
RS485 Converter Unit Instruction Manual

RS4001Z-0

Table of Contents

1.	OVERVIEW	4
2.	COMMUNICATION SPECIFICATIONS	4
3.	NAMES AND FUNCTIONS OF MAIN PARTS	5
4.	CONNECTION AND START-UP	6
5.	DIMENSIONS	8
6.	COMMUNICATION PARAMETERS	9
7.	SPECIFICATIONS	9
8.	WARRANTY	9

This RS485 communication unit cannot use at TOSVERT VF-S7/S7e inverter has a CPU whose version is V100 to V102.

For checking the version number of the CPU, refer to the “Monitor” paragraph in the instruction manual of the inverter.

NOTE

1. Make sure that this instruction manual is delivered to the end user of the RS485 converter unit.
2. Read this manual before installing or operating the RS485 Converter unit. And keep it in a safe place for reference.

Introduction

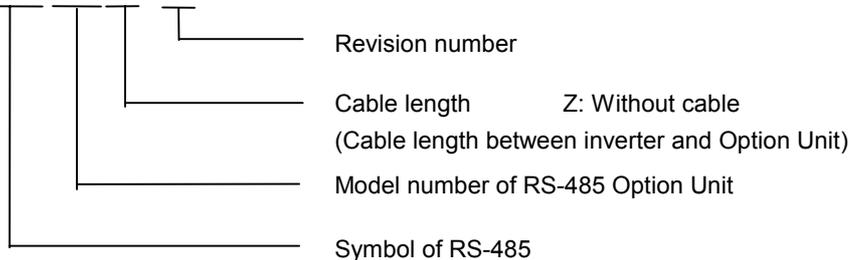
Thank you for purchasing the “RS485 Converter Option Unit(RS4001Z)” for TOSVERT series inverter. Read the safety precautions in the “*Inverter Instruction Manual*” before powering up your inverter. Using this RS485 Option Unit, a communication between the inverter, which has the common serial option (communication) connector, and a host computer is available.

Please read the entire manual carefully before attempting to control your inverter via RS485 serial connection. Besides this instruction manual, the “*Serial Communications Function Manual*” is needed to develop software which communicates with the inverter.

In addition, it has this manual kept to the operator using "RS485 Converter Unit", and please use it for future maintenance and inspection.

[Explanation of part number of RS-485 Option Unit]

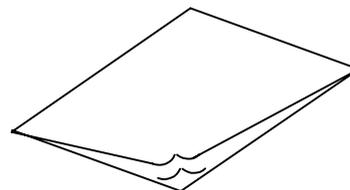
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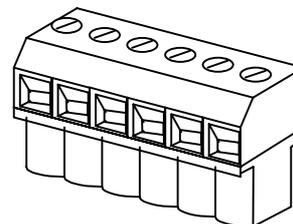
[Check of accessories]

The RS-485 Option Unit is shipped together with the following accessories in the same package. On opening the packing case, check to see if the following accessories are contained or not.

- (1) Instruction manual of RS-485 Option Unit.....1 copy
(E6580718)

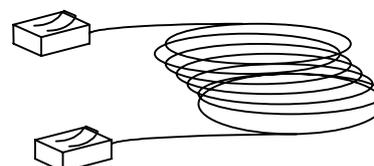


- (2) Connector terminal (remover side).....1 pcs
(MVSTBW2.5/6-ST-5.08 : Phoenix Contact)



(Note) The RS-485 Option Unit (Part Number : RS4001Z) is not provided with connection cable between the inverter and Option Unit. This should be purchased separately.

Part number of connection cable between the Inverter and Option Unit	Cable length
CAB0011	1m (1.2m, 4ft)
CAB0013	3m (3.6m, 12ft)
CAB0015	5m (4.8m, 16ft)



Carefully read the following notes

Safety precautions

On the inverter and in its instruction manual, important information is contained for preventing injuries to users and damages to assets and for proper use of the device. Read the instruction manual attached to the inverter along with this instruction manual for completely understanding the safety precautions and adhere to the contents of these manuals.

