CAUTION: There may be cases where i00010 is cleared to zero by the control word.
For more information, please refer to the CAUTION notes on Page 31.

Master Receiving Data (Slave → Master) 6 words

Relative Byte	Contents (PPO-Type 4, PLCH: ON)	
+0	Status Word (L)	More information can be found in Section 3.4.
+1	Status Word (H)	
+2	o00010 (L)	← Communication output register 1
+3	o00010 (H)	
+4	o00011 (L)	← Communication output register 2
+5	o00011 (H)	
+6	o00012 (L)	← Communication output register 3
+7	o00012 (H)	
+8	o00013 (L)	← Communication output register 4
+9	o00013 (H)	
+10	o00014 (L)	← Communication output register 5
+11	o00014 (H)	

3.2.5 Mode 0 PPO–Type 5 Communication Frame

PPO–Type 5 configuration data: 0xF3, 0xF9 (4 + 10 words IN/OUT)

■ Built-in PLC Function Not Used

Master Transmitting Data (Master → Slave) 14 words

Relative Byte	Contents (PPO-Type 5, PLCH: OFF)	
+0	PKE (L)	The leading 4 words are the PKW part. It is used for reading and writing the inverter internal parameters. This is further explained in Section 3.7.
+1	PKE (H)	
+2	IND (L)	
+3	IND (H)	
+4	PWE1 (L)	
+5	PWE1 (H)	
+6	PWE2 (L)	
+7	PWE2 (H)	
+8	Control Word (L)	← More information can be found in Section 3.4.
+9	Control Word (H)	
+10	Speed Command (L)	← 20000/Maximum rotation speed (A-00) (Frequency command when in V/f mode)
+11	Speed Command (H)	
+12	Torque Command (L)	← 5000/Rated torque
+13	Torque Command (H)	
+14	Month – Day (L)	← Day setting 1-31 [Day]
+15	Month – Day (H)	← Month setting 1-12 [Month]
+16	Hour - Minute (L)	← Minute setting 0-59 [Minute]
+17	Hour - Minute (H)	← Hour setting 0-23 [Hour]
+18	—	← Not used
+19	—	
+20	—	← Not used
+21	—	
+22	—	← Not used
+23	—	
+24	Operation Command / Multifunction Input 1 (L)	Bit data More information can be found in Section 3.5.
+25	Operation Command / Multifunction Input 1 (H)	
+26	Multifunction Input 2 (L)	
+27	Multifunction Input 2 (H)	

3.2.5 Mode 0 PPO–Type 5 Communication Frame (Continued)

■ Built-in PLC Function Not Used (Continued)

Master Receiving Data (Slave → Master) 14 words

Relative Byte	Contents (PPO-Type 5, PLCH: OFF)	
+0	PKE (L)	The leading 4 words are the PKW part. It is used for reading and writing the inverter internal parameters. This is further explained in Section 3.7.
+1	PKE (H)	
+2	IND (L)	
+3	IND (H)	
+4	PWE1 (L)	
+5	PWE1 (H)	
+6	PWE2 (L)	
+7	PWE2 (H)	
+8	Status Word (L)	← More information can be found in Section 3.4.
+9	Status Word (H)	
+10	Motor Speed (L)	← 20000/Maximum rotation speed (A-00)
+11	Motor Speed (H)	(Output Frequency when in V/f mode)
+12	ARC Output (L)	← 20000/Maximum rotation speed (A-00)
+13	ARC Output (H)	
+14	Actual Current Value (L)	← 10000/100%*
+15	Actual Current Value (H)	
+16	Torque Command Value (L)	← 5000/Rated value
+17	Torque Command Value (H)	(Operation torque when in V/f mode)
+18	DC Voltage (L)	← 200V system: Vdc × 10, 400V system: Vdc × 5
+19	DC Voltage (H)	
+20	Status Flag (L)	Bit data More information can be found in Section 3.5.
+21	Status Flag (H)	
+22	Fault Flag 1 (L)	
+23	Fault Flag 1 (H)	
+24	Fault Flag 2 (L)	
+25	Fault Flag 2 (H)	
+26	Multifunction Output (L)	
+27	Multifunction Output (H)	

* The 100% value is the value of the inverter rated current (A) multiplied by the gain shown in Table 3.15.

3.2.5 Mode 0 PPO–Type 5 Communication Frame (Continued)

■ Built-in PLC Function Used

Master Transmitting Data (Master → Slave) 14 words

Relative Byte	Contents (PPO-Type 5, PLCH: ON)	
+0	PKE (L)	The leading 4 words are the PKW part. It is used for reading and writing the inverter internal parameters. This is further explained in Section 3.7.
+1	PKE (H)	
+2	IND (L)	
+3	IND (H)	
+4	PWE1 (L)	
+5	PWE1 (H)	
+6	PWE2 (L)	
+7	PWE2 (H)	
+8	Control Word (L)	← More information can be found in Section 3.4.
+9	Control Word (H)	
+10	ｉ００１０ (L)	← Communication input register 1*
+11	ｉ００１０ (H)	
+12	ｉ００１１ (L)	← Communication input register 2
+13	ｉ００１１ (H)	
+14	ｉ００１２ (L)	← Communication input register 3
+15	ｉ００１２ (H)	
+16	ｉ００１３ (L)	← Communication input register 4
+17	ｉ００１３ (H)	
+18	ｉ００１４ (L)	← Communication input register 5
+19	ｉ００１４ (H)	
+20	ｉ００１５ (L)	← Communication input register 6
+21	ｉ００１５ (H)	
+22	ｉ００１６ (L)	← Communication input register 7
+23	ｉ００１６ (H)	
+24	Operation Command / Multifunction Input 1 (L)	Bit data More information can be found in Section 3.5.
+25	Operation Command / Multifunction Input 1 (H)	
+26	Multifunction Input 2 (L)	
+27	Multifunction Input 2 (H)	

* CAUTION: There may be cases where i00010 is cleared to zero by the control word.
For more information, please refer to the CAUTION notes on Page 31.

