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GOT Series

Human-Machine Interfaces

Start-up Manual

Graphic Operation Terminals
GOT2000

Art. No.: 406849
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Version check

Start-up Guide
Graphic Operation Terminals GOT2000
Art. No: 406849

Version			Changes / Additions / Correction
A	07/2017	pdp mw	First issue as extraction of related manuals based on German version.
B	10/2018	pdp-dko	Update to latest manuals: • GOT User's Manual (Hardware) SH(NA)-081194ENG-X (Apr. 2018) • GOT User's Manual (Utility) SH(NA)-081195ENG-U (Dec. 2017) Deletion of chapter 7 (Installation of BootOS) New chapter 7 (Operating the GOT) New chapter 10 (Display and Operation Settings for GT21)

About this Manual

The texts, illustrations, diagrams, and examples in this manual
are only intended as aids to help explain the functioning,
operation, use, and programming of
Graphic Operation Terminals GOT2000
from Mitsubishi Electric B.V.

If you have any questions regarding the installation and operation of the
devices described in this manual, please do not hesitate to contact your
sales office or one of your Mitsubishi distribution partners.
You can also obtain information and answers to
frequently asked questions from our Mitsubishi website under
http://eu3a.mitsubishielectric.com

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its products and/or the contents of this manual
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Safety Guidelines

For use by qualified staff only

This manual is only intended for use by properly trained and qualified electrical technicians who are fully acquainted with the relevant automation technology safety standards. All work with the hardware described, including system design, installation, configuration, maintenance, service and testing of the equipment, may only be performed by trained electrical technicians with approved qualifications who are fully acquainted with all the applicable automation technology safety standards and regulations. Any operations or modifications to the hardware and/or software of our products not specifically described in this manual may only be performed by authorised Mitsubishi Electric staff.

Proper use of the products

The GOT2000 series operator terminals are only intended for the specific applications explicitly described in this manual or other manuals. Please take care to observe all the installation and operating parameters specified in the manual. All products are designed, manufactured, tested and documented in agreement with the safety regulations. Any modification of the hardware or software or disregarding of the safety warnings given in this manual or printed on the product can cause injury to persons or damage to equipment or other property. Only accessories and peripherals specifically approved by MITSUBISHI ELECTRIC may be used. Any other use or application of the products is deemed to be improper.

Relevant safety regulations

All safety and accident prevention regulations relevant to your specific application must be observed in the system design, installation, setup, maintenance, servicing and testing of these products. The regulations listed below are particularly important in this regard.

This list does not claim to be complete; however, you are responsible for knowing and applying the regulations applicable to you in your location:

- VDE Standards
  - VDE 0100
    Regulations for the erection of power installations with rated voltages below 1000 V
  - VDE 0105
    Operation of power installations
  - VDE 0113
    Electrical installations with electronic equipment
  - VDE 0160
    Electronic equipment for use in power installations
  - VDE 0550/0551
    Regulations for transformers
  - VDE 0700
    Safety of electrical appliances for household use and similar applications
  - VDE 0860
    Safety regulations for mains-powered electronic appliances and their accessories for household use and similar applications.

- Fire safety regulations
- Accident prevention regulation
  - VBG No. 4
    Electrical systems and equipment.

Safety precautions

The safety precautions are ranked as "WARNING" and "CAUTION".



WARNING:

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 minor or moderate injury or property damage.

General safety information and precautions

The following safety precautions are intended as a general guideline for using Graphic Operation Terminals and PLC systems together with other equipment. These precautions must always be observed in the design, installation and operation of all control systems.

