

mitsubishi

A975GOT-TBA/TBD(-B)
A970GOT-TBA/TBD(-B)
A970GOT-SBA/SBD
A970GOT-LBA/LBD
A960GOT-EBA/EBD

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-U-JE |
| MODEL CODE | 1DM100 |
| IB(NA)-80032-H(0512)MEE | |

Mitsubishi Graphic Operation Terminal

● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

When using this equipment, thoroughly read this manual. Also pay careful attention to safety and handle the module properly.

These precautions apply only to this equipment.

Refer to the user's manual of the CPU module to use for a description of the PLC system safety precautions.

These "Safety Precautions" classify the safety precautions into two categories: "DANGER" and "CAUTION".



DANGER

Procedures which may lead to a dangerous condition and cause death or serious injury, if not carried out properly.



CAUTION

Procedures which may lead to a dangerous condition and cause superficial to medium injury, or physical damage only, if not carried out properly.

Depending on circumstances, procedures indicated by  **CAUTION** may also be linked to serious results.

In any case, it is important to follow the directions for usage.

Store this manual in a safe place so that you can take it out and read it whenever necessary. 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.
- Be sure to support the PC card with your hand when removing it.
Otherwise, the PC card may drop, resulting in a failure or damage.

[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

- While changing the backlight, do not touch the circuit boards and electronic parts of the GOT.
Doing so can cause a failure or malfunction.
- When changing the backlight, always note the following.
 - (1) Wear gloves or fingerstalls before starting the replacement of the backlight.
Not doing so can cause injury.
 - (2) 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]

DANGER

- 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 |
|------------|----------------|--|
| Jan., 1999 | IB(NA)-80032-A | First edition |
| Jun., 1999 | IB(NA)-80032-B | <div style="border: 1px solid black; padding: 2px;">Partial correction</div> Section 5.1 <div style="border: 1px solid black; padding: 2px;">Partial addition</div> Section 3.2, Section 3.3, Section 5.2 <div style="border: 1px solid black; padding: 2px;">Addition</div> A970GOT-LBA/LBD |
| Jun., 2001 | IB(NA)-80032-C | <div style="border: 1px solid black; padding: 2px;">Partial correction</div> Chapter 2, Section 5.1, Section 5.2, Section 5.3 <div style="border: 1px solid black; padding: 2px;">Addition</div> Appendix 2 |
| Feb., 2002 | IB(NA)-80032-D | <div style="border: 1px solid black; padding: 2px;">Partial correction</div> SAFETY PRECAUTIONS |
| Jan., 2004 | IB(NA)-80032-E | <div style="border: 1px solid black; padding: 2px;">Partial correction</div> Chapter 1, Section 3.2 <div style="border: 1px solid black; padding: 2px;">Addition</div> Section 5.4 |
| Mar., 2004 | IB(NA)-80032-F | <div style="border: 1px solid black; padding: 2px;">Partial correction</div> Section 5.4 <div style="border: 1px solid black; padding: 2px;">MODEL CODE change</div> Changed from 13JN45 to 1DM100. |
| Aug., 2004 | IB(NA)-80032-G | <div style="border: 1px solid black; padding: 2px;">Addition</div> Section 5.4, 5.5, 5.6 <div style="border: 1px solid black; padding: 2px;">Partial correction</div> Section 5.7 corresponds to the former Section 5.4. About Manuals, Section 3.3, Appendix 1 |
| Dec., 2005 | IB(NA)-80032-H | <div style="border: 1px solid black; padding: 2px;">Partial correction</div> Section 3.2 |
| | | |

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About Manuals

The following manuals are related to this product.
Referring to this list, please order the necessary 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 describes the system configuration, specifications, part names, handling and outline dimensions of the A975GOT/A970GOT/A960GOT Graphic operation terminal (Referred to as GOT, hereafter).

The following GOT types are available.

| Item | Type | Display section |
|---------|-----------------------------|-------------------------------|
| A975GOT | A975GOT-TBA,A975GOT-TBD | TFT color liquid crystal |
| | A975GOT-TBA-B,A975GOT-TBD-B | TFT color liquid crystal *1 |
| A970GOT | A970GOT-TBA,A970GOT-TBD | TFT color liquid crystal |
| | A970GOT-TBA-B,A970GOT-TBD-B | TFT color liquid crystal *1 |
| | A970GOT-SBA,A970GOT-SBD | D-STN color liquid crystal |
| | A970GOT-LBA,A970GOT-LBD | STN monochrome liquid crystal |
| A960GOT | A960GOT-EBA,A960GOT-EBD | EL |

*1: This manual explains the GOT of function version B.

For specifications of GOTs of other function version, refer to A985GOT/A975GOT/A970GOT/A960GOT User's Manual.

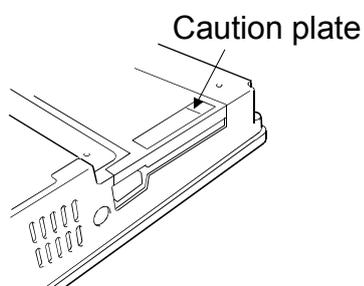
1.1 Packing List

After unpacking, confirm that you have received the following products.

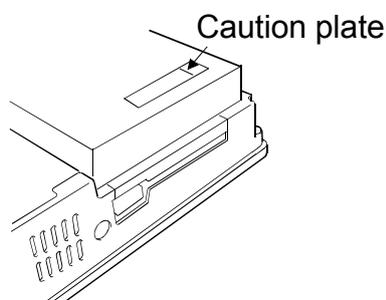
| Product | Quantity |
|---------------------------------------|----------|
| GOT main unit | 1 |
| Mounting fixture | 4 |
| Communication module securing fixture | 3 |
| Caution plate (seal) | 1 |

*1: Affix a caution plate in a conspicuous position such as memory card interface part. (Affix a caution plate on a communication module during its use)

