VF64

TOYODENKI

VF64 Inverter
OPCN-1 (JPCN-1) Interface Card

RSH64
INSTRUCTION MANUAL

INTRODUCTION

Thank you for your adoption of JEMA Net (JPCN-1) Option RSH64 for our VF64 Series Inverter.

This option is communication device meeting the Standard of PLC Field Network, which is recommended by The Japan Electrical Manufacturers' Association (JEMA). Therefore, this Manual shows summary on the setting and specifications (Standard) of Inverter side.

On use of this device, please refer Standard Book issued by JEMA.

In case of creation of communication program of master station by customer, please consult with us since detailed explanatory leaflet of communication data, etc. is available.

SAFETY PRECAUTIONS

Before use of the product, please read ***Safety precautions*** thoroughly.

In this Manual, rank of safety precautions is distinguished to ***Danger*** and ***Caution***.

Misoperation may lead to dangerous situation and could result in death or serious injury.

Misoperation may lead to dangerous situation and could result in injury light or medium degree as well as in damage to physical property only.

However, such misoperation could cause serious result depending on the situation. Since important content is written in the Manual, please obey it surely.

Caution

- Don't use the products, which are found damaged or deformed at the time of unpacking.
  - They could cause trouble or mal-operation.
- Avoid shock to the product by drop, falling down, etc.
  - They could cause damage of product and trouble.
- Connect communication cable and connector securely and lock them.
  - Imperfect connection could cause trouble and mal-operation.
- Since operation setting from low till high speed can be set to Inverter, operate Inverter confirming permissible range of motor and machine enough.

Danger

- Carry out fitting, removing, wiring works and maintenance and inspection surely After turning off the power.
  - Such works under supply of power could result in electric shock and fire.
- Turn on the input power surely after fitting of the front cover. Also, don't remove it during power supply.
  - Otherwise, that could result in electric shock.
- Don't touch Inverter terminals during power supply.
  - Otherwise, that could result in electric shock.
- If alarm is set while operation signal (command) is kept inputting, Inverter re-start suddenly. Therefore, set alarm after confirmation of turning off of operation signal (command).
  - Otherwise, that could result in injury.
- Never execute remodeling.

C O N T E N T S

1. SUMMARY OF FUNCTION

This option card ASYC64 is mounted on the connector of control P.C.Board (VFC64) of VF64 Inverter, instead of terminal block P.C.Board (VFC64TB). Function of RSH64 is to do operation command, speed command, setting of kinds of parameter, monitoring of operation, etc. by upper CPU system, personal computer, PLC, etc. rapidly.

As a network specification, RSH64 is in conformity to JPCN-1 (Standard of The Japan Electrical Manufacturers' Association) and realized transmission speed of 1Mbps.

Also, communication protocol can establish the network by creation of control program based on master station.

