

mitsubishi

A985GOT-TBA-EU
A975GOT-TBA-EU
A970GOT-TBA-EU
A970GOT-SBA-EU
A970GOT-LBA-EU
A960GOT-EBA-EU

User's Manual (Hardware)

Thank you for buying the MELSEC-GOT Series.

Prior to use, please read both this manual and detailed manual thoroughly and familiarize yourself with the product.



MODEL	A900GOT-EU-U
MODEL CODE	1DM097
IB(NA)-80030-I(0512)MEE	

Mitsubishi Graphic Operation Terminal

● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.

The instructions given in this manual are concerned with this product. For the safety instructions of the programmable controller system, please read the CPU module user's manual.

In this manual, the safety instructions are ranked as "WARNING" and "CAUTION".




DANGER

Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



CAUTION

Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

Note that the  **CAUTION** level may lead to a serious consequence according to the circumstances.

Always follow the instructions of both levels because they are important to personal safety.

Please save this manual to make it accessible when required and always forward it to the end user.

[DESIGN PRECAUTIONS]

DANGER

- Some failures of the GOT main unit, communication module, communication board or cable may keep the outputs on or off.
An external monitoring circuit should be provided to check for output signals which may lead to a serious accident.
Not doing so can cause an accident due to false output or malfunction.
- If a communication fault (including cable disconnection) occurs during monitoring on the GOT, communication between the GOT and PLC CPU is suspended and the GOT becomes inoperative.
For bus connection: The CPU becomes faulty and the GOT inoperative.
For other than bus connection: The GOT becomes inoperative.
A system where the GOT is used should be configured to perform any significant operation to the system by using the switches of a device other than the GOT on the assumption that a GOT communication fault will occur.
Not doing so can cause an accident due to false output or malfunction.

[DESIGN PRECAUTIONS]

DANGER

- Do not use the GOT as the warning device that may cause a serious accident.
An independent and redundant hardware or mechanical interlock is required to configure the device that displays and outputs serious warning.
Failure to observe this instruction may result in an accident due to incorrect output or malfunction.
- Incorrect operation of the touch switch(s) may lead to a serious accident if the GOT backlight is gone out.
When the GOT backlight goes out, the display section turns black and causes the monitor screen to appear blank, while the input of the touch switch(s) still remains active.
This may confuse an operator in thinking that the GOT is in “screensaver” mode, who then tries to release the GOT from this mode by touching the display section, which may cause a touch switch to operate.
Note that the following occurs on the GOT when the backlight goes out.
 - The monitor screen disappears even when the screensaver is not set.
 - The monitor screen will not come back on by touching the display section, even if the screensaver is set.

CAUTION

- Do not bundle the control and communication cables with main-circuit, power or other wiring.
Run the above cables separately from such wiring and keep them a minimum of 100mm apart.
Not doing so noise can cause a malfunction.

[MOUNTING PRECAUTIONS]

DANGER

- Before installing or removing the GOT main unit to or from an enclosure, always switch off the GOT power externally in all phases.
Not doing so can cause a module failure or malfunction.
- Before loading or unloading the communication board, communication module, External I/O module or memory board to or from the GOT, always switch off the GOT power externally in all phases.
Not doing so can cause a module failure or malfunction.

[MOUNTING PRECAUTIONS]

CAUTION

- The GOT should be used in the environment given in the general specifications of this user's manual.
Not doing so can cause an electric shock, fire, malfunction or product damage or deterioration.
- When mounting the GOT main unit to an enclosure, tighten the mounting screws in the specified torque range.
Undertightening can cause a drop, short circuit or malfunction.
Overtightening can cause a drop, short circuit or malfunction due to the damage of the screws or module.
- When loading the communication board, communication module or External I/O module to the GOT main unit, fit it to the connection interface of the GOT and tighten the mounting screws in the specified torque range.
Undertightening can cause a drop, failure or malfunction.
Overtightening can cause a drop, failure or malfunction due to the damage of the screws or module.
- When loading the memory board into the GOT main unit, load it into its corresponding GOT slot and tighten the mounting screws in the specified torque range.
Undertightening can cause a malfunction due to a contact fault.
Overtightening can cause a malfunction due to the damage of the screws or module.
- When loading the PC card into the GOT main unit, insert and push it into its corresponding GOT slot until the PC card eject button comes up.
Not doing so can cause a malfunction due to a contact fault.
- Before loading or unloading the PC card to or from the GOT, set the memory card access switch to the OFF position.
Not doing so can cause the PC card data to be corrupted.

[WIRING PRECAUTIONS]

DANGER

- Before starting wiring, always switch off the GOT power externally in all phases.
Not doing so may cause an electric shock, product damage or malfunction.

[WIRING PRECAUTIONS]

CAUTION

- Please make sure to ground FG terminal, LG terminal, and protective ground terminal of the GOT power supply unit by applying Class D Grounding (Class 3 Grounding Method) or higher which is used exclusively for the GOT.
Not doing so may cause an electric shock or malfunction.
- Correctly wire the power supply module on the GOT after confirming the rated voltage and terminal arrangement of the product.
Not doing so can cause a fire or failure.
- Tighten the terminal screws of the GOT power supply section in the specified torque range.
Undertightening can cause a short circuit or malfunction.
Overtightening can cause a short circuit or malfunction due to the damage of the screws or module.
- Exercise care to avoid foreign matter such as chips and wire offcuts entering the module.
Not doing so can cause a fire, failure or malfunction.
- Plug the bus connection cable by inserting it into the connector of the connected module until it "clicks".
After plugging, check that it has been inserted snugly.
Not doing so can cause a malfunction due to a contact fault.
- Plug the communication cable into the connector of the connected module and tighten the mounting and terminal screws in the specified torque range.
Undertightening can cause a short circuit or malfunction.
Overtightening can cause a short circuit or malfunction due to the damage of the screws or module.

[TEST OPERATION PRECAUTIONS]

DANGER

- Before performing test operation (bit device on/off, word device's present value changing, timer/counter's set value and present value changing, buffer memory's present value changing) for a user-created monitor screen, system monitoring, special module monitoring or ladder monitoring, read the manual carefully to fully understand how to operate the equipment.
During test operation, never change the data of the devices which are used to perform significant operation for the system.
False output or malfunction can cause an accident.

[STARTUP/MAINTENANCE PRECAUTIONS]

DANGER

- When power is on, do not touch the terminals.
Doing so can cause an electric shock or malfunction.
- Before starting cleaning or terminal screw retightening, always switch off the power externally in all phases.
Not switching the power off in all phases can cause a module failure or malfunction.
Undertightening can cause a short circuit or malfunction.
Overtightening can cause a short circuit or malfunction due to the damage of the screws or module.

CAUTION

- Do not disassemble or modify the module.
Doing so can cause a failure, malfunction, injury or fire.
- Do not touch the conductive and electronic parts of the module directly.
Doing so can cause a module malfunction or failure.
- The cables connected to the module must be run in ducts or clamped.
Not doing so can cause the module or cable to be damaged due to the dangling, motion or accidental pulling of the cables or can cause a malfunction due to a cable connection fault.
- When unplugging the cable connected to the module, do not hold and pull the cable portion.
Doing so can cause the module or cable to be damaged or can cause a malfunction due to a cable connection fault.

[BACKLIGHT CHANGING PRECAUTIONS]

DANGER

- Before changing the backlight, always switch off the GOT power externally in all phases (when the GOT is connected to the bus, the PLC CPU power must also be switched off externally in all phases) and remove the GOT main unit from the enclosure.
Not switching the power off in all phases may cause an electric shock.
Not removing the unit from the enclosure can cause injury due to a drop.

CAUTION

- When replacing the backlight, use the gloves.
Otherwise, it may cause you to be injured.
If you should directly touch the plated area of the main unit case with hand, be sure to wipe off the fingerprint and so on, and install the main unit case.
Otherwise, it may cause a trouble or malfunction or make the EMC Directives mismatched.
- Start changing the backlight more than 5 minutes after switching the GOT power off.
Not doing so can cause a burn due to the heat of the backlight.

[DISPOSAL PRECAUTIONS]

CAUTION

- When disposing of the product, handle it as industrial waste.

Revisions

*The manual number is given on the bottom right of the top cover.

Print Date	*Manual Number	Revision
Feb., 1999	IB(NA)-80030-A	First edition
Nov., 1999	IB(NA)-80030-B	<div style="border: 1px solid black; padding: 2px;">Partial correction</div> Section 1.3, Section 3.1, Section 3.2, Section 3.3, Section 5.1, Section 5.3 <div style="border: 1px solid black; padding: 2px;">Partial addition</div> Section 2.1, Section 2.2 <div style="border: 1px solid black; padding: 2px;">Addition</div> Appendix2, A985GOT-TBA-EU
May, 2001	IB(NA)-80030-C	<div style="border: 1px solid black; padding: 2px;">Partial correction</div> Section 1.1.1, Section 2.1, Section 2.2 <div style="border: 1px solid black; padding: 2px;">Partial addition</div> Section 1.1.2, Section 3.2, Section 5.3.1, Section 5.3.2, Appendix 2
Sep., 2001	IB(NA)-80030-D	<div style="border: 1px solid black; padding: 2px;">Partial correction</div> Section 2.2.2 <div style="border: 1px solid black; padding: 2px;">Partial addition</div> Section 2.1, Section 2.1.1, Section 2.2.1, Section 3.2, Section 3.3 <div style="border: 1px solid black; padding: 2px;">Addition</div> A970GOT-LBA-EU
Feb., 2002	IB(NA)-80030-E	<div style="border: 1px solid black; padding: 2px;">Partial correction</div> SAFETY PRECAUTIONS
Mar., 2002	IB(NA)-80030-F	<div style="border: 1px solid black; padding: 2px;">Partial correction</div> Section 2.2.1 <div style="border: 1px solid black; padding: 2px;">Partial addition</div> Section 2.1, Section 2.2.2, Section 2.2.3, Section 5.3.2, Section 5.3.3, Appendix 2
Oct., 2003	IB(NA)-80030-G	<div style="border: 1px solid black; padding: 2px;">Partial correction</div> Section 1.1.1, Section 2.1.2, Section 2.2, Section 3.3, Section 3.4 <div style="border: 1px solid black; padding: 2px;">Partial addition</div> Section 2.1, Section 2.1.1, Section 2.2.1, Section 2.2.2, Section 3.2, Chapter 4, Section 5.3.1, Section 5.3.2, Appendix2

Print Date	*Manual Number	Revision
Aug., 2004	IB(NA)-80030-H	<div data-bbox="710 168 1029 212" style="border: 1px solid black; padding: 2px;">Partial correction</div> Manuals, Section 2.1, Section 2.1.1, Section 3.3, Appendix 1 Section 5.6 corresponds to the former Section 5.3. Section 5.7 corresponds to the former Section 5.4. <div data-bbox="710 481 1029 526" style="border: 1px solid black; padding: 2px;">Addition</div> Section 5.3, Section 5.4, Section 5.5 <div data-bbox="710 571 1125 616" style="border: 1px solid black; padding: 2px;">MODEL CODE change</div> Changed from 13JQ24 to 1DM097
Dec., 2005	IB(NA)-80030-I	<div data-bbox="710 683 1029 728" style="border: 1px solid black; padding: 2px;">Partial correction</div> Section 3.2

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CONTENTS

1. Overview	1
1.1 Requirements to meet EMC Directive	1
1.1.1 EMC Directive	2
1.1.2 Control panel	3
1.1.3 Noise filter (power supply line filter)	4
1.2 Requirements for compliance with the Low Voltage Directive	5
1.2.1 Standard subject to GOT	5
1.2.2 Power supply	5
1.2.3 Control panel	6
1.2.4 Grounding	6
1.2.5 External wiring	7
1.3 Packing List	7
2. SYSTEM CONFIGURATION	8
2.1 Component List	8
2.1.1 Cautions when using PC card/Flash PC card	9
2.1.2 EMC Directive-incompliant communication boards/modules	9
2.2 System Configuration Cautions	10
2.2.1 Connection method	10
2.2.2 When the communication board/module is used	11
2.2.3 About the cable used	12
3. SPECIFICATIONS	13
3.1 General specifications	13
3.2 Performance specifications	14
3.3 Power supply specifications	16
3.4 Human sensor	17
4. NAMES OF THE PARTS	18
5. HANDLING	19
5.1 Handling instructions	19
5.2 Installation method	19
5.3 The precautions on the wiring	22
5.4 Connecting to the GOT Power Section	25
5.5 Connection Cable Wiring	26
5.6 Wiring precautions the part which matches the EMC Directives	27
5.6.1 Method to connect the power wire, ground wire and protective ground terminal	27
5.6.2 Grounding the ground cable	29
5.6.3 Grounding the cable	38
5.7 Method to connect the communication board	39
APPENDICES	40
Appendix1 External dimensions	40
Appendix2 Depth at the time of Communication board/module mounting	41

Manuals

The following manuals are related to this product.
Refer to the following list and order the required manuals.

Detailed Manual

Manual name	Manual No. (Model code)
A985GOT/A975GOT/A970GOT/A960GOT User's Manual (Available as an option)	SH-4005 (1DM099)

Relevant Manuals

For relevant manuals, refer to the PDF manual stored within the drawing software.

1. Overview

This user's manual explains the system configuration, specifications, component's names, operation and outside dimensions of EMC directives, Low Voltage Directives applicable products (hereafter referred to as GOT) of GOT-A900 Series.

The EMC Directives, Low Voltage Directives applicable products of GOT-A900 Series are listed as follows.

Item	Type	Display section
A985GOT	A985GOT-TBA-EU	High-luminance TFT color liquid crystal
A975GOT	A975GOT-TBA-EU	
A970GOT	A970GOT-TBA-EU	D-STN color liquid crystal
	A970GOT-SBA-EU	
	A970GOT-LBA-EU	D-STN monochrome liquid crystal
A960GOT	A960GOT-EBA-EU	High-luminance EL

1.1 Requirements to meet EMC Directive

EMC Directives which are among European Directives become forced.

EMC Directives are those which require "any strong electromagnetic force is not output to the external.: Emission (electromagnetic interference)" and "It is influenced by the electromagnetic wave from the external.: Immunity (electromagnetic sensitivity)".

Items 1.1.1 thru 1.1.3 summarize the precautions to use GOT and configure the mechanical unit in order to match the EMC directives.

Though the data described herein are produced with our best on the basis of the requirement items and standards of the restrictions gathered by Mitsubishi, they do not completely guaranteed that all mechanical unit manufactured according to the data do not always match the above directives. The manufacturer itself which manufactures the mechanical unit must finally judge the method and others to match the EMC directives.

1.1.1 EMC Directive

The standards of the EMC Directive are shown below.

Specification	Test item	Test details	Standard value
EN61000-6-4 :2001	EN55011 Radiated noise*2	Electromagnetic emissions from the product are measured.	30 M-230 MHz QP: 30 dB μ V/m (30 m in measurement range)*1 230 M-1000 MHz QP: 37 dB μ V/m (30 m in measurement range)
	EN55011 Conducted noise*2	Electromagnetic emissions from the product to the power line is measured.	150 k-500 kHz QP:79 dB, Mean: 66 dB*1 500 k-30 MHz QP: 3 dB, Mean: 60 dB
EN61131-2 : 1994/A12 (2000)	EN61000-4-2 Electrostatic immunity*2	Immunity test in which static electricity is applied to the cabinet of the equipment.	\pm 15kV Aerial discharge
	EN61000-4-4 Fast transient burst noise*2	Immunity test in which burst noise is applied to the power line and signal lines.	Power line: 2kV Digital I/O (24V or higher): 1kV (Digital I/O (24V or less)) > 250V (Analog I/O, signal lines) > 250V
	EN61000-4-3 Radiated field AM modulation*2	Immunity test in which field is irradiated to the product.	10V/m, 26-1000 MHz, 80%AM modulation@1 kHz
	EN61000-4-12 Damped oscillatory wave immunity*2	Immunity test in which a damped oscillatory wave is superimposed on the power line.	Power line: 1kV Digital I/O (24V or higher): 1 kV

*1 QP: Quasi-peak value, Mean : Average value

*2 The GOT is an open type device (device installed to another device) and must be installed in a conductive control panel.

The above test items are conducted in the condition where the GOT is installed on the conductive control panel and combined with the Mitsubishi PLC.

1.1.2 Control panel

The GOT is an open type device (device installed to another device) and must be installed in a conductive control panel.

It not only assure the safety but also has a large effect to shut down the noise generated from GOT, on the control panel.