When affixing a caution plate on the memory card interface



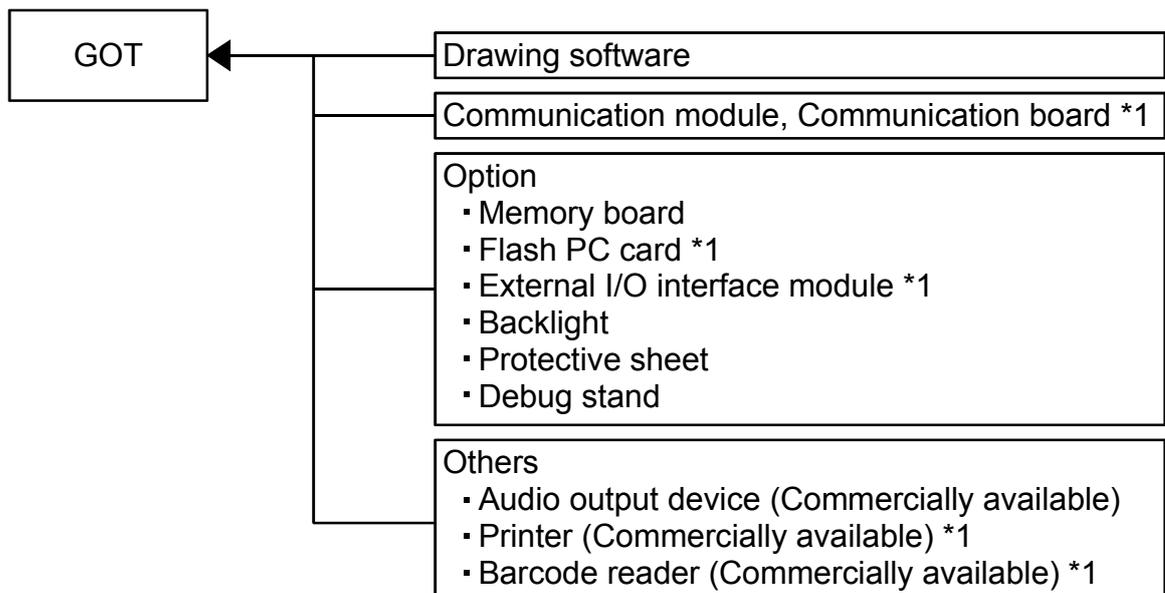
When affixing a caution plate on the communication module



*2: If the protective sheet needs to be replaced, please obtain the one that is to be purchased separately.

2. System Configuration

The overall configuration of the GOT is shown below.



*1: For details of the system configuration, refer to the GOT-A900 Series User's Manual (Connection System Manual).

3. Specifications

3.1 General specifications

| Item | Specifications | | | | | |
|-------------------------------|--|-----------------------------------|-------------|---------------------|-----------|---|
| Operating ambient temperature | Display section | | | 0 to 40°C *1 | | |
| | Other than display section | | | 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 B3502 and IEC 61131-2. | | Frequency | Acceleration | Amplitude | Sweep Count 10 times in each of X, Y and Z directions (for 80 minutes) |
| | | In case of intermittent vibration | 10 to 57Hz | — | 0.075mm | |
| | | | 57 to 150Hz | 9.8m/s ² | — | |
| | | In case of continuous vibration | 10 to 57Hz | — | 0.035mm | |
| 57 to 150Hz | 4.9m/s ² | | — | | | |
| Shock resistance | Conforms to JIS B3502 and IEC 61131-2 (147m/s ² , 3 times in each of X, Y and Z directions) | | | | | |
| Operating atmosphere | No corrosive gas | | | | | |
| Operating altitude*4 | 2000m max. | | | | | |
| Installation site | Inside control box | | | | | |
| Overvoltage category *2 | II or less | | | | | |
| Contamination level *3 | 2 or less | | | | | |

*1: For A975GOT-TBA/TBD (-B) and A970GOT-TBA/TBD (-B), it becomes 0 to 55°C.

*2: Indicates the element in the distribution system between the public electricity grid and the mechanical equipment inside the premises that the relevant device is assumed to be connected to.
Category II applies to devices such as those that draw their power supply from fixed installations.
The surge voltage withstand capability of devices with ratings up to 300V is 2,500V.

*3: This index gives a measure of the incidence of conductive materials in the environment in which the device is used.
A contamination level of 2 indicates an environment in which there is only contamination by non-conducting materials, but due to occasional condensation, conductivity may occur.

*4: Please do not use or store GOT in an environment with atmospheric pressure greater than the atmospheric pressure at sea level (0m).
There is a possibility errors may occur if this point is not observed.

3.2 Performance specifications

| Item | | Specifications | | | | |
|--------------------------------------|--------------------------------------|---|------------------------------------|--|--|--|
| | | A975GOT-TBA(-B) A975GOT-TBD(-B) | A970GOT-TBA(-B) A970GOT-TBD(-B) | A970GOT-SBA A970GOT-SBD | A970GOT-LBA A970GOT-LBD | A960GOT-EBA A960GOT-EBD |
| Display section | Type | TFT color liquid crystal | | D-STN color liquid crystal | STN monochrome liquid crystal | EL |
| | Resolution | 640 × 480 dots | | | | 640 × 400 dots |
| | Display size | 211 (8.31) × 158 (6.23) mm (inch) | | | | 192 (7.57) × 120 (4.73) mm (inch) |
| | Display color | 256 color | 16 color | 8 color | 2 color (monochrome) | 2 color (yellow orange, black) |
| | Intensity | TBA/TBD:250 cd/m ² TBA/TBD-B:380 cd/m ² (LCD only) | | 250 cd/m ² (LCD only) | | — |
| | Display angle | TBA/TBD:80 degrees TBA/TBD-B:85 degrees (right, left, up and down) | | 50 degrees(right and left), 45 degrees(up), 40 degrees(down) | | — |
| Backlight | | Cold cathode fluorescent tube backlight (Backlight OFF/screen saving time setting allowed) | | | | — |
| Life*1 | Display section*2*3 | TBA/TBD:41,000h TBA/TBD-B:43,000h (Operating ambient temperature: 25) | | 50,000h (Operating ambient temperature: 25) | | 30,000h (Initial luminance 70%,25°C) |
| | Backlight | TBA/TBD:40,000h TBA/TBD-B:43,000h | | 40,000h | | — |
| | | (Time when display luminance reaches 50% at the operating ambient temperature of 25°C) | | | | |
| | Touch key | 1 million times or more (operating force 100g max.) | | | | |
| Built-in memory | Number of write times: 100,000 times | | | | | |
| Environmental protective structure*5 | | Front section: Equivalent to IP67/NEMA4 Panel inside: IP2X | | | | |
| Outline dimensions | | 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 | | 289 (11.38) (W) × 200 (7.88) (H) mm (inch) | | | 258 (10.17) (W) × 183 (7.21) (H) mm (inch) | |
| Weight | | 1.8 (3.96) kg (lb) | | 1.9 (4.18) kg (lb) | | 1.6 (3.52) kg (lb) |
| Compatible software package*4 | | SW0D5C-GTWORKS-E Version A or later, SW1D5C-GOTRE-PACK Version A or later (The 8-step brightness adjustment of the high luminance model is complied to with Version C and above.) | | SW0D5C-GTWORKS-E Version A or later, SW1D5C-GOTRE-PACK Version A or later | SW0D5C-GTWORKS-E Version A or later, SW1D5C-GOTRE-PACK Version J or later | SW0D5C-GTWORKS-E Version A or later, SW1D5C-GOTRE-PACK Version A or later |

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

*2: The screen save and back light OFF functions of the GOT and operator detect sensor function are used to prevent the display of the screen from being printed and prolong the service life of the back light.

*3: 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.

*4: GT Works2 and GT Designer2, are supported from the first version (Version1.00A).