Special safety notes for the user



DANGER:

- ***Observe all safety and accident prevention regulations applicable to your specific application. Always disconnect all power supplies before performing installation and wiring work or opening any of the assemblies, components and devices.***
- ***Assemblies, components and devices must always be installed in a shockproof housing fitted with a proper cover and fuses or circuit breakers***
- ***Devices with a permanent connection to the mains power supply must be integrated in the building installations with an all-pole disconnection switch and a suitable fuse.***
- ***Check power cables and lines connected to the equipment regularly for breaks and insulation damage. If cable damage is found immediately disconnect the equipment and the cables from the power supply and replace the defective cabling***
- ***Before using the equipment for the first time check that the power supply rating matches that of the local mains power.***
- ***EMERGENCY OFF facilities conforming to EN 60204/IEC 204 and VDE 0113 must remain fully operative at all times and in all control system operating modes.The EMERGENCY OFF facility reset function must be designed so that it cannot ever cause an uncontrolled or undefined restart.***
- ***After the first use of the product, do not mount/remove the module to/from the base unit, and the terminal block to/from the module more than 50 times (IEC 61131-2 compliant) respectively. Exceeding the limit may cause malfunction.***
- ***It must be observed to adhere strictly the electrical and physical characteristics when operating the modules.***

Typographic Conventions

Use of notes

Notes containing important information are clearly identified as follows:

NOTE | Note text

Use of examples

Examples containing important information are clearly identified as follows:

Example ▽ Example △

Numbering in figures and illustrations

Reference numbers in figures and illustrations are shown with white numbers in a black circle and the corresponding explanations shown beneath the illustrations are identified with the same numbers, like this:

❶ ❷ ❸ ❹

Procedures

In some cases the setup, operation, maintenance and other instructions are explained with numbered procedures. The individual steps of these procedures are numbered in ascending order with black numbers in a white circle, and they must be performed in the exact order shown:

① Text

② Text

③ Text

Footnotes in tables

Footnote characters in tables are printed in superscript and the corresponding footnotes shown beneath the table are identified by the same characters, also in superscript.

If a table contains more than one footnote, they are all listed below the table and numbered in ascending order with black numbers in a white circle, like this:

① Text
② Text
③ Text

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1 Overview

1.1 About GOT

Mitsubishi Electrics GOT2000 Graphic Operation Terminals allow you to efficiently operate, monitor and control your production processes. GOTs can be seamlessly integrated to other Mitsubishi Electric FA devices like PLCs, inverters, robots or motion systems for a total automation solution.

For the GOT display screen, two kinds are available: user screen and utility screen.

1.1.1 User screen

The user screen is a screen created within GT Designer3 (GOT2000). This intuitive design environment provides graphical elements to quickly and easily develop visualization projects. Data entry fields, dialog windows even placement aids have been optimized to reduce development time and provide the flexibility every programmer demands. After screen development is complete, one touch simulation enables developers to debug and verify their projects using real-time variables and conditions.

NOTE

For details, refer to the GT Designer3 (GOT2000) manuals.

1.1.2 Utility screen

The utility screen is a factory drawn screen that cannot be edited. It can be displayed on the GOT by installing the standard monitor OS from GT Designer3 (GOT2000) to the GOT.

Brightness and time settings can be done from the utility screen, but also settings for IP address, security, license management, wireless LAN, monitoring and data management functions.

1.2 Product Overview

1.2.1 Line up

GOT2000

GT21




		3.8" type	4.3" type
Specifications		**GT2103-PMBD GT2103-PMBDS GT2103-PMBLS**	**GT2104-RTBD**
Type		TFT, monochrome, 32 greyscales	TFT, LCD, 65536 colours
Resolution (pixel)		320x128	480x272
Power supply	A types	—	—
	D types	24 V DC, L types: 5 V DC	24 V DC

GT23




		8.4" type	10.4" type
Specifications		**GT2308-VTBA GT2308-VTBD**	**GT2310-VTBA GT2310-VTBD**
Type		TFT, LCD, 65536 colours	
Resolution (pixel)		640x480	640x480
Power supply	A types	100–240 V AC	100–240 V AC
	D types	24 V DC	24 V DC

GT27





		5.7" type	8.4" type		10.4 " type	
Specifications		**GT2705-VTBD-GF ① GT2705-VTBD**	**GT2708-STBA-GF ① GT2708-STBD-GF ① GT2708-STBA GT2708-STBD**	**GT2708-VTBA-GF ① GT2708-VTBD-GF ① GT2708-VTBA GT2708-VTBD**	**GT2710-STBA-GF ① GT2710-STBD-GF ① GT2710-STBA GT2710-STBD**	**GT2710-VTBA-GF ① GT2710-VTBD-GF ① GT2710-VTWA-GF ① GT2710-VTWD-GF ① GT2710-VTBA GT2710-VTBD GT2710-VTWA GT2710-VTWD**
Type		TFT, LCD, 65536 colours				
Resolution (pixel)		640x480	800x600	640x480	800x600	640x480
Power supply	A types	—	100–240 V AC		100–240 V AC	
	D types	24 V DC	24 V DC		24 V DC	