1) Control panel

- a) The control panel must be conductive.
- b) When fixing a top or bottom plate of the control panel with bolts, do not coat the plate and bolt surfaces so that they will come into contact. And connect the door and box using a thick grounding cable in order to ensure the low impedance under high frequency.
- c) When using an inner plate to ensure electric conductivity with the control panel, do not coat the fixing bolt area of the inner plate and control panel to ensure conductivity in the largest area as possible.
- d) Ground the control panel using a thick grounding cable in order to ensure the low impedance under high frequency.
- e) The diameter of cable holes in the control panel must be 10cm (3.94in.). In order to reduce the chance of radio waves leaking out, ensure that the space between the control panel and its door is small as possible. Attach some EMI gaskets to fill up the space and suppress the leakage of radio waves. Out test have been carried out on a panel having the damping characteristics of 37 dB max. and 30 dB mean (measured by 3m method with 30 to 300 MHz).

2) Connection of power and ground wires

Ground and power supply wires for the GOT must be connected as described below.

- a) Provide an earthing point near the GOT. Earth the power supply's LG and FG terminals (LG : Line Ground, FG : Frame Ground) with the thickest and shortest wire possible. (The wire length must be 30cm (11.18in.) or shorter.) The LG and FG terminals function is to pass the noise generated in the PC system to the ground, so an impedance that is as low as possible must be ensured. As the wires are used to relieve the noise, the wire itself carries a large noise content and thus short wiring means that the wire is prevented from acting as an antenna. Note) A long conductor will become a more efficient antenna at high frequency.
- b) The earth wire led from the earthing point must be twisted with the power supply wires. By twisting with the earthing wire, noise flowing from the power supply wires can be relieved to the earthing. However, if a filter is installed on the power supply wires, the wires and the earthing wire may not need to be twisted.

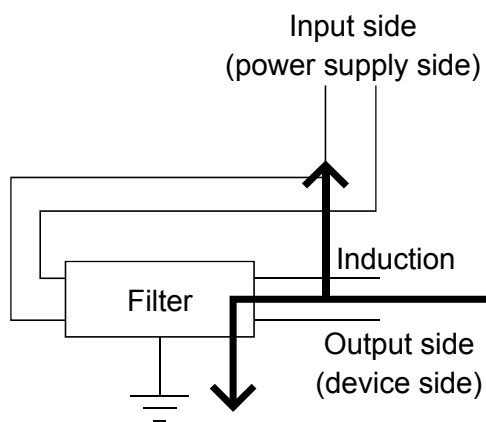
1.1.3 Noise filter (power supply line filter)

The noise filter (power supply line filter) is a device effective to reduce conducted noise. Except some models, installation of a noise filter onto the power supply lines is not necessary. However conducted noise can be reduced if it is installed. (The noise filter is generally effective for reducing conducted noise in the band of 10MHz or less.) Usage of the following filters is recommended.

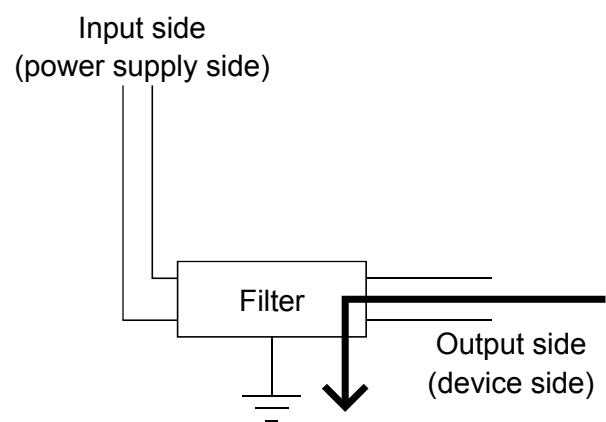
Model name	FN343-3/01	FN660-6/06	ZHC2203-11
Manufacturer	SCHAFFNER	SCHAFFNER	TDK
Rated current	3A	6A	3A
Rated voltage	250V		

The precautions required when installing a noise filter are described below.

- 1) Do not install the input and output cables of the noise filter together to prevent the output side noise will be inducted into the input side cable where noise has been eliminated by the noise filter



- a) Installing the input and output cables together will cause noise induction.



- b) Separate the input cable from the output cable.

- 2) Cannot the noise filter's ground terminal to the control panel with the shortest cable as possible (approx. 10cm (3.94 in.) or less).

1.2 Requirements for compliance with the Low Voltage Directive

The Low Voltage Directive is mandatory within Europe, effective 1st January 1997.

The Low Voltage Directive requires each device which operates with power supply ranging from 50VAC to 1000V and 75VDC to 1500V to satisfy necessary safety items.

In the Sections from 1.2.1 to 1.2.5, cautions on installation and wiring of the GOT to conform to the Low Voltage Directive requires are described.

We have put the maximum effort to develop this material based on the requirements and standards of the Directive that we have collected.

However, compatibility of the devices which are fabricated according to the contents of this manual to the above Directive is not guaranteed. Each manufacturer who fabricates such device should make the final judgement about the application method of the Low Voltage Directive and the product compatibility.

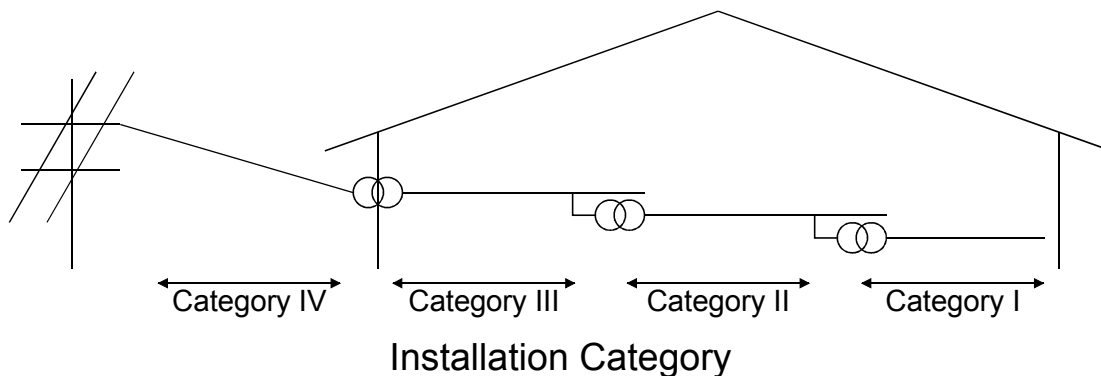
1.2.1 Standard subject to GOT

The standard subject to GOT is EN61010-1 safety of devices used in measurement rooms, control rooms, or laboratories.

1.2.2 Power supply

The insulation specification of the GOT was designed assuming installation category II. Be sure to use the installation category II power supply to the GOT.

The installation category indicates the durability level against surge voltage generated by lightning strike. Category I has the lowest durability; category IV has the highest durability.



Category II indicates a power supply whose voltage has been reduced by two or more levels of isolating transformers from the public power distribution.

1.2.3 Control panel

Because the GOT is open type equipment (device designed to be stored within another device), be sure to use it only when installed in a control panel.

1) Shock protection

In order to prevent those who are unfamiliar with power facility, e.g., an operator, from getting a shock, make sure to take the following measures on the control panel.

- a) Store the GOT within the control panel locked, and allow only those who are familiar with power facility to unlock the panel.
- b) Build the structure in order that the power supply will be shut off when the control panel is opened.

2) Dustproof and waterproof features

The control panel also provides protection from dust, water and ether substances. Insufficient ingress protection may lower the insulation withstand voltage, resulting in insulation destruction. The insulation in the GOT is designed to cope with the pollution level 2, so use in an environment with pollution level 2 or better.

Pollution level 1 : An environment where the air is dry and conductive dust does not exist.

Pollution level 2 : An environment where conductive dust does not usually exist, but occasional temporary conductivity occurs due to the accumulated dust.
Generally, this is the level for inside the control panel equivalent a control room or on the floor of a typical factory.

Pollution level 3 : An environment where conductive dust exists and conductivity may be generated due to the accumulated dust.


An environment for a typical factory floor.

Pollution level 4 : Continuous conductivity may occur due to rain, snow, etc. An outdoor environment.

1.2.4 Grounding

There are two kinds of grounding terminals as shown below. Both terminals must be grounded.

Be sure to ground the grounding for the safety reasons and EMC Directives.

Protective grounding  : Maintains the safety of the GOT and improves the noise resistance.

Functional grounding  : Improves the noise resistance.

1.2.5 External wiring

1) External devices

When a device with a hazardous voltage circuit is externally connected to the PLC, select a model which complies with the Low Voltage Directive's requirements for isolation between the primary and secondary circuits.

2) Insulation requirements

Dielectric withstand voltages are shown in the following table.

Reinforced Insulation Withstand Voltage (Installation Category II, source : IEC664)

Rated voltage of hazardous voltage area	Surge withstand voltage (1.2/50 ms)
150 VAC or below	2500V
300 VAC or below	4000V

1.3 Packing List

After unpacking, confirm that the following parts are included.

Product	Quantity
GOT main unit	1
Mounting fixture	4
Communication module securing fixture	3

* The protective sheet is attached to the product prior to shipment.
If new sheet is needed, obtain the one sold separately.

2. SYSTEM CONFIGURATION

2.1 Component List

The following items comply with the EMC Directive. (as of October, 2003)

Some restrictions may apply when using the following models, such as limitation in compatible versions. For restrictions, refer to Section 2.1.1.

Item	Type	Remark
GOT main unit	A985GOT-TBA-EU	31 cm (12 inch), high-luminance TFT color liquid crystal, 256 colors
	A975GOT-TBA-EU	26 cm (10 inch), high-luminance TFT color liquid crystal, 256 colors
	A970GOT-TBA-EU	26 cm (10 inch), high-luminance TFT color liquid crystal, 16 colors
	A970GOT-SBA-EU	26 cm (10 inch), D-STN color liquid crystal, 8 colors
	A970GOT-LBA-EU	26 cm (10 inch), D-STN monochrome liquid crystal, 2 colors
	A960GOT-EBA-EU	23cm (9 inch), high-luminance EL, 2 colors
Bus connection board*1	A9GT-BUSS	For bus connection, small connector type
Multidrop bus connection board*1	A9GT-BUS2S	For multidrop bus connection, small connector type
Serial communication board*1	A9GT-RS2	For Microcomputer connection/CPU direct connection/computer link connection (for RS-232C cable)
	A9GT-RS2T	For Microcomputer connection/CPU direct connection/computer link connection (for RS-232C cable. Built-in clock function)
	A9GT-RS4	For CPU direct connection/computer link connection (for RS-422 cable)
CC-Link communication module	A8GT-J61BT13	For CC-Link connection (intelligent device station)
Ethernet communication module	A9GT-J71E71-T	For Ethernet connection
Memory board	A9GT-FNB	Exclusively used for optional function OS storage
	A9GT-FNB1M	For optional function OS storage + expansion memory, 1M byte
	A9GT-FNB2M	For optional function OS storage + expansion memory, 2M byte
	A9GT-FNB4M	For optional function OS storage + expansion memory, 4M byte
	A9GT-FNB8M	For optional function OS storage + expansion memory, 8M byte
	A9GT-QFNB	Exclusively used for optional function OS storage
	A9GT-QFNB4M	For optional function OS storage + expansion memory, 4M byte
	A9GT-QFNB8M	For optional function OS storage + expansion memory, 8M byte
PC card*1	-	SRAM type (Commercially available, Compliant with PCMCIA Ver.2.1 or later)
	-	Commercially available compact flash PC card (based on Compact Flash™) *1
	A9GTMEM-10MF	Memory 16M byte (Hardware version D or later), formatted*2
	A9GTMEM-20MF	Memory 32M byte (Hardware version D or later), formatted*2
	A9GTMEM-40MF	Memory 64M byte (Hardware version G or later), formatted*2
Bus connector conversion box	A7GT-CNB	For conversion from large type connector to small type connector (Used for long-distance bus connection)
Printer cable	AC30PIO-20P	Cable length 3.0m For printer connection
Cable clamp	AD75CK	MITSUBISHI ELECTRIC Model AD75CK cable clamp

*1 Compact Flash™ is a trademark of Sun Disk

*2 Memory capacity differs according to the hardware versions of flash PC card.

It can be checked on the rated plate of flash card.

*3 For applicable cables, refer to section 2.2.3.

2.1.1 Cautions when using PC card/Flash PC card

Some GOT models may be incompliant with the EMC Directive when a PC card or flash PC card is used.

The following table shows if they will be compliant with the EMC Directive or not for each PC card type.

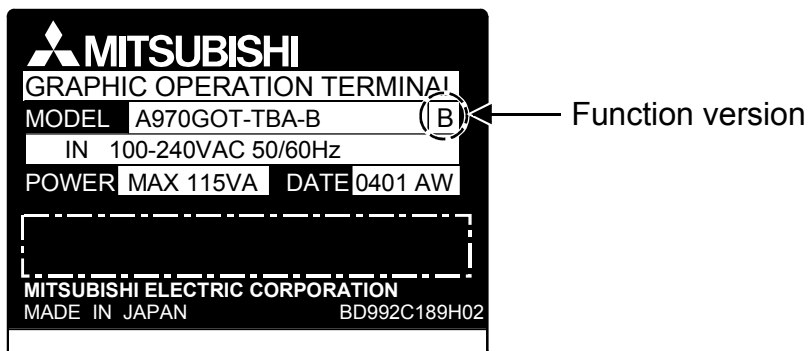
○: Compliant with EMC Directive ×: Incompliant with EMC Directive

Got model	PC card		
	Commercially-available PC card (SRAM type)	Flash PC card (A9GTMEM-*MF)	Commercially-available flash PC card
A985GOT-TBA-EU	○	×*1	Use not allowed
A975GOT-TBA-EU	○	○	○*
A970GOT-TBA-EU	○	○	○*
A970GOT-SBA-EU	○	○	○*
A970GOT-LBA-EU	○	○	○*
A960GOT-EBA-EU	○	○	○*

*1 Although the flash PC card is applicable, using this type of card does not ensure compliance with the EMC Directive.

*2 Commercially available flash PC cards are applicable for the GOTs of function version A or later.

The GOT function version is located on the rating plate at the rear of the GOT.



2.1.2 EMC Directive-incompliant communication boards/modules

The GOT is incompliant with the EMC Directive when any of the following communication boards/modules is used.

Module	Model
Bus connection board	A9GT-QBUSS, A9GT-QBUS2S
Bus connection module	A9GT-BUSSU, A9GT-BUS2SU
Data link module	A7GT-J71AP23, A7GT-J71AR23, A7GT-J71AT23B
Network module	A7GT-J71LP23, A7GT-J71BR13
CC-Link communication module	A8GT-J61BT15
External I/O module	A9GT-70KBF

2.2 System Configuration Cautions

The information of the EMC Directive-compliant models is obtained from MELFANSweb homepage (<http://www.nagoya.melco.co.jp/english/>).

2.2.1 Connection method

Use the following methods to connect with the GOT to ensure compliance with the EMC Directive.

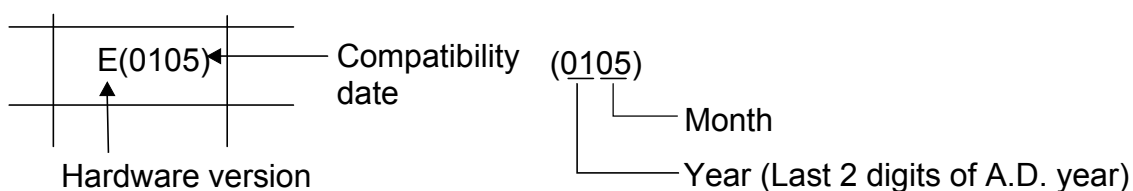
Connection method		A985GOT-TBA-EU	A975GOT-TBA-EU	A970GOT-TBA-EU	A970GOT-SBA-EU	A970GOT-LBA-EU	A960GOT-EBA-EU
Bus Connection	QCPU	×	×	×	×	×	×
	QnA/ACPU	A	A	A	A	A	A
CPU direct connection	QCPU (RS-232C)	×	T(0105)	T(0105)	E(0105)	A	L(0105)
	QnA/ACPU (RS-422)	A	A	A	A	A	A
Computer link connection	RS-232C	×	T(0105)	T(0105)	E(0105)	A	L(0105)
	RS-422	×	A	A	A	A	A
MELSECNET connection		×	×	×	×	×	×
CC-Link connection	Intelligent device	×	T(0105)	T(0105)	E(0105)	A	L(0105)
	Remote device station	×	×	×	×	×	×
Ethernet connection		×	Y(0203)	Y(0203)	M(0203)	E(0203)	Q(0203)
Microcomputer connection	RS-232C	×	T(0105)	T(0105)	E(0105)	A	L(0105)
Other PLC connection	RS-232C	×	T(0105)	T(0105)	E(0105)	A	L(0105)
	RS-422	×	A	A	A	A	A

<How to read the table>

The above table shows the GOT hardware version and compatibility date for each connection method.