3.2.5 Mode 0 PPO–Type 5 Communication Frame (Continued)

■ Built-in PLC Function Used (Continued)

Master Receiving Data (Slave → Master) 14 words

Rela-tive Byte	Contents (PPO-Type 5, PLCH: ON)	
+0	PKE (L)	The leading 4 words are the PKW part. It is used for reading and writing the inverter interna parameters. This is further explained in Section 3.7.
+1	PKE (H)	
+2	IND (L)	
+3	IND (H)	
+4	PWE1 (L)	
+5	PWE1 (H)	
+6	PWE2 (L)	
+7	PWE2 (H)	
+8	Status Word (L)	← More information can be found in Section 3.4.
+9	Status Word (H)	
+10	o00010 (L)	← Communication output register 1
+11	o00010 (H)	
+12	o00011 (L)	← Communication output register 2
+13	o00011 (H)	
+14	o00012 (L)	← Communication output register 3
+15	o00012 (H)	
+16	o00013 (L)	← Communication output register 4
+17	o00013 (H)	
+18	o00014 (L)	← Communication output register 5
+19	o00014 (H)	
+20	Status Flag (L)	Bit data More information can be found in Section 3.5.
+21	Status Flag (H)	
+22	Fault Flag 1 (L)	
+23	Fault Flag 1 (H)	
+24	Fault Flag 2 (L)	
+25	Fault Flag 2 (H)	
+26	Multifunction Output (L)	
+27	Multifunction Output (H)	

3.3 Original Mode

3.3.1 Mode 1 Communication Frame

Configuration data: 0xE9, 0xDF, 0xD1 (Output 10 words, Input 18 words)

■ Built-in PLC Function Not Used

Master Transmitting Data (Master → Slave) 10 words

Relative Byte	Contents (Mode 1, PLCH: OFF)	
+0	PKE (L)	
+1	PKE (H)	
+2	IND (L)	
+3	IND (H)	The leading 4 words are the PKW part.
+4	PWE1 (L)	It is used for reading and writing the inverter interna parameters.
+5	PWE1 (H)	This is further explained in Section 3.7.
+6	PWE2 (L)	
+7	PWE2 (H)	
+8	Operation Command / Multifunction Input 1 (L)	
+9	Operation Command / Multifunction Input 1 (H)	Bit data
+10	Multifunction Input 2 (L)	More information can be found in Section 3.5.
+11	Multifunction Input 2 (H)	
+12	Speed Command (L)	← 20000/Maximum rotation speed (A-00)
+13	Speed Command (H)	(Frequency command when in V/f mode)
+14	Torque Command (L)	← 5000/Rated torque
+15	Torque Command (H)	
+16	Month – Day (L)	← Day setting 1-31 [Day]
+17	Month – Day (H)	← Month setting 1-12 [Month]
+18	Hour - Minute (L)	← Minute setting 0-59 [Minute]
+19	Hour - Minute (H)	← Hour setting 0-3 [Hour]

3.3.1 Mode 1 Communication Frame (Continued)

■ Built-in PLC Function Not Used (Continued)

Master Receiving Data (Slave → Master) 18 words

Relative Byte	Contents (Mode 1, PLCH: OFF)	
+0	PKE (L)	The leading 4 words are the PKW part. It is used for reading and writing the inverter interna parameters. This is further explained in Section 3.7.
+1	PKE (H)	
+2	IND (L)	
+3	IND (H)	
+4	PWE1 (L)	
+5	PWE1 (H)	
+6	PWE2 (L)	
+7	PWE2 (H)	
+8	Status Flag (L)	Bit data. More information can be found in Section 3.5.
+9	Status Flag (H)	
+10	Fault Flag 1 (L)	
+11	Fault Flag 1 (H)	
+12	Fault Flag 2 (L)	
+13	Fault Flag 2 (H)	
+14	Multifunction Output (L)	
+15	Multifunction Output (H)	
+16	Motor Speed (L)	← 20000/Maximum rotation speed (A-00)
+17	Motor Speed (H)	(Output Frequency when in V/f mode)
+18	ARC Output (L)	← 20000/Maximum rotation speed (A-00)
+19	ARC Output (H)	
+20	Actual Current Value (L)	← 10000/100%*
+21	Actual Current Value (H)	
+22	Torque Command Value (L)	← 5000/Rated value
+23	Torque Command Value (H)	(Operation torque when in V/f mode)
+24	DC Voltage (L)	← 200V system: Vdc × 10, 400V system: Vdc × 5
+25	DC Voltage (H)	
+26	Output Voltage (L)	← 200V system: Vo × 20, 400V system: Vo × 10
+27	Output Voltage (H)	
+28	Output Frequency (L)	← 20000/Maximum rotation speed (A-00)
+29	Output Frequency (H)	
+30	OL Pre-counter (L)	← OL protection operation at 10000
+31	OL Pre-counter (H)	
+32	Motor Temperature (L)	← 10/1°C (When using temperature detector option)
+33	Motor Temperature (H)	
+34	Motor Magnetic Flux (L)	← 1024/Rated value
+35	Motor Magnetic Flux (H)	

* The 100% value is the value of the inverter rated current (A) multiplied by the gain shown in Table 3.15.