1-1. JPCN-1 network

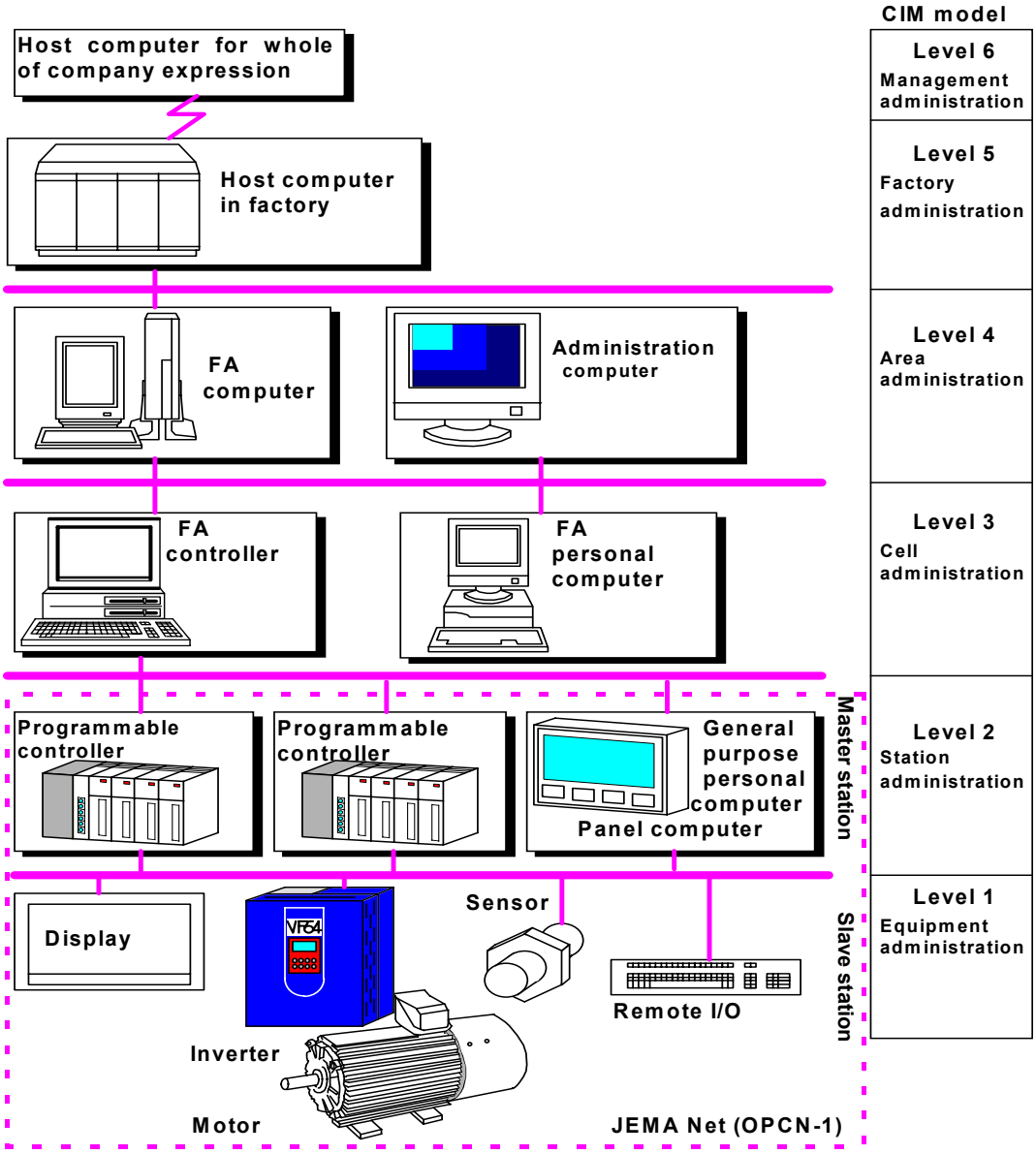
JPCN-1 (JEMA Programmable Controller Network level-1) is the Standard of network, which aims station administration of FA System making Programmable Controller as its center.

RSH64 Option has verification of this Standard, which aims control of plural input/output devices by one PLC in PLC lower network rapidly, economically and in small size.

1-2. Placing of JPCN-1

JPCN-1 is multi-vender network to offer mutual connection specification among different makers, different models and placing in OSI (Open System Interconnection/CIM ref. Model is to connect level 1 and level 2. It offers data communication network between devices such as sensor, actuator, Inverter, servo motor, etc. of being so called "field area" and control equipment (PLC, etc.). See figure below.

We developed and started selling of product complying with the demand at an early stage.



2. Basic specification

2-1. Standard Book of JEMA

Code of Standard Book	Year of latest issue	Name of Standard	Time of enactment	Price
JEM-F3008	1993	Field Network Standard for programmable controller (Level 1)	1993.11	¥6,720
JEM-F3009	1994	Test and inspection methods of Field Network Standard for programmable controller (Level 1)	1994. 6	
JEM-TR192	1995	Standard for users of 7U service of data readout/write in JEM-F3008	1994.12	