(The compatibility date for hardware version A is not shown.)

Please use the recommended GOT hardware version or later.



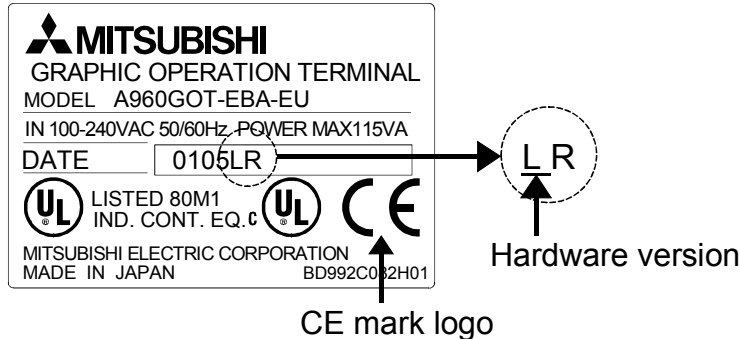
× indicates the product is not compliant with the EMC Directive.

*1 For details about each connection method, refer to the GOT-A900 Series User's Manual (Connection System Manual).

POINT

- Hardware version

The GOT hardware version is located on the rating plate at the rear of the GOT.
(The products including a CE mark logo on the rating plate and packing boxes are compliant with EMC Directive.)



- Connected devices

If connecting to the PLC or microcomputer other than Mitsubishi products (MELSEC-Q series, MELSEC-QnA series or MELSEC-A series) please refer to the EMC Directive compliance manual for that specific device.

2.2.2 When the communication board/module is used

Use the following communication boards/module with the GOT to ensure compliance with the EMC Directive.
The GOT does not comply with the EMC Directive when connected with other than followings.

Connection method		Communication board/module
Bus connection		A9GT-BUSS (Hardware version C or later) A9GT-BUS2S (Hardware version C or later)
CPU direct connection	RS-232C communication	A9GT-RS2 (Hardware version B or later) A9GT-RS2T (Hardware version C or later)
	RS-422 communication	A9GT-RS4 (Hardware version B or later)
Computer link connection	RS-232C communication	A9GT-RS2 (Hardware version B or later) A9GT-RS2T (Hardware version C or later)
	RS-422 communication	A9GT-RS4 (Hardware version B or later)
CC-Link connection		A8GT-J61BT13 (Hardware version E or later)
Ethernet connection		A9GT-J71E71-T (Hardware version C or later)
Microcomputer connection	RS-232C	A9GT-RS2 (Hardware version C or later) A9GT-RS2T (Hardware version C or later)
Other PLC connection	RS-232C communication	A9GT-RS2 (Hardware version B or later) A9GT-RS2T (Hardware version C or later)
	RS-422 communication	A9GT-RS4 (Hardware version B or later)

2.2.3 About the cable used

If making the GOT applicable to the EMC directive, be sure to use the cables shown below.

○: Compliant with EMC Directive ×: Incompliant with EMC Directive

Connection method		Cable	EMC Directive	
Bus connection	A/QnACPU	AC06/12/30/50B, A1SC07/12/30/50B, A8GT-C12/30/50NB, A9GT-J2C10B, A8GT-C100/200/300BS	AC12/30/50B-R, A1SC05/07/30/50NB, A370C12/25B, A8GT-C100/200/ 300EXSS,	○
	QCPU (Q mode)	QC06/12/30/50/100B, A9GT-QC150/200/250/300/350BS		×
CPU direct connection	RS-232C communication	QC30R2		○
	RS-422 communication	AC30/100/300R4-25P		○
Computer link connection	RS-232C communication	User created cable		○
	RS-422 communication	AC30/100/300R4-25P User created cable		○
CC-Link connection		CC-Link dedicated cable.		○
Ethernet connection		Category 5 Twisted pair shield cable		○
Microcomputer connection	RS-232C	User produced cable		○
Other PLC connection	RS-232C communication	User created cable		○
	RS-422 communication			○

POINT

Modify the cables (including user-produced cable) to ensure compliance with the EMC Directive.
For details, refer to Section 5.3.2.

3. SPECIFICATIONS

3.1 General specifications

Item	Specifications					
Operating ambient temperature	Display section (Other than display section)		0 to 40°C (0 to 55°C)			
Storage ambient temperature	-20 to 60°C					
Operating ambient humidity	10 to 90%RH, non-condensing					
Storage ambient humidity	10 to 90%RH, non-condensing					
Vibration resistance	Conforms to JIS B3501 and IEC 61131-2.	Under intermittent vibration	Frequency	Acceleration	Amplitude	Sweep Count 10 times each in X, Y and Z directions (for 80 minutes)
			10 to 57Hz	-	0.075mm	
		Under continuous vibration	57 to 150Hz	9.8m/s ²	-	
			10 to 57Hz	-	0.035mm	
		57 to 150Hz	4.9m/s ²	-		
Shock resistance	Conforms to JIS B3501 and IEC 61131-2 (147m/s ² , 3 times each in X, Y and Z directions)					
Operating atmosphere	No corrosive gases					
Operating altitude*3	2000m max.					
Installation location	Inside control box					
Overvoltage category*1	II or less					
Pollution degree*2	2 or less					

*1 This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within the premises. Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300 V is 2500 V.

*2 This index indicates the degree to which conductive material is generated in the environment where the equipment is used. In pollution degree 2, only non-conductive pollution occurs but temporary conductivity may be produced due to condensation.

*3 Do not use or store the GOT under pressure higher than the atmospheric pressure of altitude 0m (0ft.). Failure to observe this instruction may cause a malfunction.

3.2 Performance specifications

Item		Specifications					
		A985GOT -TBA-EU	A975GOT -TBA-EU	A970GOT -TBA-EU	A970GOT -SBA-EU	A970GOT -LBA-EU	A960GOT -EBA-EU
Display section	Type	High-luminance TFT color liquid crystal			D-STN color liquid crystal	D-STN monochrome liquid crystal	High-luminance EL
	Resolution	800 × 600 dots	640 × 480 dots				640 × 400 dots
	Display size	246 (9.69) (w) × 184.5 (7.26) (H) mm (inch)	211 (8.31) (w) × 158 (6.23) (H) mm (inch)				192 (7.57) (w) × 120 (4.73) (H) mm (inch)
	Display color	256 color		16 color	8 color	2 color	2 color (yellow orange, black)
Operator detect sensor	Detection length	1 (39.37) m (inch)	-				
	Detection range	70°each in up / down, left / right directions					
	Detection delay time	0 to 4 sec.					
Backlight		Cold cathode fluorescent tube backlight (Backlight OFF/screen saving time setting allowed)					-
Life*1	Display section*2*4	50,000 h	41,000 h	50,000 h			30,000 h (Initial luminance 70%, 25°C)
		(Operating ambient temperature: 25°C)					
	Backlight*2	40,000 h	(Time when display luminance reaches 50% at the operating ambient temperature of 25°C)				
		-					
Touch key	1 million times or more (operating force 0.98N max.)						
Built-in memory	Number of write times: 100,000 times						
Environmental protective structure		Front section: Equivalent to IP67/NEMA4 Panel inside: IP2X					
External dimensions		312 (12.28) (W) × 238 (9.37) (H) × 49 (1.93) (D) mm (inch)	297 (11.7) (W) × 208 (8.2) (H) × 46 (1.81) (D) mm (inch)				268 (10.56) (W) × 192 (7.56) (H) × 49 (1.93) (D) mm (inch)
Panel cutting dimensions		302(11.89) (W) × 228 (8.98) (H) mm (inch)	289 (11.39) (W) × 200 (7.88) (H) mm (inch)				258 (10.17) (W) × 183 (7.21) (H) mm (inch)
Weight		2.4 kg (5.3 lb)	1.8 kg (4.0 lb)		1.9 kg (4.2 lb)		1.6 kg (3.5 lb)
Compatible software package*3*5		A985GOT-TBA-EU SW0D5C-GTWORKS-E version A or later/ SW1D5C-GOTRE-PACK version C or later A975GOT-TBA-EU, A970GOT-TBA-EU, A970GOT-SBA-EU, A970GOT-LBA-EU, A960GOT-EBA-EU SW0D5C-GTWORKS-E version A or later/ SW0D5C-GOTRE-PACK version A or later					

*1 When parts must be changed, consult your sales representative.

*2 The screen saving/back light OFF function of GOT is provided to prevent images from becoming permanently etched on the display and extend the backlight life.

*3 The 8-step brightness adjusting function of A975GOT-TBA-EU and A970GOT-TBA-EU is supported by SW1D5C-GTWORKS-E Version A or later SW1D5C-GOTRE-PACK Version C or later.

When the package of the older version is used, the brightness of the display portion is fixed at the highest brightness.

- *4 Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements.
Please note that these dots appear due to its characteristic and are not caused by product defect.
- *5 GT Works2 and GT Designer2, are supported from the first version (Version 1.00A)
- *6 The specifications differ depending on the version of GOT (hardware version, function version).

(1) Specification differences by the version of GOT

The specifications of the GOT-A900 series differ depending on the version (hardware version, function version).

The following shows specification differences of the GOT-A900 series by version.

(a) Environmental protective structure

The environmental protective structure (IP rating) differs depending on the hardware version of GOT.

Item		Specification	
		A985GOT-TBA-EU, A975GOT-TBA-EU A970GOT-TBA-EU, A970GOT-SBA-EU A960GOT-EBA-EU	A970GOT-LBA-EU
Environmental protective structure	Front section: Equivalent to IP65 Panel inside: IP2X	Hardware version A or later	
	Front section: Equivalent to IP67/NEMA4 Panel inside: IP2X	Hardware version A or later	Hardware version B (Dec., 2001) or later

3.3 Power supply specifications

Item	Specifications
	A985GOT-TBA-EU, A975GOT-TBA-EU, A970GOT-TBA-EU, A970GOT-SBA-EU, A970GOT-LBA-EU, A960GOT-EBA-EU
Input power supply voltage	100AC to 240V (+10%, -15%)
Input frequency	50/60Hz ± 3
Input max. apparent power	Using 100VAC Communication board loaded: 50VA or less Communication module loaded: 60VA or less *1 Using 200VAC Communication board loaded: 63VA or less Communication module loaded: 75VA or less *1
Inrush current	40 Ap max. (264VAC, max. load)
Permissible instantaneous power failure time	20 ms (100VAC or more)
Noise immunity	By noise simulator of 1,500Vp-p noise voltage, 1 μ s noise width and 25 to 60Hz noise frequency
Dielectric withstand voltage	1500VAC for 1 second across AC external terminals and earth
Insulation resistance	10M Ω or larger by insulation resistance tester
Applicable wire size	0.75 to 2 mm ²
Applicable solderless terminal	RAV1.25-3, V2-S3.3, V2-N3A, FV2-N3A
Applicable tightening torque (Terminal block terminal screw)	59 to 88 N • cm
External output	Refer to *2

*1: When the communication module for bus connection (A9GT-BUSSU/A9GT-BUS2SU/A9GT-QBUS2SU) is loaded, this value is equivalent to the input max. apparent power value when the communication board is loaded.

*2: For external outputs, please refer to the A985GOT/A975GOT/A970GOT/A960GOT User's Manual.

Remarks

Note that the GOT is reset if an instantaneous power failure occurs in the power supply. However, if the instantaneous power failure is within 20ms the GOT will normally operate.

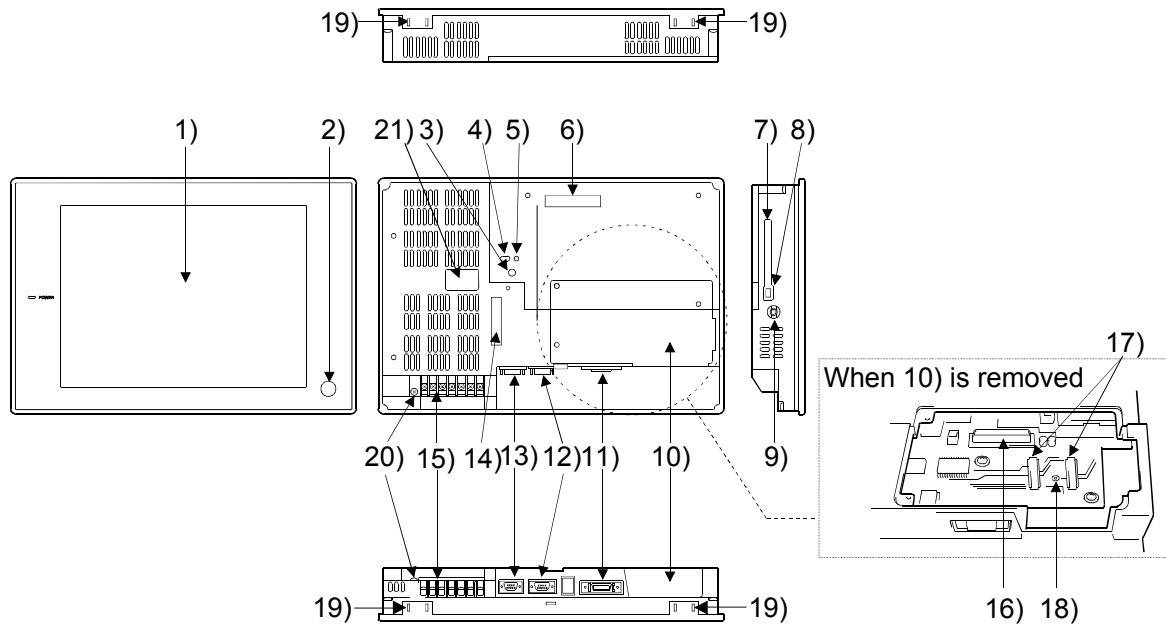
3.4 Human sensor

The human sensor mounted in the A985GOT, can detect operators in the sensor detection area and turn the backlight ON and OFF automatically. Refer to the GOT-A900 Series Operating Manual (Extended • Option Functions Manual) for details on setting the human sensor.

1) Cautions when using human sensor

- (a) If there is a transparent material such as glass or acrylic in the sensor detection area, the human sensor cannot detect a human through it.
- (b) The human sensor may not function correctly in places where sudden temperature changes occur such as near the blow-off port of air conditioners.
- (c) The human sensor may not function correctly in places where the sensor section is subject to direct sun rays.

4. NAMES OF THE PARTS



No.	Name	Description
1)	Display section	Shows the screen
2)	Operator detect sensor (A985GOT only)	Sensor that detects Operators
3)	Reset button	Used to reset the hardware of the GOT
4)	Memory card access switch	Used to set the condition of access to the PC card when it is loaded during power-on (Factory-set to OFF) OFF: Access from GOT to PC card inhibited ON: Access from GOT to PC card enabled
5)	Memory card LED	Indicates whether the PC card may be loaded/unloaded or not Off: PC card may be loaded/unloaded (When switch 4 is OFF) On: PC card must not be loaded/unloaded (When switch 4 is ON)
6)	Communication module interface	Interface for loading the communication module
7)	Memory card interface	Interface for loading the PC card
8)	Memory card ejection button	Button used to withdraw the PC card
9)	Speech output terminal	For external speaker connection
10)	Slot cover	Fixture to cover the slot
11)	Printer interface	For printer connection
12)	RS-232C interface	For connection of personal computer For connecting the bar code reader
13)	CRT interface (A985GOT only)	For CRT connection
14)	Option module interface	For option module loading
15)	Terminal block	For power input and external output
16)	Communication board slot	Slot for communication board loading
17)	Memory board slot	Slot for memory board loading
18)	Screw hole for attaching memory board	Screw hole used to attach the memory board
19)	Mounting fixture fitting portion	For mounting fixture fitting
20)	Protective ground terminal *	For earthing (For safety, please make sure to ground this terminal.)
21)	Rating plate	-

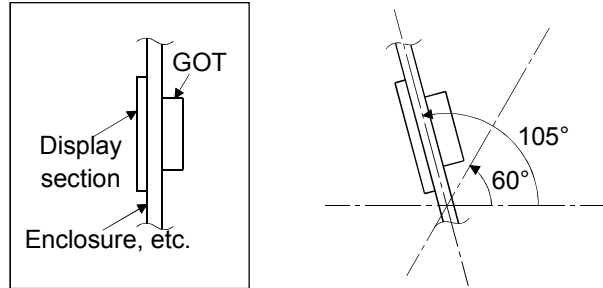
* This is attached to the model of which case is mode of conductive metal.

5. HANDLING

5.1 Handling instructions

When mounting the main unit to a control panel or similar, set the display section as shown below.

When the temperature inside the enclosure is 40 to 55°C or less, the mounting angle should be in the range 60 to 105 degrees.



The GOT will be deteriorated earlier if it is used at the mounting angle other than the above. Therefore, the temperature inside the enclosure should be within 40°C.