3.3.1 Mode 1 Communication Frame (Continued)

Configuration data: 0xEF, 0xDF, 0xD6 (Output 16 words, Input 23 words)

■ Built-in PLC Function Used

Master Transmitting Data (Master → Slave) 16 words

Relative Byte	Contents (Mode 1, PLCH: ON)	
+0	PKE (L)	The leading 4 words are the PKW part. It is used for reading and writing the inverter interna parameters. This is further explained in Section 3.7.
+1	PKE (H)	
+2	IND (L)	
+3	IND (H)	
+4	PWE1 (L)	
+5	PWE1 (H)	
+6	PWE2 (L)	
+7	PWE2 (H)	
+8	Operation Command / Multifunction Input 1 (L)	Bit data More information can be found in Section 3.5.
+9	Operation Command / Multifunction Input 1 (H)	
+10	Multifunction Input 2 (L)	
+11	Multifunction Input 2 (H)	
+12	i00010 (L)	← Communication input register 1
+13	i00010 (H)	
+14	i00011 (L)	← Communication input register 2
+15	i00011 (H)	
+16	i00012 (L)	← Communication input register 3
+17	i00012 (H)	
+18	i00013 (L)	← Communication input register 4
+19	i00013 (H)	
+20	i00014 (L)	← Communication input register 5
+21	i00014 (H)	
+22	i00015 (L)	← Communication input register 6
+23	i00015 (H)	
+24	i00016 (L)	← Communication input register 7
+25	i00016 (H)	
+26	i00017 (L)	← Communication input register 8
+27	i00017 (H)	
+28	i00018 (L)	← Communication input register 9
+29	i00018 (H)	
+30	i00019 (L)	← Communication input register 10
+31	i00019 (H)	

3.3.1 Mode 1 Communication Frame (Continued)

■ Built-in PLC Function Used (Continued)

Master Receiving Data (Slave → Master) 23 words

Relative Byte	Contents (Mode 1, PLCH: ON)	
+0	PKE (L)	The leading 4 words are the PKW part. It is used for reading and writing the inverter interna parameters. This is further explained in Section 3.7.
+1	PKE (H)	
+2	IND (L)	
+3	IND (H)	
+4	PWE1 (L)	
+5	PWE1 (H)	
+6	PWE2 (L)	
+7	PWE2 (H)	
+8	Status Flag (L)	Bit data. More information can be found in Section 3.5.
+9	Status Flag (H)	
+10	Fault Flag 1 (L)	
+11	Fault Flag 1 (H)	
+12	Fault Flag 2 (L)	
+13	Fault Flag 2 (H)	
+14	Multifunction Output (L)	
+15	Multifunction Output (H)	
+16	o00010 (L)	← Communication output register 1
+17	o00010 (H)	
+18	o00011 (L)	← Communication output register 2
+19	o00011 (H)	
+20	o00012 (L)	← Communication output register 3
+21	o00012 (H)	
+22	o00013 (L)	← Communication output register 4
+23	o00013 (H)	
+24	o00014 (L)	← Communication output register 5
+25	o00014 (H)	
+26	o00015 (L)	← Communication output register 6
+27	o00015 (H)	
+28	o00016 (L)	← Communication output register 7
+29	o00016 (H)	
+30	o00017 (L)	← Communication output register 8
+31	o00017 (H)	
+32	o00018 (L)	← Communication output register 9
+33	o00018 (H)	
+34	o00019 (L)	← Communication output register 10
+35	o00019 (H)	
+36	o0001A (L)	← Communication output register 11
+37	o0001A (H)	
+38	o0001B (L)	← Communication output register 12
+39	o0001B (H)	
+40	o0001C (L)	← Communication output register 13
+41	o0001C (H)	
+42	o0001D (L)	← Communication output register 14
+43	o0001D (H)	
+44	o0001E (L)	← Communication output register 15
+45	o0001E (H)	

3.4 Control/Status Word

Note: The PBUS66-Z only corresponds to "speed control mode" of the control (status) word, established in the PROFIDRIVE Profile. (It does not correspond to "Positioning mode")

3.4.1 Explanation of Control Word (Master → Slave)

Table 3.5 Control Word

Bit	Value	Meaning	Explanation	Notes
0	1	ON	Power ON (Operation permitted in the case of VF66B)	
	0	OFF1	STOP in the case of VF66B	"Free stop" in the case of torque control
1	1	Operation Possible		
	0	OFF2	"Free stop" in the case of VF66B (Emergency stop) *** Note 1**	
2	1	Operation Possible		
	0	OFF3	"Quick stop" in the case of VF66B ***Note 2**	"Free stop" in the case of torque control
3	1	Operation	RUN	
	0	Operation Prohibited	STOP	
4	1	Operation Possible		
	0	Ramp-Function Prohibited	ARC output is set to "0" ***Note 3**	In the case of torque control, this command is ignored.
5	1	Ramp-Function Enabled		
	0	Ramp-Function Stopped	ARC output is stopped at the current value ***Note 4**	In the case of torque control, this command is ignored.
6	1	Set Value Enabled		
	0	Set Value Prohibited	The set value is changed to "0"	In the case of torque control, this command is ignored.
7	1	Acknowledge	The fault signal from the slave is acknowledged	
	0			
8	1	Jog 1 ON	Forward inching (Jog)	Enabled only when bit 4, 5 and 6 is "0"
	0	Jog 1 OFF		
9	1	Jog 2 ON	Reverse inching (Jog)	Enabled only when bit 4, 5 and 6 is "0"
	0	Jog 2 OFF		
10	1	Master Command Enabled	Command from the master is enabled	
	0	Master Command Disabled	Command from the master is disabled Command from the previous cycle is retained	
11 12 13 14 15	Bit 11~15 not used			

*** Note 1: If c-00 is "0" (multifunction input at terminal block), or the built-in PLC function is being used, this command works the same as a regular stop.**

*** Note 2: If this command is used, the motor will be instructed to stop suddenly so be extra careful to avoid damage to connected equipment or the inverter.**
Also, when c-00 is "0", or the built-in PLC function is being used, this command works the same as a regular stop.

*** Note 3: If this command is used, the motor will be instructed to stop suddenly so be extra careful to avoid damage to connected equipment or the inverter.**
Also, when c-00 is "0", or the built-in PLC function is being used, this command works the same as a "set value prohibited" command.