Handling in general

 Danger	
 Never Disassemble	<ul style="list-style-type: none"> ▼ Never disassemble, modify or repair the product. Disassembling the inverter could cause electric shocks, fire or injuries. For repairs, call your agency.
 Prohibited	<ul style="list-style-type: none"> ▼ Do not remove connectors when the power is on. It could lead to electric shocks. ▼ Do not put or insert foreign objects such as waste cable, bars, or wires into the product. It could lead to electric shocks or fire. ▼ Do not splash water over the product. It could lead to electric shocks or fire.
 Mandatory	<ul style="list-style-type: none"> ▼ Wiring should be conducted after turning the inverter power off. ▼ Turn off the power immediately in case any abnormalities such as smokes, smells or abnormal noise are found. Neglect of these conditions could lead to fire. For repairs, call your agency.

Transportation and installation

 Danger	
 Prohibited	<ul style="list-style-type: none"> ▼ Do not install or operate the inverter if it is damaged or any part is missing from it. Operating the inverter in a defective condition could lead to electric shocks or fire. For repairs, call your agency. ▼ Do not put any inflammable material near the product. It could catch fire if the product sparks because of a breakdown and the like. ▼ Do not install the product where it could be splashed with water and the like. It could lead to electric shocks or fire.
 Mandatory	<ul style="list-style-type: none"> ▼ The product must be used under environmental conditions prescribed in this instruction manual. Using the product under conditions not specified by the instruction manual could lead to breakdown.
 Cautions	
 Prohibited	<ul style="list-style-type: none"> ▼ Do not install the product in any place subject to vibrations or it could fall. Otherwise it can cause injury to people.

About operation

 Danger	
 Prohibited	<ul style="list-style-type: none"> ▼ Do not wipe the body with a wet cloth. It could lead to electric shocks. ▼ Do not pull on the cable It could cause damage or error.

About disposal of the product

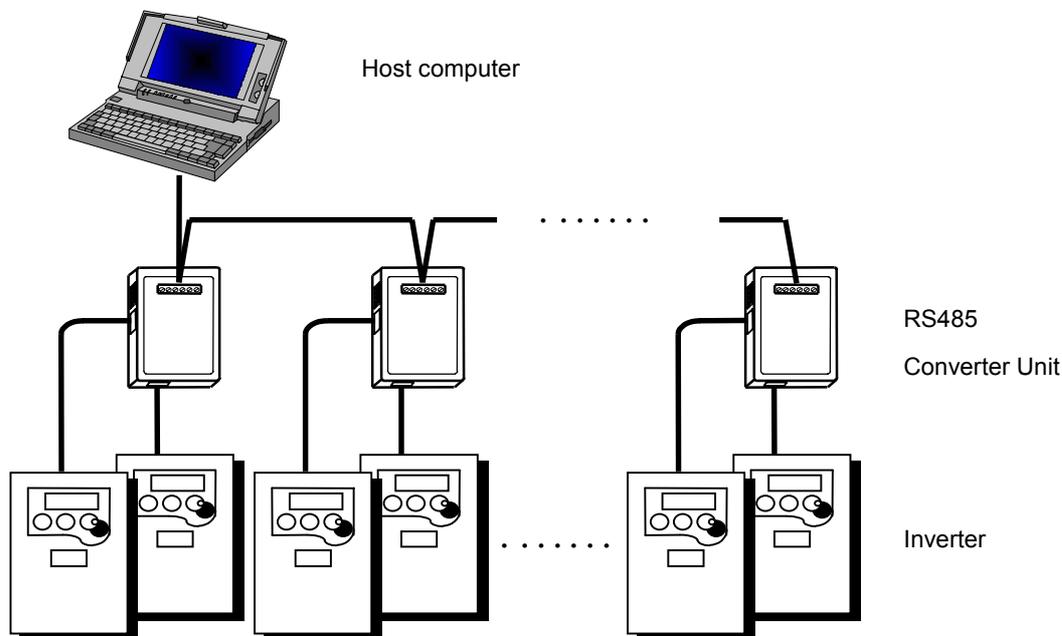
 Cautions	
 Mandatory	<ul style="list-style-type: none"> ▼ Dispose of the product as an industrial waste. Unless it is disposed of as an industrial waste, it will become risks for human injury.

