Hitachi Inverter

SJ300/L300P SERIES

SJ-PB(T) (Profibus-DP Option)

INSTRUCTION MANUAL

Thank you for purchase of “HITACHI INVERTER”. This manual explains about treatment of “SJ-PB(T) (Profibus-DP Option)”. By reading this manual and an instruction manual of inverter use practically for installation, maintenance, and inspection. After reading this manual, keep it handy for future reference.

Make sure to reach this manual to the end user.

Table of Contents

After reading this manual, keep it at handy for future reference.

NB622BX

HITACHI

- Request -

Thank you for purchase of “SJ-PB(T) (Profibus-DP Option)”.

This instruction manual explains about treatment and maintenance of “SJ-PB(T)”. Before using the product, carefully read this manual with the instruction manual of inverter, and keeps it handy for quick reference of operator and maintenance inspector. Before installing, operating, maintenance and inspection read this manual carefully and follow the instructions exactly.

Always keep various kinds of specification mentioned in this manual and use exactly. And make sure to prevent trouble by correct inspection and maintenance. Make sure to reach this manual to the end user.

- About treatment of this manual -

(1)Please consent that mentioned items of this manual may be change without permission.

(2)Keep this manual carefully not to lose because it can not be reissued

(4)Contents in this manual is written to make assurance doubly sure but, but please contact if you have some doubts about spelling mistakes, omitted word etc.

(5)Please agree that there is no responsibility for effects resulted, in spite of contents above mentioned.

- About trademark -

(1)Profibus is registered trademark of Profibus Nutzerorganisation.

Revision History Table

No.	Revision contents	The date of issued	Manual No.
1.	Initial release of Manual NB622X	May. 2001	NB622X
2.	Looking at again details.	Oct. 2001	NB622AX
3.	Adding mention of SJ-PBT. Looking at again details.	June. 2002	NB622BX

Except this table, revised only spelling mistakes omitted words, and error writings without notice.

SAFTY PRECAUTIONS

Carefully read this manual and all of the warning labels attached to the inverter before installing, operating, maintaining, inspecting, it. Safety precautions are classified into “Warning” and “Caution” in this manual.

⚠ WARNING : Indicates a potentially hazardous situation which, if not avoided, can result in serious injury or death.

⚠ CAUTION : Indicates a potentially hazardous situation which, if not avoided, can result in minor to moderate injury, or serous damage to the product

The situation described in ⚠ CAUTION may, if not avoided, lead to serious results. Important safety measures are described in CAUTION (as well as WARNING) so be sure observe them.
Notes are described in this manual in “(Note)”. Carefully read the contents and follow them exactly.

⚠ CAUTION

In all the illustrations in this manual, covers and safely device are occasionally removed to describe the details. When the product is operated, make sure that the covers and safety devices are placed as they were specified originally and operate it according to the instruction manual.

⚠ WARNING

Wiring:
Wiring work shall be carried out by electrical experts.
Otherwise, there is a danger of electric shock, fire and/or damage of product.
Implement wiring after checking that the power supply is off.
Otherwise, there is a danger of electric shock and/or fire.

Operating:
Be sure not to touch the surface or the terminal of option board while energizing.
Otherwise, there is a danger of electric shock and/or fire.
Be sure not to remove the Profibus option printed board while operating.
Otherwise, there is a danger of electric shock and/or fire.

Maintenance, Inspection and Part Replacement:
Wait at least 10 minutes after turning off the input power supply before performing maintenance and inspection.
(Confirm the charge lamp on the inverter is off, checks direct current voltage between P-N terminals and confirm it is less than 45V)
Otherwise, there is a danger of electric shock.
Make sure that only qualified persons will perform maintenance, inspection, and part replacement
(Before starting the work, remove metallic objects from your person (wristwatch, bracelet, etc.). Be sure to use tools protected with insulation.)
Otherwise, there is a danger of electric shock and/or injury.

Note:
Never modify the unit.
Otherwise, there is a danger of electric shock and/or injury.

⚠ CAUTION

Installation:
Be sure not to let the foreign matter enter such as wire clippings, spatter from welding, metal shaving, dust etc.
Otherwise, there is a danger of fire.
Be sure to fix inverter to option printed board with an attached fixed screw.
Otherwise, there is a danger of connecting error.
Be sure to fasten the screws connecting signal wire in side of option printed board. Check for any loosening of screw.
Otherwise, there is a danger of connecting error.

Wiring:
Be sure to fasten the screws not to loose.
Otherwise, there is a danger of connecting error.

Operation:
Check rotary direction, abnormal motor noise and vibrations during operating.
Otherwise, there is a danger of injury to personnel and/or machine breakage

1.1 INSPECTION UPON UNPACKING

Make sure to treat the product carefully not to give shock and vibration while unpacking. Check that the product is the one you ordered, no defect, and that there is no damage during transportation.

(Contents of packing)

(1) SJ-PB(T)(Profibus-DP option printed board):1 (Regarding SJ-PBT, also Install network connector)
(2) Instruction manual:1
(3) Screws fixed printed board (M3 times 8 mm):2

If you discover any problems, contact your sales agent immediately.

1.2 INQUIRY OF THE PRODUCT AND WARRANTY FOR THE PRODUCT

1.2.1 REQUIRE WHILE INQUIRING

If inquiry of breakage, question, damage etc. is needed, please tell the following information to the supplier you ordered or the nearest Hitachi Distributor.

(1) Type(SJ-PB(T))
(2) Manufacturing number (Item of label, that labeled surface of PCB. X&&&&&& &:6 figures number.
Or ######## #:8 figures serial number.)
(3) Date of purchasing
(4) Contents of inquiry
- Damage parts and its condition etc.
- Question parts and their contents etc.

In order to shorten impossible working time, standing spare unit is recommended.

1.2.2 WARRANTY OF THE PRODUCT

This product is guaranteed to last for one year after purchase. But, the next case is toll repair, even if within warranty period.

(1) In case caused by operating mistake, and incorrect repair and modification.
(2) Trouble caused by reasons except the shipped product.
(3) In case of using in range over the value of specification.
(4) In case caused by natural calamity, disaster, and secondary disaster.

Warranty mentioned here means warranty for shipped product itself. Damage caused by trouble of shipped product is not guaranteed.

[Toll repair]

Any explanation and repair after the warranty period (one-year) shall be charged to the purchaser. And also any explanation and repair out of warranty mentioned above, even within warranty period, shall be charged to the purchaser. If you require the toll repair, please contact your Hitachi distributor.

1.3 Outline of product

SJ-PB(T) is Profibus-DP communication board for SJ300/L300P series inverter.
SJ300/L300P series inverter can get to connect another devices via Profibus-DP when install SJ-PB(T).
SJ-PB(T) is possible to use for all models of SJ300/L300P series.

The SJ-PB(T) option board communicates according to the Profibus Protocol Standard DIN 19245 part 1 & 3. This means that it can communicate with all masters that comply with this standard, but it does not necessarily mean that all services available in the Profibus standard are supported. The “Profibus Profile for Variable Speed Drives” (order no. 3.072), also known as Profidrive, is a subset of Profibus which only supports the services relevant to speed control applications.

In a control system the option board will act as a slave that can be read and written to, from a Profibus-DP master. It will not initiate communication to other nodes, it will only respond to incoming telegrams.

(Note) RS485 communication function is disabled by installing SJ-PB(T) to the inverter.

Difference between SJ-PB and SJ-PBT is only connector for networking. Others are no difference.

1.4 Appearance and Names of Parts

Figure 1-1 indicates the appearance of SJ-PB(T).

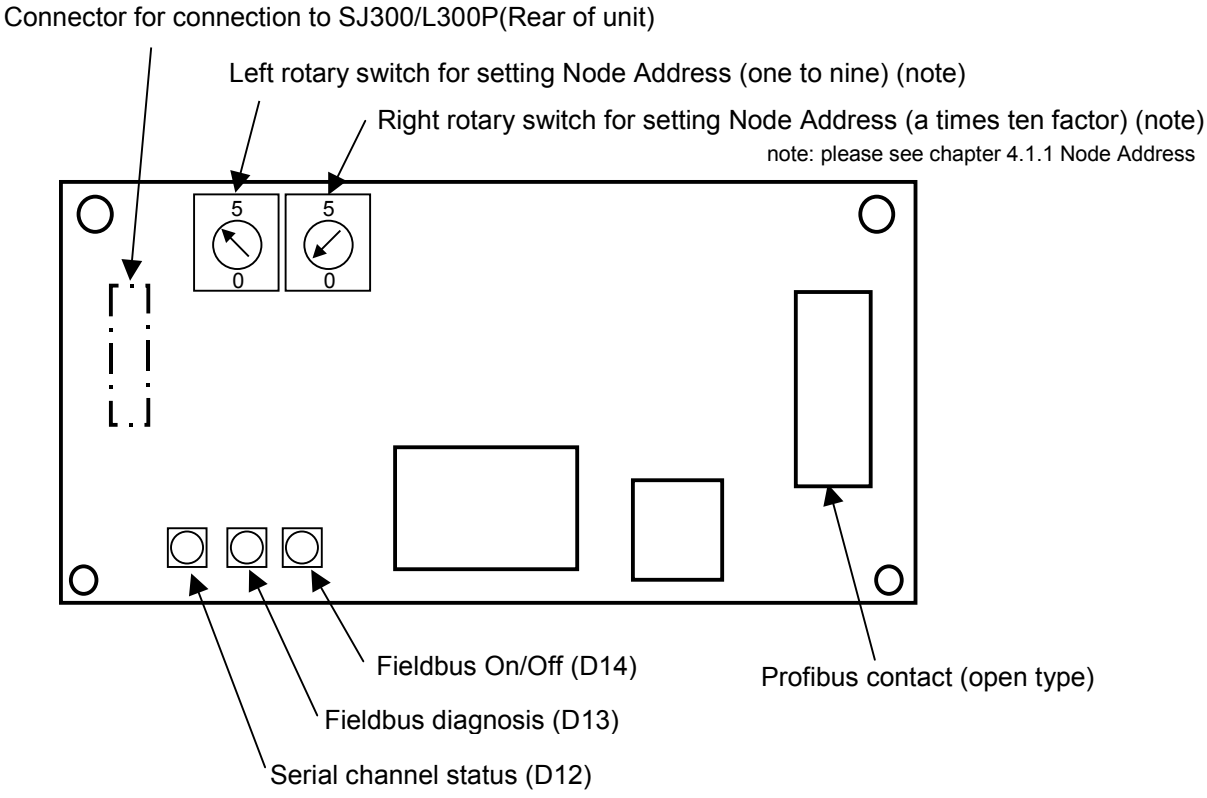


Figure 1-1 Appearance of SJ-PB(T)

1.5 Profibus-DP Supported Version

SJ-PB(T) can use following Manufacturing number (MFG No) of SJ300/L300P series.

After Manufacturing number : XX8KXXXXXXXXXXX（SJ300-0.4-55kW / L300P-11-75kW supported）
XXEMXXXXXXXXXXX（SJ300-75-132kW / L300P-90-132kW supported）

(Note) Manufacturing number is written in specifications label on main body of SJ300/L300Pseries. Refer to figure 1-2, figure 1-3.
(Figure1-2, 1-3 are the example of SJ300 series. L300P series are the same manner as SJ300 series.)