*** Note 4: When c-00 is "0", or the built-in PLC function is being used, this command is ignored.**

*** Note 5: If 2 or more of each of the OFF1, OFF2 and OFF3 commands are input simultaneously, the order of priority is OFF2-OFF3-OFF1 starting at the highest one.**

3.4.2 Explanation of Status Word (Slave → Master)

Table 3.6 Status Word

Bit	Value	Meaning	Explanation	Notes
0	1	Ready to Switch On	Switch ON (control word bit 0 is “1”) is possible	
	0	Not Ready to Switch On	Switch ON (control word bit 0 is “1”) is not possible	
1	1	Ready	Preparation completed (Operation possible)	
	0	Not ready	Operation is not possible	
2	1	Operation	Running	
	0	Not In Operation	Stopped	
3	1	Fault	Under protection operation	
	0	No Fault		
4	1	No OFF2		
	0	OFF2	OFF2 state	
5	1	No OFF3		
	0	OFF3	OFF3 state	
6	1	Switch On Inhibit	Cancelled by OFF1, and then ON	
	0			
7	1	Alarm	Alarm present	
	0	No Alarm		
8	1	Set Value - Actual Value Within Tolerance Range		In the case of torque control, it is not used.
	0	Set Value - Actual Value Outside Tolerance Range	Actual value does not become the set value within a specified amount of time	In the case of torque control, it is not used.
9	1	Control Request	Command from master is enabled	
	0	Local Operation	Local operation state	
10	1	Speed Set Value Reached		In the case of torque control, it is not used.
	0	Speed Set Value Not Reached		In the case of torque control, it is not used.
11 12 13 14 15	Bit 11~15 not used			

3.4.3 PROFIDRIVE (Control Word) Operating Procedure

The following is an extract from the PROFIDRIVE Profile. For more information, please refer to the PROFIDRIVE Profile.

■ Operation Command

Firstly, the [XXXX X1XX XXXX X110] OFF1 Command control word is transmitted from the master to the slave.
(X is set as either "0" or "1" depending on circumstances.)
The slave enters the "Ready to switch on" state.
Then, by setting Bit 0 to "1" [XXXX X1XX XXXX X111], the slave enters the "Ready" state. After that, by setting Bit 3 to "1", it enters a state of operation.

CAUTION: If Bit 3 = 1 during an OFF1 command [XXXX X1XX XXXX 1110], operation will commence the instant Bit 0 changes to "1" so please exercise caution.

■ JOG Command

In the above-mentioned operation command state, when the value of Bit 4, 5 and 6 are "0" and Bit 8 or Bit 9 is "1", a Jog command will commence.
With the PBUS66-Z, when both Bit 8 and 9 are "1", priority is given to Bit 8.

■ Fault State Acknowledgement

When the inverter starts protection operation and enters a fault state (status word Bit 3 = 1), the master acknowledges the fault by setting the "fault acknowledge" bit (Bit7) from 0 to 1.
If the inverter protection state is canceled after fault acknowledgement, fault state (status word Bit 3 = 1) is cancelled and operation is resumed by the procedure shown in the following clause.

■ Resuming Operation From a Special State

After the inverter is stopped by the OFF2 or OFF3 command, or when protection operation is canceled and fault bit cleared after fault acknowledgement, the slave enters the "Switch-on-inhibit" special state. In order to cancel this state and resume operation, it is necessary to enter the OFF1 state [XXXX X1XX XXXX X110] once. Note that while in the "Switch-on- inhibit" state, the inverter will not operate even if an operation command is input.

CAUTION:

- When using the built-in PLC function in Mode 0, the value of i00010 will be cleared to "0" if the control word is in any of the following states:
    - OFF1, OFF2 or OFF3 state
    - Ramp-Function Prohibited state
    - Set Value Prohibited state

3.5 Operation Command / Status Flag / Fault Flag / Multifunction Input and Output

3.5.1 Master Output (Input to Inverter)

■ Operation Command / Multifunction Input 1

Table 3.7 Operation Command / Multifunction Input 1

Bit	Standard (Built-in PLC function not used)	Built-in PLC function used
0	Operation command (***Note 1**) START (1) / STOP (0)	★ <I00020>
1	Jog command (*** Note 1**) JOG(1)	★ <I00021>
2	Reverse command (*** Note 1**) Reverse (1) / Forward (0)	★ <I00022>
3	Excitation command Excit (1)	★ <I00023>
4	DC brake command DC-brake (1)	<I00024>
5	Protection reset (1) (*** Note 2**)	<I00025>
6	<Multifunction input> Preset speed selection bit 8-6 = 001: Preset speed 1, 010: Preset speed 2, 011: Preset speed 3 = 100: Preset speed 4, 101: Preset speed 5, 110: Preset speed 6 = 111: Preset speed 7, 000: Preset speed not used	<I00026>
7		<I00027>
8		<I00028>
9	<Multifunction input>Acceleration/deceleration time selection bit 10-9 = 00: Acc1/dEc1, 01: Acc2/dEc2 = 10: Acc3/dEc3, 11: Acc4/dEc4	* <I00029>
10		* <I0002A>
11	<Multifunction input> Rotation speed UP command (MRH mode) Spd.up (1)	<I0002B>
12	<Multifunction input> Rotation speed DOWN command (MRH mode) Spd.down (1)	<I0002C>
13	<Multifunction input> Rotation speed hold (1)	* <I0002D>
14	<Multifunction input> S-pattern acceleration/deceleration prohibited (1)	<I0002E>
15	<Multifunction input> Max rotation speed reduction (1)	<I0002F>

*** Note 1: Bit 0, 1 and 2 are ignored in Mode 0 (PROFIDRIVE compatible mode).**
(In Mode 0, Operation and Jog commands are input by the control word.)

*** Note 2: Input protection reset, only when there is no problem in resetting.**
If this precaution is not followed, the inverter may run out of control or break down.