*5: 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 | | |
|------------------------------------|---|--|--|--|
| | | A975GOT-TBA(-B) A975GOT-TBD(-B) A970GOT-TBA(-B) A970GOT-TBD(-B) | A970GOT-SBA A970GOT-SBD A970GOT-LBA A970GOT-LBD | A960GOT-EBA A960GOT-EBD |
| 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 N (Dec., 2001) or later | | Hardware version K (Dec., 2001) or later |

3.3 Power supply specifications

| Item | Specifications | |
|--|--|---|
| | A975GOT-TBA(-B) A970GOT-TBA(-B) A970GOT-SBA A970GOT-LBA A960GOT-EBA | A975GOT-TBD(-B) A970GOT-TBD(-B) A970GOT-SBD A970GOT-LBD A960GOT-EBD |
| Input power supply voltage | 100AC to 240V (+10%,-15%) | 24VDC(+25%,-20%) |
| Input frequency [Hz] | 50/60 ± 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 | - |
| Input max. power | - | 40W |
| Inrush current | 40Ap max. (264VAC, max. load) | 61Ap max. (30VDC, max. load) |
| Permissible instantaneous power failure time | 20ms (100VAC or more) | 1ms (19.2VDC or more) |
| Noise immunity | By noise simulator of 1,500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency | By noise simulator of 500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency |
| Dielectric withstand voltage | 1500VAC for 1 minute across AC external terminals and earth | 500VAC for 1 minute across DC external terminals and earth |
| Insulation resistance | 10MΩ or larger by insulation resistance tester | |
| Applicable wire size | 0.75 to 2mm ² | |
| Applicable solderless terminal | RAV1.25-3, V2-S3.3, V2-N3A, FV2-N3A | |
| Applicable tightening torque (Terminal block terminal screw) | 59 to 88N•cm | |
| External output | Refer to *2 | |

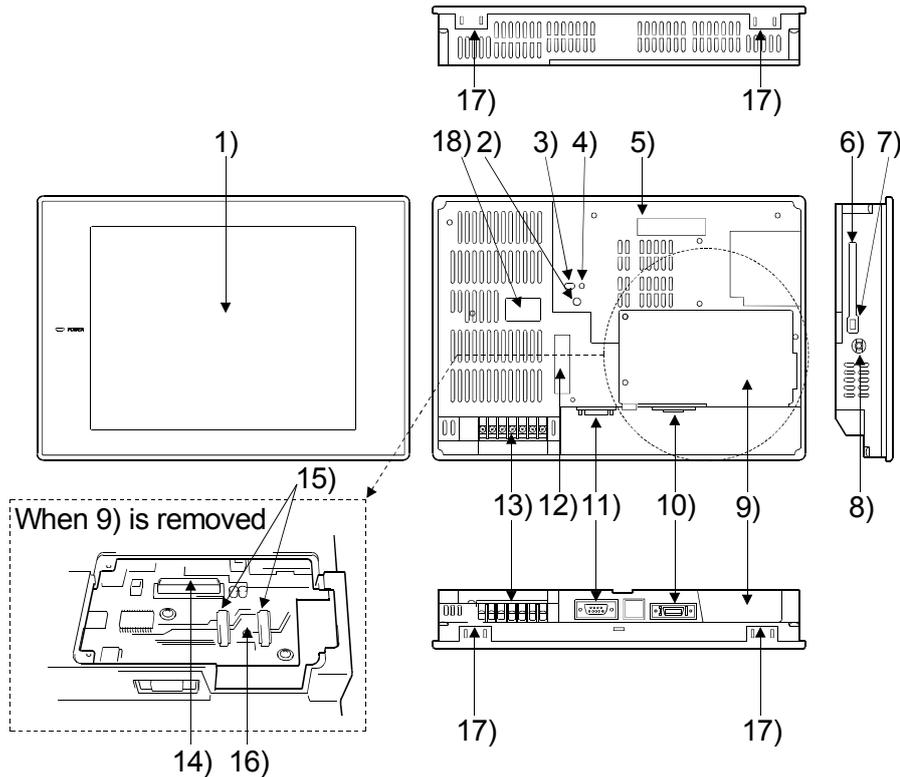
*1: When the communication module for bus connection (A9GT-BUSSU/A9GT-BUS2SU/A9GT-QBUS2SU) is loaded, this value is equivalent to the input max. apparent power value when the communication board is loaded.

*2: For external outputs please refer to the A985GOT/A975GOT/A970GOT/A960GOT User's Manual that is to be purchased separately.

Remarks

Note that the power is reset if an instantaneous power failure occurs. However, if the instantaneous power failure is within 20ms when using 100 to 240VAC, or within 1ms when using 24VDC, the operation will be normal.

4. Name of the Parts



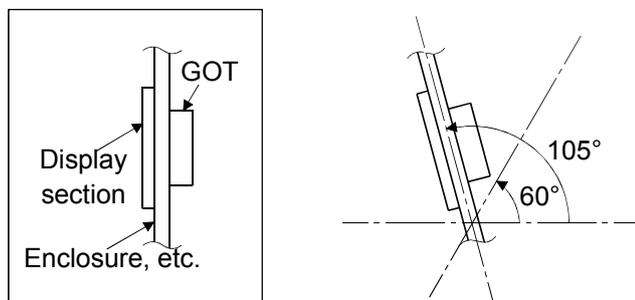
| No. | Name | Description |
|-----|---------------------------------------|---|
| 1) | Display section | Shows the screen |
| 2) | Reset button | Used to reset the hardware of the GOT |
| 3) | memory card access switch | Used to set the condition of access to the PC card when it is loaded during power-on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

5. Handling

5.1 Handling instructions

When mounting the main unit to a control box or the like, 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.

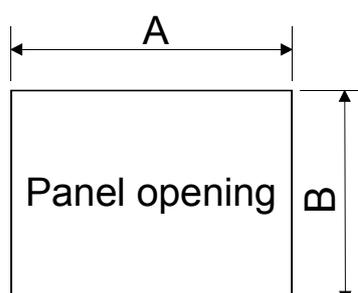
Tighten the screws in the following specified range.

| Screw Location | Tightening Torque Range |
|---|-------------------------|
| Terminal block terminal screw (M3 screw) | 59 to 88N•cm |
| Mounting Fixture 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) | |
| 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

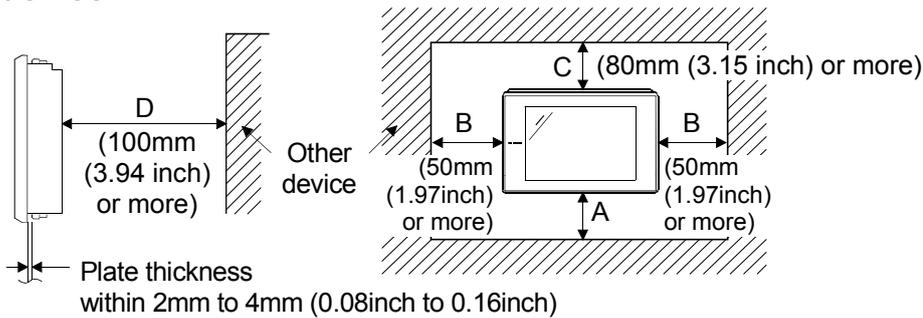
When mounting the GOT on a control box door, user-made mounting base or the like, the door or mounting base must be cut as indicated below.