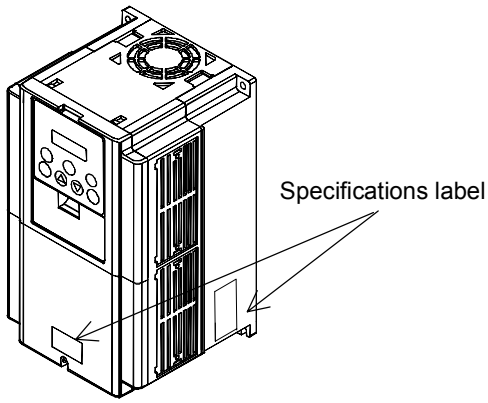


Figure 1-2 Position of specifications label

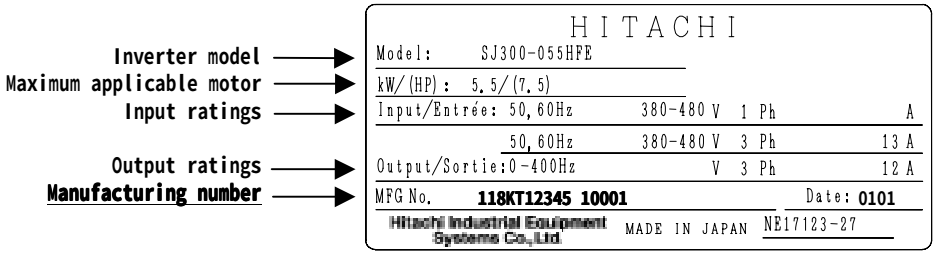


Figure 1-3 Contents of specifications label

1.6 Technical features of Profibus-DP

- Physical media: EIA RS 485 twisted pair cable or fiber optic.
- Baud rate: 9.6 kbaud up to 12Mbaud.
- Maximum number of nodes: 126
- Maximum number of I/O: 244 bytes/slave.
- Bus topology: Master-Slave communication. The figure below gives an overview of a Profibus-DP network.
- Cyclic user data transfer between DP-Master and DP-Slaves.
- Watch-Dog Timer at the DP-Slaves
- Connecting or disconnecting stations without affecting other stations.
- Powerful diagnosis mechanisms, 3 hierarchical levels of the diagnosis messages.
- Synchronization of inputs and/or outputs.
- All messages are transmitted with Hamming Distance HD=4.

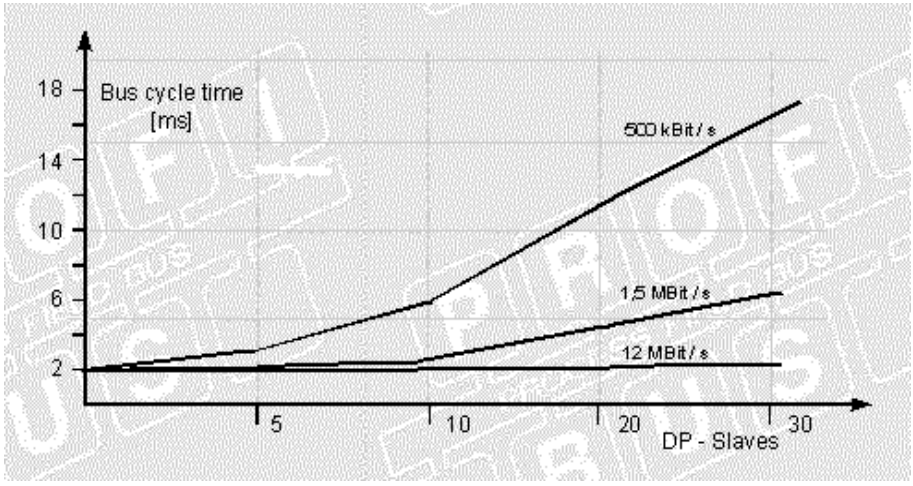


Figure 1-4 Bus cycle time of a Profibus-DP Mono Master system (2 bytes I/O data/slave)

1.7 Production specification

Bacicaly, the environmental specification of the SJ-PB(T) is in accordance with SJ300/L300P series inverter. Please refer the instruction manual of SJ300/L300P series.
But only application temperature of SJ-PB(T) is different. Please note.

application temperature : 0 to 50 degree

2.1 Mounting method of option board

Figure 2-1 describes how to mount the option board to the option port 1 or 2.
There are four holes on the option board, match the two of them with the screw holes on the option port 1 or 2. and mount the other two holes with the guide posts which are located on the option port 1 and 2. To avoid connection failure, secure the option board with screws after connection.

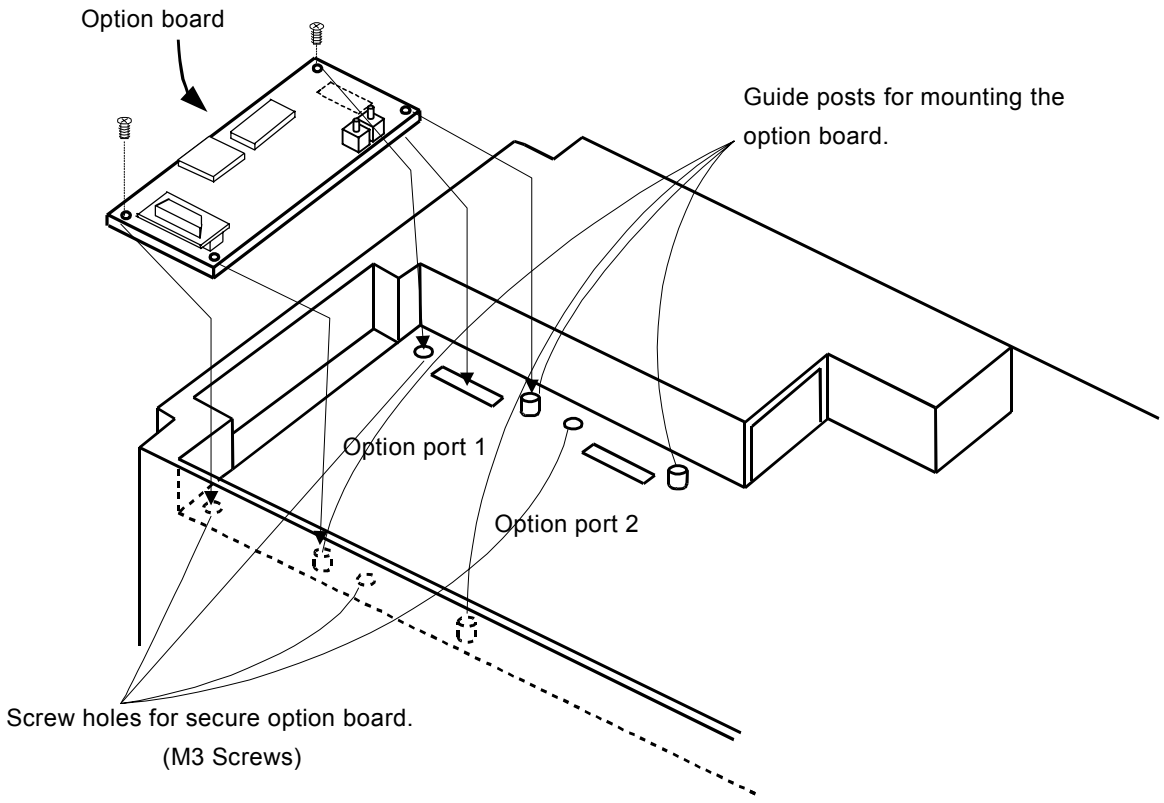


Figure 2-1 Installation of option board

CHAPTER 3 WIRING, CONNECTING

3.1 Physical interface

Isolation: The bus is galvanically separated from the other electronics with an on board DC/DC converter. Bus signals (A-line and B-line) are isolated via photo couplers.
Profibus-DP communication ASIC: VPC3 chip from ProfiChip.
Bus connection: The SJ-PB connects to the Profibus network with a 9-pin female DSUB connector. For the pin layout, refer to Table 3-1.

Table 3-1 Pin Layout of SJ-PB

Pin	Name	Function
Housing	Shield	Connected to PE
1	Not Connected	-
2	Not Connected	-
3	B-Line	Positive RxD/TxD according to RS 485 specification
4	RTS	Request To Send (note)
5	GND BUS	Isolated GND from RS 485 side (note)
6	+5V BUS	Isolated +5V from RS 485 side (note)
7	Not Connected	-
8	A-Line	Negative RxD/TxD according to RS 485 specification
9	Not Connected	-

(note) +5V BUS and GND BUS are used for bus termination. Some devices, like optical transceivers (RS485 to fibre optics) might require external power supply from these pins. RTS is used in some equipment to determine the direction of transmission. In standard applications only A-Line, B-Line and Shield are used.

The SJ-PBT connects to the Profibus network with a 6-poles 2pieces connector. For the pin layout, refer to Table 3-2.

Table 3-2 Pin Layout of SJ-PBT

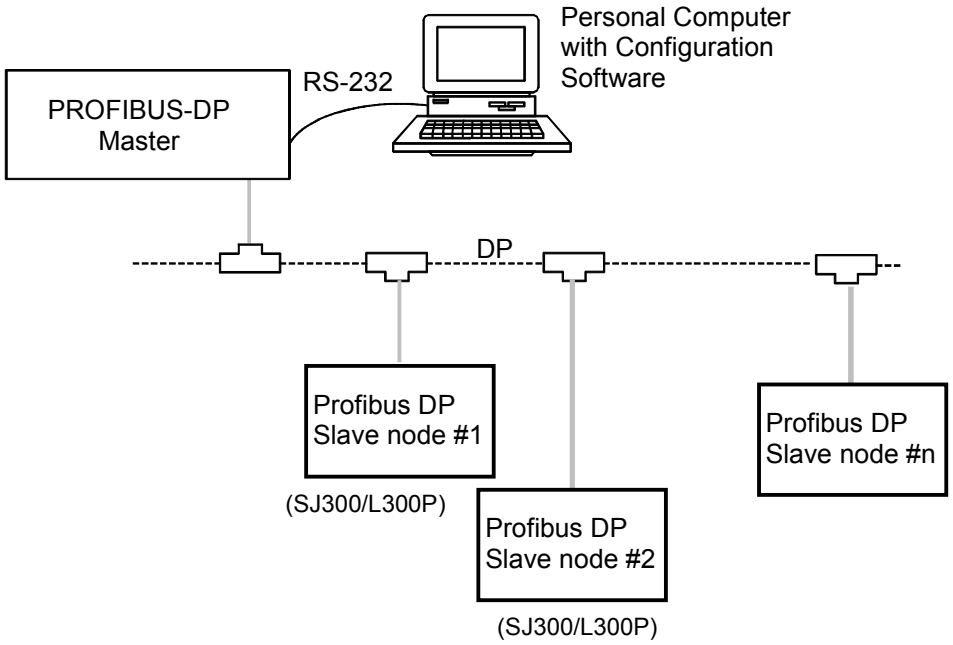
Pin	Name	Function
1	B-Line(in)	Positive RxD/TxD according to RS 485 specification
2	A-Line(in)	Negative RxD/TxD according to RS 485 specification
3	Shield	Connected to PE
4	B-Line(out)	Positive RxD/TxD according to RS 485 specification
5	A-Line(out)	Negative RxD/TxD according to RS 485 specification
6	Shield	Connected to PE

3.2 Profibus connectors

On the SJ-PB, any standard Profibus connector can be used. Depending on baudrate, IP-classing and physical size of connector there are several different manufacturers and models, the prizing may also vary. For more information it is recommended to contact the manufacturer, e.g., Siemens or Erni.
SJ-PBT: In this case, the network connector is attached with SJ-PBT option board.

3.3 Wiring note

1.Installing / removing the cable or connector must be done after checking the power supply off.
2.Wiring should not have bare cables exposed between connector contacts.
3.Network cables should be fixed without tension. Cables fixed under tension have potential of causing a communication fault by to be removed a connector.
4.A terminating resistor is not built-in the unit. Please provide it.
5.Ensure external emergency stop measures are taken to stop the inverter, in the event of a network fault.
(a) Remove the Power supply of the Inverter when the network master detects a communication fault.
(b) When the master detects a communication fault, turn on the intelligent input terminal which would be allocated (FRS), (RS) and/or (EXT) function.
6.Basic components for construction of Profibus-DP application are shown bellow.
Refer to the master's description manuals when Profibus-DP Network system comes into operation.



CHAPTER 4 SETTING

4.1 Profibus Configuration

Follow the procedure below to set Baud rate in Profibus-DP and Node Address, reset the power supply after changing the setting (setting will be reflected after resetting power supply). Initial Node Address: 0, Initial Baud rate: According to master's setting.