① GOT + CC-Link IE Field Network communication unit set GT15-J71GF13-T2

GT25






5.7" type	8.4" type	10.4" type	12.1" type
GT2505-VTBD	GT2508-VTBA-GF ① GT2508-VTBD-GF ① GT2508-VTWA-GF ① GT2508-VTWD-GF ① GT2508-VTBA GT2508-VTBD GT2508-VTWA GT2508-VTWD	GT2510-VTBA-GF ① GT2510-VTBD-GF ① GT2510-VTWA-GF ① GT2510-VTWD-GF ① GT2510-VTBA GT2510-VTBD GT2510-VTWA GT2510-VTWD	GT2512-STBA-GF ① GT2512-STBD-GF ① GT2512-STBA GT2512-STBD
TFT, LCD, 65536 colours			
640x480	640x480	640x480	800x600
—	100–240 V AC	100–240 V AC	100–240 V AC
24 V DC	24 V DC	24 V DC	24 V DC

GT27




12.1" type	15" type
GT2712-STBA-GF ① GT2712-STBD-GF ① GT2712-STWA-GF ① GT2712-STWD-GF ① GT2712-STBA GT2712-STBD GT2712-STWA GT2712-STWD	GT2715-XTBA-GF ① GT2715-XTBD-GF ① GT2715-XTBA GT2715-XTBD
TFT, LCD, 65536 colours	
800x600	1024x768
100–240 V AC	100–240 V AC
24 V DC	24 V DC

GOT2000 Wide




		7" type		10.1" type
Specifications		**GT2107-WTSD**	**GT2507-WTSD**	**GT2510-WXTSD**
Type		TFT, 65536 colours	TFT, LCD, 65536 colours	
Resolution (pixel)		800x480	800x480	1280x800
Power supply	A types	—	—	—
	D types	24 V DC	24 V DC	24 V DC

GOT2000 Handy




	5.7" type	6.5" type
Specifications	**GT2505HS-VTBD**	**GT2506HS-VTBD**
Type	TFT, LCD, 65536 colours	
Resolution (pixel)	640x480	640x480
Power supply A types	—	—
Power supply D types	24 V DC	24 V DC

The Handy GOT are not covered in this manual.

GOT2000 Open frame





		8.4" type	10.4" type	12.1" type
Specifications		**GT2508F-VTNA GT2508F-VTND**	**GT2510F-VTNA GT2510F-VTND**	**GT2512F-STNA GT2512F-STND**
Type		TFT, LCD, 65536 colours		
Resolution (pixel)		640x480	640x480	800x600
Power supply	A types	100–240 V AC	100–240 V AC	100–240 V AC
	D types	24 V DC	24 V DC	24 V DC

GOT2000 Rugged



	7" widescreen
Specifications	**GT2507T-WTSD**
Type	TFT, LCD, 65536 colours
Resolution (pixel)	800x480
Power supply A types	—
Power supply D types	24 V DC

GOTSimple

GS21




		7" type	10" type
Specifications		**GS2107-WTBD**	**GS2110-WTBD**
Type		TFT, LCD, 65536 colours	
Resolution (pixel)		800x480	800x480
Power supply	A types	—	—
	D types	24 V DC	24 V DC

1.2.2 GOT special functions

- Multi-touch/gesture control
- Transparent function
- Multimedia function
- Document display function
- Backup/restore function
- Sequence program monitor
- Alarm functions
- Data logging
- Operator authentication & operation log function
- VNC Remote access
- GOT Mobile function
- Remote personal computer function
- MES interface function
- FTP function

1.2.3 Enhanced support of FA Device Setup Tools

- Transferring and monitoring sequence programs with the personal computer connected to the GOT can be executed when connecting to a PLC CPU with the direct CPU connection or bus connection. (FA transparent function).