| Item | A [mm](inch) | B [mm](inch) |
|---------|------------------------------------|-----------------------------------|
| A975GOT | 289 (11.39) | 200 (7.88) |
| A970GOT | [+1.0(0.04), -0(0)] | [+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) |
|-------------------------------|--------------------|
| A97*GOT + Communication board | 130 (5.12) or more |
| A960GOT + Communication board | 140 (5.51) or more |
| A97*GOT + A9GT-BUSSU/BUS2SU | 15 (0.59) or more |
| A960GOT + A9GT-BUSSU/BUS2SU | 30 (1.18) 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 a PC card or an audio output device (for a connected cable connector and a wire), a clearance of 100 mm (3.94 inch) or more is required. When removing a PC card by opening a cover of the memory card interface part, a clearance of 50 mm (1.97 inch) is required. (A clearance of 50 mm (1.97 inch) or more is required when an audio output device or a memory card is not used.) (A clearance of 50mm (1.97 inch) or more is required when these are not used.)

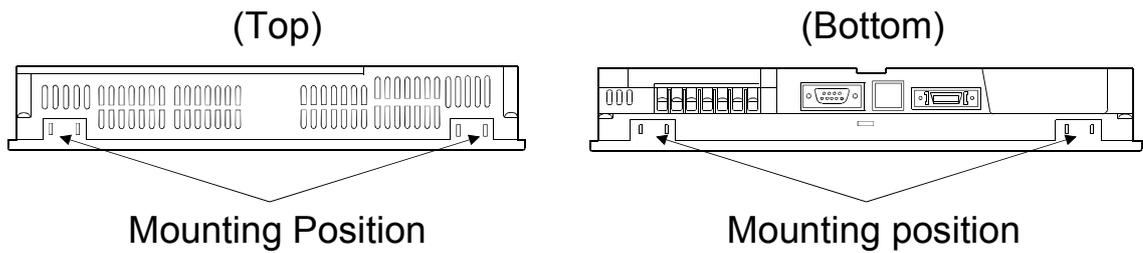
Part C size: Please allow a gap 80mm (3.15inch) or more from the structure and other equipment in the upper part of the unit to often allow good ventilation.

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.

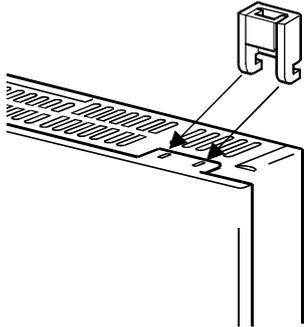
(3) Mounting method

(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.



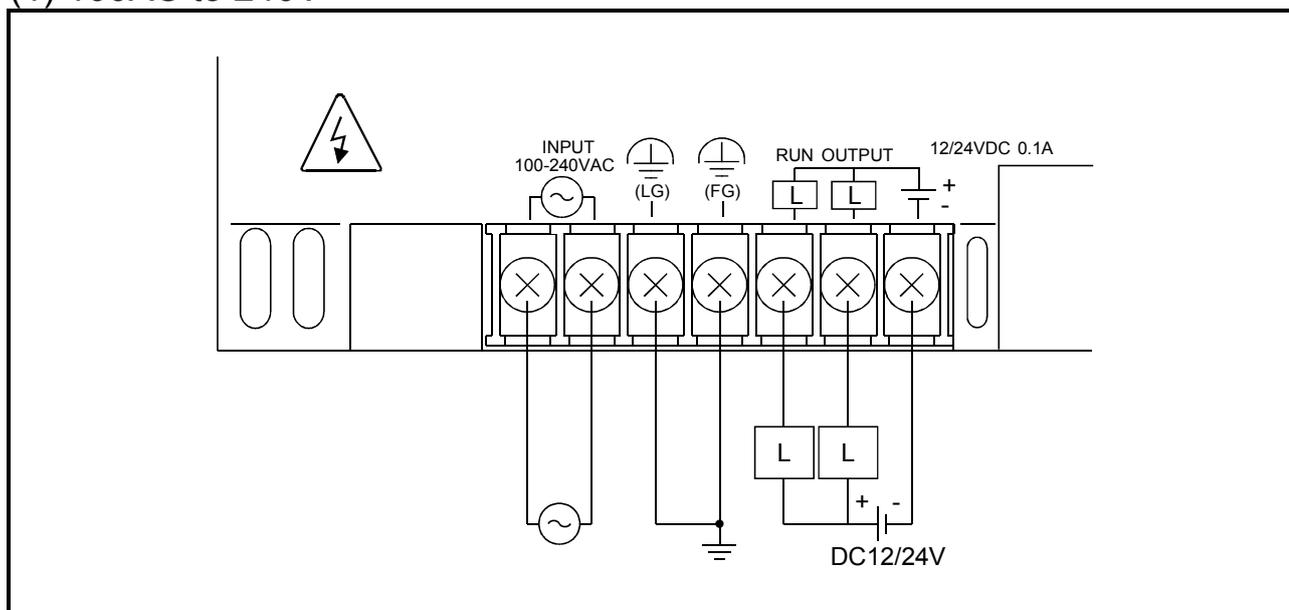
(c) How to mount and fix the mounting fixture is given below.