2-2. Basic specification

Item	Specification
Power source	Control side +5V ... to be supplied from control P.C.Board (VFC64) of Inverter main unit
	Communication side +5V ... to be supplied isolatedly from built-in DC/DC converter
Communication protocol	In conformity to JEM-F3008 (JPCN-1)
Applicable class of JPCN-1	TYPE-S521
Electrical charac-teristics of physical layer	In conformity to RS-485
Objective devices of communication	Devices having specification of master station of JPCN-1 in addition to our uGPCH
Type of connection	Bus type (Multi-drop system)
Transmission speed and transmission distance	To be set by built-in console of VF64 Inverter main unit 125kpbs - 1000m or less 250kpbs - 800m or less 500kpbs - 480m or less 1Mbps - 240m or less
Transmission procedure	Half duplex transmission
Synchronization system	Frame synchronization
Modulation system	Base band system
Encoding system	NRZI
Connection, wiring system Connection cable	Terminal block (5 poles), 2 wires or 3 wires type Twisted pair cable with shield (CO-SPEV-SB(A)2Px0.5 is recommendable
Number of connection station	1～31 stations as slave station against master station of 1 unit
Setting of station number	to be set by built-in rotary switch of RSH64 main unit
Communication control system	Polling/selecting system
Error check system	FCS (Frame check sequence)
Data type	Binary or bit data
Network service	Initial setting, Input/output, Data readout, Data writing service,Reset, Simultaneous communication all together

3.Explanation of RSH64 P.C.Board

3-1. Name of each part

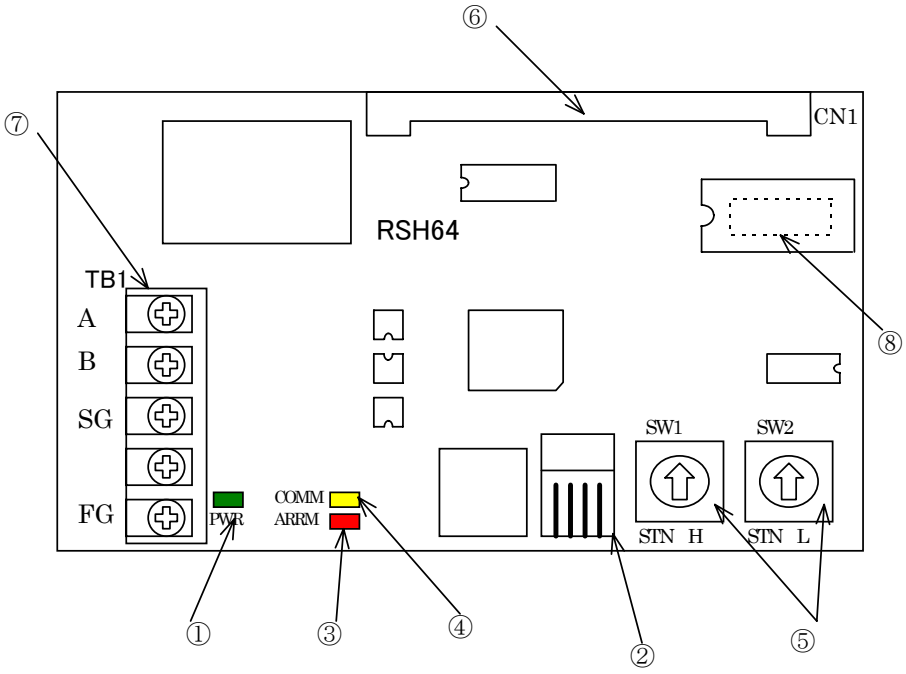


Fig. 3-1 Outside appearance of RSH64 P.C.Board

No.	Name	Explanation
①	Power source lamp (green)	shows supply of power for communication (Lamp goes on when power is supplied)
②	Connector	For insertion of communication connector (For our adjustment)
③	Alarm lamp(red)	goes on at the time of communication error (CRC error, occurrence of over-run) or time out. blinks when incorrect station number is set (80H FFH)
④	Communication lamp (yellow)	goes on at the times of transmission data carrying out and detection of received data
⑤	Rotary switch	For setting of station number (Recognition of station number is at the time of turning on the power only)
⑥	Connector	For connection with Inverter control P.C.Board (VFC64)
⑦	Terminal block	For connection with master station, and RSH64
⑧	ROM label	shows software version

3.Explanation of RSH64 P.C.Board

3-2. Fitting method of RSH64

(1) Open the cover of unit, and insert ***CN1*** of RSH64 option P.C.Board side to connector ***CN7*** of VFC64 side, and lock the lower part of option P.C.Board by claw for fixing of unit side.