2 System Configuration

2.1 Overview

The following overview shows the overall configuration of the GOT2000 series.

For further details concerning the connection of a GOT please see the GOT2000 Series Connection Manual for GT Works3 or GT Designer3 (GOT2000).

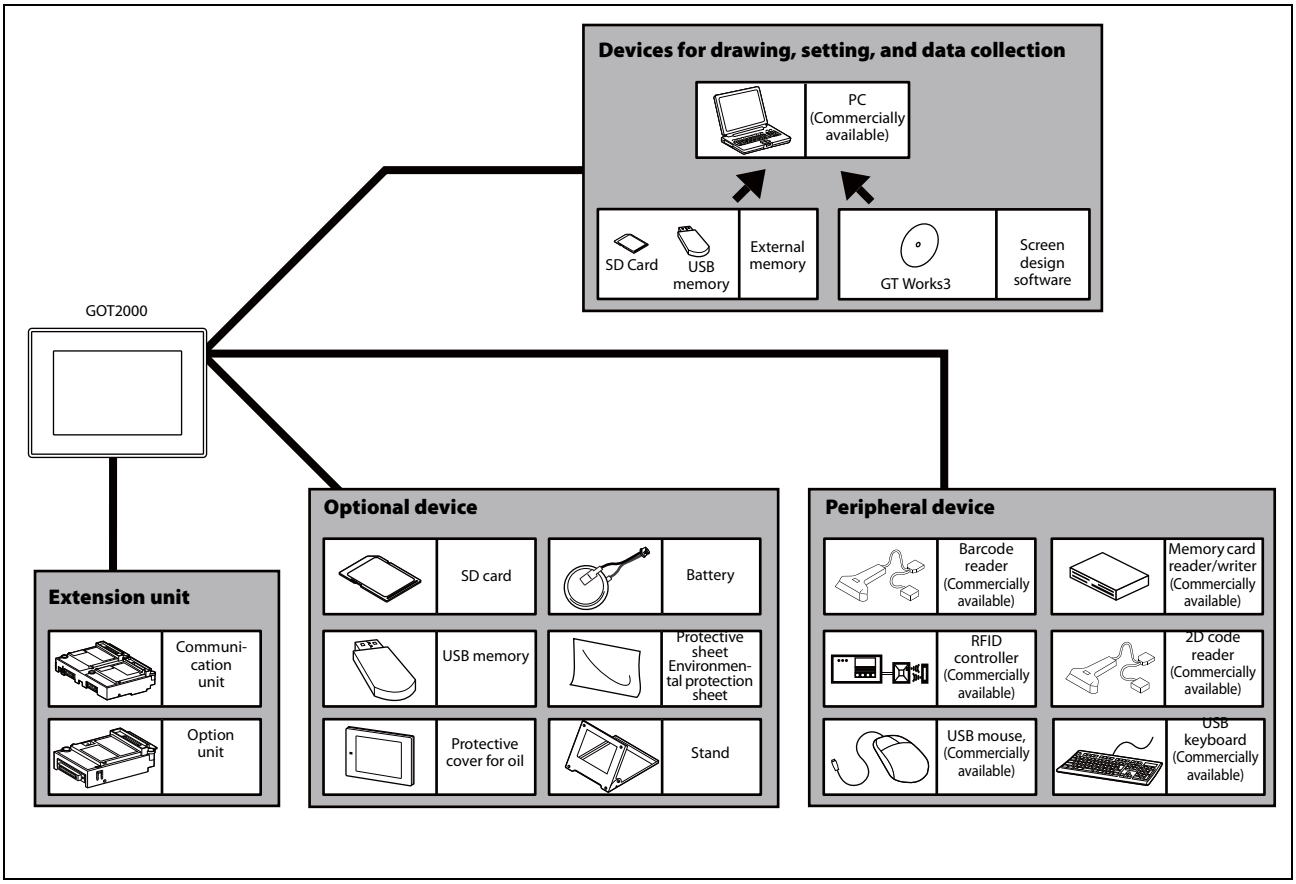


Fig. 2-1: *Overall Configuration*

2.2 Model name

2.2.1 How to read the model name