4.1.1 Node Address

Before power-on the SJ300/L300P the node address has to be set. This is done with the two rotary switches(Figure 1-1) on the SJ-PB(T); this enables address settings from 0-99 in decimal format. The right rotary switch at the top of the option board represents a times ten factor. The rotary switch at the left represents one to nine. For example, if address 27 shall be set: Set the right rotary switch to two and the left rotary switch to seven.

Address = (Right Switch Setting x 10) + (Left Switch Setting x 1)

(Note) The node address cannot be changed during operation; the module needs to be re-powered in order for the change to have effect.

4.1.2 Baudrate

The baudrate on a Profibus-DP network is set during configuration of the master and only one baudrate is possible in a Profibus-DP installation. The SJ-PB(T) has an auto baudrate detection function and the user does not have to configure the baudrate on the module. Refer to 4-1 for the baudrates supported.

Table 4-1 Supported baudrates

Baudrates supported by SJ-PB(T)
9.6 kbit/s
19.2 kbit/s
45.45 kbit/s
93.75 kbit/s
187.5 kbit/s
500 kbit/s
1.5 Mbit/s
3 Mbit/s
6 Mbit/s
12 Mbit/s

4.1.3 PPO-type selection

The SJ-PB(T) supports PPO-type 1-5. (Refer to chapter 5.1 for PPO description)

The PPO type is configured from the master. The SJ-PB(T) senses the configuration and configures itself accordingly. The amount of input/output data transferred on the Profibus network depends on the selected PPO type. Amount of data transferred in the data-exchange telegram is ranging from 4 bytes input/output (PPO3) to 28 bytes input/output (PPO5).

4.2 Setting of controlling frequency and start/stop commands

The SJ300/L300P inverters can be configured to take reference set-points and commands from several different locations. Refer to the table below for information of how to configure the inverter so that the fieldbus controls frequency and the commands.

Control	Frequency Setting Selection - A001	Operation Setting Selection - A002
SJ-PB(T) controls frequency and commands	2	1
SJ-PB(T) controls frequency only	2	Not equal to 1.
SJ-PB(T) controls commands only	Not equal to 2.	1
SJ-PB(T) has no control.	Not equal to 2.	Not equal to 1.

However, since the SJ-PB(T) module uses the “Terminal” to give commands and “Operator” to give references to the inverter certain steps must be taken in order to be able to control the inverter manually (not from fieldbus). Study the table below to see how the control word bits shall be set to accomplish control from fieldbus and from the user.

Controlling the inverter with A001 = 2 (Operator), A002 = 1 (Terminal).	Control word bit settings		
	10	12	13
SJ-PB(T) controls frequency and commands	1	0	0
SJ-PB(T) controls frequency only*	1	1	0
SJ-PB(T) controls commands only	1	0	1
SJ-PB(T) has no control.	1	1	1
	0	-	-

from the “Terminal” input when a SJ-PB(T) is present in the option slot. In order to do this, bit ten in the Control Word shall be set to zero. That is, by setting A001=2, A002=1, and control word bit 10=0 it is possible to control the inverter with the terminal while giving frequency reference from the fieldbus.

*Please note that when frequency reference is controlled from the fieldbus and commands from another location (such as “Terminal”) the direction of the motor must be controlled from the command source (Reverse/Forward command). In this case changing the sign of reference value cannot control the direction of the motor.

4.3 Action at communication error

In case of occurring transmission errors (communication cut-off with the master), the following actions can be selected.
Depending on what option slot the option module is connected to, P001 (Option 1) or P002 (Option 2) is changed.

P001/P002	Action at error detection		Remarks
0	Inverter will trip.	Option trip E6x or E7x.	Fault can be reset either from fieldbus or from keypad.
1	Continue operation according to the last received command.	-	-

CHAPTER5 OPERATING

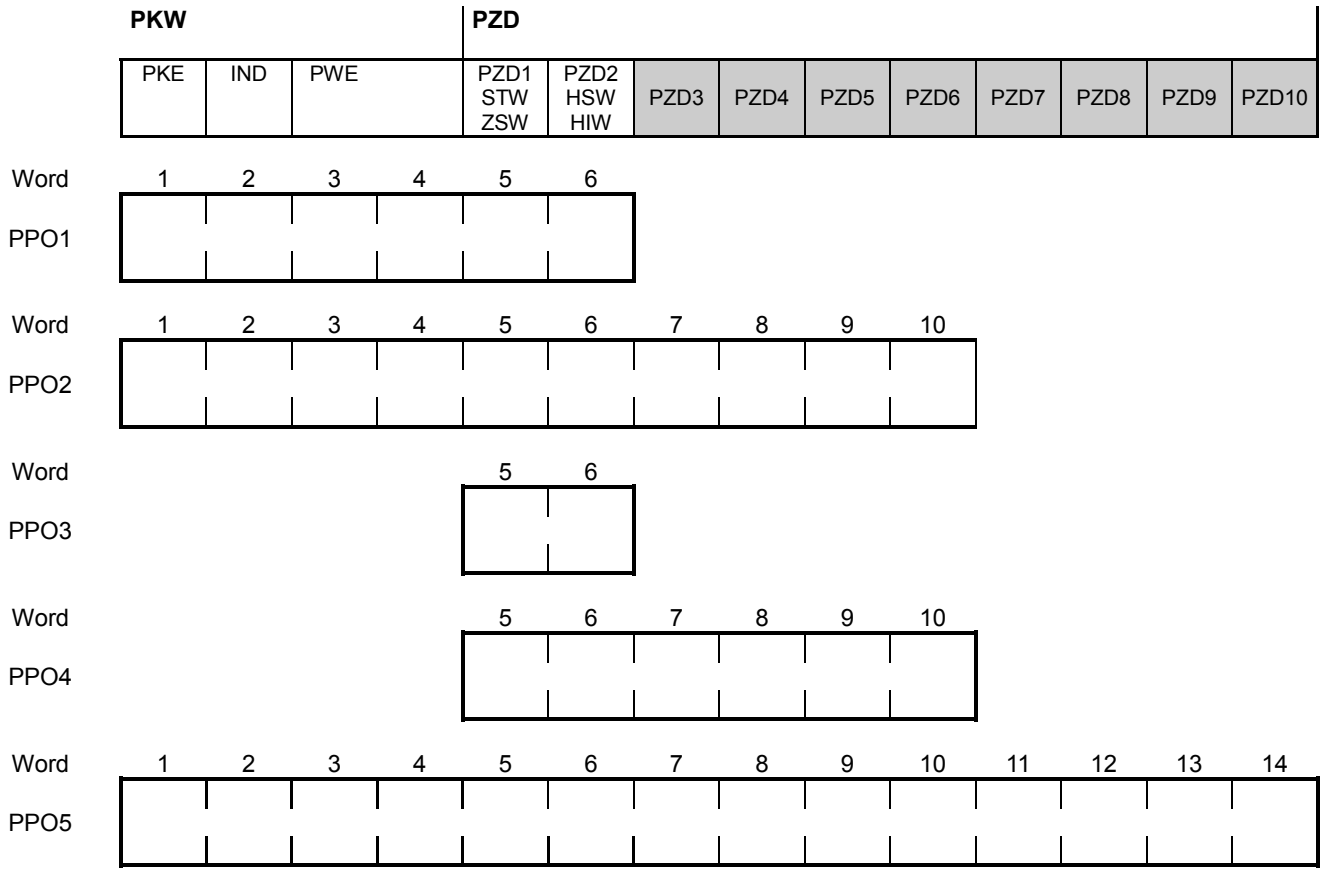
This section describes how to control the inverter via control word/status word and how to access the inverters parameters.

5.1 PPO- description

The structure of the user data is designated as parameter process data objects (PPO) in the Profidrive profile. The profile defines five PPO types, where SJ-PB supports all these PPO types.
There are PPO's with a parameter area (PKW) and a process data area (PZD). There is also PPO's that consist exclusively of process data (PZD).

1. PPO1 consists of the PKW area and 2 words PZD.
2. PPO2 consists of the PKW area and 6 words PZD.
3. PPO3 consists only of 2 words PZD.
4. PPO4 consists only of 6 words PZD.
5. PPO5 consists of the PKW area and 10 words PZD.

The user can configure what shall be transferred in PZD3-10 (shaded grey below), for more instructions of how to do this configuration see chapter 5.3.3, 5.4.2, 5.4.3 and Appendix.



PKW -- Parameter ID/value.
PZD -- Process data, cyclically transferred.
PKE -- Parameter ID (1st and 2nd octet).
IND -- Sub-index (3rd octet), 4th octet is reserved.
PWE -- Parameter value (5th to 8th octet, 32-bits).
STW -- Control word.
ZSW -- Status word.
HSW -- Main reference.
HIW -- Main actual value.

5.2 PKW-part

The parameter part (PKW) is fixed to 4 words and can be used for reading and/or updating the parameters in the inverter one by one. Requests and responses is a handshake procedure and cannot be batched, meaning that if the master sends out a read/write request, it has to wait for the response, before it sends a new request.
The PKW is further divided into three parts; PKE- Parameter ID (2 bytes), IND – Sub-index (2 bytes) and PWE- Parameter value (4 bytes).

PKW			PZD								
PKE	**IND**	**PWE**	PZD1 STW ZSW	PZD2 HSW HIW	PCD3	PCD4	PCD5	PCD6	PCD7	PCD8	PCD9	PCD10

PKW: Parameter ID/value.
PKE: Parameter ID.
IND: Sub-index (3rd byte, 4th byte is reserved).
PWE: Parameter value (4 bytes).

PKE handling:

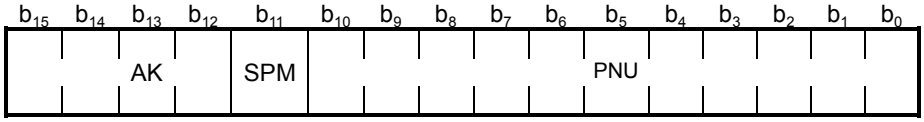


Figure 5-1 PCA word

AK: Request/response characteristics (Range 0-15)
SPM: Toggle bit for Spontaneous Messages, not used by SJ-PB(T).
PNU: Parameter number. Range 1- 418 for Hitachi specific parameters and 900-999 for Profidrive specific parameters. Please refer to chapter 3.5 for which Profidrive specific parameters that are supported.

Request/Response handling

The AK portion of the PKE word defines the request/response that may be issued.

Since parameter length of the SJ300/L300P inverter may vary, parameter values are always transferred so that the least significant byte is placed in octet 8.

If the Request/Response contains array elements, the high byte (byte 3) of the IND word will carry the array sub index, low byte (byte 4) is reserved for future use.

AK content (master -> slave)

Request	Function	Ackn (+)	Ackn (-)
0	No request	0	-
1	Request parameter value	1	7
2	Change parameter value (word)	1	7/8
3	Change parameter value (long word)	2	7/8
4	Request description element (note)	3	7
5	Change description element (note)	3	7
6	Request parameter value (array)	4	7
7	Change parameter value (array word)	4	7/8
8	Change parameter value (array long word) (note)	5	7/8
9	Request number of array elements	6	7

AK content (Slave -> master)

Response ID	Function
0	No response
1	Transfer parameter value (word)
2	Transfer parameter value (long word)
3	Transfer description element (note)
4	Transfer parameter value (array word)
5	Transfer parameter value (array long word) (note)
6	Request number of array elements
7	Request rejected, followed by fault code (in PWE part). 0 = Non-admissible parameter number 1 = Parameter value cannot be changed 2 = Upper or lower limit exceeded 3 = Erroneous sub-index 4 = No array 5 = Incorrect data type 7 = Descriptive element cannot be changed 9 = Descriptive data not available 11 = No parameter change rights 17 = Task cannot be executed due to operating status 102= Task cannot be executed due to communication error. 106 = Illegal Task, Task ID not allowed. 18 = Other
8	No parameter change rights by PKW interface
9	Parameter data signal (word) (note)
10	Parameter data signal (double word) (note)

If the inverter rejects a request from the master, the AK word in the PPO-read will indicate this by assuming value 7 or 8. The describing fault number will be found in the PWE part.

(note) Not supported by the SJ-PB(T) option board.