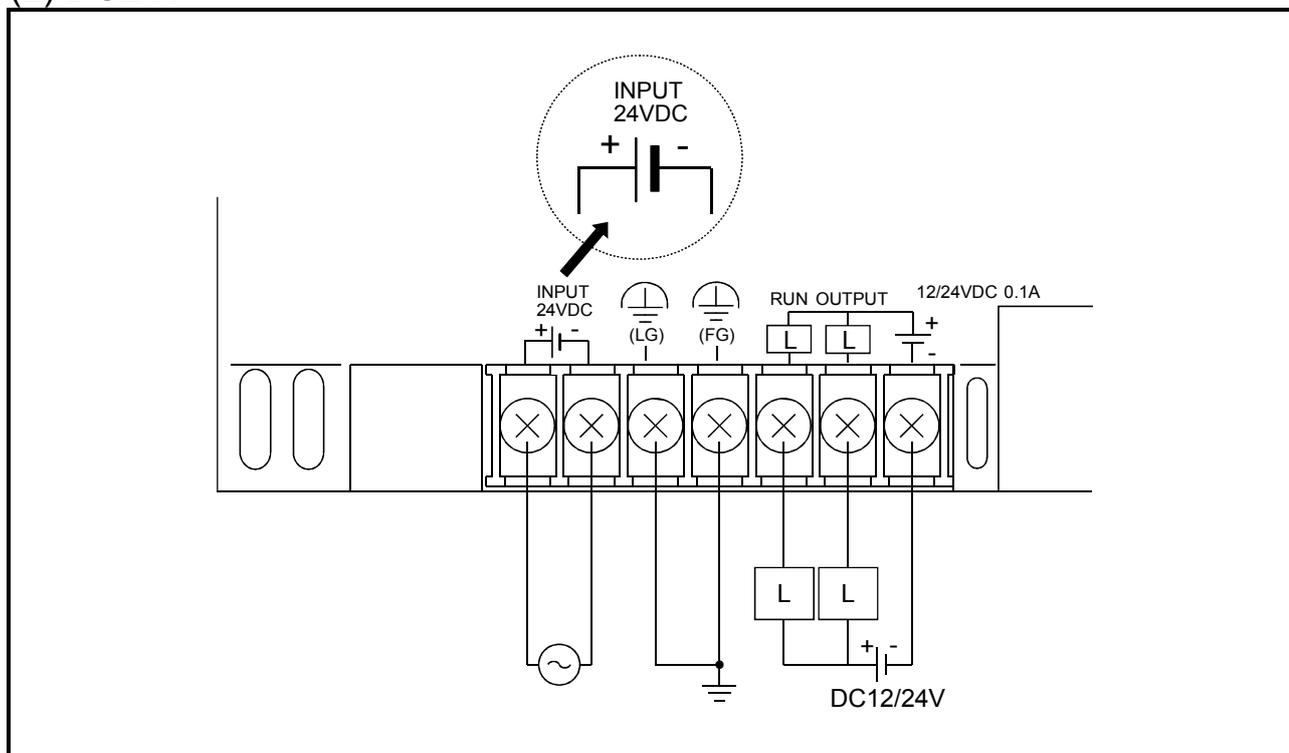
- 1) Insert the mounting fixture into the fixture fitting portion of the GOT main unit.
- 2) Tighten and fix the mounting screw in the specified torque range.

5.3 Wiring diagram

(1) 100AC to 240V



(2) DC24V



* For application of external outputs of RUN OUTPUT, please refer to the[A985GOT/A975GOT/A970GOT/A960GOT User's Manual]

5.4 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.

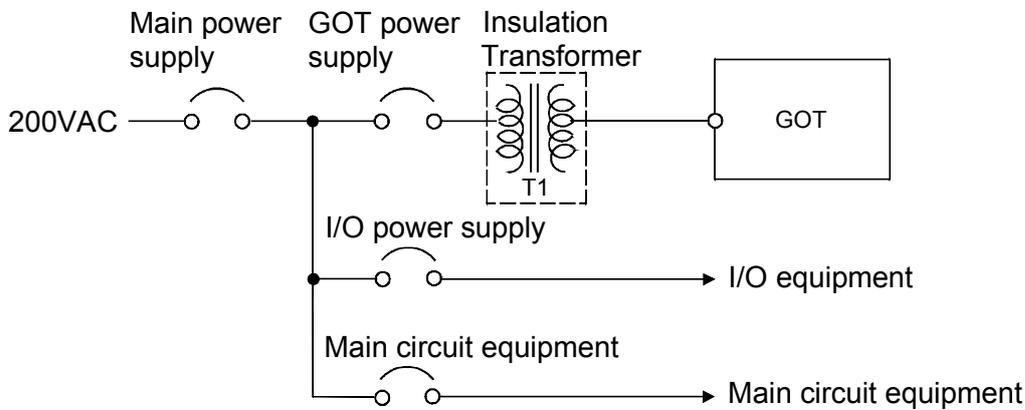
(3) Ground noise without fail

- (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

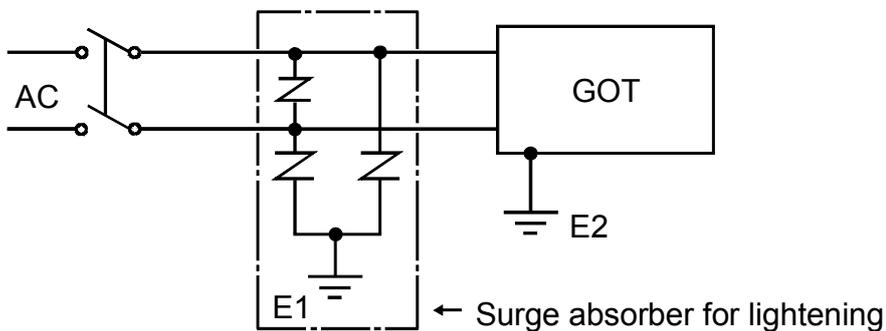
- Separate the GOT's power supply line from the lines for I/O devices and power devices as shown below.
When there is much noise, connect an insulation transformer.

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

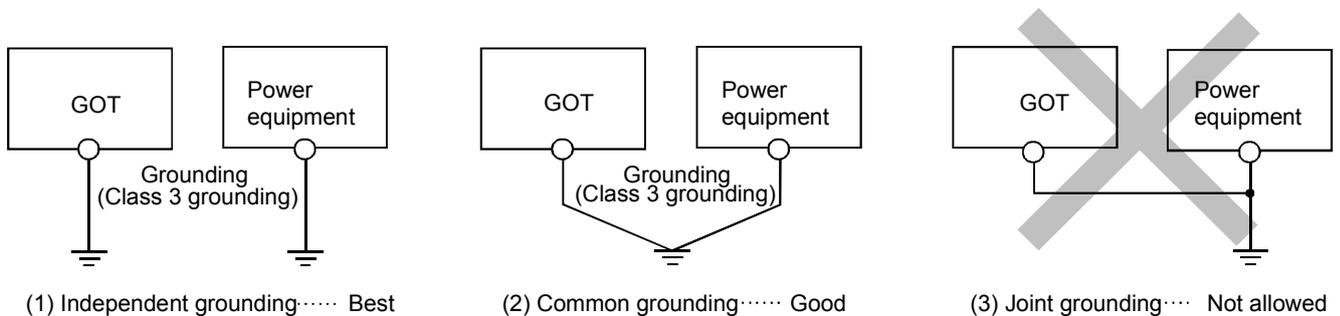


POINT

- (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.