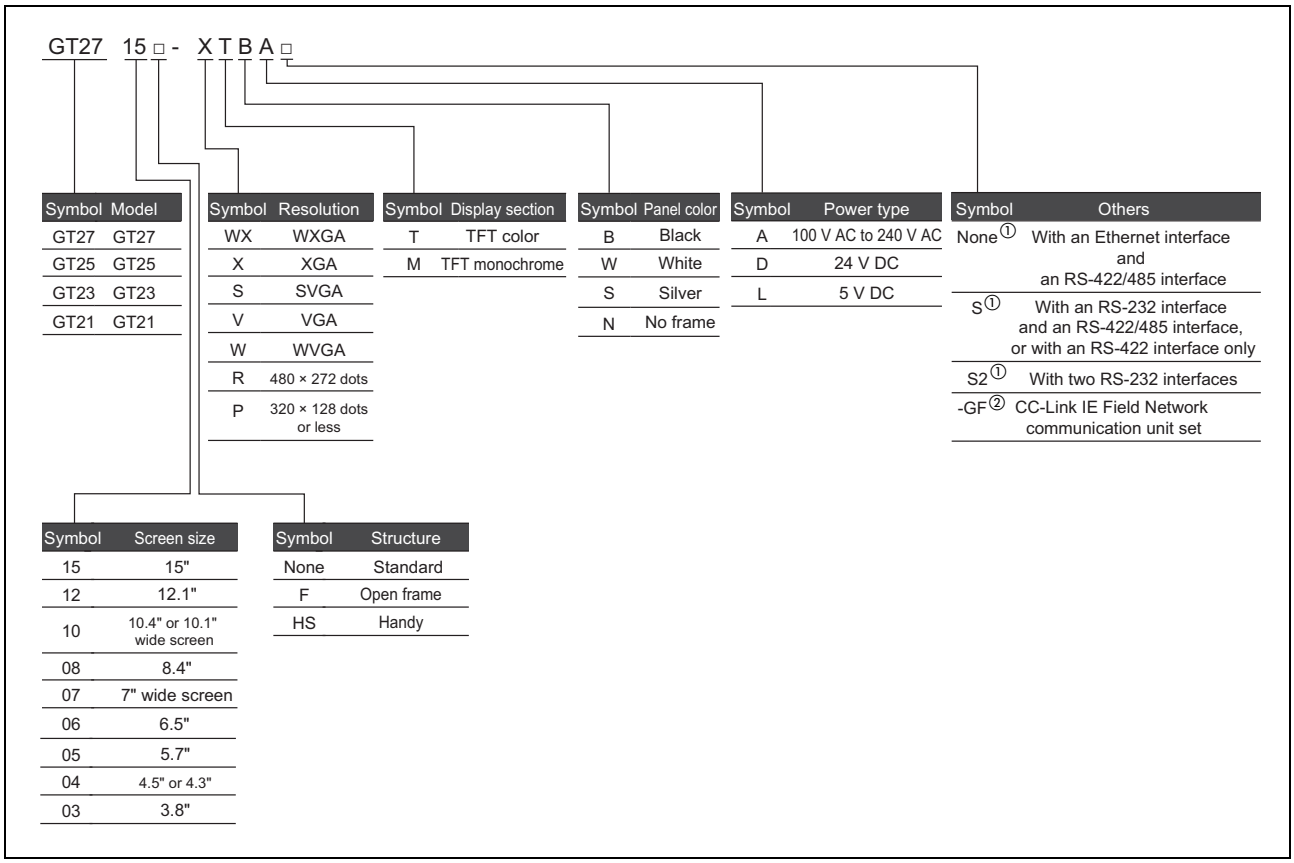


Fig. 2-2: *How to read the model name of GT models*

① For GT21 only
② For GT27 and GT25 only

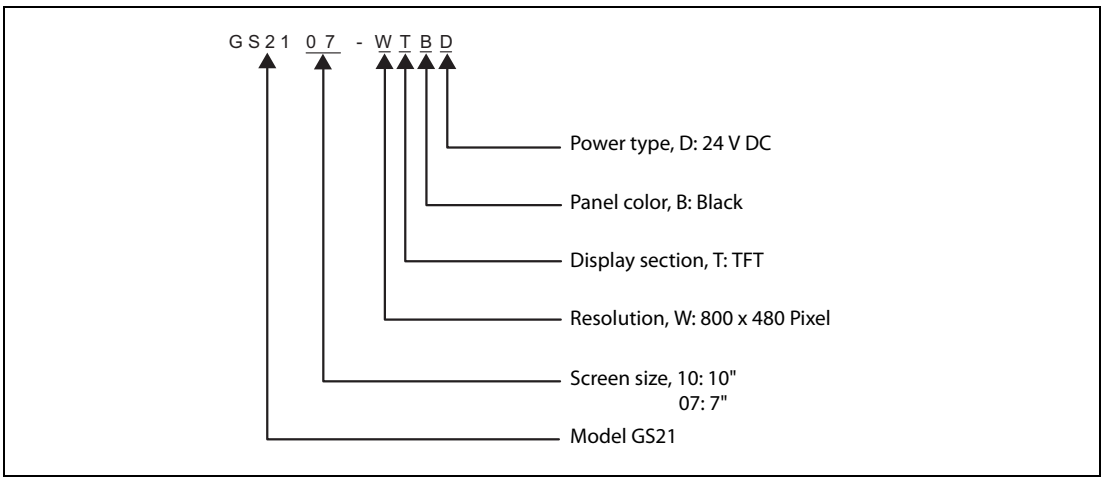


Fig. 2-3: *How to read the model name of GS models*

2.3 Extension Units and Accessories

NOTE

For extension units, optional devices and further accessories please see the Automation Book, Art. No. 170021 or the HMI Catalogue, Art. No. 68542.