*** Note 3: Note that the bits (contacts) marked with "★" or "*" are also operated from the control word in Mode 0.**

*** Note 4: The bits (contacts) marked with "★" are forced OFF at communication abnormality detection.**

■ Multifunction Input 2

Table 3.8 Multifunction Input 2

Bit	Standard (Built-in PLC function not used)	Built-in PLC function used
0	<Multifunction input> Droop control inactive (1)	<I00030>
1	<Multifunction input> Speed/torque control selection (1)	<I00031>
2	<Multifunction Input> Forward/reverse operation command selection (1)	<I00032>
3	<Multifunction input> External failure signal 1 (Protection relay 86A active) (1)	<I00033>
4	<Multifunction input> External failure signal 2 (Protection relay 86A active) (1)	<I00034>
5	<Multifunction input> External failure signal 3 (Protection relay 86A active) (1)	<I00035>
6	<Multifunction input> External failure signal 4 (Protection relay 86A active) (1)	<I00036>
7	<Multifunction input> External failure signal 1 (Protection relay 86A inactive) (1)	<I00037>
8	<Multifunction input> External failure signal 2 (Protection relay 86A inactive) (1)	<I00038>
9	<Multifunction input> External failure signal 3 (Protection relay 86A inactive) (1)	<I00039>
10	<Multifunction input> External failure signal 4 (Protection relay 86A inactive) (1)	<I0003A>
11	<Multifunction input> Trace-back external trigger (1)	<I0003B>
12	<Multifunction input> Second setting block selection (1)	<I0003C>
13	<Multifunction input> Emergency stop input (1)	* <I0003D>
14	<Multifunction input> Not used	<I0003E>
15	<Multifunction input> Rotation speed command terminal block selection (1)	<I0003F>

***Note: Note that the bits (contacts) marked with "*" are also operated from the control word in Mode 0.**

3.5.2 Master Input (Output From Inverter)

■ Inverter Status Flags

Table 3.9 Inverter Status Flags

Bit	Contents
0	Normal operation command
1	Normal operation
2	Jog operation
3	Reverse command
4	DC excitation
5	Power failure
6	Automatic measuring
7	Energization
8	Excitation
9	DC brake
10	External DB protection or communication abnormality
11	Selecting second setting block
12	External signal input 1 ON
13	External signal input 2 ON
14	External signal input 3 ON
15	External signal input 4 ON

■ Fault Flag 1

Table 3.10 Fault Flag 1

Bit	Contents
0	Over-current protection
1	IGBT protection
2	Not used (Undefined)
3	Not used (Undefined)
4	Gate PCB abnormality
5	DC part over-voltage
6	Overload protection
7	Current sensor abnormality
8	Start jam
9	Over-speed protection
10	Over-frequency protection
11	Insufficient voltage (Power failure)
12	Over-torque protection
13	Unit overheat
14	Storage memory abnormality
15	Option error

3.5.2 Master Input (Output From Inverter) (Continued)

■ Fault Flag 2

Table 3.11 Fault State Flag 2

Bit	Contents
0	Sensor-less start error
1	Communication time-out error
2	Speed control error
3	Motor overheat (When using temperature detection option)
4	Charging resistor overheat
5	FCL operation
6	Setting error
7	Open phase
8	CPU processing abnormality
9	Fan failure
10	PG error
11	Sensor error
12	External failure 1
13	External failure 2
14	External failure 3
15	External failure 4

■ Multifunction Output

Table 3.12 Multifunction Output

Bit	Standard (Built-in PLC function not used)	Built-in PLC function used
0	Not used (Undefined)	<O00040>
1	Rotation speed detection (1) (Rotation speed = Detection setting (1))	<O00041>
2	Rotation speed detection (1) (Rotation speed ≥ Detection setting (1))	<O00042>
3	Rotation speed detection (1) (Rotation speed ≤ Detection setting (1))	<O00043>
4	Rotation speed detection (2) (Rotation speed = Detection setting (2))	<O00044>
5	Rotation speed detection (2) (Rotation speed ≥ Detection setting (2))	<O00045>
6	Rotation speed detection (2) (Rotation speed ≤ Detection setting (2))	<O00046>
7	Setting attainment	<O00047>
8	Torque detection	<O00048>
9	Absolute value of torque detection	<O00049>
10	Power failure	<O0004A>
11	Overload pre-alarm	<O0004B>
12	Retrying	<O0004C>
13	In reverse	<O0004D>
14	Selecting second setting block	<O0004E>
15	Fan motor failure	<O0004F>

3.6 Diagnosis Data

PROFIBUS-DP has been designed with a “Slave_diagnostics” diagnosis data function where the slave status information is sent from the slave to the master. For the PBUS66-Z, when the slave (VF66B inverter) enters a protection state, or when the protection state is cancelled after fault acknowledgement (after protection state is cancelled for Mode 1), the external diagnosis data is updated and a diagnosis read request is submitted to the master.
The contents of the PBUS66-Z external diagnosis data are explained as follows. The diagnosis data consists of a communication frame with a unit of bytes. After turning on the inverter power, when the protection state has never yet occurred, the contents of external diagnosis data (Figure 3.3 byte number of +6 and up) are undefined. The external diagnosis data contents are cleared once the inverter power is turned off.

Diagnosis Data Contents

Relative Byte	Contents
+0	*
+1	*
+2	*
+3	*
+4	*
+5	*
+6	External data number (0 or 9)
+7	Status Flag (H)
+8	Status Flag (L)
+9	Fault Flag 1 (H)
+10	Fault Flag 1 (L)
+11	Fault Flag 2 (H)
+12	Fault Flag 2 (L)
+13	Multifunction Output (H)
+14	Multifunction Output (L)

}Defined in PROFIBUS-DP

← If this value is “0”, the data contents following it are undefined.

Figure 3.3 Diagnosis Data Configuration

3.7 Explanation of PKE Part (Inverter internal data access)

The PBUS66-Z uses 4 words from the PKW part of each communication frame to read the VF66B inverter configuration data, trace-back data, monitor information and protection history as well as to rewrite the configuration data.

The format of this PKW part is defined in the PROFIDRIVE Profile.