5.3 PZD-part

In this chapter the process data part (PZD) of a PPO is discussed.
The PZD part consists of a fixed part (PZD1-2, all PPO's) and a parameterable part (PZD 3-10, shaded grey above, PPO 2, 4 and 5).
In the fixed part, control word and speed reference are transferred to the inverter while status word and actual output frequency are transferred from the inverter.
In the parameterable part, PZD word 3-10, the user can configure what parameters that should be transferred to/from the inverter every bus-cycle (see chapter 5.3.3 and Appendix).

5.3.1 Control- / status word (STW/ZSW)

This section describes how to operate the inverter with the control-/status word. With the control word the Profidrive state-machine (Figure 5-2) is controlled, the status word is reflecting the state of the inverter.
Profidrive Control Word (STW):
The control word is used to send control commands to the inverter (PLC->Inverter).

Control word			
Bit	**Value**	**Meaning**	**Remark**
0	1	On1	Inverter can be started if all other start conditions are fulfilled.
	0	OFF1	Normal stop; uses deceleration time specified in "1st Deceleration time" (F003).
1	1	ON2	Inverter can be started if all other start conditions are fulfilled.
	0	OFF2	Inverter coast to stop. Returns to *Switch-on inhibit* state.
2	1	ON3	Inverter can be started if all other start conditions are fulfilled.
	0	OFF 3	Quick stop that uses deceleration time specified in "2nd deceleration time" (F203).
3	1	Operation enabled	Inverter can be started if all other start conditions are fulfilled.
	0	Operation disabled	Inverter coast to stop (Enter *Inhibit operation* state).
4	1	Condition for operation	Inverter can be started if all other start conditions are fulfilled.
	0	Ramp generator disabled	Output frequency is set to zero. Inverter remains in the running state.
5	1	Ramp generator enabled	Inverter can be started if all other start conditions are fulfilled.
	0	Stop ramp generator	Actual output frequency is frozen. A change to frequency set-point has no effect.
6	1	Enable set-point	Inverter can be started if all other start conditions are fulfilled, using "1st Acceleration time" (F002).
	0	Inhibit set-point	Normal stop that uses deceleration time specified in "1st deceleration time".
7	1	Acknowledge	Fault is acknowledged on positive edge, i.e. bit 7=0 then 1 (*Enter Switch-on inhibited* state).
	0	No function	
8	1	Inching 1 ON	Inverter accelerates to inching set-point 1. Profidrive must be in "Enable o*peration*" state. Parameter "Jogging frequency" specifies the jogging set-point (A038).
	0	Inching 1 OFF	Inverter brakes as fast as possible and goes into the "*Enable operation"* state.
9		Not used	
10	1	Data valid	The control word and frequency set-point (from Profibus) are activated. Please refer to chapter 2.2.4.
	0	Data invalid	The control word and frequency set-point (from Profibus) are not valid. Please refer to chapter 2.2.4.
11	1	REV	Inverter will operate in reverse motion. Please note that a negative reference and reverse selected will result in inverter running forward.
	0	FWD	Inverter will operate in forward motion.
12	1	Commands invalid	The fieldbus module will not write any commands to the inverter. This makes it possible to operate motor via the terminal input (if A002 is set to "Terminal").
	0	Commands valid	The fieldbus module can write commands to the inverter (if A002 is set to "Terminal").
13	1	Reference invalid	The fieldbus module will not write any reference to the inverter.
	0	Reference valid	The fieldbus module can write reference to the inverter (if A001 is set to "Operator").
14, 15		Not used	

Profidrive Status Word (ZSW):

The status word indicates the status of the inverter (Inverter -> PLC).

Status word			
Bit	**Value**	**Meaning**	**Remark**
0	1	Ready to switch-on	Control word bit 0=0 and bits 1, 2, 10 are set to 1 (*Ready to switch-on* state).
	0	Not ready to switch-on	Control word bit 0, 1 or 2 (OFF1, OFF2, OFF3) is set to 0, or the inverter is tripped.
1	1	Ready for operation	Control word bit 0, 1 and 2 are set to 1. Inverter is not faulted (*Ready* state).
	0	Not ready for operation	Control word bit 0, 1 or 2 (OFF1, OFF2, OFF3) is set to 0, or the inverter is faulted.
2	1	Operation enabled	Control word bit 0, 1, 2 and 3 are set to 1. Inverter is not faulted (*Enable operation* state).
	0	Operation inhibited	Control word bit 0, 1, 2 or 3 (OFF1, OFF2, OFF3, Operation disabled) is set to 0, or the inverter is faulted.
3	1	Fault	Inverter is faulted.
	0	No fault	Inverter is not faulted.
4	1	ON2	Control word bit1=1.
	0	OFF2	OFF2 command active. Control word bit1=0 (*OFF2 active* state).
5	1	ON3	Control word bit2=1.
	0	OFF 3	OFF3 command active. Control word bit2=0 (*OFF3 active* state).
6	1	Start enable	Control word bit1 or 2 (OFF2, OFF3) is set to 0 or fault has been acknowledged (*Switch-on inhibit* state*)*.
	0	No switch-on inhibit	Control word bit 0=0 and bit10=1 (*Not ready to switch-on* state).
7		Not used	
8	1	Frequency equal set-point	Actual output frequency does equal frequency set-point.
	0	Frequency not equal set-point	Actual output frequency does not equal frequency set-point (i.e. motor accelerating/decelerating).
9	1	Bus control	Run command or frequency setting is valid via Profibus.
	0	Local control	Run command and frequency setting are invalid via Profibus.
10	1	Frequency within range	Actual output frequency is above or equal to the limit specified by “Arrival frequency at acceleration/deceleration 1” (C042/C043).
	0	Frequency out of range	Actual output frequency is below the limit specified by by “Arrival frequency at acceleration/deceleration 1” (C042/C043).
11		Not used	-
12	-		Mirror of bit 12 in the control word.
13	-		Mirror of bit 13 in the control word.
14, 15	-	Not used	-

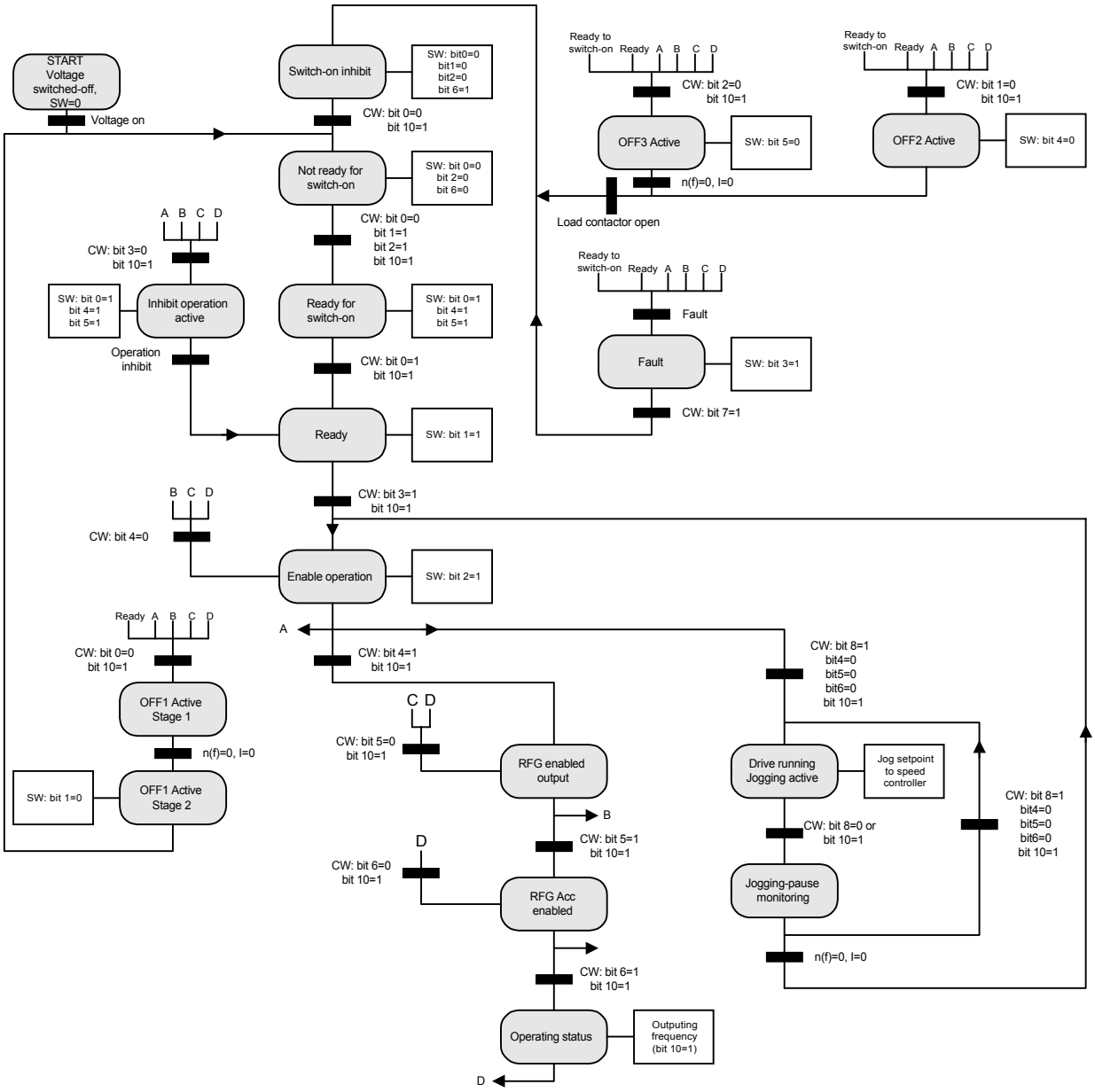


Figure 5-2 Profidrive state diagram

5.3.2 Frequency set-point/ Actual frequency

The data format is “Standardized value”, where 0 hex = 0 % and 4000 hex is 100% of Maximum frequency specified in parameter A004.

Standardized value

A linear value.

0%=0 (0h), 100% is 2^{14} (4000h)

Data type	N2
Range	-200%…200%-2^{-14}
Resolution	2^{-14} = 0.0061%
Length	2 bytes

Notation: 2’s complement notation.
MSB is 1st bit after sign bit in 1st byte.
Sign bit = 0 = positive number
Sign bit = 1 = negative number

Bit	8	7	6	5	4	3	2	1
Byte 1	SIGN	2^{0}	2^{-1}	2^{-2}	2^{-3}	2^{-4}	2^{-5}	2^{-6}
Byte 2	2^{-7}	2^{-8}	2^{-9}	2^{-10}	2^{-11}	2^{-12}	2^{-13}	2^{-14}

5.3.3 PZD word 3-10

In PZD word 3-10 the user can determine which inverter parameters that should be transferred to/from the inverter every bus-cycle.

With some of the PPO types (PPO2, 4, 5) it is possible to read and write parameters cyclically. Parameter write values are placed in the PZD's 3-10 transferred from the master to the inverter. Parameter read values are placed in the PZD's 3-10 transferred from the inverter to the master. However, the meaning of the data transferred in PZD3-10 must be defined in some way so that it can be determined what parameters that shall be written, and also so that the data transferred from the inverter can be connected with the correct parameter.

Parameter 915 and 916 are used to determine what parameters that shall be written (915) and read (916) cyclically (parameter number as specified below, for examples of how to assign these refer to chapter 5.4.2 and 5.4.3).