Cautions on use

Cautions	
	<ul style="list-style-type: none"> ▼ Avoid installation locations that may be subjected to rapid changes in ambient temperature or/and humidity. ▼ Route the transmission cable separate from the inverter input/output power wiring. When disconnecting connection cable, make sure to hold its connector with care not to give unreasonable stress to the cable and the unit. ▼ Since connectors of optional cables have locking pawls for disconnection prevention at the inverter and the Option Unit, disconnect such a connector while pressing the pawl by finger for unlocking. ▼ Mount the Option Unit securely on the panel, otherwise it could fall and cause malfunction or breakdown. ▼ Connect an electromagnetic contactor or the like between the inverter and the power source to secure external control of emergency stop of operation. ▼ Do not assign the same inverter number to more than one inverter in the same system. ▼ The inverter's EEPROM has a life of 10,000 write cycles. Do not write to the same EEPROM address more than 10,000 times.

1. Overview

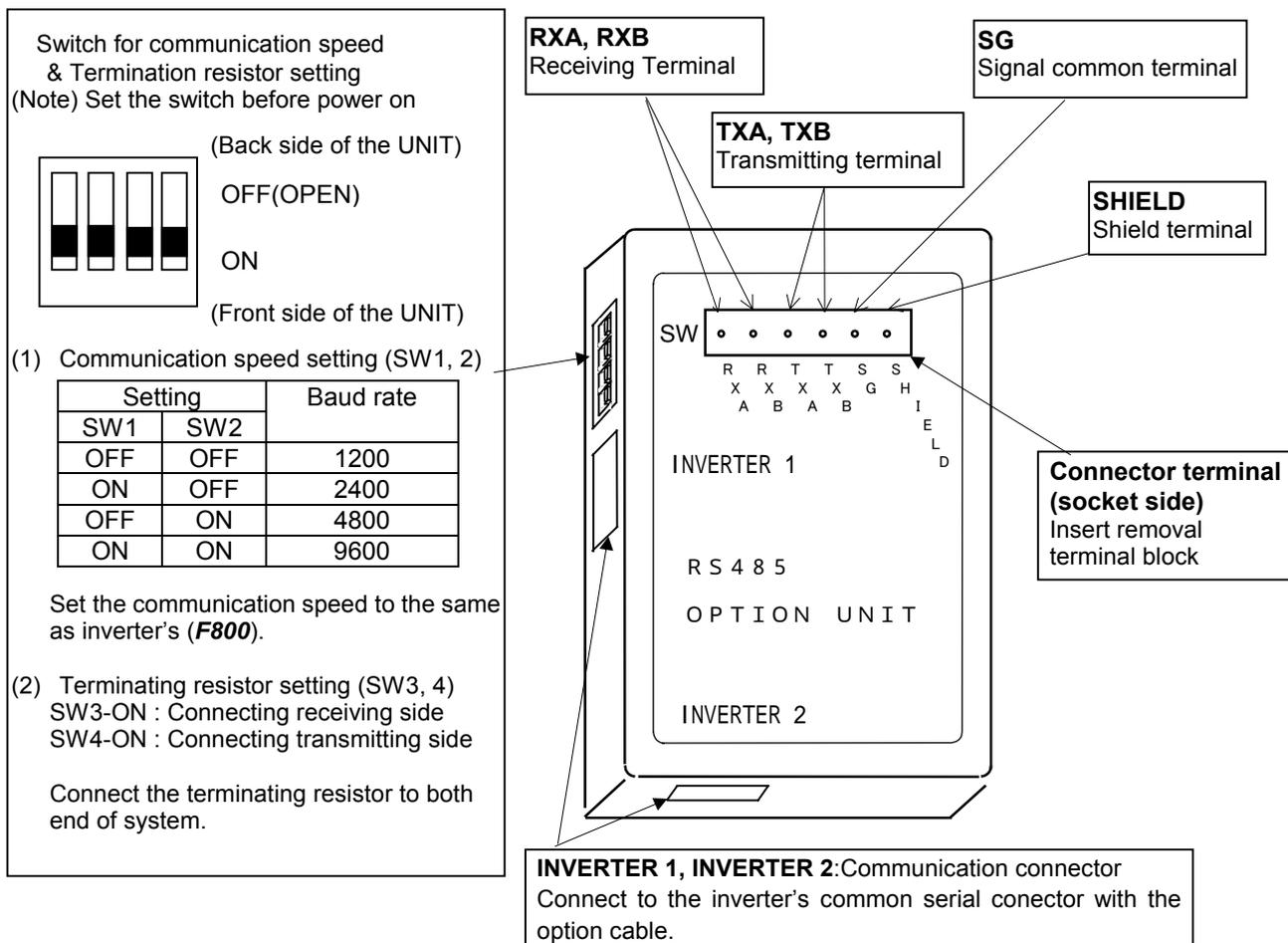
By using RS485 Converter Unit, a network can be constructed that allows communication between a host computer and multiple inverter units. A maximum of 32 Option Units can be connected on the same network. And two inverters can be connected to one RS485 Converter Unit. A maximum of 64 inverters can be connected on the same network.