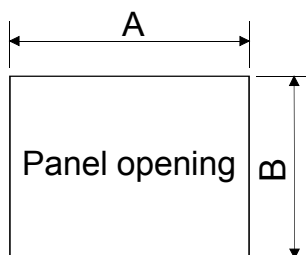
Tighten the screws in the following specified range.

Screw Location	Tightening Torque Range
Terminal block terminal screw (M3 screw)	59 to 88N•cm
Module mounting screw (M4 screw)	36 to 48N•cm
Communication module mounting screw (M3 screw)	
Communication board mounting screw (M3 screw)	
Option module mounting screw (M3 screw)	
SVGA type CRT mounting screw (M3 screw)	
Case fixing screw (M3 screw)	
Memory board mounting screw (M2.6 screw)	25 to 35N•cm
RS-232C connector mounting screw (#4-40 UNC (inch screw))	20 to 28N•cm

5.2 Installation method

1) Mounting panel cutting dimensions

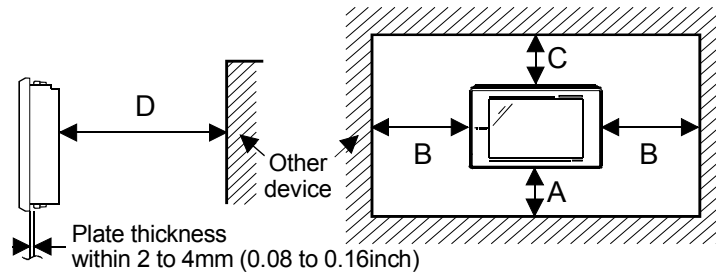
When mounting the GOT on a control panel door, user-made mounting base or similar, the door or mounting base must be cut as indicated below.



Type	A [mm](inch)	B [mm](inch)
A985GOT	302 (11.89) [+1.0(0.04), -0(0)]	228 (8.98) [+1.0(0.04), -0(0)]
A97*GOT	289 (11.39) [+1.0(0.04), -0(0)]	200 (7.88) [+1.0(0.04), -0(0)]
A960GOT	258 (10.17) [+1.0(0.04), -0(0)]	183 (7.21) [+1.0(0.04), -0(0)]

2) Mounting position

When mounting the GOT, the following clearances must be left from the other device.



Part A size: As the GOT connection cable is led out downward, the following clearance must be provided in consideration of the bending radius.

Item	A [mm] (inch)
A985/975/970GOT	130 (5.12) or more
A960GOT	140 (5.51) or more

When using a cable prepared by user, please consider the connector cover to be used and the bending radius of the cable.

When using a bar code reader, please consider the dimensions of the connector to be used and the bending radius of the cable.

Part B size: When using the PC card or audio output, a clearance of 100mm (3.94 inch) or more is required to lead out the cable and to mount or remove the PC card. (A clearance of 50mm (1.97 inch) or more is required when these are not used.)

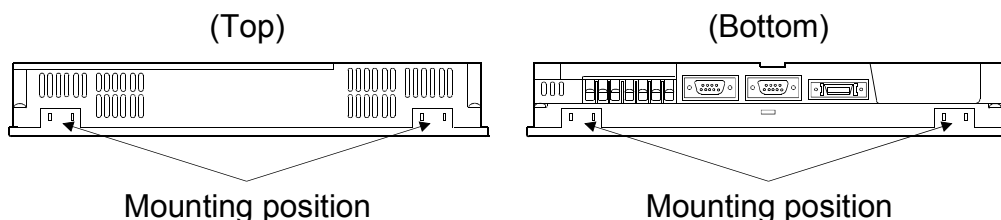
Part C size: Please allow a gap 80mm (3.15inch) or more from the structure and other equipment in the upper part of the unit to often allow good ventilation.

Part D size: When installing a device that generates radiation noise (contactor, etc.) or a device generating high levels of heat near the GOT, provide a clearance of 100mm (3.94 inch) behind the module to avoid the effect of the noise and heat.

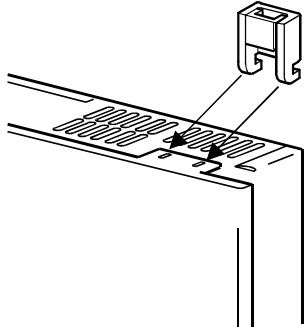
3) Mounting method

a) Put the GOT main unit into the panel opening, with its front face first.

b) Mount the GOT in the following four locations at its top and bottom.



c) How to mount and fix the mounting fixture is given below.



- 1) Insert the mounting fixture into the fixture fitting portion of the GOT main unit.
- 2) Tighten and fix the mounting screw in the specified torque range.

POINT
Do not paint at the sections where the mounting fixture and control panel contact. Instead provide a conductivity between the mounting fixture and control panel.

5.3 The Precautions on the Wiring

DANGER

- Completely turn off the externally supplied power used in the system when installing or placing wiring. Not completely turning off all power could result in electric shock, damage to the product.

CAUTION

- Be sure to ground the FG terminal and LG terminal of the GOT power supply section to the protective ground conductor. Not doing so could result in electric shock or erroneous operation.
- When wiring in the GOT power section, be sure that it is done correctly by checking the product's rated voltage and the terminal layout. Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or erroneous operation.
- Tighten the terminal screws of the GOT power supply section within the specified torque range.
If the terminal screws are loose, it could result in short circuits, erroneous operation or erroneous operation.
Tightening the terminal screws too far may cause damages to the screws and/or the module, resulting in fallout, short circuits, or erroneous operation.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the module GOT main unit.

• General view of noise countermeasures

There are two types of noise: radiated noise, which is transmitted through the air, and conducted noise, which is transmitted through a connection wire. In noise countermeasures, the both two types of noise should be taken into account. As the noise countermeasures, there are the following three methods.

(1) Block noise

- (a) Keep signal wires away from a possible noise source as power wires or high-power driving circuits.
- (b) Shield signal wires.

(2) Reduce generated noise

- (a) Reduce the noise generated from high-power motor drive circuits.

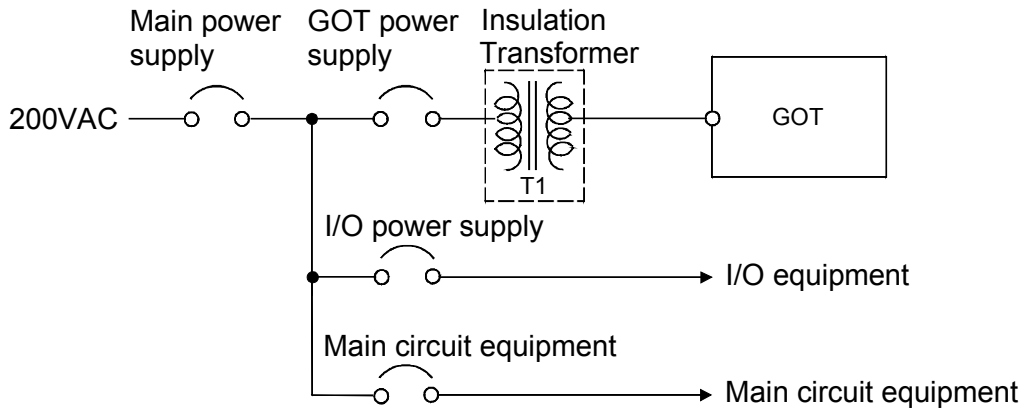
(3) Ground noise without fail

- (a) Earth the grounding wire to the ground without fail.
- (b) Use a grounding wire as thick and short as possible to ensure low grounding impedance.
- (c) Separate the grounding between power and control systems.

(1) Power supply wiring

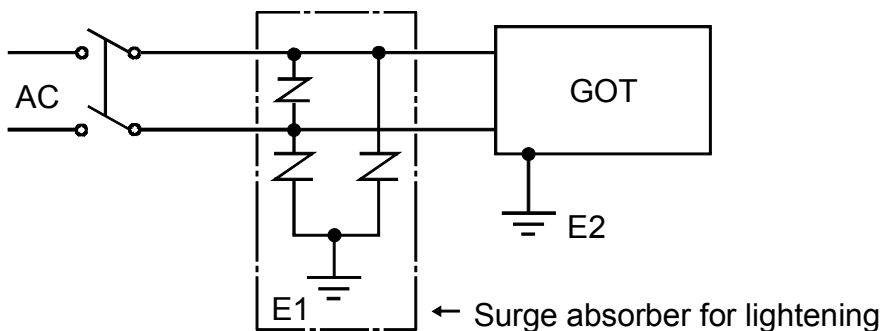
- Separate the GOT's power supply line from the lines for I/O devices and power devices as shown below.
When there is much noise, connect an insulation transformer.

Power supply wiring diagram



- 100VAC, 200VAC and 24VDC wires should be twisted as dense as possible.
Connect the modules with the shortest distance.
Also, to reduce the voltage drop to the minimum, use the thickest wires possible (0.75 to 2mm²).
Use a solderless terminal for M3 screw. Also, be sure to tighten the M3 screw within tightening torque 0.55 to 0.88 N•m in order not to cause trouble.
- Do not bundle the 100VAC, 200VAC and 24VDC wires with, or run them close to, the main circuit (high voltage, large current) and I/O signal lines. Reserve a distance of at least 100 mm from adjacent wires.
- As a countermeasure to power surge due to lightning, connect a surge absorber for lightning as shown below.

Lightening surge absorber connection diagram

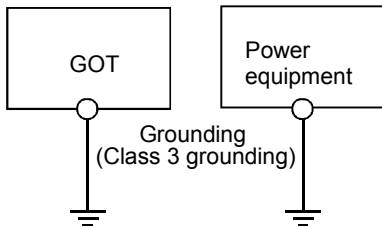


POINT

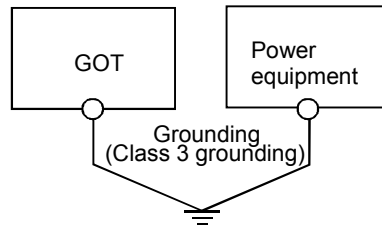
- (1) Separate the ground of the surge absorber for lightning (E1) from that of the GOT (E2).
- (2) Select a surge absorber for lightning whose power supply voltage does no exceed the maximum allowable circuit voltage even at the time of maximum power supply voltage elevation.

(2) Grounding

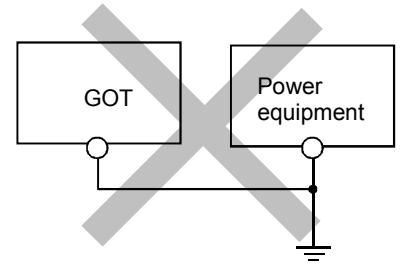
- For grounding, perform the following:
Use a dedicated grounding wire as far as possible. (Grounding resistance of 100Ω or less.)
- When a dedicated grounding cannot be performed, use (2) Common Grounding shown below.
Also, be sure to take noise countermeasures other than grounding.



(1) Independent grounding…… Best



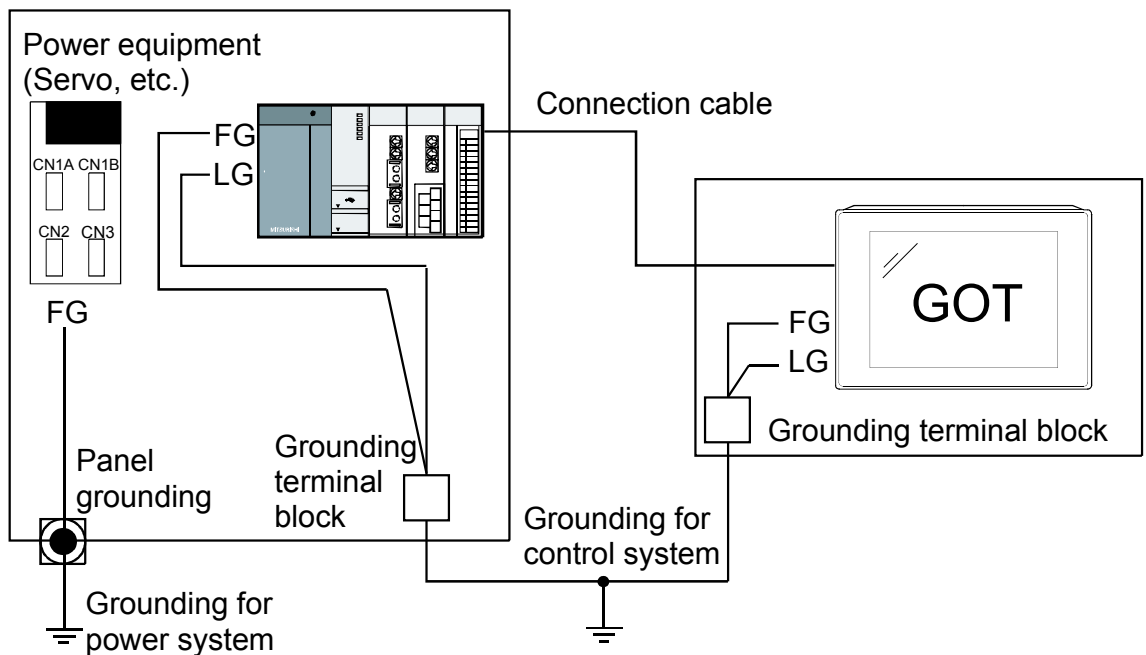
(2) Common grounding…… Good



(3) Joint grounding…… Not allowed

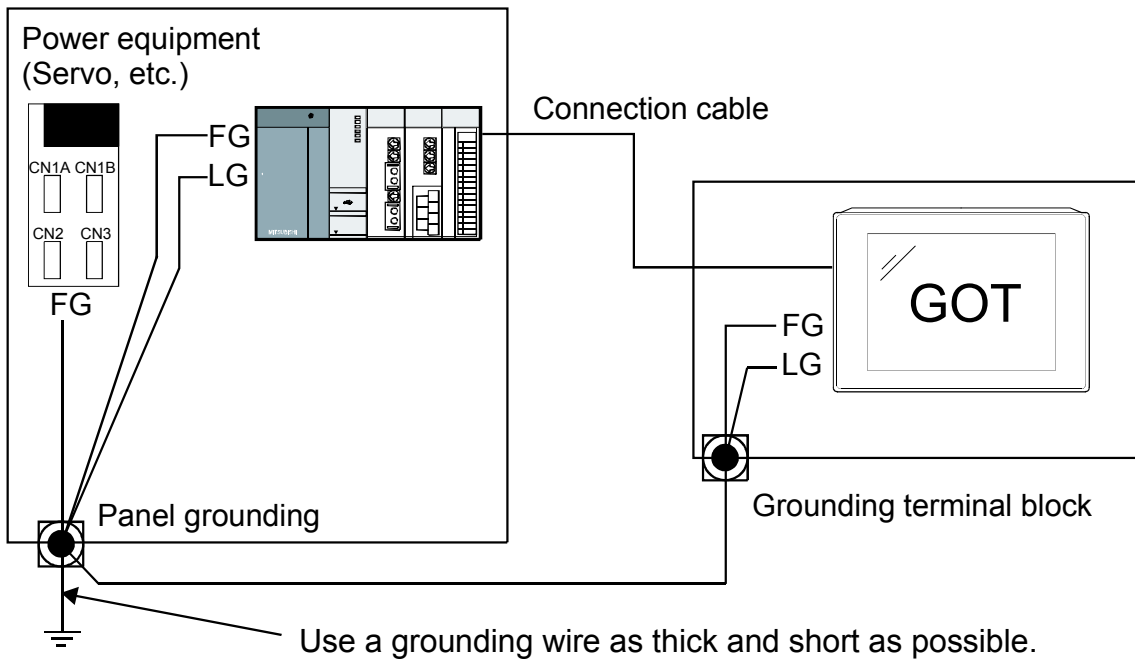
- For grounding a cable, use the cable of 2 mm^2 or more.
Position the ground-contact point as closely to the sequencer as possible, and reduce the length of the grounding cable as much as possible.

(a) An example of independent grounding



- * For control system grounding, apply single-point grounding for one system.
Especially for the devices communicating each other, be sure to earth the grounding wire at one point.