Assignment of PZD write word 3-10 (PLC -> Inverter) with parameter 915:

915, sub-index 1 = Parameter number for parameter transferred in PZD3

915, sub-index 2 = Parameter number for parameter transferred in PZD4

915, sub-index 3 = Parameter number for parameter transferred in PZD5

915, sub-index 4 = Parameter number for parameter transferred in PZD6

915, sub-index 5 = Parameter number for parameter transferred in PZD7

915, sub-index 6 = Parameter number for parameter transferred in PZD8

915, sub-index 7 = Parameter number for parameter transferred in PZD9

915, sub-index 8 = Parameter number for parameter transferred in PZD10

Assignment of PZD read word 3-10 (Inverter ->PLC) with parameter 916:

916, sub-index 1 = Parameter number for parameter transferred in PZD3

916, sub-index 2 = Parameter number for parameter transferred in PZD4

916, sub-index 3 = Parameter number for parameter transferred in PZD5

916, sub-index 4 = Parameter number for parameter transferred in PZD6

916, sub-index 5 = Parameter number for parameter transferred in PZD7

916, sub-index 6 = Parameter number for parameter transferred in PZD8

916, sub-index 7 = Parameter number for parameter transferred in PZD9

916, sub-index 8 = Parameter number for parameter transferred in PZD10

Please Note:

1. PZD words 3-6 are enabled if PPO 2 or 4 is selected. PZD words 3-10 are enabled with PPO5.
2. Parameter numbers are within the range 1-418. See chapter 5 for an index of the inverter parameter numbers. If a parameter number is set to 0, the actual PZD word will be ignored.
3. Only parameters that are of size **two bytes or less** can be assigned as PZD objects.

5.4 Parameter Examples

5.4.1 Writing a four byte parameter

In this first example, PPO1 is used to set parameter F002 (1st Acceleration time 1) to 4.00 seconds. Also, a Start command and a frequency set-point (50%) is given.

Please note: When reading/writing parameters via the Profidrive profile the cross-reference list must be used, see chapter 5. For example, parameter F002 (1st Acceleration time 1) have parameter number 23 (17h) on Profibus.

	PKW				PZD	
Word	1 PKE	2 IND	3 PWE	4 PWE	5 STW ZSW	6 HSW HIW
Request: PLC->Inverter	30 17	00 00	00 00	01 90	04 06 04 7F*	20 00
Response: Inverter->PLC	20 17	00 00	00 00	01 90	03 31 03 37	20 00

In the request message the first two bytes are used for parameter identification. The first digit (2) denotes the function “Change parameter value (long word)” (refer to chapter 3.2). The second digit along with the second byte (0 and 17) indicates parameter number 23. Bytes 7 and 8 (01 90 = DEC 400) is the parameter value (400 meaning 4.00 seconds). The last four bytes are the Control Word and Frequency set-point. Control Word value 04 06 -> 04 7F* starts the motor, while 20 00 (refer to 5.3.2) signifies 50 % of the maximum frequency specified in parameter A004.

In the response message, the first digit (2) indicates the function “Transfer parameter value (long word)”. Value (01 90 in bytes 7 and 8) and parameter number (x0 17) are mirrored from the request. The last four bytes are Status Word and Actual frequency (%).

5.4.2 Writing a two byte array parameter

In this second example, we are configuring PZD3 to contain the value of parameter A038, “Jogging frequency” in the responses **from the inverter to the master** (PLC). PPO2 is used. On Profibus parameter A038 corresponds to parameter number 61 (3Dh). This is configured with parameter number 916 (394h), “Assignment of PZD read word” (see also chapter 5.3. and 5.5).

	PKW				PZD					
Word	1 PKE	2 IND	3 PWE	4 PWE	5 STW ZSW	6 HSW HIW	7 PZD3	8 PZD4	9 PZD5	10 PZD6
Request: PLC->Inverter	73 94	01 00	00 00	00 3D	04 06 04 7F	20 00	00 00	00 00	00 00	00 00
Response: Inverter->PLC	43 94	01 00	00 00	00 3D	03 31 03 37	20 00	01 F4	00 00	00 00	00 00

In the request message the first two bytes are used for parameter identification. The first digit (7) denotes the function “Change parameter value (array word)” (refer to chapter 3.2). The second digit along with the second byte (3 and 93) indicates parameter number 916. Byte 3 (01) denotes sub-index in the array parameter, in this case “01” means the first index in the array. Bytes 7 and 8 (00 3D = 61dec) contains the parameter number that shall be mapped. This means that in the PZD3 place the read value of parameter A038 (Profibus parameter number 61dec) shall be transferred from the inverter to the master every bus-cycle.
In the response message, the first digit (4) indicates the function “Transfer parameter value (array word)”. Sub-index (01 00), value (00 3D in bytes 7 and 8) and parameter number (x3 94) are mirrored from the request. In the PZD3 field (word 7) the value (01 F4 = 500dec, 5.00 Hz) of “Jogging frequency” is transferred.

5.4.3 Writing a two byte array parameter #2

In this third example, we are configuring PZD3 to contain the value of parameter A004, “1st Maximum frequency” in the request **from the master to the inverter**. PPO2 is used. On Profibus parameter A004 corresponds to parameter number 62 (3Eh). This is configured with parameter number 915 (393h), “Assignment of PZD write word” (see also chapter 5.3.3 and 5.5).

Word	PKW 1 PKE	2 IND	3 PWE	4 PWE	PZD 5 STW ZSW	6 HSW HIW	7 PZD3	8 PZD4	9 PZD5	10 PZD6
Request: PLC->Inverter	73 93	01 00	00 00	00 3E	04 7F	20 00	00 4B	00 00	00 00	00 00
Response: Inverter->PLC	43 93	01 00	00 00	00 3E	03 37	20 00	01 F4	00 00	00 00	00 00

In the request message the first two bytes are used for parameter identification. The first digit (7) denotes the function “Change parameter value (array word)” (refer to chapter 3.2). The second digit along with the second byte (3 and 93) indicates parameter number 915. Byte 3 (01) denotes sub-index in the array parameter, in this case “01” means the first index in the array. Bytes 7 and 8 (00 3E = 62dec) contains the parameter number that shall be mapped. In the PZD3 field (word 7) the value (00 4B = 75, 75 Hz) of “1st Maximum frequency” is transferred. That is, parameter A004 will be written with the value 75.
In the response message, the first digit (4) indicates the function “Transfer parameter value (array word)”. Sub-index (01 00), value (00 3E in bytes 7 and 8) and parameter number (x3 93) are mirrored from the request. As can be seen in word 7 (PZD3) 01 F4h is transferred from the inverter to the master, that is the mapping from the example above (5.4.2) is still present.

*To start the inverter the Profibus state machine must be shifted in a correct way. This may be done in two steps. First the control word should be set to 04 06 (Enter *Ready to switch-on state*) and then to 04 7F (Enter *Operating state*). Refer to the state diagram in Figure 5-2.

5.5 Profidrive specific parameters

The table below shows which Profidrive specific parameters that are supported by the SJ-PB(T).

Table 5-1 Profidrive parameters

PNU - Parameter Number	**Description**	**Range**	
915 Assignment of PZD write word 3-10	Refer to chapter 5.3.3 and 5.4.3 for how to assign PZD words. Use the parameter cross-reference list in chapter 5. **Please note:** Parameters will be lost when turning power off unless parameter 971 has been written with "0->1".	Parameter range: 1 – 418. Sub-index range: 1 – 8.	R/W
916 Assignment of PZD read word 3-10	Refer to chapter 5.3.3 and 5.4.2 for how to assign PZD words. Use the parameter cross-reference list in chapter 5. **Please note:** Parameters will be lost when turning power off unless parameter 971 has been written with "0->1".	Parameter range: 1 – 418. Sub-index range: 1 – 8.	R/W
918 Profibus-DP slave address	Returns address switch setting.	1-99	R
927 Parameter edit rights	1 – PKW interface enabled. Parameters can be read/written. 0 – PKW interface disabled, only parameter 927 can be read/written.	0, 1	R/W
928 Control rights (process data).	1 – Option board will send control word, reference and will update PZD3-10. 0 – PZD not enabled.	0, 1	R/W
947 Indexed Fault memory	Fault. Codes as described in table 5-2 below. Sub-index 1 = Not acknowledged fault. Sub-index 9 = Latest acknowledged fault. Sub-index 17 = 2nd latest acknowledged fault. Sub-index 25 = 3rd latest acknowledged fault. Sub-index 33 = 4th latest acknowledged fault. Sub-index 41 = 5th latest acknowledged fault. Sub-index 49 = 6th latest acknowledged fault.	-	R
963 PROFIBUS-DP baud rate	the baudrate of the Profibus-DP network 0: 12 Mbit/s 1: 6 Mbit/s 2: 3 Mbit/s 3: 1.5 Mbit/s 4: 500 kbit/s 5: 187.5 kbit/s 6: 93.75 kbit/s 7: 45.45 kbit/s 8: 19.2 kbit/s 9: 9.6 kbit/s	0-9	R
964 Device identification	Bit 15 represents the type of inverter, 0 – SJxxx, 1 – LxxxP. Rest of the word represents the model number. SJ300 - 0x012C L300P - 0x812C	012Ch, 812Ch	R
965 Profile version	Returns the Profidrive profile version used in the SJ-PB implementation	2	R
967 Control Word	Shows the latest received control word in hex format Refer to chapter 5.3.1 for detailed information about the control word.	Bit 0-15	R
968 Status Word	Shows the latest status word in hex format Refer to chapter 5.3.1 for detailed information about the status word.	Bit 0-15	R
971 Transfer into non-volatile memory	Please note that it will take approximately 10s for this process to finish (inverter must be stopped). 0 – No function. 1 – Will save inverter parameters to non-volatile memory and the Profile specific parameters to FLASH.	0, 1	W

The malfunction codes are coded as follows.

Table5- 2 Malfunction codes

Fault code SJ300/L300P parameter 947	Fault description
0	No fault
1	Overcurrent inverter.
2	Overcurrent deceleration.
3	Overcurrent acceleration.
4	Overcurrent.
5	Overload protection.
6	Braking resistor overload protection.
7	Over-voltage protection.
8	EEPROM error.
9	Under-voltage.
10	Current detector error.
11	CPU error.
12	External trip.
13	USP error.
14	Ground fault protection.
15	Incoming over-voltage protection.
16	Temporary power loss protection.
21	Abnormal temperature.
23	Gate allay error.
24	Open-phase error.
30	IGBT error.
35	Thermistor error.
36	Abnormal brake.
60-69	Option 1 error 0-9.
70-79	Option 2 error 0-9.

6.1 Trip display

When the inverter is in a tripped state, the inverter displays an error code (See table below). The trip history monitor (d081 to d086) also displays the same error code as the inverter.

Trip code

Inverter's running condition of trip detected

6.2 Protection function list

The table below describes an error code for protecting the inverter and the motor.
Error Display in the table below, X is 6 (Error for option slot 1) or 7 (Error for option slot 2).

No.	Function	Error Display	Action
1	Profibus communication error	EX0	This error is displayed, when disconnection occurred, while the inverter is operating with Profibus.
2	Inverter communication error	EX9	This error is displayed, when communication timeout occurs between the inverter and the option board.

With regard to the other errors except table above, refer to Inverter instruction manual chapter 4 Explanation of function.

6.3 Countermeasure for a trip state

The table below only corresponds to additional trip codes, with regard to the other countermeasures refer to Inverter instruction manual chapter 4 Explanation of function.

Trip code	Name of trip	Cause	Conformation	Countermeasure
EX0	Profibus Communication error	Defective connector for signal cable causes connection fail.	Check the area of connection.	Improve the connection and then reset the power supply.
		Terminating resistor is not connected.	Check the Connection	Connect the terminating Resistor and then reset the power supply
		Wiring distance does not much with baudrate.	Check the wiring distance	Adjust the setting to the matching Baudrate or adjust wiring distance
EX9	Inverter communication error	Option board is removed.	Check as mentioned left	Mount the option board again and then secure it with screws.

6.4 LED display and Countermeasure

Following states are indicated by three LED's.

LED	Color	Function	Countermeasure
Fieldbus On/Off	Green	Fieldbus is on-line.	-
	Red	Fieldbus is off-line.	Confirm connection fails of connector.
Fieldbus diagnosis	Flash Red 1Hz	Configuration error.	Confirm setting data and send correct data.
	Flash Red 2Hz	User configuration data error.	Confirm system setting and adjust adequate.
	Flash Red 4Hz	VPC3+ initialization failed.	Need to change the SJ-PB.
Serial channel status	Green	Serial channel status OK.	-
	Flash Red 1Hz	Serial communication error.	Confirm cable length and connection fails of connector. And then adjust adequate.
	Red	No serial communication. (Or during initializing inverter data. In this case, after initializing, LED color returns to green)	Confirm cable length and connection fails of connector. And then adjust adequate.