3 Part Names

3.1 GT27

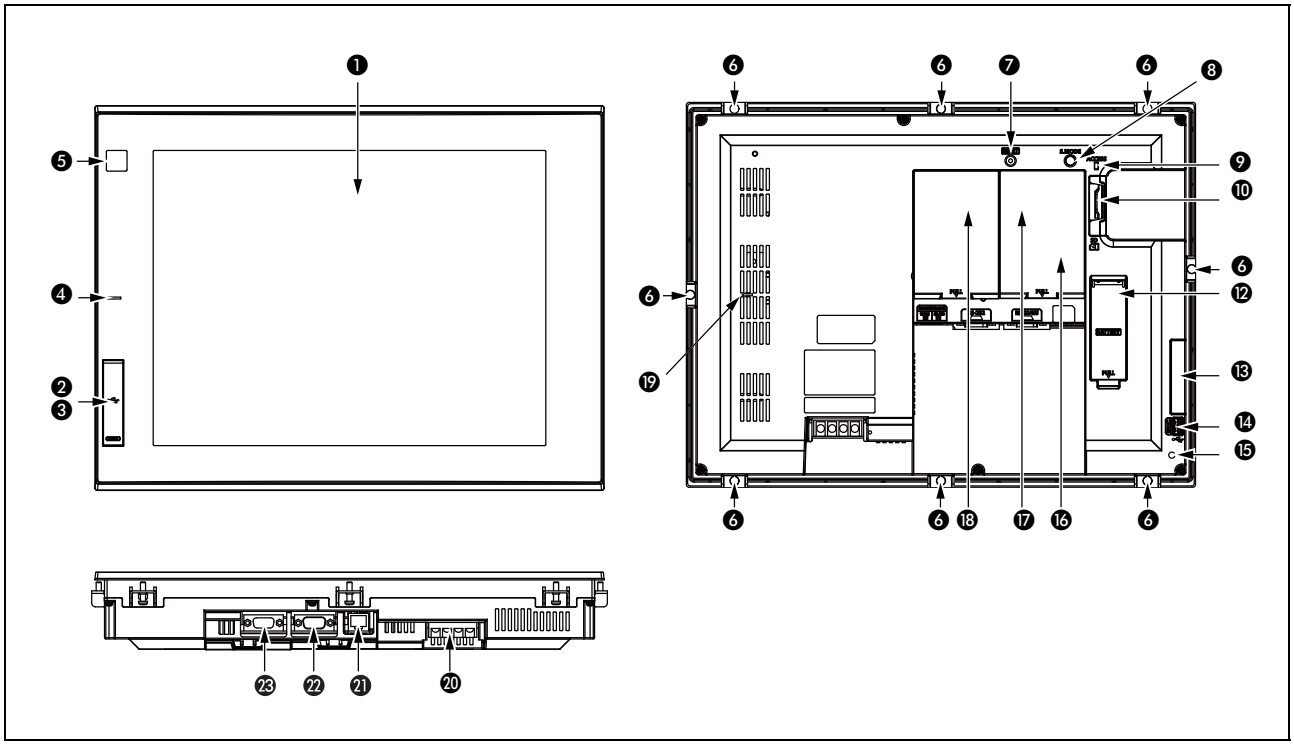


Fig. 3-1: Part names of GT2715-X