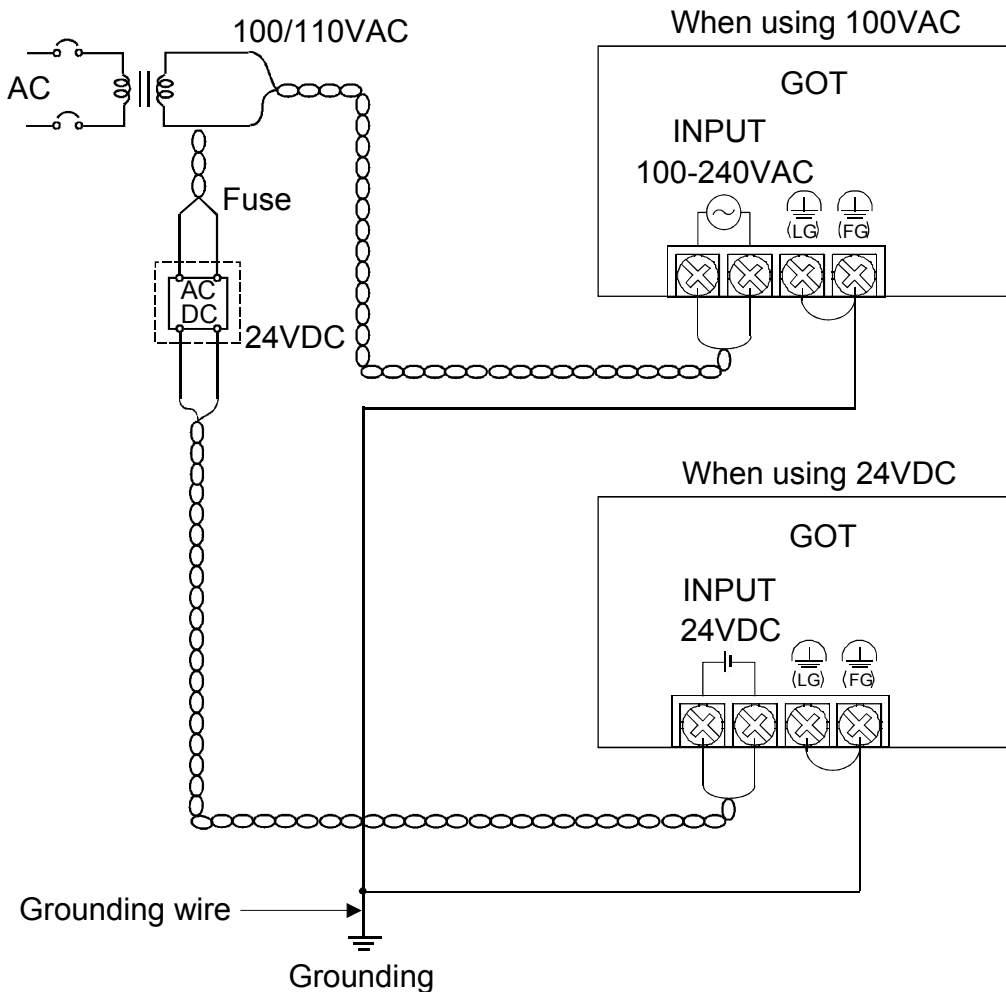
(b) An example of common grounding



* Apply single-point grounding for one system.

5.4 Connecting to the GOT Power Section

The following diagram shows the wiring example of power lines, grounding lines, etc. to the GOT power section.

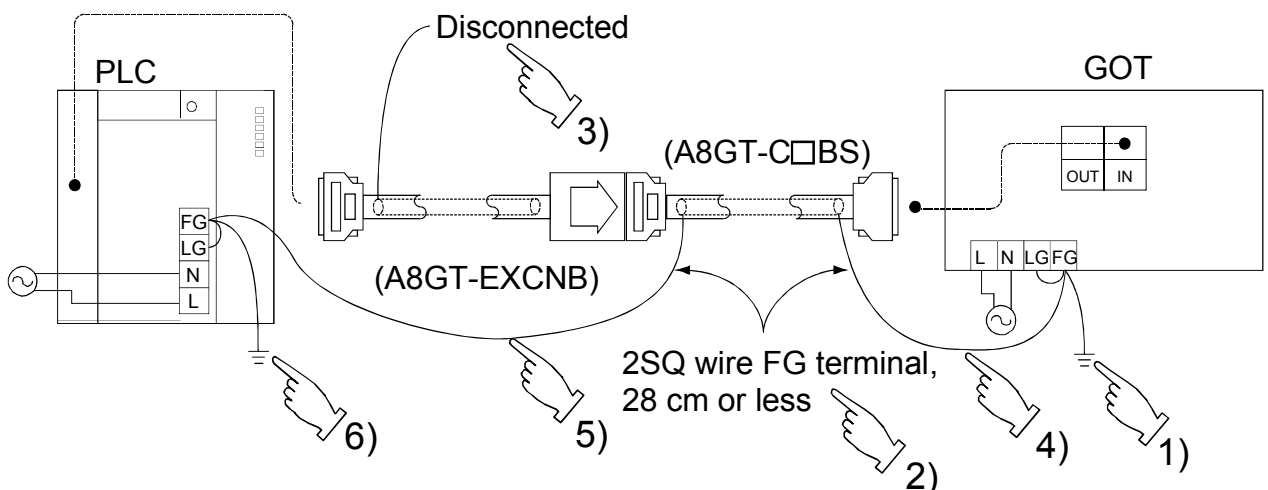


POINT

- (1) Use the thickest possible (max. 2 mm² (14 AWG)) wires for the 100/200 VAC and 24 VDC power cables. Be sure to twist these wires starting at the connection terminals. To prevent a short-circuit should any screws loosen, use solderless terminals with insulation sleeves.
- (2) When the LG terminals and FG terminals are connected, be sure to ground the wires. Do not connect the LG terminals and FG terminals to anything other than ground. If LG terminals and FG terminals are connected without grounding the wires, the PLC may be susceptible to noise.
In addition, since the LG terminals have potential, the operator may receive an electric shock when touching metal parts.

5.5 Connection Cable Wiring

- Do not bind connection cables with the main circuit (high voltage, heavy current) or I/O signal cables, or lay them close to each other.
- When using A8GT-C□EXSS-1 or A8GT-C□BS, ground wires as below.
(1) When using A8GT-C□EXSS-1 cable



- 1) Connect the LG and FG terminals of GOT unit power to the ground through the terminal block with one wire.
 - 2) Use FG wires of 28 cm or less for the A8GT-C□BS cable.
 - 3) Do not connect the FG grounding wire of A8GT-EXCNCB cable.
 - 4) Connect the A8GT-C□BS cable's FG wire to FG of the GOT unit power terminal block.
 - 5) Connect the A8GT-C□BS cable's FG wire on the PLC side to FG of the PLC power supply module.
 - 6) Connect the LG and FG terminals of the terminal block on the PLC to ground with one wire.
- (2) When using A8GT-C□BS cable
Connect the A8GT-C□BS cable's FG wires on the both sides to the FG terminals on the power terminal block of the both side GOTs.

5.6 Wiring precautions the part which matches the EMC Directives

Connect and wire GOT-A900 series equipment as instructed below.

If the GOT-A900 series equipment is configured in a way that differs from the following instructions then the system will not comply with EMC directives.

The GOT case is made of different material depending on the hardware version.

Make sure to confirm the hardware version of the GOT used, as the wiring or connection method varies with the case material.

The following table shows the GOT hardware version and the corresponding case material.

Type	Material	
	Conductive material case	Non-conductive mold (resin) case
A985GOT-TBA-EU	A or later	-
A975GOT-TBA-EU	A or later	E or later (July, 2003)
A970GOT-TBA-EU	A or later	E or later (July, 2003)
A970GOT-SBA-EU	A or later	S or later (July, 2003)
A970GOT-LBA-EU	A or later	L or later (July, 2003)
A960GOT-EBA-EU	A or later	V or later (August, 2003)

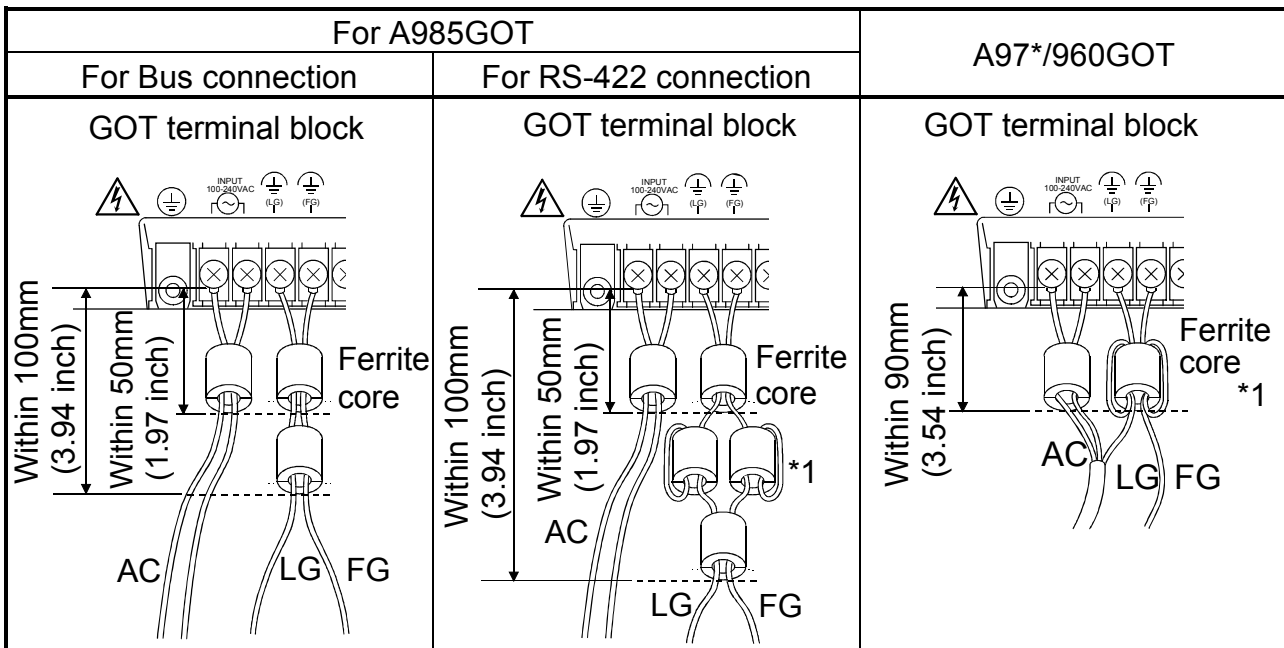
5.6.1 Method to connect the power wire, ground wire and protective ground terminal

1) Method to connect the power wire and ground wire

Connect the power wire and connection cable as shown in the illustration, and be sure to attach a ferrite core (TDK type ZCAT3035-1330) within the range shown below.

Lead the power wire and ground wire as shown in Section 1.1.2 (2).

Always ground the LG and FG wires.



*1: Double wrap the FG and LG wire around the ferrite core.

2) Method to ground the protective ground terminal

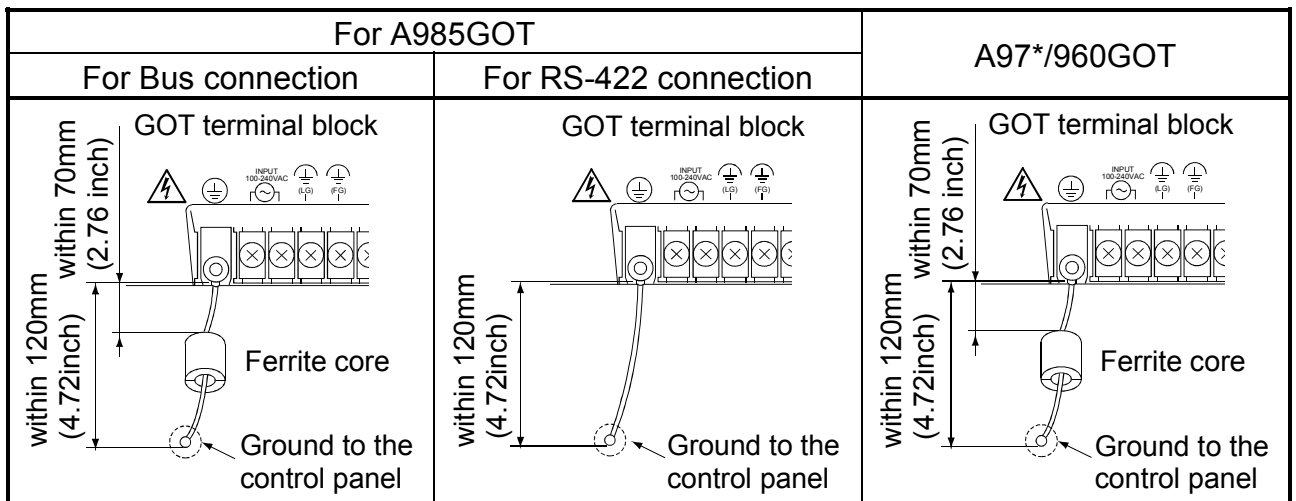
a) For GOT with conductive metal case

Be sure to ground the protective ground terminal of the GOT main unit to the control panel.

At this time, keep the length of the ground wire grounding the control panel to within 120mm (4.72 inch).

Moreover, be sure to install the ferrite core (TDK brand ZCAT3035-1330) within 70mm from the protective ground terminal.

(The ferrite core is not used when using the A985GOT RS-422 connection.)

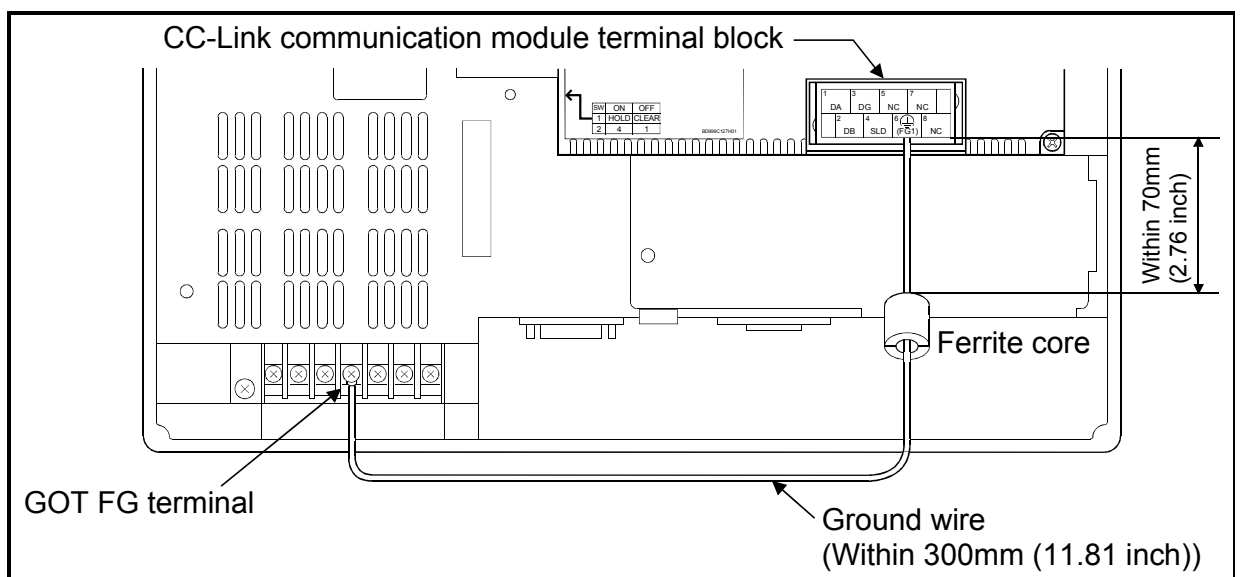


b) For GOT with non-conductive mold (resin) case

This GOT does not include the protective ground terminal, as it does not require grounding.

3) CC-Link connection

Use the grounding wire (300mm or less) to connect the FG terminal of the CC-Link communication module to that of the GOT power supply section. Then, attach the ferrite core (ZCAT3035-1330) within 70mm of the FG terminal of A8GT-J61BT13



5.6.2 Grounding the ground cable

Manufacture the cable used with the GOT with the following method. When manufacturing the cable, a ferrite core, cable clamp and cable shielding material are required.

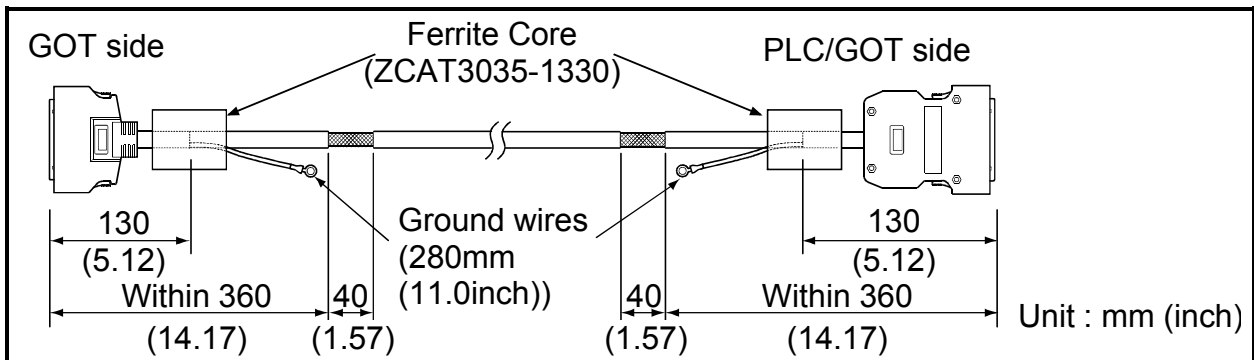
The cable clamp used by Mitsubishi Electric for the EMC specification compatibility test is shown below.