Parameter cross-reference list

To be able to read/write parameters via Profibus it is necessary to use a cross-reference list to convert from Profibus parameters to actual parameter values in the inverter.
Example, if parameter “1st Acceleration time 1” shall be read then parameter number 23 shall be used (if the keypad is used F002 is used).
The L300P inverter supports a slightly different parameter map; the “L300P” field reflects this. “No” means that the L300P inverter does not support the parameter, a figure means that the parameter is supported, but with this maximum value instead.

Code	No.	Size	Range	Magn.	Contents	L300P	Read/ Write
A020	1	4	0～400.00Hz	*100	1st setting Multispeed frequency 0		R/W
A220	2	4	0～400.00Hz	*100	2nd setting Multispeed frequency 0		R/W
A320	3	4	0～400.00Hz	*100	3rd setting Multispeed frequency 0	No	R/W
A021	4	4	0～400.00Hz	*100	Multispeed frequency 1		R/W
A022	5	4	0～400.00Hz	*100	Multispeed frequency 2		R/W
A023	6	4	0～400.00Hz	*100	Multispeed frequency 3		R/W
A024	7	4	0～400.00Hz	*100	Multispeed frequency 4		R/W
A025	8	4	0～400.00Hz	*100	Multispeed frequency 5		R/W
A026	9	4	0～400.00Hz	*100	Multispeed frequency 6		R/W
A027	10	4	0～400.00Hz	*100	Multispeed frequency 7		R/W
A028	11	4	0～400.00Hz	*100	Multispeed frequency 8		R/W
A029	12	4	0～400.00Hz	*100	Multispeed frequency 9		R/W
A030	13	4	0～400.00Hz	*100	Multispeed frequency 10		R/W
A031	14	4	0～400.00Hz	*100	Multispeed frequency 11		R/W
A032	15	4	0～400.00Hz	*100	Multispeed frequency 12		R/W
A033	16	4	0～400.00Hz	*100	Multispeed frequency 13		R/W
A034	17	4	0～400.00Hz	*100	Multispeed frequency 14		R/W
A035	18	4	0～400.00Hz	*100	Multispeed frequency 15		R/W
A061	19	4	0～400.00Hz	*100	1st Upper limiter frequency		R/WOS
A261	20	4	0～400.00Hz	*100	2nd Upper limiter frequency		R/WOS
A062	21	4	0～400.00Hz	*100	1st Lower limiter frequency		R/WOS
A262	22	4	0～400.00Hz	*100	2nd Lower limiter frequency		R/WOS
F002	23	4	0.01～3600.00s	*100	1st Acceleration time 1		R/W
F202	24	4	0.01～3600.00s	*100	2nd Acceleration time 1		R/W
F302	25	4	0.01～3600.00s	*100	3rd Acceleration time 1	No	R/W
F003	26	4	0.01～3600.00s	*100	1st Deceleration time 1		R/W
F203	27	4	0.01～3600.00s	*100	2nd Deceleration time 1		R/W
F303	28	4	0.01～3600.00s	*100	3rd Deceleration time 1	No	R/W
A092	30	4	0.01～3600.00s	*100	1st Acceleration time 2		R/W
A292	31	4	0.01～3600.00s	*100	2nd Acceleration time 2		R/W
A392	32	4	0.01～3600.00s	*100	3rd Acceleration time 2	No	R/W
A093	33	4	0.01～3600.00s	*100	1st Deceleration time 2		R/W
A293	34	4	0.01～3600.00s	*100	2nd Deceleration time 2		R/W
A393	35	4	0.01～3600.00s	*100	3rd Deceleration time 2	No	R/WOS

Code	No.	Size	Range	Magn.	Contents	L300P	Read/ Write
A011	36	4	0～400.00Hz	*100	O Start frequency set		R/WOS
A012	37	4	0～400.00Hz	*100	O End frequency set		R/WOS
A111	38	4	-400.00～ 400.00Hz	*100	O2 Start frequency set		R/WOS
A112	39	4	-400.00～ 400.00Hz	*100	O2 End frequency set		R/WOS
A101	40	4	0～400.00Hz	*100	OI Start frequency set		R/WOS
A102	41	4	0～400.00Hz	*100	OI End frequency set		R/WOS
A063	43	4	0～400.00Hz	*100	Jumping frequency 1		R/WOS
A065	44	4	0～400.00Hz	*100	Jumping frequency 2		R/WOS
A067	45	4	0～400.00Hz	*100	Jumping frequency 3		R/WOS
A069	46	4	0～400.00Hz	*100	Frequency of stopping acceleration		R/WOS
A095	47	4	0～400.00Hz	*100	1st Frequency of 2-stage acceleration		R/WOS
A295	48	4	0～400.00Hz	*100	2nd Frequency of 2-stage acceleration		R/WOS
A096	49	4	0～400.00Hz	*100	1st Frequency of 2-stage deceleration		R/WOS
A296	50	4	0～400.00Hz	*100	2nd Frequency of 2-stage deceleration		R/WOS
b007	51	4	0～400.00Hz	*100	Frequency of frequency matching		R/WOS
b053	52	4	0.01～3600.00s	*100	Deceleration time of Non-stop operation at Instantaneous power failure	No	R/WOS
C042	53	4	0～400.00Hz	*100	Arrival frequency at acceleration1		R/WOS
C043	54	4	0～400.00Hz	*100	Arrival frequency at deceleration1		R/WOS
C045	55	4	0～400.00Hz	*100	Arrival frequency at acceleration2	No	R/WOS
C046	56	4	0～400.00Hz	*100	Arrival frequency at deceleration2	No	R/WOS
A003	58	2	30～400Hz	*1	1st Base frequency		R/WOS
A203	59	2	30～400Hz	*1	2nd Base frequency		R/WOS
A303	60	2	30～400Hz	*1	3rd Base frequency	No	R/WOS
A038	61	2	0～9.99Hz	*100	Jogging frequency		R/W
A004	62	2	30～400Hz	*1	1st Maximum frequency		R/WOS
A204	63	2	30～400Hz	*1	2nd Maximum frequency		R/WOS
A304	64	2	30～400Hz	*1	3rd Maximum frequency	No	R/WOS
H020	66	4	0～65.530Ω	*1000	1st Primary resistor R1 of motor	No	R/WOS
H220	67	4	0～65.530Ω	*1000	2nd Primary resistor R1 of motor	No	R/WOS
H021	68	4	0～65.530Ω	*1000	1st Secondary resistor R2 of motor	No	R/WOS
H221	69	4	0～65.530Ω	*1000	2nd Secondary resistor R2 of motor	No	R/WOS
H022	70	4	0～655.35mH	*100	1st Inductance L of motor	No	R/WOS
H222	71	4	0～655.35mH	*100	2nd Inductance L of motor	No	R/WOS
H023	72	4	0～655.35A	*100	1st No load current Io of motor	No	R/WOS
H223	73	4	0～655.35A	*100	2nd No load current Io of motor	No	R/WOS
H024	74	4	0.001～ 9999.000kgm2	*100	1st Inertia J of motor	No	R/WOS
H224	75	4	0.001～ 9999.000kgm2	*100	2nd Inertia J of motor	No	R/WOS
H030	76	4	0～65.5350Ω	*1000	1st Primary resistor R1 of motor (Auto)	No	R/WOS
H230	77	4	0～65.530Ω	*1000	2nd Primary resistor R1 of motor (Auto)	No	R/WOS
H031	78	4	0～65.530Ω	*1000	1st Secondary resistor R2 of motor (Auto)	No	R/WOS
H231	79	4	0～65.530Ω	*1000	2nd Secondary resistor R2 of motor (Auto)	No	R/WOS
H032	80	4	0～655.35mH	*100	1st Inductance L of motor (Auto)	No	R/WOS
H232	81	4	0～655.35mH	*100	2nd Inductance L of motor (Auto)	No	R/WOS

APPENDIX PARAMETER CROSS-REFERENCE LIST

Code	No.	Size	Range	Magn.	Contents	L300P	Read/ Write
H033	82	4	0～655.35A	*100	1st No load current Io of motor (Auto)	No	R/WOS
H233	83	4	0～655.35A	*100	2nd No load current Io of motor (Auto)	No	R/WOS
H034	84	4	0.001～ 9999.000kgm2	*100	1st Inertia J of motor (Auto)	No	R/WOS
H234	85	4	0.001～ 9999.000kgm2	*100	2nd Inertia J of motor (Auto)	No	R/WOS
A043	86	2	0～50.0%	*10	1st Break point of manual torque boost		R/W
A243	87	2	0～50.0%	*10	2nd Break point of manual torque boost		R/W
A343	88	2	0～50.0%	*10	3rd Break point of manual torque boost	No	R/W
A052	89	2	0～60.00Hz	*100	Frequency of DC braking start		R/WOS
A055	90	2	0～60.0s	*10	Time of DC braking working		R/WOS
A058	91	2	0～60.0s	*10	Time of DC braking working for beginning of inverter running		R/WOS
A064	92	2	0～10.00Hz	*100	Width of jumping frequency 1		R/WOS
A066	93	2	0～10.00Hz	*100	Width of jumping frequency 2		R/WOS
A068	94	2	0～10.00Hz	*100	Width of jumping frequency 3		R/WOS
A070	95	2	0～60.0s	*10	Time of stopping to accelerate		R/WOS
A073	96	2	0～3600.0s	*10	Integrate (I) gain of PID control		R/W
A074	97	2	0～100.00	*100	Differential (D) gain of PID control		R/W
A075	98	2	0.01～99.99%	*100	Scale of PID control		R/WOS
A086	99	2	0～100.0	*10	Response time of Energy saving function		R/W
b003	101	2	0.3～100.0s	*10	Waiting time of retry		R/WOS
b012	102	2	20.0～120.0	*10	Level of 1st Electronic thermal protection		R/WOS
b212	103	2	20.0～120.0	*10	Level of 2nd Electronic thermal protection		R/WOS
b312	104	2	20.0～120.0	*10	Level of 3rd Electronic thermal protection	No	R/WOS
b015	105	2	0～400Hz	*1	Free electronic thermal frequency 1		R/WOS
b016	106	2	0～1000.0A	*10	Free electronic thermal current 1		R/WOS
b017	107	2	0～400Hz	*1	Free electronic thermal frequency 2		R/WOS
b018	108	2	0～1000.0A	*10	Free electronic thermal current 2		R/WOS
b019	109	2	0～400Hz	*1	Free electronic thermal frequency 3		R/WOS
b020	110	2	0～1000.0A	*10	Free electronic thermal current 3		R/WOS
b100	111	2	0～400Hz	*1	Free V/F control frequency 1		R/WOS
b101	112	2	0.0～800.0V	*10	Free V/F control voltage 1		R/WOS
b102	113	2	0～400Hz	*1	Free V/F control frequency 2		R/WOS
b103	114	2	0.0～800.0V	*10	Free V/F control voltage 2		R/WOS
b104	115	2	0～400Hz	*1	Free V/F control frequency 3		R/WOS
b105	116	2	0.0～800.0V	*10	Free V/F control voltage 3		R/WOS
b106	117	2	0～400Hz	*1	Free V/F control frequency 4		R/WOS
b107	118	2	0.0～800.0V	*10	Free V/F control voltage 4		R/WOS
b108	119	2	0～400Hz	*1	Free V/F control frequency 5		R/WOS
b109	120	2	0.0～800.0V	*10	Free V/F control voltage 5		R/WOS
b110	121	2	0～400Hz	*1	Free V/F control frequency 6		R/WOS
b111	122	2	0.0～800.0V	*10	Free V/F control voltage 6		R/WOS
b112	123	2	0～400Hz	*1	Free V/F control frequency 7		R/WOS
b113	124	2	0.0～800.0V	*10	Free V/F control voltage 7		R/WOS
b022	125	2	50.0～200.0	*10	Level of Overload restriction 1	50.0～ 150.0	R/WOS