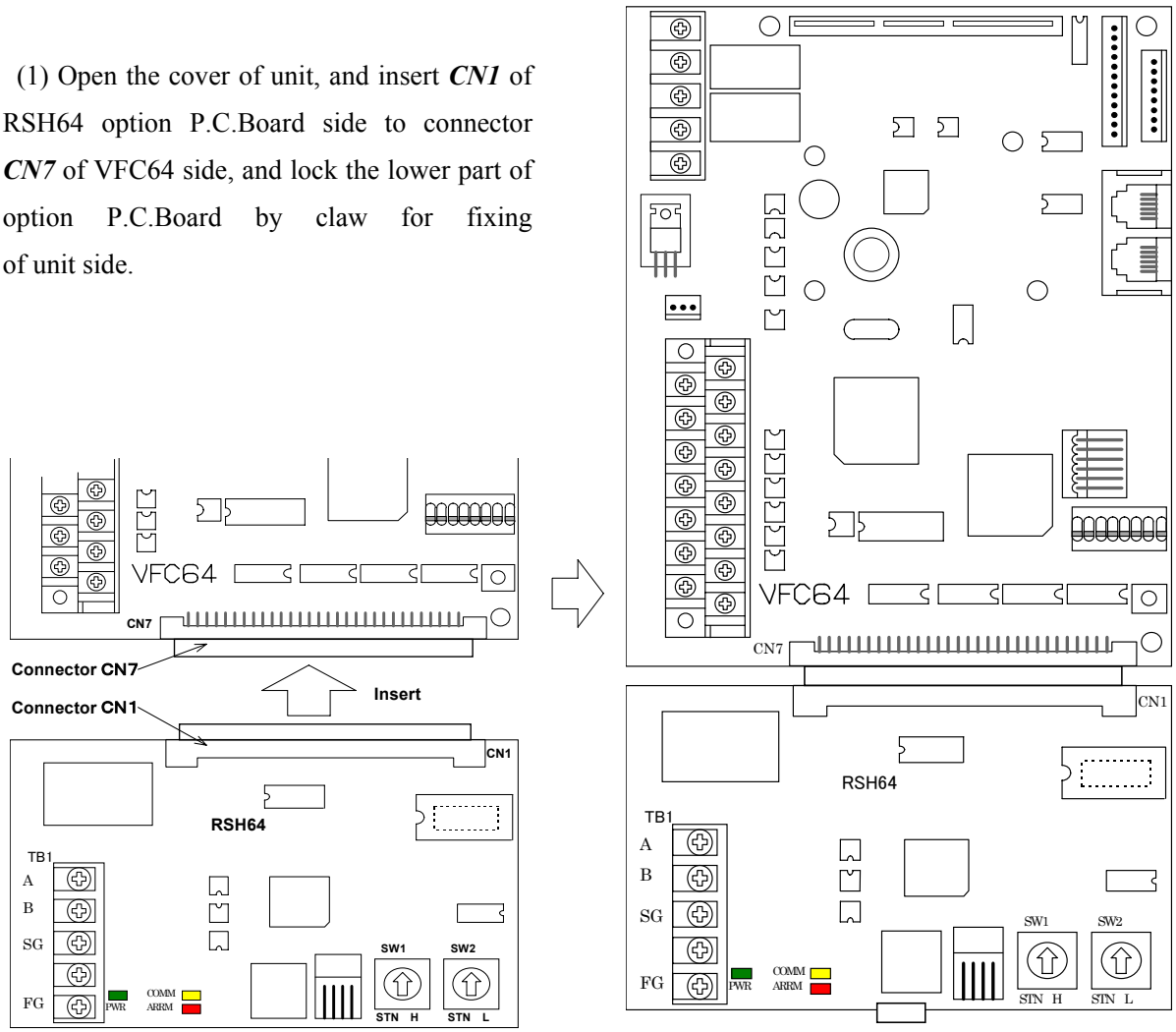


Fig.3-2 Fitting method of RSH64 Option P.C.Board

As to removing

Surely turn off the power in case of fitting and removing of option P.C.Board.
At this time, start the work after confirmation of going off of [CHG lamp] (red) in the Inverter unit.
If option P.C.Board is mounted/demounted during power supply, there may be a case of becoming abnormal of control circuit P.C.Board.