- TDK brand ZCAT3035-1330 Ferrite Core
- TDK brand ZCAT2436-1330 Ferrite Core
- Mitsubishi Electric Model AD75CK cable clamp
- Japan Zipper Tubing Co., Ltd. Zipper tube SHNJ type

1) BUS connection cable

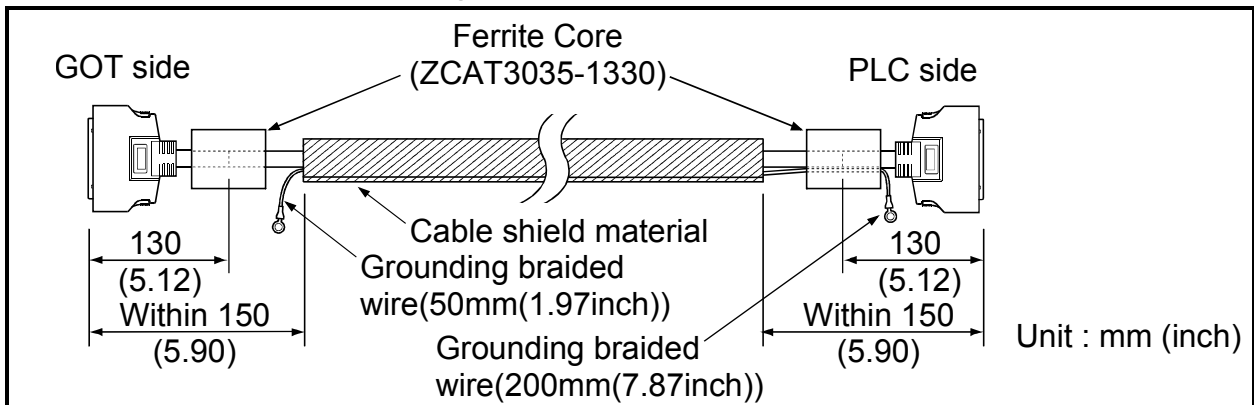
a) For A8GT-C100/200/300EXSS, A8GT-C100/200/300BS.

- Cut the connection wire protruding from both ends of the cable to the lengths shown below.
- Peel the sheath (with the length shown below) at both ends of the cable, and expose the shield braided wire for grounding. (For grounding with cable clamps. (refer to Section 5.6.3.))



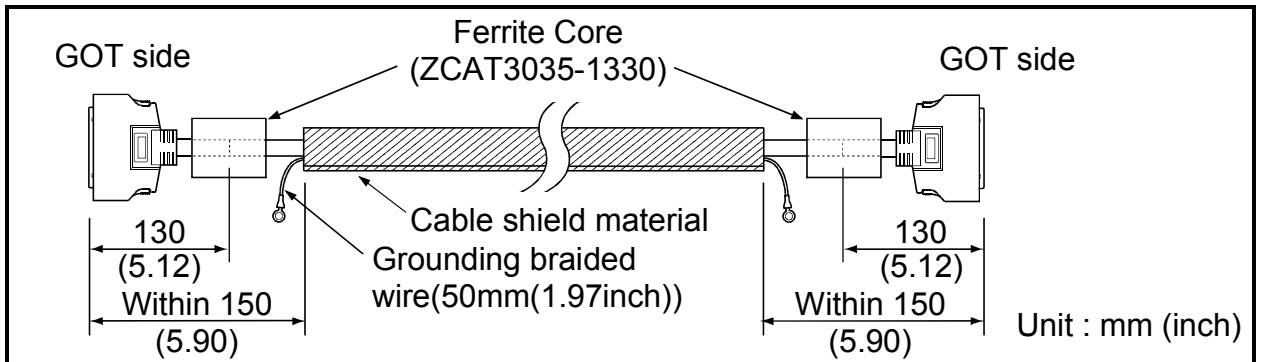
b) For other cables between GOT and base unit

- Wind cable shield material around the cable, and pull out the grounding braided wire of the cable shield material with the length shown below.
- Pass the grounding braided wire on the programmable logic controller side through the core.



c) For other cables between GOT and GOT

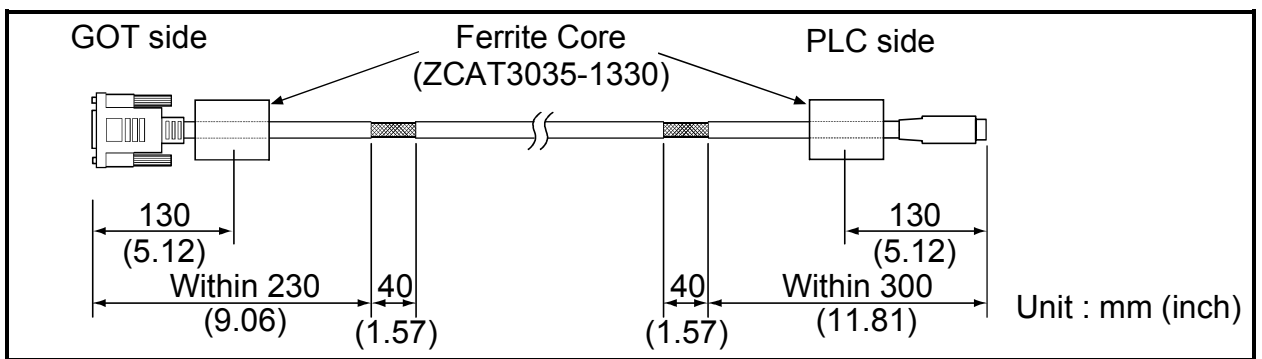
- Wind cable shield material around the cable, and pull out the grounding braided wire of the cable shield material with the length shown below.
- Do not pass the grounding braided wire on the programmable logic controller through the core.



2) CPU Direct connection

a) For RS-232C cable (QC30R2)

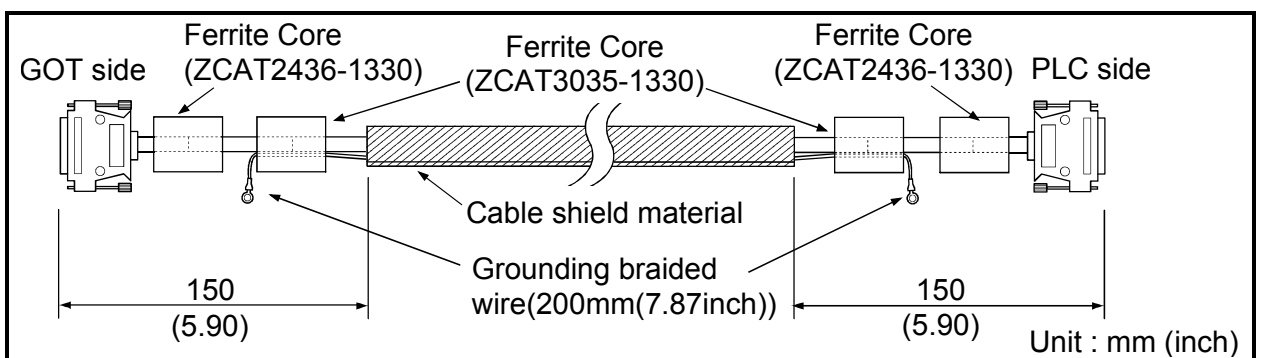
- Peel the sheath (with the length shown below) at both ends of the cable, and expose the shield braided wire for grounding. (For grounding with cable clamps. (refer to Section 5.6.3.))



b) RS-422 cable (For AC30/100/300R4-25P)

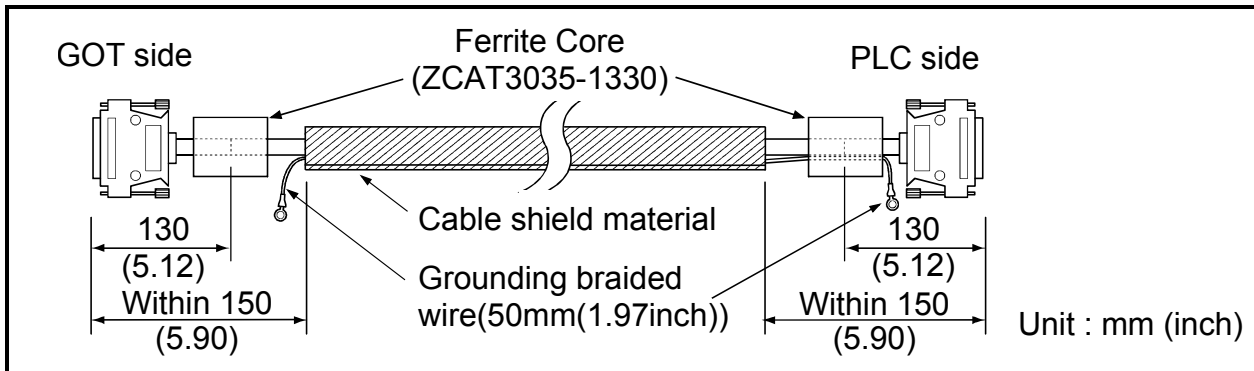
(1) For A985GOT

- Wind cable shield material around the cable, and pull out the grounding braided wire of the cable shield material with the length shown below.
- Do not pass the braided wire for grounding through the ZCAT2436-1330 ferrite core.



(2) For A97*/960GOT

- Wind cable shield material around the cable, and pull out the grounding braided wire of the cable shield material with the length shown below.
- Pass the grounding braided wire on the programmable logic controller side through the core.



3) Computer link connection

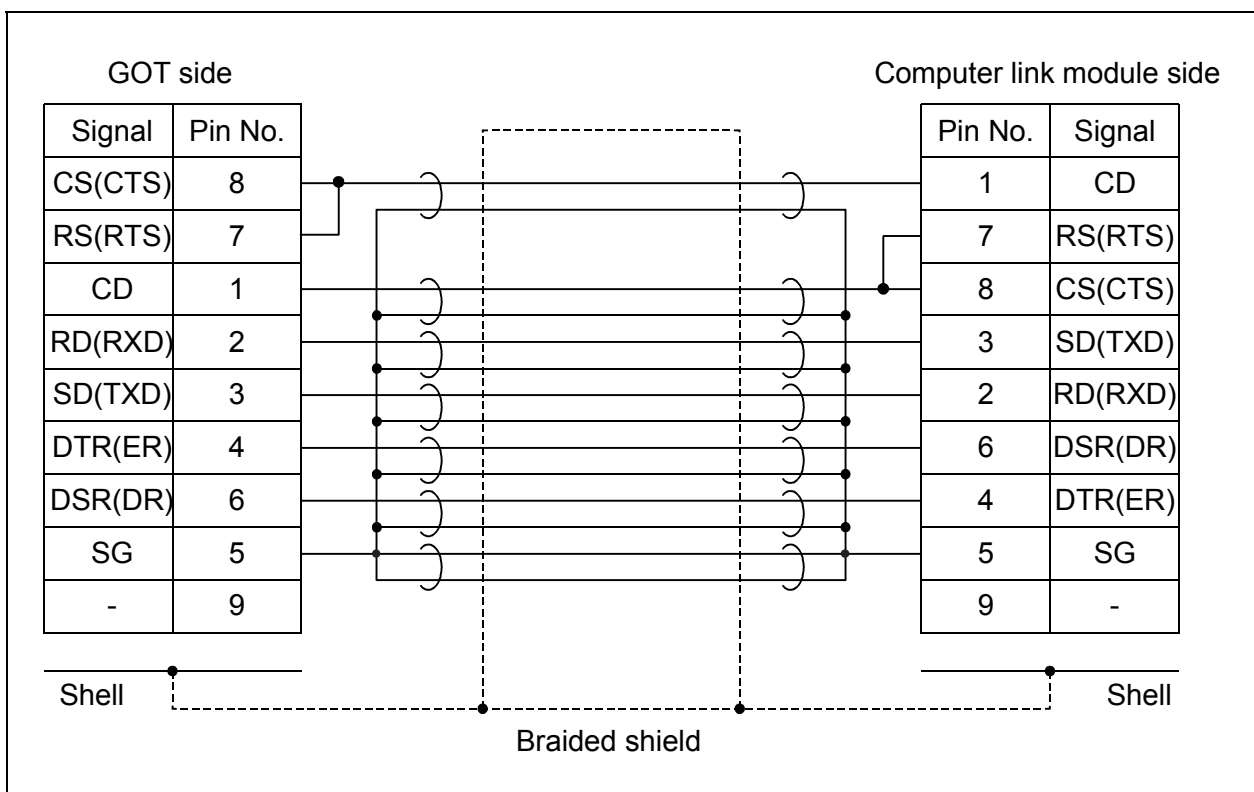
a) For RS-232C cable

The RS-232C cable used to connect the GOT, the computer link module PLC CPU with computer link function must be prepared by the user.

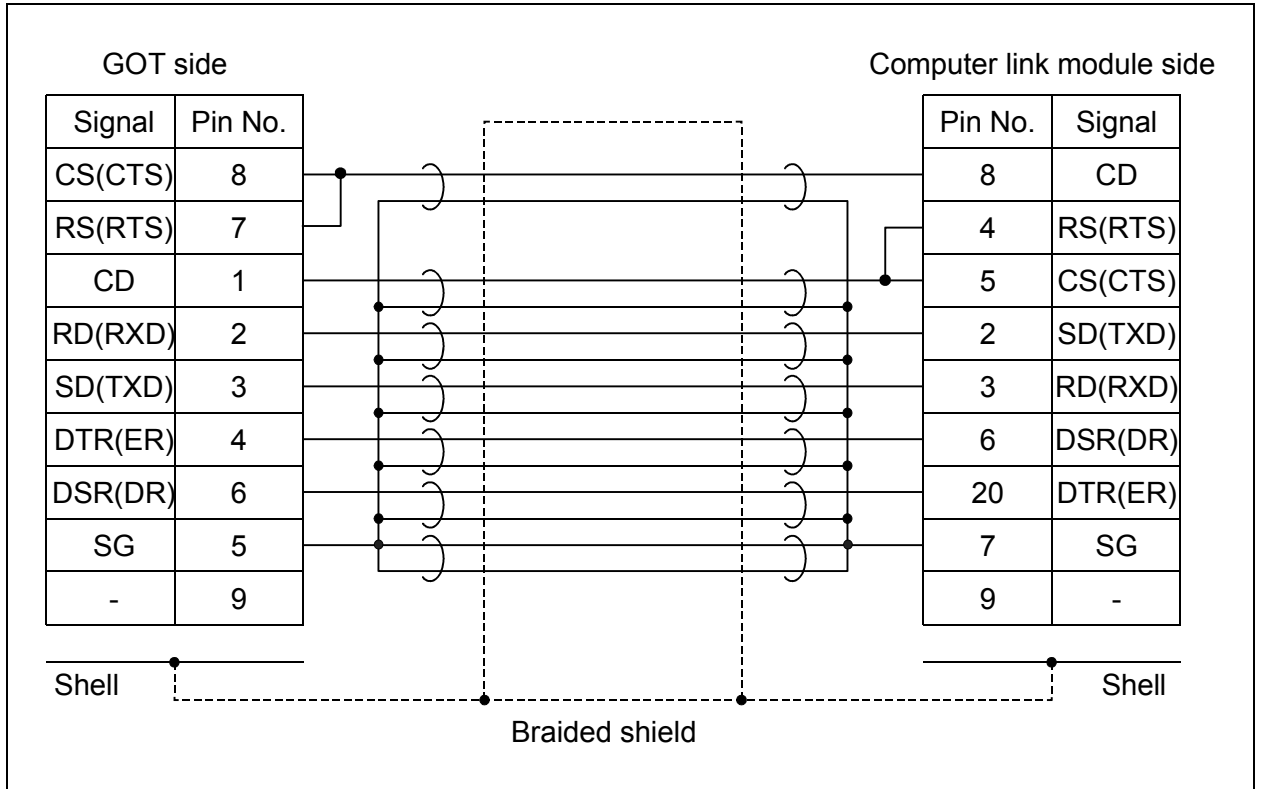
The RS-232C cable connection diagram and the connector are as follows.