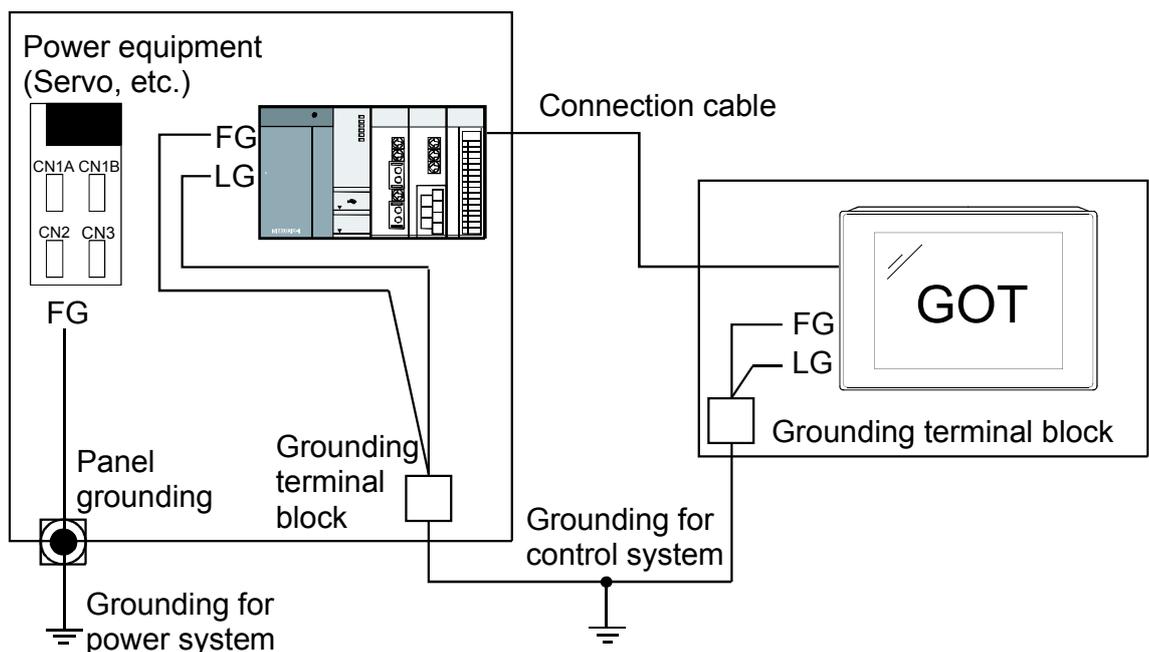
(2) Grounding

- 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.



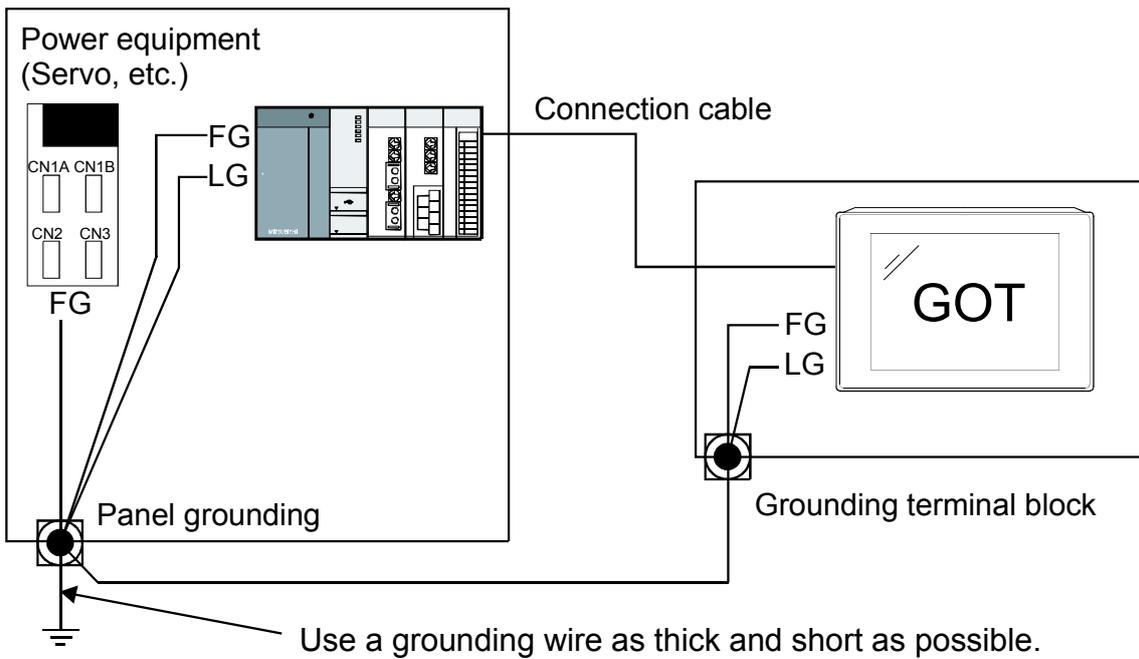
- For grounding a cable, use the cable of 2 mm^2 or more.
Position the ground-contact point as closely to the sequencer as possible, and reduce the length of the grounding cable as much as possible.

(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.

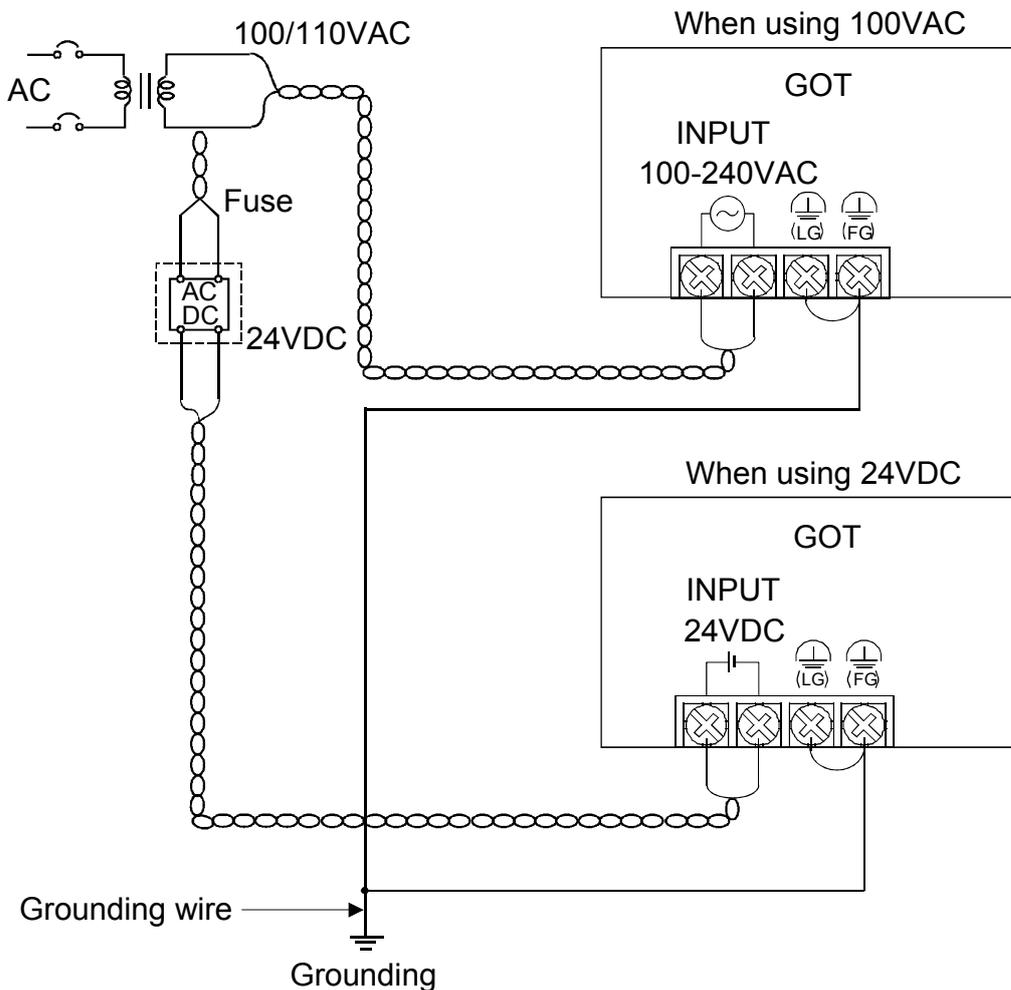
(b) An example of common grounding



* Apply single-point grounding for one system.