3.7.1 Explanation of Each Word Data

■ 1st WORD: PKE

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Contents	AK				SPM	Parameter number (PNU)										

AK: Task ID (Master Output) / Response ID (Master Input)
SPM: Not used (fixed to "0”)
PNU: Parameter Number (BIT10 0: First setting block 1: Second setting block)

Task ID (Master → Slave)
0: No command
1: Data read request
2: Data write request
6: Data read request with sub-index

Response ID (Slave → Master)
0: No response
1: Request data send
4: Request data send with sub-index
7: Error (Error code send)

Note 1: During normal operation (when there is no request), set the task ID to “0”.

Note 2: After an error response, set the task ID to “0” once, before sending a re-request.

Figure 3.4 PKE Configuration

■ 2nd WORD: IND

The sub-index number is specified. It is ignored for all task IDs except “6”.
This is used when reading trace-back data and protection history.

■ 3rd WORD: PWE1

This is not used.

■ 4th WORD: PWE2

Input and output data
This is used for input of write request values and output of read request values.
If a data read/write error occurs on the slave side, while “7” is output to the response ID, an error code is output to this frame.

Table 3.13 PWE2 Error Codes

Error Code	
0:	PNU number out of range
1:	Write request data prohibited to write
2:	Write request data out of range
3:	IND number out of range
101 (065h):	No read request data
102 (066h):	Task ID out of specification

3.7.2 Monitor Data Reading

■ Master → Slave Transmission Data

PKE: Task ID: Set to 1.
PNU: The parameter number of the monitor data to read is set.
(More information can be found in Table 3.14.)）
IND: This is ignored.
PWE1: This is ignored.
PWE2: This is ignored.

*** The master must continue transmitting data until there is a response from the slave.**

■ Slave → Master Response Data

PKE: Response ID: 1 (normal response) or 7 (error)
PNU: The parameter number of the request monitor data
IND: 0
PWE1: 0
PWE2: During processing: 0
Normal response: Requested monitor data value
Error: Error code

*** The slave continues sending the same data until the next task command comes from the master.**

Explanation of the Monitor Data PNU

Table 3.14 Monitor Data

PNU	Built-in PLC Function Not Used		Built-in PLC Function Used
Number	Contents	Scale	Contents
677(2A5h)	System Information		System Information
678(2A6h)	System Version		System Version
679(2A7h)	PBUS66-Z Version		PBUS66-Z Version
680(2A8h)	Status Flag		Status Flag
681(2A9h)	Fault Flag 1		Fault Flag 1
682(2AAh)	Fault Flag 2		Fault Flag 2
683(2ABh)	Multifunction Output		Multifunction Output
684(2ACh)	Motor Speed (Output Frequency when in V/f mode)	20000/Maximum rotation speed (A-00)	Communication output register 1 [o00010]
685(2ADh)	ARC Output	20000/Maximum rotation speed (A-00)	Communication output register 2 [o00011]
686(2AEh)	Actual Current Value	10000/100% (*3)	Communication output register 3 [o00012]
687(2AFh)	Torque Command Value (Operation torque when in V/f mode)	5000/100%	Communication output register 4 [o00013]
688(2B0h)	DC voltage	10/V(*1)	Communication output register 5 [o00014]
689(2B1h)	Output Voltage	20/V(*2)	Communication output register 6 [o00015]
690(2B2h)	Output Frequency	20000/Maximum rotation speed (A-00)	Communication output register 7 [o00016]
691(2B3h)	OL Pre-Counter	OL protection operation at 10000	Communication output register 8 [o00017]
692(2B4h)	Motor Temperature	10/1°C	Communication output register 9 [o00018]
693(2B5h)	Motor Magnetic Flux	1024/Rated value	Communication output register 10 [o00019]
694(2B6h)	Not used	Undefined	Communication output register 11 [o0001A]

PNU	Built-in PLC Function Not Used		Built-in PLC Function Used
Number	Contents	Scale	Contents
695(2B7h)	Not used	Undefined	Communication output register 12 [o0001B]
696(2B8h)	Not used	Undefined	Communication output register 13 [o0001C]
697(2B9h)	Not used	Undefined	Communication output register 14 [o0001D]
698(2BAh)	Not used	Undefined	Communication output register 15 [o0001E]

*1: The scale is 5/V in 400V system.

*2: The scale is 10/V in 400V system.

*3: The 100% value is the value of the inverter rated current (A) multiplied by the gain shown in Table 3.15. For more information about the inverter rated current, please refer to the VF66B inverter manual.

Table 3.15 The Gain Of Each Model

VF66B			
Capacity	Gain	Capacity	Gain
2R222	10	2R244	100
3R722	10	3R744	100
5R522	10	5R544	10
7R522	10	7R544	10
1122	10	1144	10
1522	10	1544	10
2222	10	2244	10
3022	10	3044	10
3722	10	3744	10
4522	10	4544	10
5522	10	5544	10
7522	10	7544	10
9022	1	11044	10
15022	1	16044	10
18022	1	20044	1
—	1	25044	1
—	1	31544	1
—	1	40044	1
—	—	50044	1
—	—	60044	1
—	—	75044	1
—	—	10004	1

3.7.3 Trace-Back Data Reading

■ Master → Slave Transmission Data

PKE: Task ID: Set to 6.

PNU: The channel number of the trace-back data to read is set.
(More information can be found in Table 3.17)）

IND: Lower 8 Bit: Trace-back data history is specified.
(More information can be found in Table 3.16)
Lower 8 Bit: Request data point is specified at 0 to 99 (0h to 63h).

Table 3.16 Trace-Back Data History Configuration

Bit9	Bit8	Trace-Back Data History
0	0	1 before (Newest)
0	1	2 before
1	0	3 before
1	1	4 before (Oldest)

PWE1: This is ignored.
PWE2: This is ignored.