(1) Connection diagram

- If D-sub 9-pin is used for the connector of the computer link module. (A1SJ71QC24(-R2), A1SJ71UC24-R2, A1SJ71C24-R2, A1SCPUC24-R2, A2CCPUC24, QJ71C24(-R2))



- If D-sub 25-pin is used for the connector of the computer link module.
(AJ71QC24(-R2), AJ71UC24)



(2) Precautions for manufacturing cable

- Make a twisted pair for each signal and SG.
- Connect the braided shield to the connector shell (both ends).
- The cable used for the Mitsubishi EMC Directive compatibility test had the following specifications.

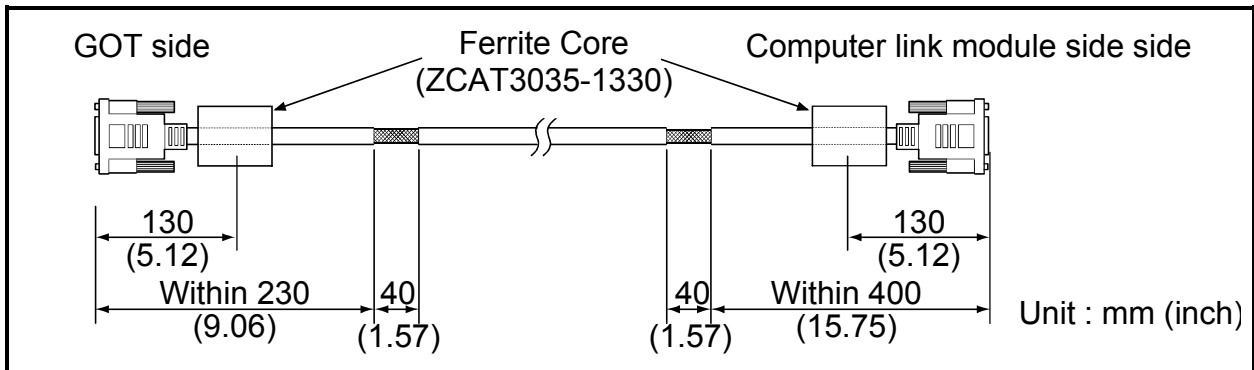
Item	Specification
Cable type	Twisted pair shield cable
Conductor section area (mm ²)	0.2

(3) Connector and connector cover

- GOT connector
Use the connector matching the following model for the GOT.
9-pin D-sub (male) inch screw type
manufactured by DDK
17JE-23090-27 (D3CC)
- Connector of computer link unit
Refer to the user's manual of the computer link module.

(4) Cable production method

- Peel the sheath (with the length shown below) at both ends of the cable, and expose the shield braided wire for grounding. (For grounding with cable clamps. (refer to Section 5.6.3.))
- The cable must be 15m or shorter.



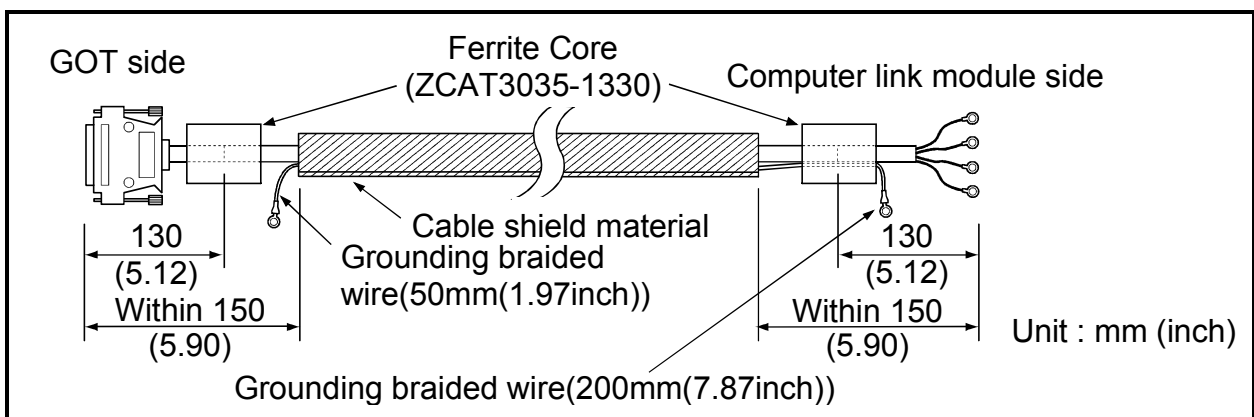
a) For RS-422 cable (AC30/100/300R4-25P)

Refer to (2) (b) 1)

b) For RS-422 cable (User created cable)

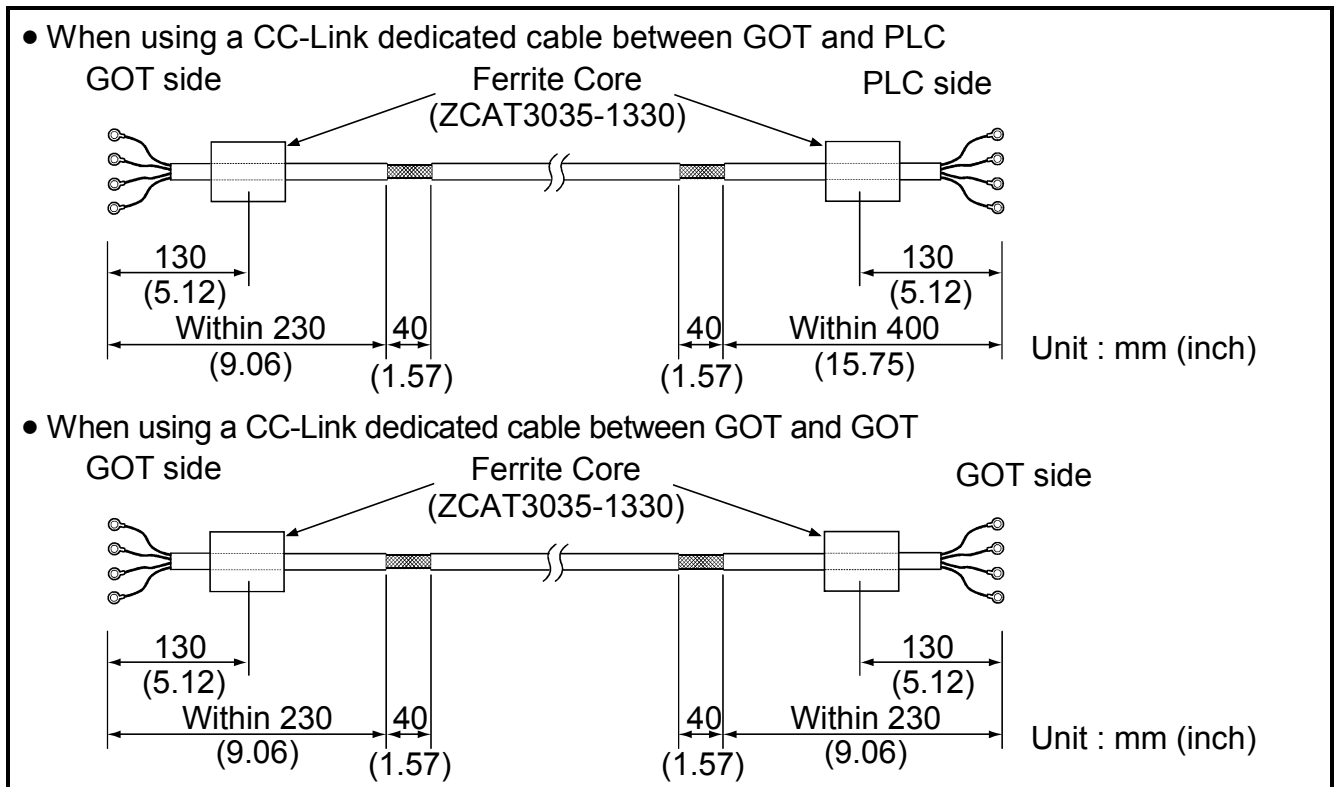
Refer to the GOT-A900 series User's Manual (Connection System Manual) for information about the cable creation method.

- Wind cable shield material around the cable, and pull out the grounding braided wire of the cable shield material with the length shown below.
- Pass the grounding braided wire on the programmable logic controller side through the core.



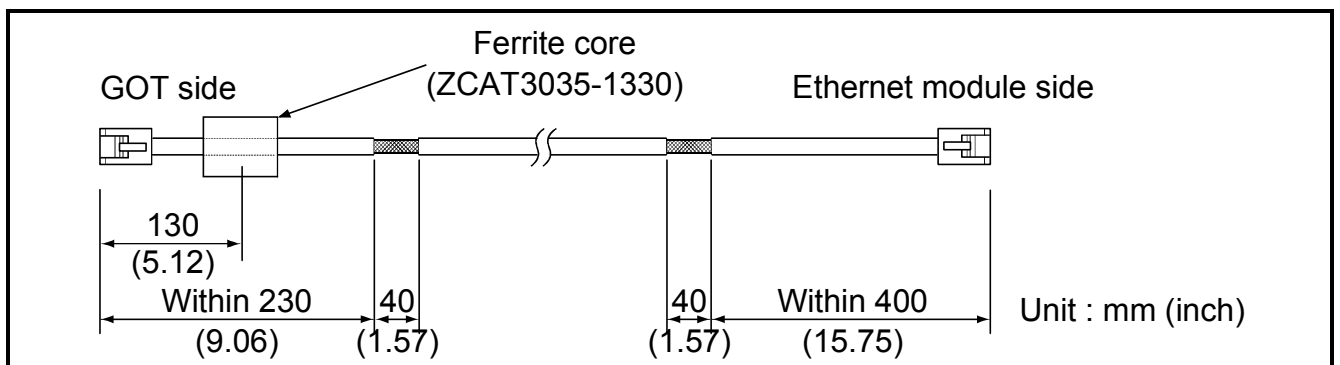
4) CC-Link connection (CC-Link dedicated cable)

- Strip the outer insulation layer at both ends of the cable by the length shown below to expose the braided shield for grounding. (For grounding with cable clamps. (refer to Section 5.6.3.))



5) Ethernet Connection (Shielded twisted pair cable 10BASE-T)

- Strip the outer insulation layer at both ends of the cable by the length shown below to expose the braided shield for grounding. (For grounding with cable clamps. (refer to Section 5.6.3.))



- 6) PLC and microcomputer (manufactured by other company) connection
Produce the cable (RS-232C cable, RS-422 cable) for connecting the GOT to a PLC or microcomputer (manufactured by other company) with reference to the GOT-A900 Series User's Manual (Connection System Manual).

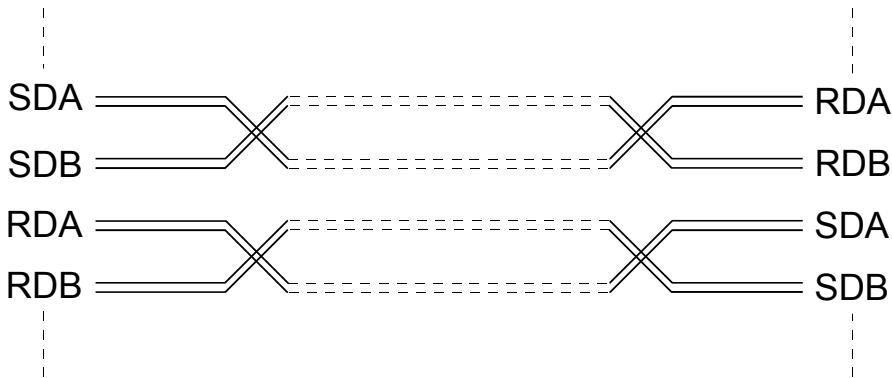
POINT

Configure the system to meet the EMC Directive specifications for the connected device when connecting the GOT with the PLC or microcomputer (manufactured by other company).

This section gives the instructions to comply with the EMC Directive. The manufacturer should finally decide the EMC Directive compliance method or judge if the configured system is compliant with the EMC Directive.

(a) For RS-422 cable

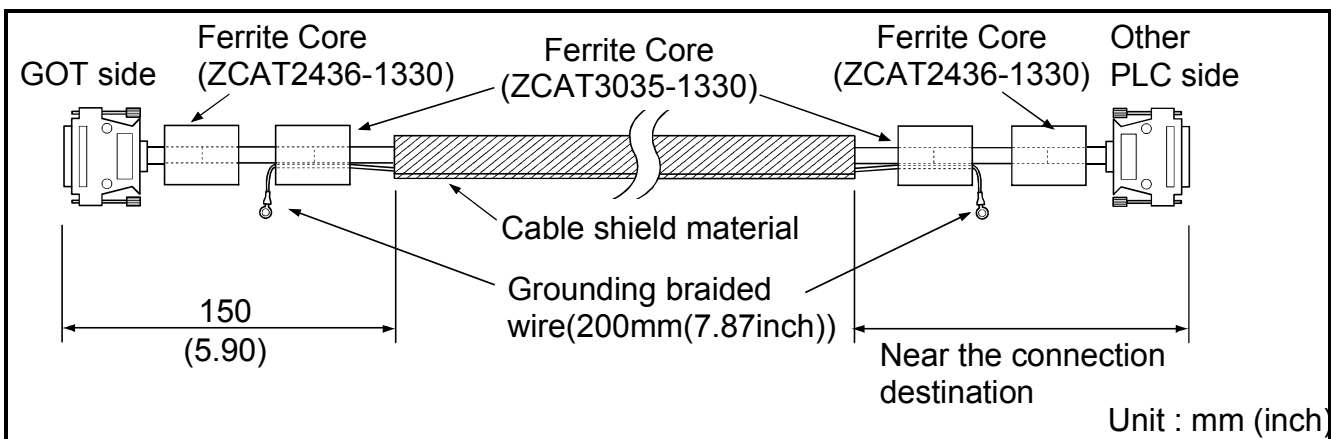
- Each signal wire (excluding SG and FG) should be made into a two power wires and connected, then twisted.



- Make the SG wire more than two wires and connect.

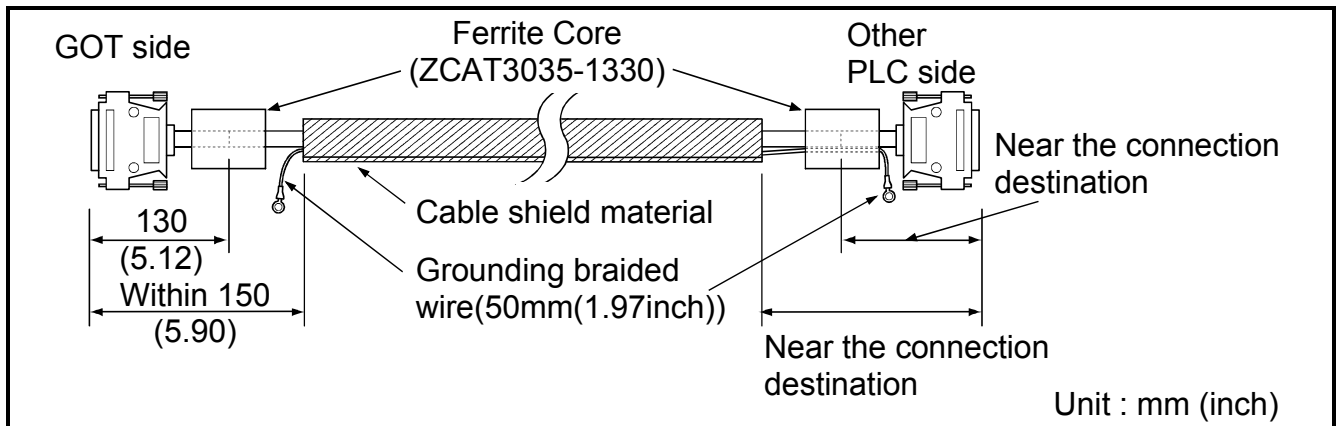
1) For A985GOT

- Wind cable shield material around the cable, and pull out the grounding braided wire of the cable shield material with the length shown below.
- Do not pass the braided wire for grounding through the ZCAT2436-1330 ferrite core.



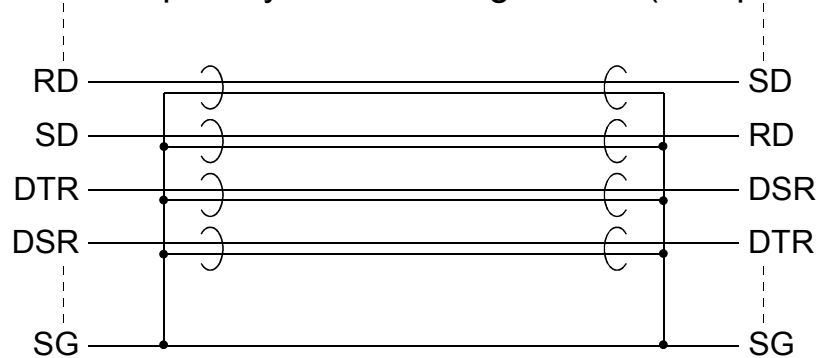
2) For A97*/960GOT

- Wind cable shield material around the cable, and pull out the grounding braided wire of the cable shield material with the length shown below.
- Pass the grounding braided wire on the programmable logic controller side through the core.