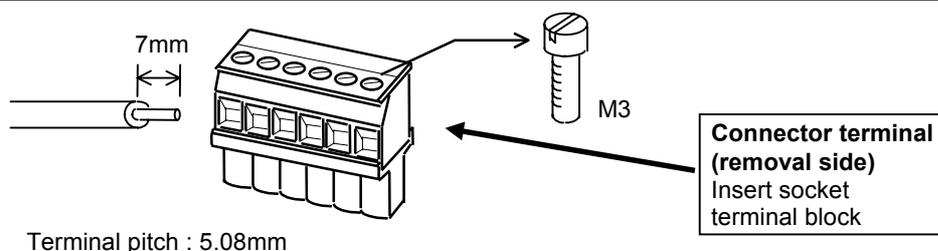
2. Communication specifications

Item	Specifications
Interface	Conforming to EIA RS485 standard
Configuration	4-wire, bus type (terminating resistor is necessary at each end of system)
Communication Distance	1,000m maximum
Connection Points	32 units maximum
Number of ASDs per one Option Unit	2 units maximum
Number of ASDs on the Same Network	64 units maximum
Communication Line Isolation	Not isolated
Synchronization Method	Start-stop synchronization
Communication Speed	1200/2400/4800/9600 baud selectable (parameter and switch selection)
Other	Please be sure to add a parity bit. (This product does not fit to none parity bit.)

3.Names and functions of main parts



Connector terminal (removal side)



***Wire size** (shielded twisted-pair cable recommended)

Bare wire (without stick lug) : 0.4(0.2)~1.5mm² (Refer to a page 6)

Phoenix Contact TWIN terminal : (wire size below) × 2

Part number: AI-TWIN2×0.5-8WH, AI-TWIN2×0.75-8GY, AI-TWIN2×1-8RD, AI-TWIN2×1.5-8BK

*** Others**

COMBICON terminal blocks such as the Phoenix Contact TMSTBP series that allows signal branching can be used in place of included terminal.