4. Setting of RSH64

4-1. Setting of Rotary Switch

Set station number of slave station (Inverter unit) in communication of JPCN-1 by rotary switches [SW1] and [SW2] on RSH64 P.C.Board. As RSH64 is slave station, set the number by hexadecimal of 01H 7FH. Since 00H is station number of master station, setting will be ineffective, even setting is done. Therefore, don't use it for setting.

(Example) For setting of station number at 04H, set SW1 at 0 and SW2 at 4 as shown in Fig. 4.

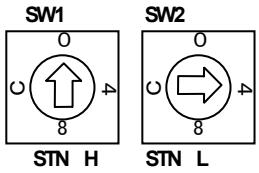


Fig. 4-1 Switch

Make setting of rotary switch in the status of turning off the power.

4-2. Method of initial setting of Inverter

In case of control of Inverter by JPCN-1 communication function, it is necessary to set and input the built-in console (SET64 or SET64OP) of Inverter main unit and contact of terminal block on the Inverter control P.C.Board. In accordance with the purpose of use, set the items of [Baud rate], [Operation position selection], [Multifunction input position selection], etc. of (1)-- (5) explained below.

(1) Setting of baud rate

FUNC			
Setting No.	**Setting item**	**LCD(★)**	**Content of setting**
J-02	Setting of JPCN-1 baud rate	JPCN1 BPS	0～3

0: 125kbps, 1: 250kbps, 2: 500kbps, 3: 1Mbps

(2) Setting of number of output frame (Master station → RSH64)

Setting No.	**Setting item**	**LCD(★)**	**Content of setting**
J-04	Setting of number of JPCN-1 output frame	Output Frame	2～12

Setting is input of WORD unit. (6 Words at the time of delivery from factory)

(3) Setting of number of input frame (RSH64 → Master station)

FUNC			
Setting No.	**Setting item**	**LCD(★)**	**Content of setting**
J-05	Setting of number of JPCN-1 input frame	Input Frame	4～19

Setting is input of WORD unit. (14 Words at the time of delivery from factory)

4-2. Method of initial setting of Inverter

(4) Operation command position selection

FUNC			
Setting No.	**Setting item**	**LCD(★)**	**Content of setting**
J-00	Digital option use selection	DG-Option	Off On

(5) Selection of multifunction input position

FUNC			
Setting No.	**Setting item**	**LCD(★)**	**Content of setting**
c-00	Selection of multifunction input position	ML-In Sel	0 (Terminal) 1 (DG.Option)

(★)When option console (SET64OP) is used.

(6) Shortcircuit of forward run contact

In case of making run/stop of Inverter by communication, ***it is necessary to shortcircuit the forward run operation (ST-F) contact of terminal block***. (If this contact is in status of open, control of Inverter by communication cannot be executed.)

By opening when error occurred in external device such as master station, this contact can keep the safety of system. Also, in case that sequence function of Inverter is effective and forward run command position is changed, add the sequence to turn ***forward run(ST-F) command to ON when input signal to terminal block*** in ladder drawing is inputted.

(7) Make rewriting of setting data by communication effective

In case of changing of setting data of Inverter by communication from master station, turn No.3 of SW1 on control P.C.Board of Inverter main unit to ON side. See ***Fig. 4-2***