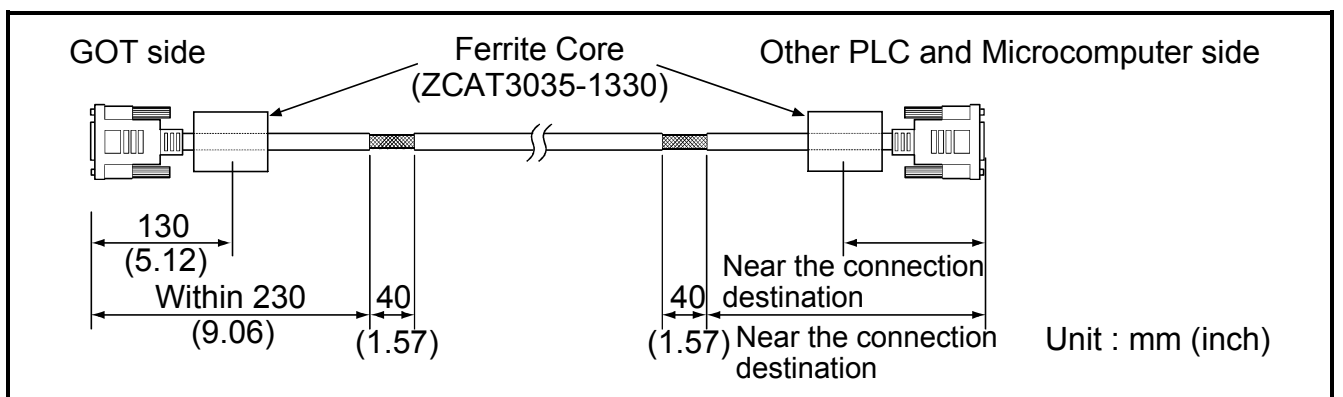


(b) RS-232C

- Use a twisted pair style for each signal wire (except SG, FG) with SG.

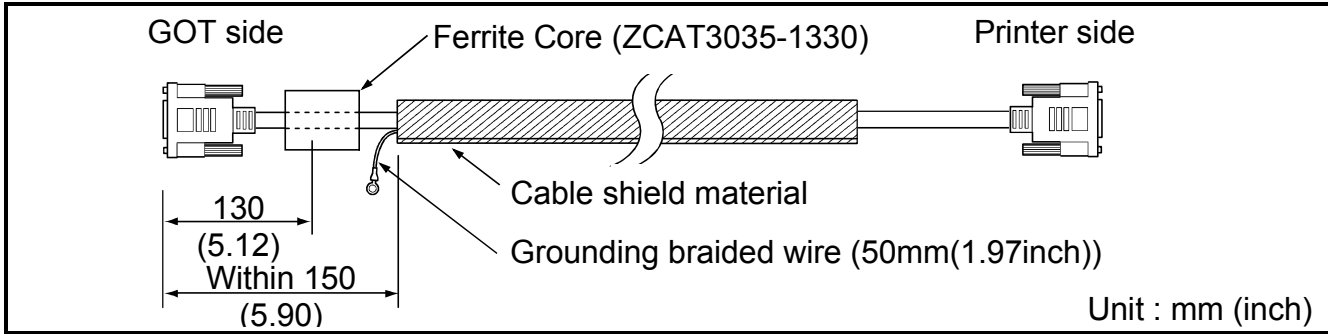


- Strip the outer insulation layer at both ends of the cable by the length shown below to expose the braided shield for grounding. (For grounding with cable clamps. (refer to Section 5.6.3.))



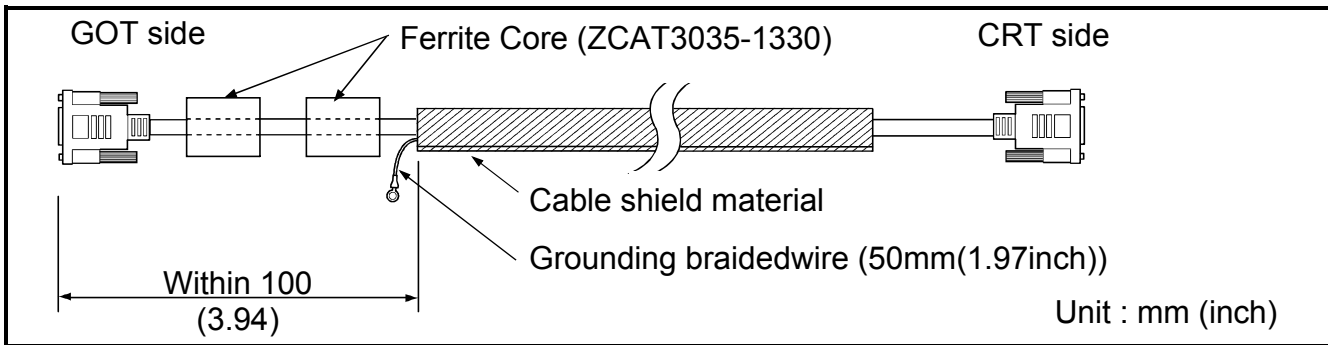
7) Printer cable

- Wind cable shield material around the cable, and pull out the grounding braided wire of the cable shield material by the length shown below.



8) CRT cable (CRT cable enclosed with CRT)

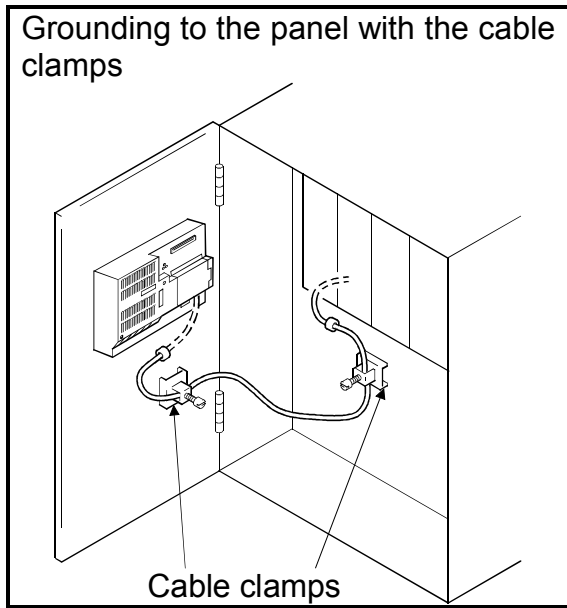
- Wind cable shield material around the cable, and pull out the grounding braided wire of the cable shield material by the length shown below.
- The cable length must be with 1.5m.



5.6.3 Grounding the cable

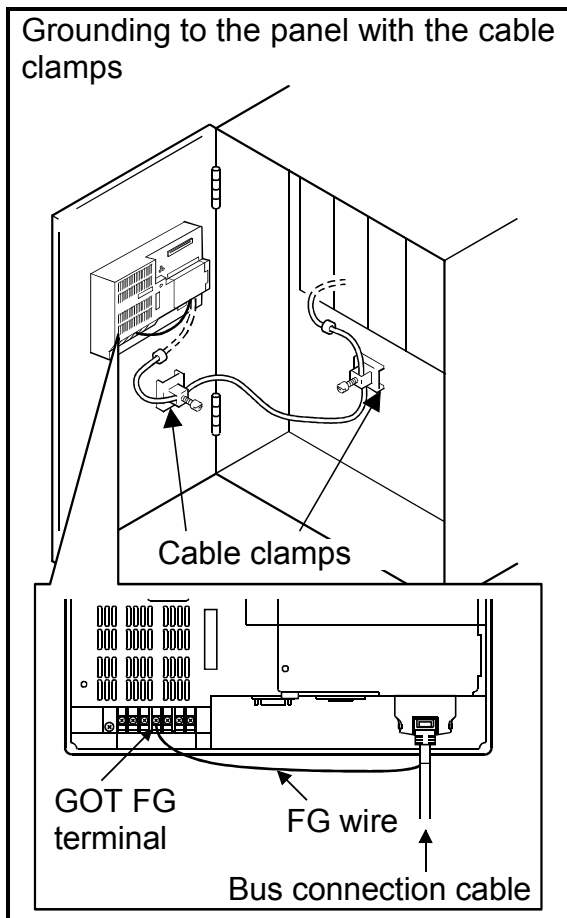
Ground the cable and grounding wire to the control panel where the GOT and base unit are grounded.

1) GOT with conductive metal case



- For bus connection cable (For A8GT-C100/ C200/300EXSS, A8GT-C100/200/300BS), ground the braided shield and grounding wire onto the panel with the cable clamp (AD75CK).
- For RS-232C cable, CC-Link dedicated cable and shielded twisted pair cable, ground the braided shield onto the panel with the cable clamp (AD75CK).
- For RS-422 cable and printer cable ground the grounding braided wire onto the panel with a screw.

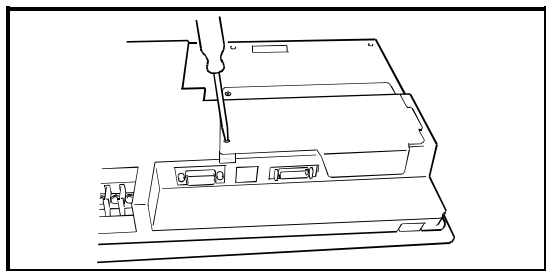
2) GOT with non-conductive mold (resin) case



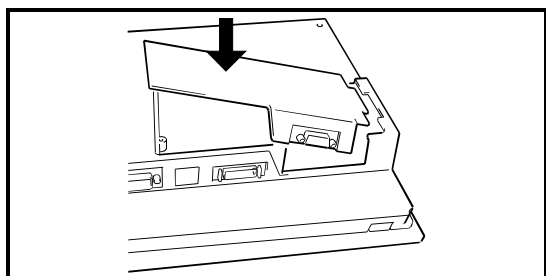
- For the A8GT-C100/200/300EXSS or A8GT-C100/200/300BS bus connection cable, ground the braided shield onto the panel with the cable clamp (AD75CK). Ground the grounding wire to the FG terminal, which is situated on the GOT power supply section.
- For RS-232C cable, CC-Link dedicated cable and shield/twisted pair cable, ground the braided shield onto the panel with the cable clamp (AD75CK).
- For other bus cable, RS-422 cable and printer cable, ground the grounding braided wire onto the panel with a screw.

5.7 Method to connect the communication board

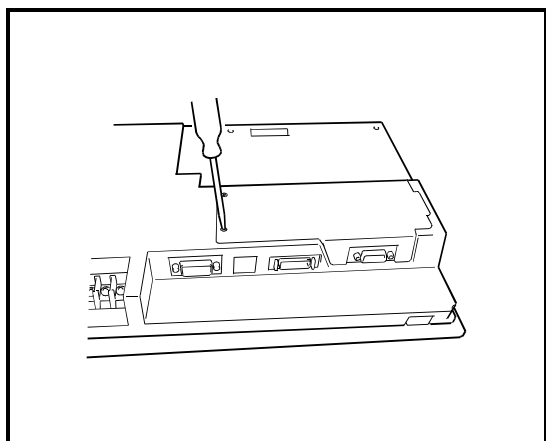
The method to install the communication board used by the GOT is shown below.



- 1) Loosen the mounting screws (2 pcs.) which secure the slot cover.
Remove the slot cover.
Save the removed slot cover.



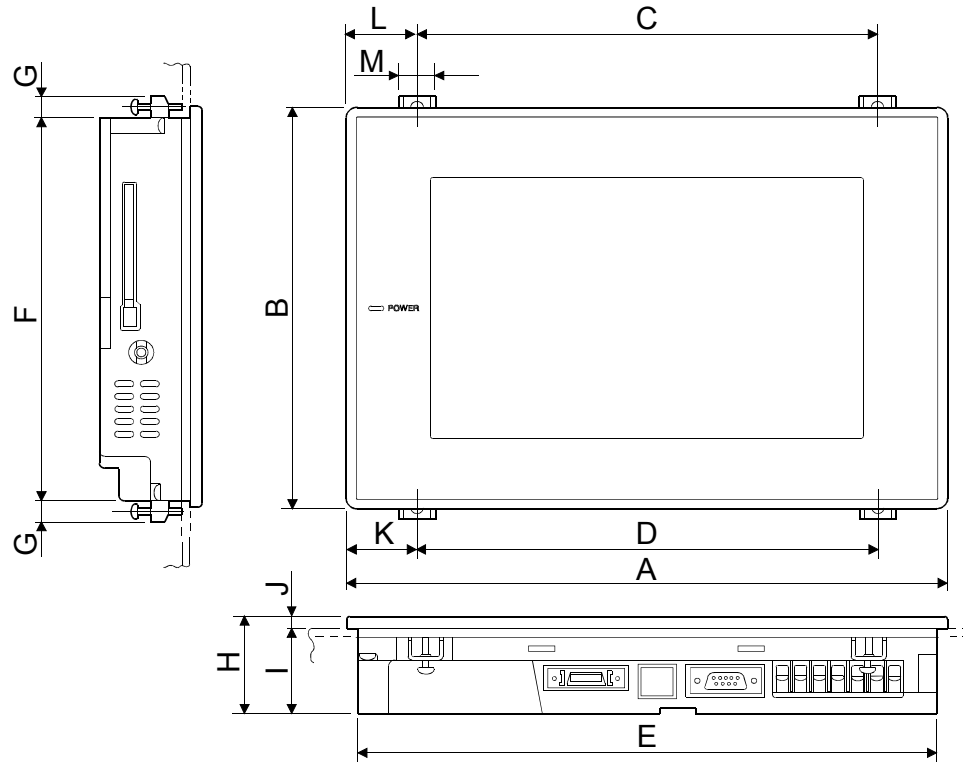
- 2) Insert the convex portion of the communication board into the concave portion of the GOT.
Securely press the communication board against the GOT.



- 3) Tighten and fix the mounting screws (2 pcs.) of the communication board in the specified torque range.
- 4) To remove the communication board, reverse the installing procedure.
To install the slot cover, also reverse the removing procedure.
Here, securely install the slot cover, and securely tighten the mounting screws (2 pcs.) in the specified torque range.

APPENDICES

Appendix1 External dimensions



Unit: mm (inch)

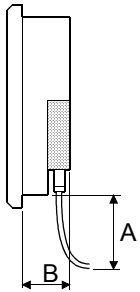
	A	B	C	D	E	F	G	H	I	J	K	L	M
A985GOT	312 (12.28)	238 (9.37)	245 (9.64)	245 (9.64)	301 (11.85)	227 (8.94)	10 (0.39)	49 (1.93)	43 (1.69)	6 (0.24)	33.5 (1.32)	33.5 (1.32)	15.4 (0.61)
A975GOT, A970GOT	297 (11.70)	208 (8.18)	235 (9.25)	229 (9.02)	288 (11.34)	199 (7.84)	10 (0.39)	46 (1.81)	40 (1.57)	6 (0.24)	34 (1.34)	31 (1.22)	15.4 (0.61)
A960GOT	268 (10.55)	192 (7.56)	204 (8.03)	198 (7.80)	257 (10.12)	182 (7.17)	10 (0.39)	49 (1.93)	43 (1.69)	6 (0.24)	35 (1.38)	32 (1.26)	15.4 (0.61)

Appendix2 Depth at the time of Communication board/module mounting

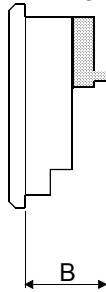
1) A985/960GOT

Mounted communication board/module	A [mm] (inch)	B [mm] (inch)
A9GT-BUSS	100 (3.94)	43 (1.69)
A9GT-BUS2S	100 (3.94)	65 (2.56)
A9GT-RS2, A9GT-RS2T	*1	43 (1.69)
A9GT-RS4	130 (5.12)*2	43 (1.69)
A9GT-J61BT13	-	82 (3.23)
A9GT-J71E71-T	-	73.2 (2.88)

Communication board mounting



Communication module mounting



2) A97*GOT

Mounted communication board/ module	A [mm] (inch)	B [mm] (inch)
A9GT-BUSS	85 (3.35)	40 (1.58)
A9GT-BUS2S	85 (3.35)	62 (2.44)
A9GT-RS2, A9GT-RS2T	*1	40 (1.58)
A9GT-RS4	130 (5.12)*2	40 (1.58)
A8GT-J61BT13	-	79 (3.11)
A9GT-J71E71-T	-	70.2 (2.76)

*1: Depends on the dimensions of the converter and cable used.

*2: Dimension for use of the AC*R4-25P. When the other cable is used, the dimension depends on the converter and cable used.

Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- This product has been manufactured under strict quality control. However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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