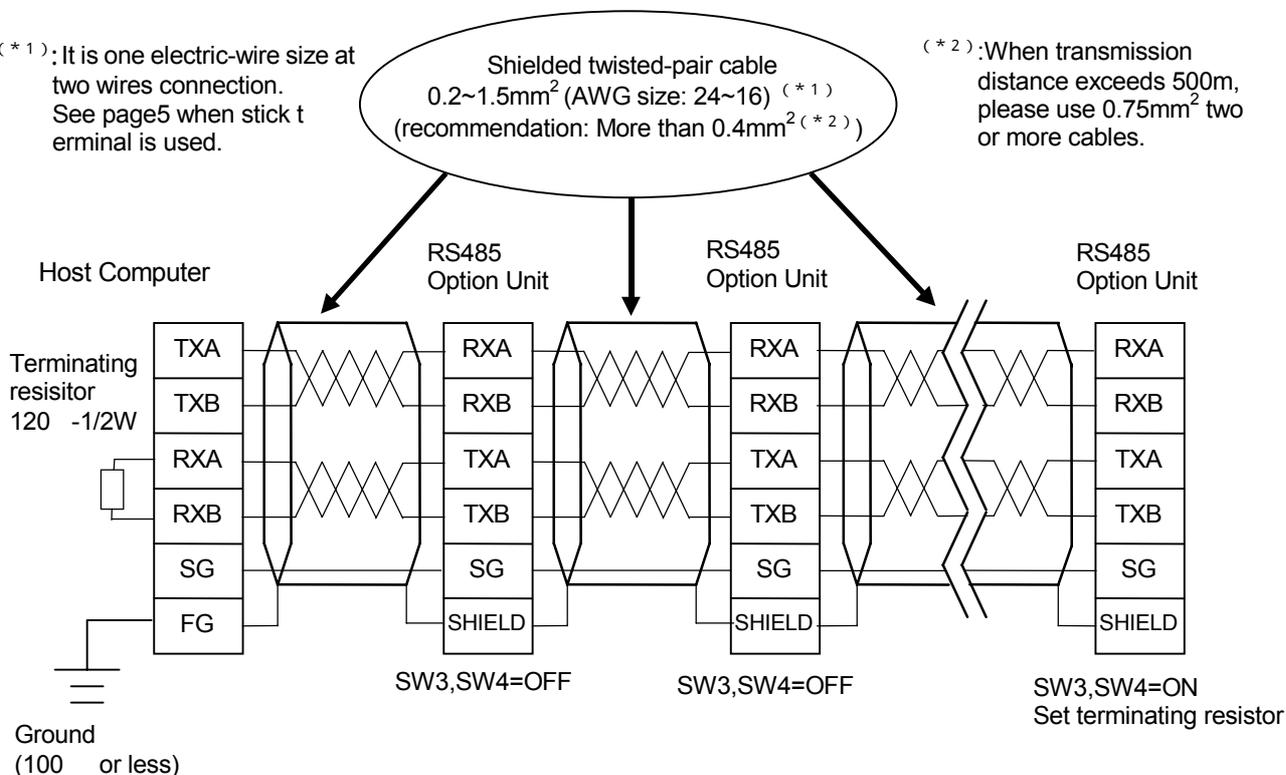
4.Connection and start-up

Procedure

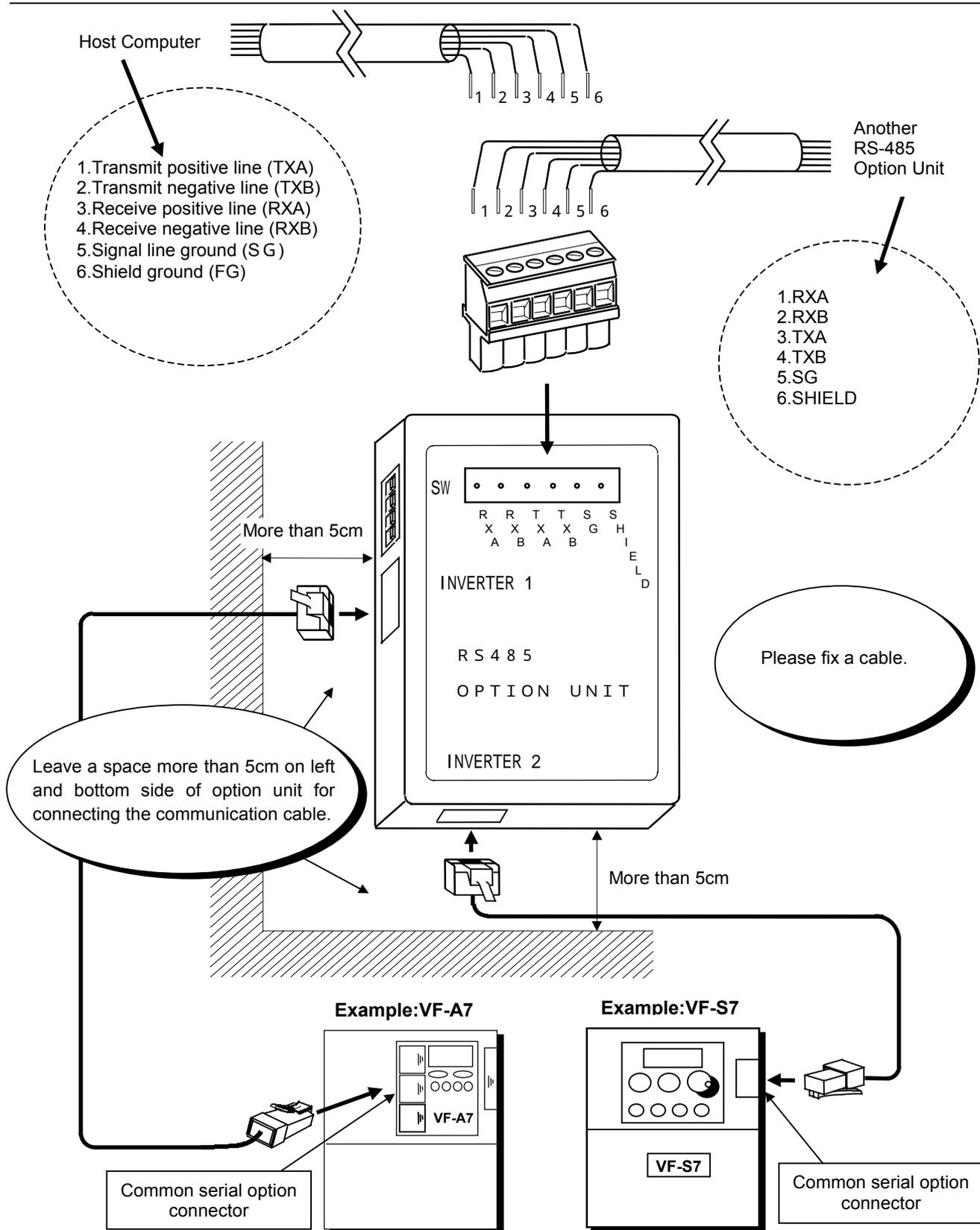
- (1) Set the communication speed to SW on the RS-485 Option Unit.
- (2) Connect terminating resistor in both ends of units. The RS-485 Option Unit has internal terminating resistor. Set SW3 and SW4 to ON to connect these terminating resistors. (Refer to a page 5)
- (3) Install the RS-485 Option Unit on a metal panel.
- (4) Connect the cable to the removable terminal block. If the stick-lugs are not used, strip the insulation from the wire and insert the wire directly into the terminal. Be sure not to short any wires. Wire the cable as shown in the figure. Use a common cable in the system.
- (5) Connect the shield of the twisted pair cable to the SHIELD terminal on each RS-485 Option Unit, and make the ground connection. Do not connect host computer ground to a power ground or any other noise-producing ground connection.
- (6) Insert the removable terminal block back into the RS-485 Option Unit.
- (7) Connect the communication connectors (INVERTER1 and INVERTER2) of the RS-485 Option Unit to the inverter's common serial option (communication) connector of the with the optional cable.
- (8) Turn on the power of the inverter.
- (9) Set the communication parameters of the inverter. (Refer to a page 9)