5.5 Connecting to the GOT Power Section

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

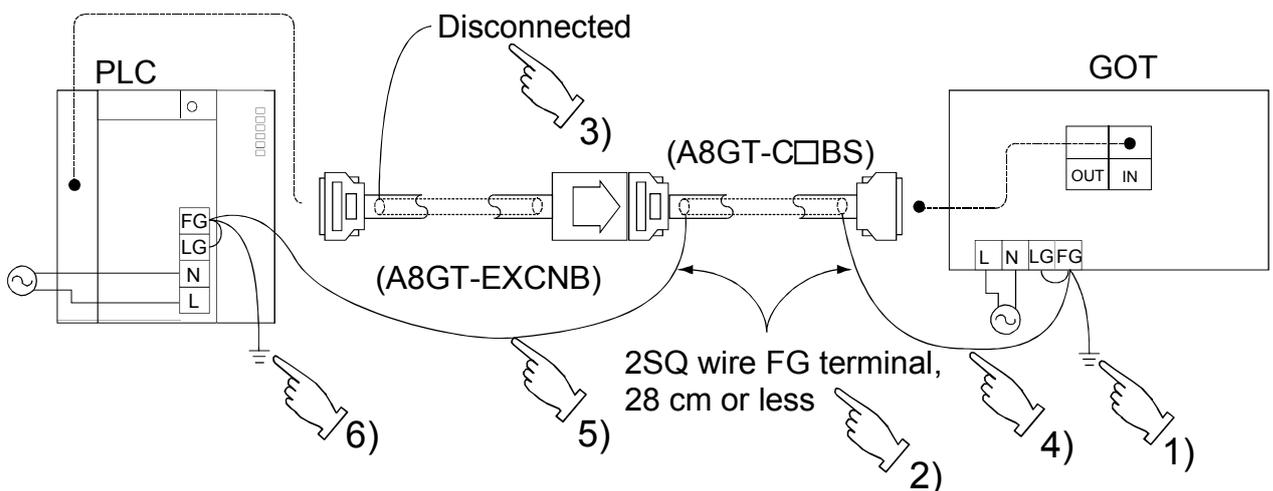


POINT

- (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.

5.6 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



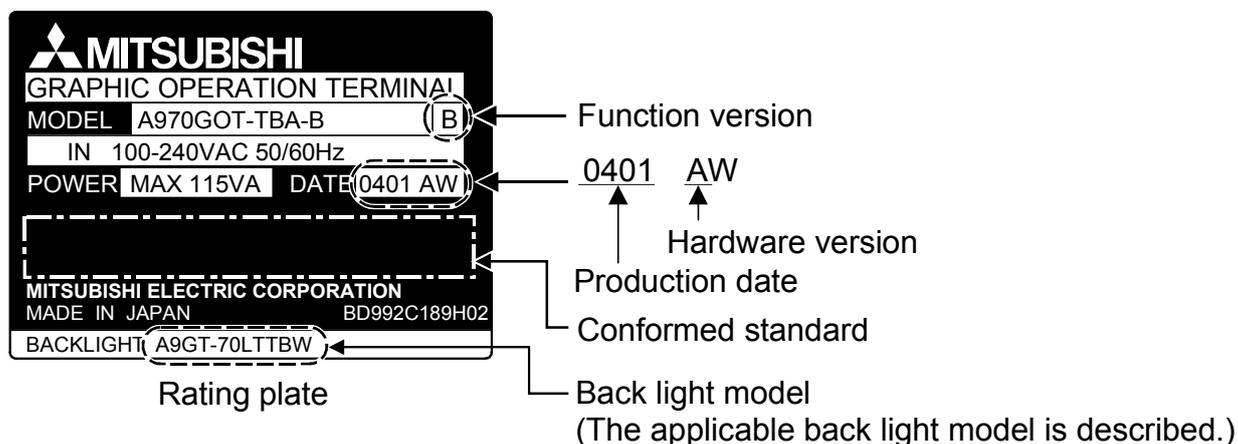
- 1) Connect the LG and FG terminals of GOT unit power to the ground through the terminal block with one wire.
 - 2) Use FG wires of 28 cm or less for the A8GT-C□BS cable.
 - 3) Do not connect the FG grounding wire of A8GT-EXCNCB cable.
 - 4) Connect the A8GT-C□BS cable's FG wire to FG of the GOT unit 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.

5.7 Precautions for back light replacement

Use the following back lights for the GOT that includes this manual.

| Type | Model | Replacement back light |
|---------|---|------------------------|
| A975GOT | A975GOT-TBA (Hardware version D (JAN,1998) or later), A975GOT-TBD (Hardware version B (JAN,1998) or later) | A9GT-70LTTB |
| | A975GOT-TBA-B (Function version B (JAN,2004) or later), A975GOT-TBD-B (Function version B (JAN,2004) or later) | A9GT-70LTTBW |
| A970GOT | A970GOT-TBA (Hardware version D (JAN,1998) or later), A970GOT-TBD (Hardware version B (JAN,1998) or later) | A9GT-70LTTB |
| | A970GOT-TBA-B (Function version B (JAN,2004) or later), A970GOT-TBD-B (Function version B (JAN,2004) or later) | A9GT-70LTTBW |
| | A970GOT-SBA, A970GOT-SBD, A970GOT-LBA, A970GOT-LBD | A9GT-70LTS |

The GOT hardware version and function version can be checked from the rating plate, which is situated on the backside of the GOT.