*** The master must continue transmitting data until there is a response from the slave**

■ Slave → Master Response Data

PKE: Response ID: 0 (during processing) or 4 (normal response) or 7 (error)
PNU: Request data channel number
IND: The IND transmitted from the master is returned unchanged.
PWE1: 0
PWE2: During processing: 0
Normal response: Requested data value
Error: Error code

*** The slave continues sending the same data until the next task command comes from the master.**

Table 3.17 Trace-Back Data Contents (When F-15 to 26 are “0”)

PNU	Channel	V/f Mode		Induction Motor Vector Mode		ED Motor Vector Mode	
Number		Contents	Scale	Contents	Scale	Contents	Scale
700(2BCh)	0	U phase output current (Instantaneous value)	2357/100%	U phase output current (Instantaneous value)	2357/100%	U phase output current (Instantaneous value)	2357/100%
701(2BDh)	1	V phase output current (Instantaneous value)	2357/100%	V phase output current (Instantaneous value)	2357/100%	V phase output current (Instantaneous value)	2357/100%
702(2BEh)	2	W phase output current (Instantaneous value)	2357/100%	W phase output current (Instantaneous value)	2357/100%	W phase output current (Instantaneous value)	2357/100%
703(2BFh)	3	DC voltage	10/V(*1)	DC voltage	10/V(*1)	DC voltage	10/V(*1)
704(2C0h)	4	Output voltage (Actual value)	20/V(*2)	Output voltage (Actual value)	20/V(*2)	Output voltage (Actual value)	20/V(*2)
705(2C1h)	5	Not used	Undefined	Rotation speed	20000/Max value(*7)	Rotation speed	20000/Max value(*7)
706(2C2h)	6	Frequency command	20000/Max value(*7)	Rotation speed command	20000/Max value(*7)	Rotation speed command	20000/Max value(*7)

PNU	Channel	V/f Mode		Induction Motor Vector Mode		ED Motor Vector Mode	
Number		Contents	Scale	Contents	Scale	Contents	Scale
707(2C3h)	7	Torque	5000/100%	Torque	5000/100%	Torque	5000/100%
708(2C4h)	8	Output frequency	20000/Max value(*7)	Output frequency	20000/Max value(*7)	Output frequency	20000/Max value(*7)
709(2C5h)	9	Not used	Undefined	Slip frequency	20000/Max value(*7)	d-axis current	10000/100%
710(2C6h)	10	Not used	Undefined	Flux command	1024/100%	q-axis current	10000/100%
711(2C7h)	11	Temperature	10/℃	Temperature	10/℃	d-axis position	65536/360°
712(2C8h)	12	Fault flag (1)(*3)	Refer to Table 3.10	Fault flag (1)(*3)	Refer to Table 3.10	Fault flag (1)(*3)	Refer to Table 3.10
713(2C9h)	13	Fault flag (2)(*4)	Refer to Table 3.11	Fault flag (2)(*4)	Refer to Table 3.11	Fault flag (2)(*4)	Refer to Table 3.11
714(2CAh)	14	Status flag(*5)	Refer to Table 3.18	Status flag(*5)	Refer to Table 3.18	Status flag(*5)	Refer to Table 3.18
715(2CBh)	15	Command flag(*6)	Refer to Table 3.19	Command flag(*6)	Refer to Table 3.19	Command flag(*6)	Refer to Table 3.19

*1: The scale is 5/V in 400V system.
*2: The scale is 10/V in 400V system.
*3: The same as the contents shown in Table 3.10.
*4: The same as the contents shown in Table 3.11.
*5: The status flag is the same as the contents shown in Table 3.18.
*6: The command flag is the same as the contents shown in Table 3.19.
*7: The maximum value is the inverter configuration parameter A-00 value.

Table 3.18 Status Flags

Bit	Meaning	Bit	Meaning
0	Normal operation command	8	Excitation
1	Normal operation	9	DC brake
2	Jog operation	10	Stronger flux when starting
3	Reverse command	11	Not used (Undefined)
4	DC excitation	12	Not used (Undefined)
5	Power failure	13	Reverse command state just before operation
6	Automatic measuring	14	Not used (Undefined)
7	Energization	15	High speed current limiting FCL in operation

Table 3.19 Command Flags

Bit	Meaning	Bit	Meaning
0	Normal operation command	8	DC excitation command
1	Jog operation command	9	0 speed maintenance command
2	Reverse command	10	Automatic measuring command
3	Excitation command	11	Emergency B-contact command
4	DC brake command	12	Not used (Undefined)
5	Reset command	13	Not used (Undefined)
6	Initial excitation command	14	Not used (Undefined)
7	Emergency stop command	15	Constant recalculation request

3.7.4 Protection History Reading

■ Master → Slave Transmission Data

PKE: Task ID: Set to 6.
PNU: Specified as 720 (2D0h).
IND: The past 6 protection history entries are specified by the numbers 1 to 6.
1 is the newest and 6 is the oldest.
(If no history exists, there is a “no data” error response from the slave.)
PWE1: This is ignored.
PWE2: This is ignored.

*** The master must continue transmitting data until there is a response from the slave**

■ Slave → Master Response Data

PKE: Response ID: 0 (during processing) or 4 (normal response) or 7 (error)
PNU: 720 (2D0h)
IND: The IND transmitted from the master is returned unchanged.
PWE1: 0
PWE2: During processing: 0
Normal response: Requested protection code value (More information can be found in Table 3.20.)
Error: Error code

*** The slave continues sending the same data until the next task command comes from the master.**

Table 3.20 Protection History Data

Bit	Contents	Explanation of Contents
0 to 7	Protection code	Refer to Table 3.21
8, 9	Inverter mode	00: V/f mode 01: Induction motor vector mode 10: ED motor vector mode 11: Not used
10, 11	Not used (Undefined)	—
12	Setting block	0: First setting block 1: Second setting block
13 to 15	Not used (Undefined)	—