Code	No.	Size	Range	Magn.	Contents	L300P	Read/ Write
b023	126	2	0.10～30.00	*100	Constant value of Overload restriction 1		R/WOS
b025	127	2	50.0～200.0	*10	Level of Overload restriction 2	50.0～ 150.0	R/WOS
b026	128	2	0.10～30.00	*100	Constant value of Overload restriction 2		R/WOS
b034	129	2	0～65535(*10hr)	*1/10	Display time of warning		R/WOS
b051	130	2	0～1000.0V	*10	Starting voltage of Nonstop operation for Instantaneous power failure	No	R/WOS
b052	131	2	0～1000.0V	*10	Starting voltage of OV-LAD stop at Nonstop operation for Instantaneous power failure	No	R/WOS
b054	132	2	0～10.00Hz	*100	Frequency width of starting deceleration at Nonstop operation for Instantaneous power failure	No	R/WOS
b082	133	2	0.10～9.99Hz	*100	Minimum frequency		R/WOS
b086	134	2	0.1～99.9	*10	Coefficient of converting frequency		R/W
b090	135	2	0～100.0%	*10	Usage rate of BRD		R/WOS
b096	136	2	330～380/ 660～760	*1	On level of BRD		R/WOS
b099	137	2	0～9999ƒ	*1	Level of Thermister error		R/WOS
b121	138	2	0～5.00,“	*100	Waiting time for establishing external braking condition	No	R/WOS
b122	139	2	0.00～5.00s	*100	Waiting time for acceleration at external braking	No	R/WOS
b123	140	2	0.00～5.00s	*100	Waiting time for stop at external braking	No	R/WOS
b124	141	2	0.00～5.00s	*100	Waiting time for confirmation signal at external braking	No	R/WOS
b125	142	2	0～400.00Hz	*100	Release frequency of external braking	No	R/WOS
b126	143	2	0～200.0(%)	*10	Release current of external braking	No	R/WOS
H005	145	2	0.001～65.535	*1000	1st Speed response gain	No	R/W
H205	146	2	0.001～65.535	*1000	2nd Speed response gain	No	R/W
H006	147	2	0～255	*1	1st Stability gain		R/W
H206	148	2	0～255	*1	2nd Stability gain		R/W
H306	149	2	0～255	*1	3rd Stability gain	No	R/W
H050	150	2	0～1000.0(%)	*10	1st Proportional gain of speed control (PI control)	No	R/W
H250	151	2	0～1000.0(%)	*10	2nd Proportional gain of speed control (PI control)	No	R/W
H051	152	2	0～1000.0(%)	*10	1st Integral gain of speed control (PI control)	No	R/W
H251	153	2	0～1000.0(%)	*10	2nd Integral gain of speed control (PI control)	No	R/W
H052	154	2	0.01～10.00	*100	1st Proportional gain of speed control (P control)	No	R/W
H252	155	2	0.01～10.00	*100	2nd Proportional gain of speed control (P control)	No	R/W
H060	156	2	0～100.0	*10	1st Limiter of 0Hz control	No	R/W
H260	157	2	0～100.0	*10	2nd Limiter of 0Hz control	No	R/W
H070	158	2	0～1000.0(%)	*10	PI Proportion gain Change	No	R/W
H071	159	2	0～1000.0(%)	*10	PI Integral gain Change	No	R/W
H072	160	2	0.01～10.00	*100	P Proportion gain Change	No	R/W
C029	162	1	00～07	code	Selection of AMI function		R/WOS
C087	163	1	0～255	*1	Adjustment of AMI output		R/W

APPENDIX PARAMETER CROSS-REFERENCE LIST

Code	No.	Size	Range	Magn.	Contents	L300P	Read/ Write
C088	164	1	0.0～20.0mA	*10	Adjustment of Offset of AMI output		R/W
C091	166	1	00,01	code	Selection of Debug mode method		R/W
C041	168	2	0～200.0(%)	*10	Level1 of overload restriction warning		R/WOS
C111	169	2	0～200.0(%)	*10	Level2 of overload restriction warning	No	R/WOS
C044	170	2	0～100.0%	*10	Level over acceptable deviation of PID control		R/WOS
C063	171	2	0～100.00Hz	*100	Level f detecting Zero speed	No	R/WOS
C061	173	2	0～100%	*1	Warning Level of electronic thermal protection		R/WOS
C078	174	2	0～1000ms	*1	Waiting time of communication start		R/WOS
P011	176	2	128～65000pls	*1	Pulse number of the encoder	No	R/WOS
P014	177	2	0～4095	*1	Stop position at Orientation mode	No	R/WOS
P015	178	2	0～120.00Hz	*100	Speed at Orientation mode	No	R/WOS
P017	179	2	0～10000pls	*1	Defining Area of completion of Orientation mode	No	R/WOS
P018	180	2	0～9.99s	*100	Delay time of completion Orientation mode	No	R/WOS
P020	181	2	0～9999	*1	The numerator of electric gear	No	R/WOS
P021	182	2	0～9999	*1	The denominator of electric gear	No	R/WOS
P022	183	2	0～655.35	*100	Feed forward gain of position control	No	R/WOS
P023	184	2	0～100.00	*100	Loop gain of position control	No	R/WOS
P026	185	2	0～150.0	*10	Level of detecting over speed	No	R/WOS
P027	186	2	0～120.00Hz	*100	Value of detecting over deviation	No	R/WOS
F004	188	1	00,01	code	Selection of running direction for DIG-OPE		R/WOS
A001	189	1	00～05	code	Selection of frequency command destination		R/WOS
A002	190	1	01～05	code	Selection of running command destination		R/WOS
A005	191	1	00,01	code	Selection of AT function		R/WOS
A006	192	1	00～02	code	Selection of O2 terminal function		R/WOS
A013	193	1	0～100%	*1	Starting rate of O terminal		R/WOS
A014	194	1	0～100%	*1	End rate of O terminal		R/WOS
A015	195	1	00,01	code	Selection of starting function of O terminal		R/WOS
A016	196	1	1～30times	*1	Analog Sampling		R/WOS
A113	197	1	-100～100%	*1	Starting rate of O2 terminal		R/WOS
A114	198	1	-100～100%	*1	End rate of O2 terminal		R/WOS
A103	199	1	0～100%	*1	Starting rate of OI terminal		R/WOS
A104	200	1	0～100%	*1	End rate of OI terminal		R/WOS
A105	201	1	00,01	code	Selection of starting function of OI terminal		R/WOS
A019	203	1	00,01	code	Selection of Multispeed method		R/WOS
A039	204	1	00～05	code	Selection of Jogging method		R/WOS
A041	205	1	00,01	code	Selection of 1st Torque boost Method		R/WOS
A241	206	1	00,01	code	Selection of 2nd Torque boost Method		R/WOS
A042	207	1	0～20.0%	*10	Value of 1st Manual torque boost		R/W
A242	208	1	0～20.0%	*10	Value of 2nd Manual torque boost		R/W
A342	209	1	0～20.0%	*10	Value of 3rd Manual torque boost	No	R/W
A044	210	1	00～05	code	Selection of 1st Control method	00～02	R/WOS
A244	211	1	00～04	code	Selection of 2nd Control method	00～02	R/WOS
A344	212	1	00,01	code	Selection of 3rd Control method	No	R/WOS

Code	No.	Size	Range	Magn.	Contents	L300P	Read/ Write
A045	213	1	20～100%	*1	Gain of output voltage		R/W
A051	214	1	00,01	code	Selection of DC braking method		R/WOS
A053	215	1	0～5.0s	*10	Delay time of DC braking start		R/WOS
A054	216	1	0～100	*1	Power of DC braking(end of running)		R/WOS
A056	217	1	00,01	code	Selection of edge/level action of DC braking trigger		R/WOS
A057	218	1	0～100	*1	Power of DC braking(start of running)		R/WOS
A059	219	1	0.5～15.0kHz	*10	Carrier frequency of DC braking	0.5～12.0	R/WOS
A071	220	1	00,01	code	Selection of PID control presence		R/WOS
A072	221	1	0.2～5.0	*10	Proportional(P) gain of PID control		R/W
A076	222	1	00,01	code	Selection of feedback destination for PID control		R/WOS
A081	223	1	00～02	code	Selection of AVR function		R/WOS
A082	224	1	0～10	code	Selection of Motor voltage		R/WOS
A085	225	1	00～02	code	Selection of operation mode	00,01	R/WOS
A094	226	1	00,01	code	Selection of 1st 2-stage accel/decel Method		R/WOS
A294	227	1	00,01	code	Selection of 2nd 2-stage accel/decel Method		R/WOS
A097	228	1	00～03	code	Selection of acceleration pattern		R/WOS
A098	229	1	00～03	code	Selection of deceleration pattern		R/WOS
A131	230	1	01～10	code	Curve constant of acceleration		R/WOS
A132	231	1	01～10	code	Curve constant of deceleration		R/WOS
b001	233	1	00～03	code	Selection of retry method		R/WOS
b002	234	1	0.3～1.0s	*10	Acceptable time for Instantaneous power failure		R/WOS
b004	235	1	00～02	code	Selection of method(action) at instantaneous power andunder voltage		R/WOS
b005	236	1	00,01	code	Retry number of instantaneous power and under voltage		R/WOS
b006	237	1	00,01	code	Selection of fail phase function		R/WOS
b013	238	1	00～02	code	Selection of characteristic of 1st electronic thermal protection		R/WOS
b213	239	1	00～02	code	Selection of characteristic of 2nd electronic thermal protection		R/WOS
b313	240	1	00～02	code	Selection of characteristic of 3rd electronic thermal protection	No	R/WOS
b021	242	1	00～03	code	Selection of method of overload restriction1		R/WOS
b024	243	1	00～03	code	Selection of method of overload restriction2		R/WOS
b031	244	1	00～03,10	code	Selection of method of Software lock		R/WOS
b037	245	1	00～02	code	Selection of Display		R/WOS
b040	247	1	00～04	code	Selection of method of Torque limiter	No	R/WOS
b041	248	1	0～200%	*1	Level of torque limiter in forward and drive (1st quadrant)	No	R/WOS
b042	249	1	0～200%	*1	Level of torque limiter in reverse and regenerative (2nd quadrant)	No	R/WOS
b043	250	1	0～200%	*1	Level of torque limiter in reverse and drive (3rd quadrant)	No	R/WOS
b044	251	1	0～200%	*1	Level of torque limiter in forward and regenerative (4th quadrant)	No	R/WOS