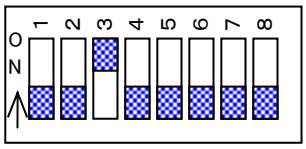


Fig.4-2 DIP switch

5. Composition of hardware

5-1. Internal Control Blocks

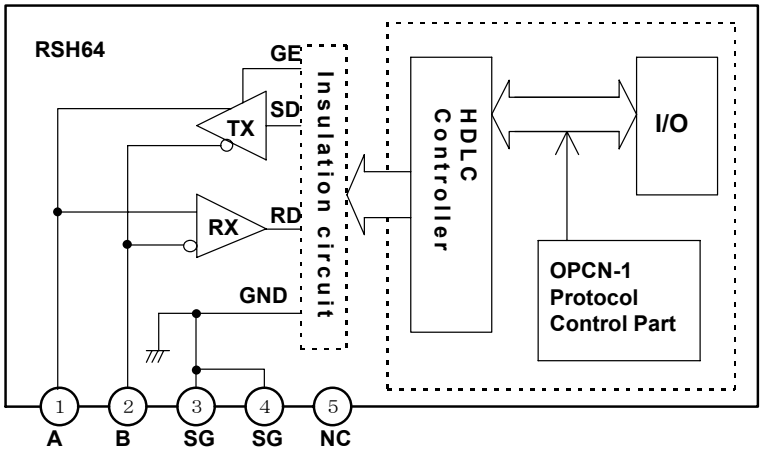


Fig. 5-1 Conceptual drawing of control circuit

- **RD** : Received data .....Data signal transmitted from master station
- **SD** : Transmission data ..... Data signal to be transmitted to master station
- **GE** : Permission of transmission..... Signal to be set at the time of transmission
- **A/B**: RS485 signal polarity ..... Signal level of RS485
- **SG** : Signal earthing
- **NC** : Earthing for safety (FG) ..... Use when earthing wire is connected to all over stations

5-2. External connection diagram

Connection of each station is wired by transmission cable via terminal block. Connect terminal resistor to end station. In case that terminal resistor is not connected to master station, connect terminal resistor like end station.

Fig. 5-2 and ***Fig. 5-3*** show method of connection with external. Figures show the examples of use of twisted pair shield transmission wire of 2P or 3P.