Table 3.21 Protection Codes

Protection Code	Protection Contents	Explanation of Protection Operation
1	Over-current protection	Protection of the instantaneous value of output current works by 3.58 or more times of an inverter amperage rating value.
2	IGBT protection	Protection works at the time of the over-current of IGBT, or a gate power supply fall.
3	Emergency stop A input contact is ON	In the multifunctional input set as the emergency stop A, an emergency stop works by ON.
4	Emergency stop B input contact is OFF	In the multifunctional input set as the emergency stop B, an emergency stop works by OFF.
5	Gate PCB abnormality	Protection detection by a GAC board. (only for models using GAC PCB)
6	DC part over-voltage	200V model: When D.C. part voltage exceeds 400V, protection works. 400V model: When D.C. part voltage exceeds 800V, protection works.
7	Overload protection	If an output current effective value operates for more than 1 minute with 150% of motor amperage rating values, overload protection will work.
8	Current sensor abnormality	Protection works by failure of a current sensor.
9	Un-starting	After operation or jog instruction input, even if 10 seconds pass, when operation is impossible, protection works.
10	Over-speed protection	When motor speed exceeds fault speed setting, protection works. (Induction motor vector mode / ED motor vector mode)
11	Over-frequency protection	When output frequency exceeds a fault frequency setup, protection works. (V/f mode)
12	Insufficient voltage (Power failure)	200V model: If D.C. voltage becomes less than 180V during operation, protection will work. 400V model: If D.C. voltage becomes less than 180V during operation, protection will work.
13	Over-torque protection	When over-torque protected operation is set as ON and it operates for more than 1 minute by 150% of rated torque, protection works. (Induction motor vector mode / ED motor vector mode)
14	Unit overheat	When the temperature of IGBT becomes beyond a predetermined value, protection works.
15	Storage memory abnormality	When the setting data memorized by the built-in memory cannot be acquired correctly, protection works.
16	Option error	If option substrate use is set as ON and an option substrate causes a defect of operation, protection will work.
17	Sensor-less start error	In sensor-less mode, when the phase detection at the time of starting goes wrong, protection works. (ED motor vector mode)
18	Communication time-out error	When a communication error (timeout) is caused between an option and a master at the time of the option use which performs network communication, protection works.
19	Speed control error	When rate control unusual detection is set as ON and the deviation of motor speed and an instruction value (rate control input) exceeds a preset value (console setup), protection works. (Induction motor vector mode / ED motor vector mode)
20	Motor overheat	When motor temperature exceeds 150 degrees C at the time of ON at the time of temperature detection option use in a motor overheating selection setup (F-06), protection works.
21	Charging resistor overheat	In a model of 7.5kW or less, when charge resistance is overheated, protection works.
22	FCL operation	When an instant current limit (FCL) continues for 10 seconds (near 0Hz 2 seconds) continuously, protection works.
23	Setting error	When it starts in the state where a setup of motor rating and a motor constant has abnormalities, protection works.
24	Open phase	When an output line is disconnected, protection works.
25	CPU processing abnormality	When CPU performs unusual processing due to the instant sag of 5V power supply for control, protection works.
26	Fan failure	When the fan in an inverter breaks down, protection works. (no protection stop).
27	PG error	- Even if a motor rotates above by two cycles by an electric phase, when there is no input of U, V, and W signal from PG, protection works. - When a motor is two or more revolutions in a machine phase and there is no input in Z signal of PG, protection works. (ED motor vector mode)
28	Sensor error	When there is no input of a current sensor or PG, protection works. (ED motor vector mode)
29	External failure 1	When the external failure 1 of a multifunctional input is inputted, protection works.
30	External failure 2	When the external failure 2 of a multifunctional input is inputted, protection works.
31	External failure 3	When the external failure 3 of a multifunctional input is inputted, protection works.
32	External failure 4	When the external failure 4 of a multifunctional input is inputted, protection works.

*** Please also refer to the VF66B inverter manual.**

*** Protection codes 33 and above show GAC protection detection and is only for models using GAC. For more information, please refer to the supported VF66B inverter model manual.**

3.7.5 Configuration Data Reading

■ Master → Slave Transmission Data

PKE: Task ID: Set to 1.
PNU: The parameter number of the configuration data to read is set. **(Note 1)**
BIT10 0: First setting block 1: Second setting block
IND: This is ignored.
PWE1: This is ignored.
PWE2: This is ignored.

*** The master must continue transmitting data until there is a response from the slave**

■ Slave → Master Response Data

PKE: Response ID: 0 (during processing) or 1 (normal response) or 7 (error)
PNU: Request data parameter number
IND: 0
PWE1: 0
PWE2: During processing: 0
Normal response: Request data value (Note 2)
Error: Error code

*** The slave continues sending the same data until the next task command comes from the master.**

3.7.6 Configuration Data Rewriting

■ Master → Slave Transmission Data

PKE: Task ID: Set to 2.

PNU: The parameter number of the configuration data to write is set. **(Note 1)**

BIT10 0: First setting block 1: Second setting block

IND: This is ignored.

PWE1: This is ignored.

PWE2: The data value to write is set. **(Note 2)**

*** The master must continue transmitting data until there is a response from the slave**

■ Slave → Master Response Data

PKE: Response ID: 0 (during processing) or 1 (normal response) or 7 (error)

PNU: Configuration data parameter number

IND: 0

PWE1: 0

PWE2: During processing: 0
Normal response: Written data value.
Error: Error code

*** The slave continues sending the same data until the next task command comes from the master.**

*** The configuration data is written to the inverter internal EEPROM. As the amount of times you can write to an EEPROM during its service life is limited, try to avoid excessive rewriting of data.**

Note 1: Please contact us for inquiries regarding the VF66B inverter configuration data numbers.

Note 2: The value of the data to be read/written consists of the configuration data with the decimal point omitted. For example, when sending the value of 15.0, the actual data sent by the communication is 150 = 96h.

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Contents of this manual are subject to change without notice.

2012-09

QG18742B