APPENDIX PARAMETER CROSS-REFERENCE LIST

Code	No.	Size	Range	Magn.	Contents	L300P	Read/ Write
b045	252	1	00,01	code	Selection of LAD stop by torque	No	R/WOS
b035	253	1	00～02	code	Selection of running direction limitation		R/WOS
b046	254	1	00,01	code	Selection of preventive of reverse running	No	R/WOS
b036	255	1	00～06	*1	Selection of method of educing voltage start		R/WOS
b050	257	1	00,01	code	Selection of Non stop operation at instantaneous power failure	No	R/WOS
b080	258	1	0～255	*1	Adjustment of AM(analog monitor)		R/W
b081	259	1	0～255	*1	Adjustment of FM(digital monitor)		R/W
b083	260	1	0.5～15.0kHz	*10	Carrier frequency(PWM frequency	0.5～12.0	R/WOS
b084	261	1	00～02	code	Selection of Initialization		R/WOS
b085	262	1	00～02	code	Selection of initialized data		R/WOS
b087	263	1	00,01	code	Selection of STOP key function		R/WOS
b088	264	1	00,01	code	Selection free run function		R/WOS
b091	265	1	00,01	code	Selection of action at stop		R/WOS
b092	267	1	00,01	code	Selection of action of cooling fan		R/WOS
b095	268	1	00～02	code	Selection of BRD function		R/WOS
b098	269	1	00～02	code	Selection of Thermister function		R/WOS
b120	270	1	00,01	code	Selection of external braking function	No	R/WOS
C001	272	1	01～48,255	code	Selection of function in Intelligent input 1	01～39	R/WOS
C002	273	1	01～48,255	code	Selection of function in Intelligent input 2	01～39	R/WOS
C003	274	1	01～48,255	code	Selection of function in Intelligent input 3	01～39	R/WOS
C004	275	1	01～48,255	code	Selection of function in Intelligent input 4	01～39	R/WOS
C005	276	1	01～48,255	code	Selection of function in Intelligent input 5	01～39	R/WOS
C006	277	1	01～48,255	code	Selection of function in Intelligent input 6	No	R/WOS
C007	278	1	01～48,255	code	Selection of function in Intelligent input 7	No	R/WOS
C008	279	1	01～48,255	code	Selection of function in Intelligent input 8	No	R/WOS
C011	280	1	00,01	code	Selection of a(NO) or b(NC) contact in Intelligent input 1		R/WOS
C012	281	1	00,01	code	Selection of a(NO) or b(NC) contact in Intelligent input 2		R/WOS
C013	282	1	00,01	code	Selection of a(NO) or b(NC) contact in Intelligent input 3		R/WOS
C014	283	1	00,01	code	Selection of a(NO) or b(NC) contact in Intelligent input 4		R/WOS
C015	284	1	00,01	code	Selection of a(NO) or b(NC) contact in Intelligent input 5		R/WOS
C016	285	1	00,01	code	Selection of a(NO) or b(NC) contact in Intelligent input 6	No	R/WOS
C017	286	1	00,01	code	Selection of a(NO) or b(NC) contact in Intelligent input 7	No	R/WOS
C018	287	1	00,01	code	Selection of a(NO) or b(NC) contact in Intelligent input 8	No	R/WOS
C019	288	1	00,01	code	Selection of a(NO) or b(NC) contact in FW input		R/WOS
C101	289	1	00,01	code	Selection of UP/DOWN function		R/WOS
C102	290	1	00～02	code	Selection of RESET function		R/WOS
C103	291	1	00,01	code	Selection of frequency matching function at RESET		R/WOS

Code	No.	Size	Range	Magn.	Contents	L300P	Read/ Write
C021	292	1	00～26	code	Selection of function in Intelligent output 11	00～13	R/WOS
C022	293	1	00～26	code	Selection of function in Intelligent output 12	00～13	R/WOS
C023	294	1	00～26	code	Selection of function in Intelligent output 13	No	R/WOS
C024	295	1	00～26	code	Selection of function in Intelligent output 14	No	R/WOS
C025	296	1	00～26	code	Selection of function in Intelligent output 15	No	R/WOS
C026	297	1	00～26	code	Selection of function in Alarm relay output	00～13	R/WOS
C027	298	1	00～07	code	Selection of FM function		R/WOS
C028	299	1	00～07	code	Selection of AM function		R/WOS
C086	300	1	0～10.0V	*10	Adjustment of offset of AM		R/W
C031	301	1	00,01	code	Selection of a(NO) or b(NC) contact in Intelligent output 11		R/WOS
C032	302	1	00,01	code	Selection of a(NO) or b(NC) contact in Intelligent output 12		R/WOS
C033	303	1	00,01	code	Selection of a(NO) or b(NC) contact in Intelligent output 13	No	R/WOS
C034	304	1	00,01	code	Selection of a(NO) or b(NC) contact in Intelligent output 14	No	R/WOS
C035	305	1	00,01	code	Selection of a(NO) or b(NC) contact in Intelligent output 15	No	R/WOS
C036	306	1	00,01	code	Selection of a(NO) or b(NC) contact in Alarm relay output		R/WOS
C040	307	1	00,01	code	Selection of output mode of overload warning signal		R/WOS
C055	308	1	0～200%	*1	Level of over torque in forward and drive (1st quadrant)	No	R/WOS
C056	309	1	0～200%	*1	Level of over torque in reverse and regenerative (2nd quadrant)	No	R/WOS
C057	310	1	0～200%	*1	Level of over torque in reverse and drive (3rd quadrant)	No	R/WOS
C058	311	1	0～200%	*1	Level of over torque in forward and regenerative (4th quadrant)	No	R/WOS
C062	313	1	00～02	code	Selection of Alarm code	No	R/WOS
C070	314	1	02～05	code	Selection of Data command		R/WOS
C071	315	1	02～06	code	Selection of communication speed for RS485		R/WOS
C072	316	1	1～32	*1	Selection of Inverter address for RS 485		R/WOS
C073	317	1	7,8bits	*1	Selection of bit length of data for RS485		R/WOS
C074	318	1	00～02	code	Selection of parity (odd or even) for RS485		R/WOS
C075	319	1	1,2bits	*1	Selection of stop bit for RS485		R/WOS
H001	321	1	00～02	code	Selection of Auto-tuning presence	No	R/WOS
H002	322	1	00～02	code	Selection of Motor constant for 1st motor	No	R/WOS
H202	323	1	00～02	code	Selection of Motor constant for 2nd motor	No	R/WOS
H003	324	1	00～21	code	Selection of Motor capacity for 1st motor		R/WOS
H203	325	1	00～21	code	Selection of Motor capacity for 2nd motor		R/WOS
H004	326	1	00～03	code	Selection of Motor poles for 1st motor		R/WOS
H204	327	1	00～03	code	Selection of Motor poles for 2nd motor		R/WOS
P012	328	1	00,01	code	Selection of Control Mode	No	R/WOS

Code	No.	Size	Range	Magn.	Contents	L300P	Read/ Write
P013	329	1	00～03	code	Selection of method of Pulse lines input	No	R/WOS
P016	330	1	00,01	code	Set of Orientation direction	No	R/WOS
P019	331	1	00,01	code	Selection of location of electric gear	No	R/WOS
P001	332	1	00,01	code	Selection of action at option1 error		R/WOS
P002	333	1	00,01	code	Selection of action at option2 error		R/WOS
P010	334	1	00,01	code	Selection of feedback option	No	R/WOS
P025	336	1	00,01	code	Selection of Available of compensation of secondary resistor	No	R/WOS
P031	337	1	00～02	code	Acc/Dec input mode selection		R/WOS
P032	338	1	00～02	code	Stop position setting input mode selection	No	R/WOS
d016	340	4	0～ 4294836225s	*1	Set of Accumulated time during running		RO
d017	341	4	0～ 4294836225s	*1	Set of Accumulated time during power ON		RO
C085	343	2	0～1000.0	*10	Adjusting value of Thermister		R/W
C081	344	2	0～65535	*1	Adjustment of ? terminal		R/W
C083	345	2	0～65535	*1	Adjustment of ? terminal		R/W
C082	346	2	0～65535	*1	Adjustment of ? terminal		R/W
C121	348	2	0～65535	*1	Adjustment of Zero of ? terminal		R/W
C123	349	2	0～65535	*1	Adjustment of Zero of ? terminal		R/W
C122	350	2	0～65535	*1	Adjustment of Zero of ? terminal		R/W
d080	352	2	0～65535	*1	Accumulated number of Trip(error)		RO
	354	1	00～05	*1	Pointer of history of last trip(error)		RO
d081	355	4	00～H'FF	*1	Factor and Status of Trip1		RO
d081	356	4	0～400.00Hz	*100	Frequency of Trip1		RO
d081	357	2	0～1000.0A	*10	Output current of Trip1		RO
d081	358	2	0～1000.0V	*10	PN voltage (DC voltage) of Trip1		RO
d081	359	4	0～ 4294836225s	*1	Accumulated time during running of Trip1		RO
d081	360	4	0～ 4294836225s	*1	Accumulated time during power ON of Trip1		RO
d082	361	4	00～H'FF	*1	Factor and Status of Trip2		RO
d082	362	4	0～400.00Hz	*100	Frequency of Trip2		RO
d082	363	2	0～1000.0A	*10	Output current of Trip2		RO
d082	364	2	0～1000.0V	*10	PN voltage (DC voltage) of Trip2		RO
d082	365	4	0～ 4294836225s	*1	Accumulated time during running of Trip2		RO
d082	366	4	0～ 4294836225s	*1	Accumulated time during power ON of Trip2		RO
d083	367	4	00～H'FF	*1	Factor and Status of Trip3		RO
d083	368	4	0～400.00Hz	*100	Frequency of Trip3		RO
d083	369	2	0～1000.0A	*10	Output current of Trip3		RO
d083	370	2	0～1000.0V	*10	PN voltage (DC voltage) of Trip3		RO
d083	371	4	0～ 4294836225s	*1	Accumulated time during running of Trip3		RO
d083	372	4	0～ 4294836225s	*1	Accumulated time during power ON of Trip3		RO
d084	373	4	00～H'FF	*1	Factor and Status of Trip4		RO
d084	374	4	0～400.00Hz	*100	Frequency of Trip4		RO
d084	375	2	0～1000.0A	*10	Output current of Trip4		RO

Code	No.	Size	Range	Magn.	Contents	L300P	Read/ Write
d084	376	2	0～1000.0V	*10	PN voltage (DC voltage) of Trip4		RO
d084	377	4	0～ 4294836225s	*1	Accumulated time during running of Trip4		RO
d084	378	4	0～ 4294836225s	*1	Accumulated time during power ON of Trip4		RO
d085	379	4	00～H'FF	*1	Factor and Status of Trip5		RO
d085	380	4	0～400.00Hz	*100	Frequency of Trip5		RO
d085	381	2	0～1000.0A	*10	Output current of Trip5		RO
d085	382	2	0～1000.0V	*10	PN voltage (DC voltage) of Trip5		RO
d085	383	4	0～ 4294836225s	*1	Accumulated time during running of Trip5		RO
d085	384	4	0～ 4294836225s	*1	Accumulated time during power ON of Trip5		RO
d086	385	4	00～H'FF	*1	Factor and Status of Trip6		RO
d086	386	4	0～400.00Hz	*100	Frequency of Trip6		RO
d086	387	2	0～1000.0A	*10	Output current of Trip6		RO
d086	388	2	0～1000.0V	*10	PN voltage (DC voltage) of Trip6		RO
d086	389	4	0～ 4294836225s	*1	Accumulated time during running of Trip6		RO
d086	390	4	0～ 4294836225s	*1	Accumulated time during power ON of Trip6		RO
-	392	1	00～02	code	Selection of Area code of inverter		RO
-	393	1	01～15	code	Selection of Capacity code of inverter		RO
-	394	1	00,01	code	Selection of Voltage of inverter		RO
-	395	1	00,01	code	Selection of Changeover of inverter mode		RO
d001	397	4	0～400.000Hz	*1000	Output frequency		RO
d004	398	4	0～400.000Hz	*1000	Feedback data of PID control		RO
d007	399	4	0～39960.000	*1000	Value of conversion of frequency		RO
d101	400	4	0～400.000Hz	*1000	Output frequency after Vector control		RO
d016	401	4	0～ 4294836225s	*1	Accumulated time during running		RO
d017	402	4	0～ 4294836225s	*1	Accumulated time during Power ON		RO
-	403	4	0～400.000Hz	*1000	Setting frequency from terminal		RO
-	404	4	0～400.000Hz	*1000	Setting frequency from attached potentiometer		RO
-	405	4	0～400.000Hz	*1000	Setting frequency from digital operator		RO
d002	407	2	0～1000.0A	*10	Output current		RO
d005	408	2	0～H'FFFF	bit	Status of Input terminal		RO
d012	409	2	-300～+300%	*1	Output Torque	No	RO
d014	410	2	0～1000.0kW	*10	Input electric power		RO
	412	2	0～1000.0V	*10	DC voltage		RO
	413	2	0～100.0s	*10	On time of BRD running		RO
	414	2	0～100.0%	*10	Used rate of electronics thermal protection		RO
d006	416	2	0～H'FFFF	bit	Status of output terminal		RO
d013	417	2	0～1000.0V	*10	Output voltage		RO
d003	418	1	00～02	code	Direction of present running		RO

R/W: Parameter is read/writable.

R/WOS: Parameter is readable, but can only be written when the inverter is stopped.

R/O: Parameter is read-only. Cannot be written.