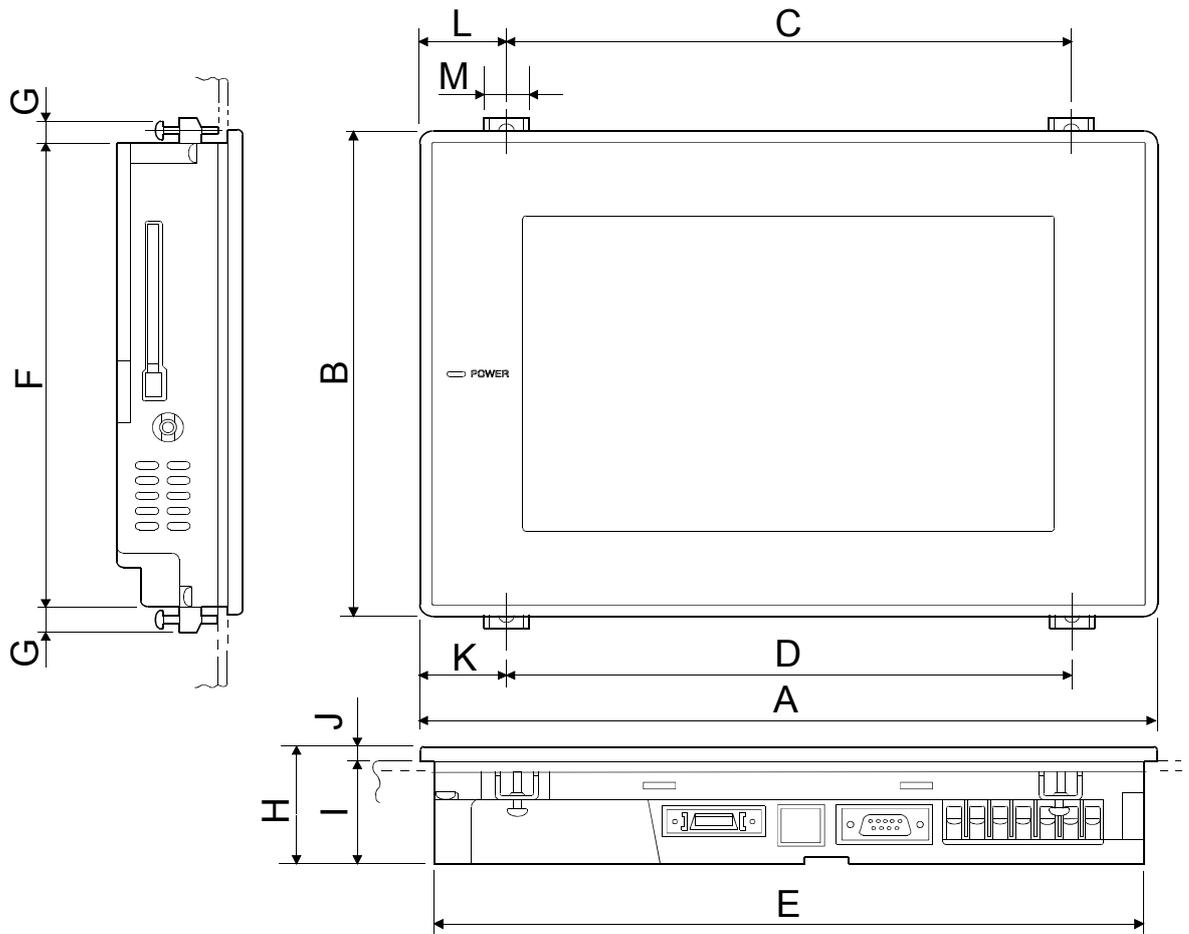


The applicable back light differs with the GOT hardware version and function version.

For more information, refer to A985GOT/A975GOT/A970GOT/A960GOT User's Manual.

Appendices

Appendix 1 Outline dimension drawing



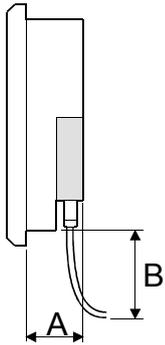
Unit: mm(inch)

| Item | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---------------------|----------------|---------------|---------------|---------------|----------------|---------------|--------------|--------------|--------------|-------------|--------------|--------------|----------------|
| A975GOT, A970GOT | 297 (11.70) | 208 (8.20) | 235 (9.26) | 229 (9.02) | 288 (11.35) | 199 (7.84) | 10 (0.40) | 46 (1.81) | 40 (1.58) | 6 (0.24) | 34 (1.34) | 31 (1.22) | 15.4 (0.61) |
| A960GOT | 268 (10.56) | 192 (7.56) | 204 (8.04) | 198 (7.80) | 257 (10.13) | 182 (7.17) | 10 (0.40) | 49 (1.94) | 43 (1.69) | 6 (0.24) | 35 (1.38) | 32 (1.26) | 15.4 (0.61) |

Appendix 2 Depth dimension for when mounting each type of module

(1) A97*GOT

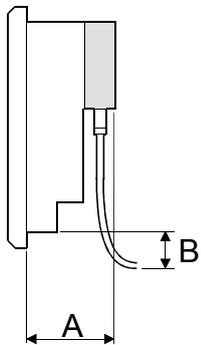
Communication board loading



| Installed communication module | A [mm] (inch) | B [mm] (inch) |
|--------------------------------|---------------|---------------|
| A9GT-QBUSS, A9GT-BUSS | 40 (1.57) | 85 (3.35) |
| A9GT-QBUS2S, A9GT-BUS2S | 62 (2.44) | 85 (3.35) |
| A9GT-BUSSU, A9GT-BUS2SU | 74 (2.91) | 15 (0.59) |
| A9GT-RS2(T) | 40 (1.57) | *1 |
| A9GT-RS4 | 40 (1.57) | 115 (4.53) |
| A7GT-J71AP23, A7GT-J71LP23 | 74 (2.91) | *2 |
| A7GT-J71AR23, A7GT-J71BR13 | 74 (2.91) | *3 |
| A7GT-J71AT23B | 96 (3.78) | - |
| A8GT-J61BT13, A8GT-J61BT15 | 79 (3.11) | - |
| A9GT-J71E71-T | 70.2 (2.76) | - |
| A9GT-70KBF | 82.6 (3.25) | - |

(2) A960GOT

Communication module/Option module loading



| Installed communication module | A [mm] (inch) | B [mm] (inch) |
|--------------------------------|---------------|---------------|
| A9GT-QBUSS, A9GT-BUSS | 43 (1.69) | 100 (3.94) |
| A9GT-QBUS2S, A9GT-BUS2S | 65 (2.56) | 100 (3.94) |
| A9GT-BUSSU, A9GT-BUS2SU | 77 (3.03) | 30 (1.18) |
| A9GT-RS2(T) | 43 (1.69) | *1 |
| A9GT-RS4 | 43 (1.69) | 130 (5.12) |
| A7GT-J71AP23, A7GT-J71LP23 | 77 (3.03) | *2 |
| A7GT-J71AR23, A7GT-J71BR13 | 77 (3.03) | *3 |
| A7GT-J71AT23B | 99 (3.90) | - |
| A8GT-J61BT13, A8GT-J61BT15 | 82 (3.23) | - |
| A9GT-J71E71-T | 73.2 (2.88) | - |
| A9GT-70KBF | 85.6 (3.37) | - |

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

*2 This dimension is between 195mm (7.68) maximum and 80mm (3.15) minimum depending on the optional fiber cable and connector connected.

*3 This dimension is between 80mm (3.15) maximum and 73mm (2.87) minimum depending on the coaxial cable connected.

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