(* 1): It is one electric-wire size at two wires connection. See page5 when stick terminal is used.

(* 2): When transmission distance exceeds 500m, please use 0.75mm² two or more cables.



Cable connection



5. Dimensions

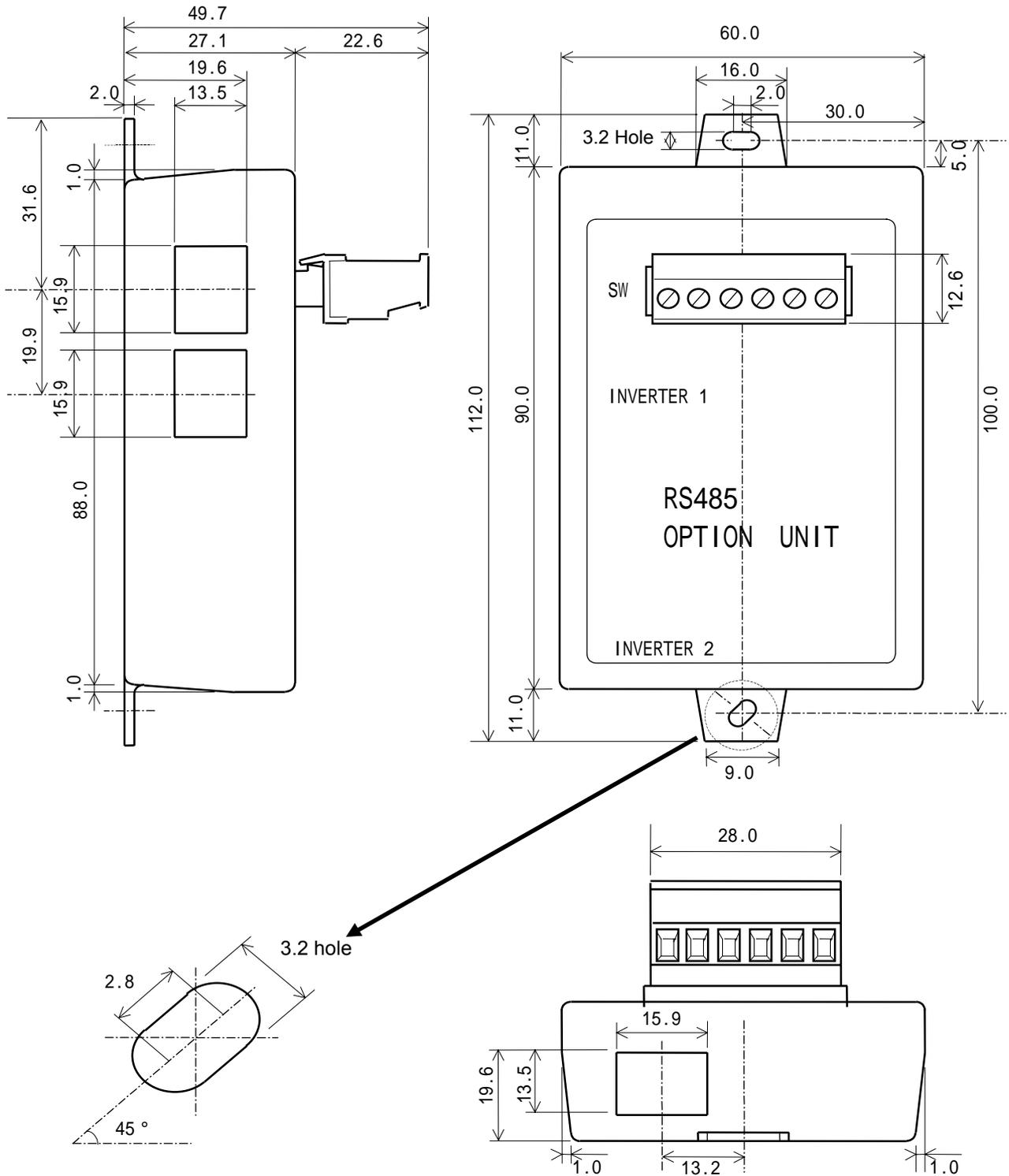
Dimensions of the RS-485 Option Unit (with connector terminal (removal side)) are shown below.

Make sure a space for connecting cables.

Use M3 screws to install.

RS485 Converter Unit

(Unit: mm)



6. Communication parameters

Be careful the parameter setting range, initial value, etc. may change with the inverter models.

Function	Parameter	Note
Communication speed	<i>F800</i>	Communication speed must be the same in the same network (Inverters, Host computer, RS485 units).
Parity	<i>F801</i>	Parity setting must be the same in the same network (Inverters, Host computer). In addition, None parity is not available. Select odd or even parity bit.
Inverter number	<i>F802</i>	Do not assign the same inverter number in the same network (Inverters, Host computer). Need to set the inverter number in the transmission format.

7. Specifications

Item	Specifications
Part number	RS4001Z-0
Service environment	Indoors. Altitude of less than 1000m (3280 ft). Must not be exposed to direct sunlight, subjected to corrosive and/or explosive gases, vapor, dust, chips, cutting oil, grinding agent, etc.
Ambient temperature	From -10°C to +50°C (14°F to 104°F)
Storage temperature	From -25°C to +65°C (-13°F to 149°F)
Relative humidity	20 to 90% (no condensation allowed)
Vibration	5.9m/s ² or less
Cooling system	Self-cooling

8. Warranty

Any part of the RS485 Option Unit that proves defective will be repaired and adjusted free of charge under the following conditions:

1. If and when a trouble occurs on the option unit properly installed and handled within one year of delivery, and if the trouble is clearly attributable to defects inherent in our design and manufacture, the product will be repaired free of charge.
2. The warranty covers only the delivered option unit.
3. Even in the term of the warranty, repair/adjustment service will be charged for the following cases.
 - 1) Fault or damage resulting from misuse, unauthorized modification or repair.
 - 2) Fault or damage resulting from falling down of the product or traffic accident during transportation.
 - 3) Fault or damage originating from fire, salt water/salty breezes, some kind of gas, earthquake, storm or flood, lightning, abnormal supply voltage, other natural disasters.
 - 4) Fault or damage caused by improper use of this option unit as it is used for a purpose out of its original function.
4. If there is another special warranty contracted for this option unit, the special warranty has priority over this warranty.