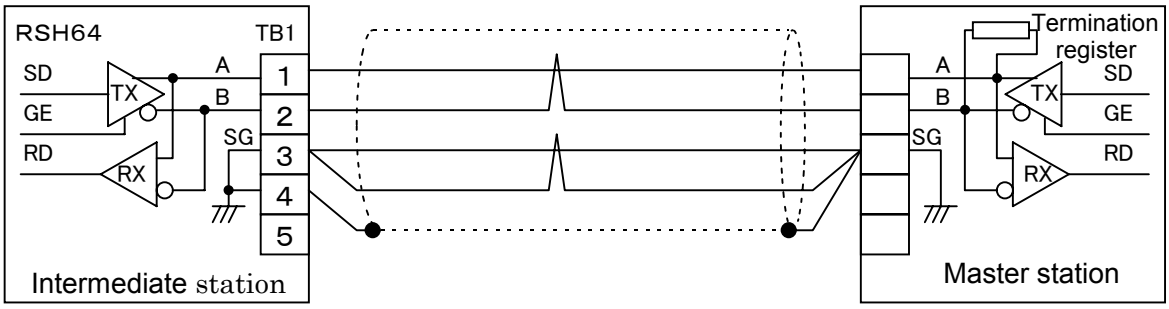


Fig. 5-2 Connection with master station
Termination Register

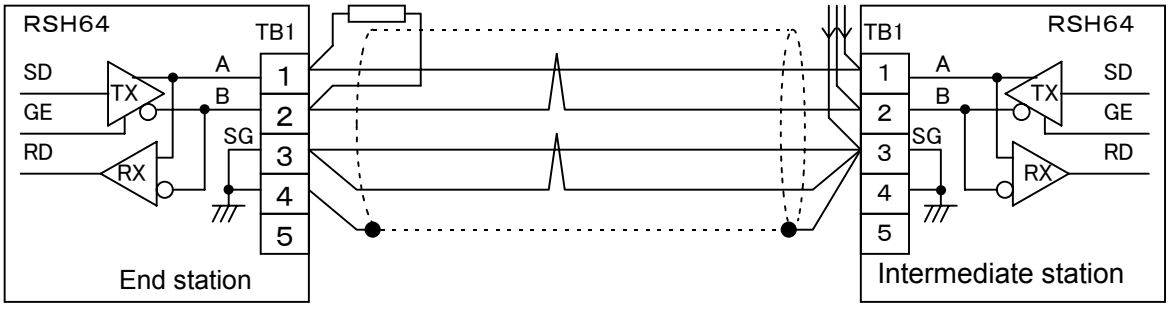
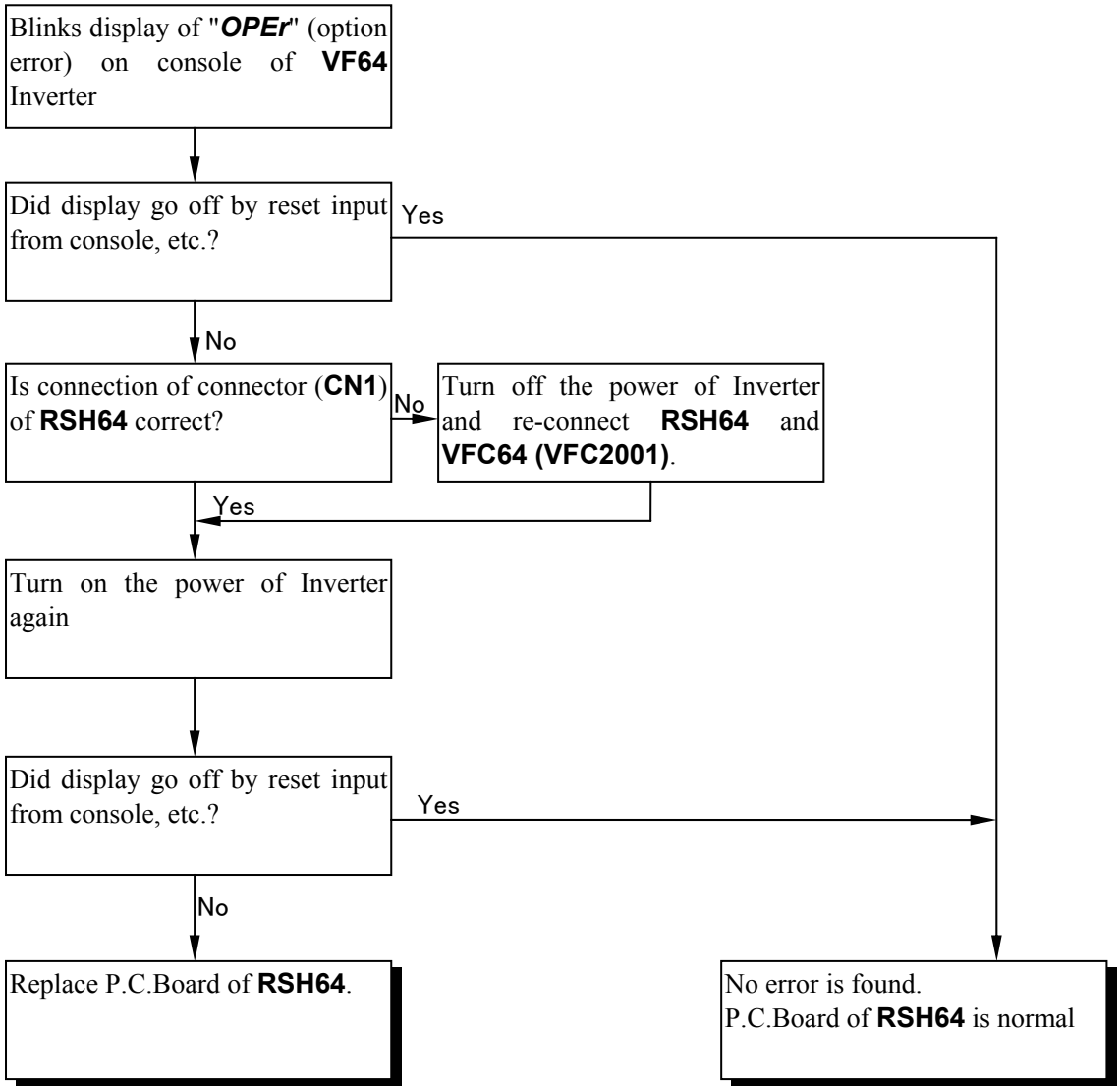


Fig. 5-3 Connection with end station

Note: In case of connection of plural sets of RSH64, connect termination resistor of 100Ω to between ① and ② of terminal block at end station.

6. Troubleshooting

6-1. Option error



6. Troubleshooting

6-2. Communication cannot be executed