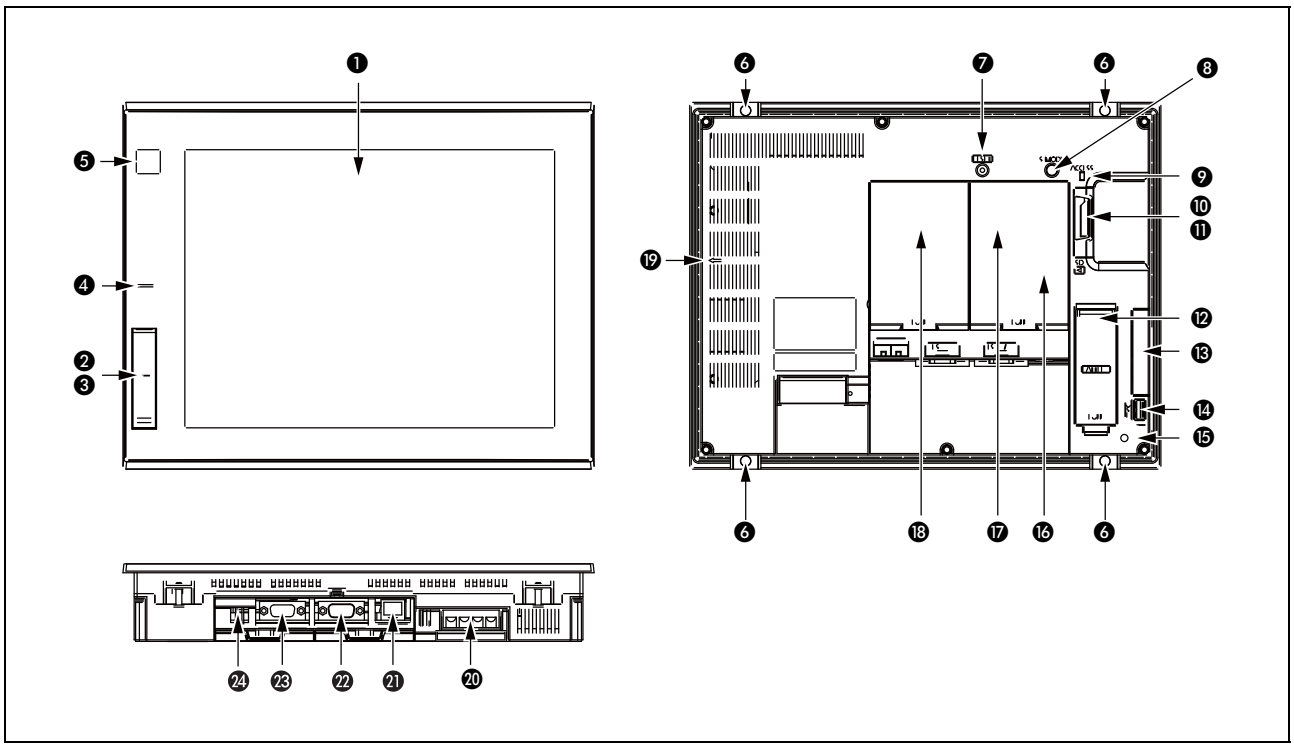


Fig. 3-2: Part names of GT2712-S

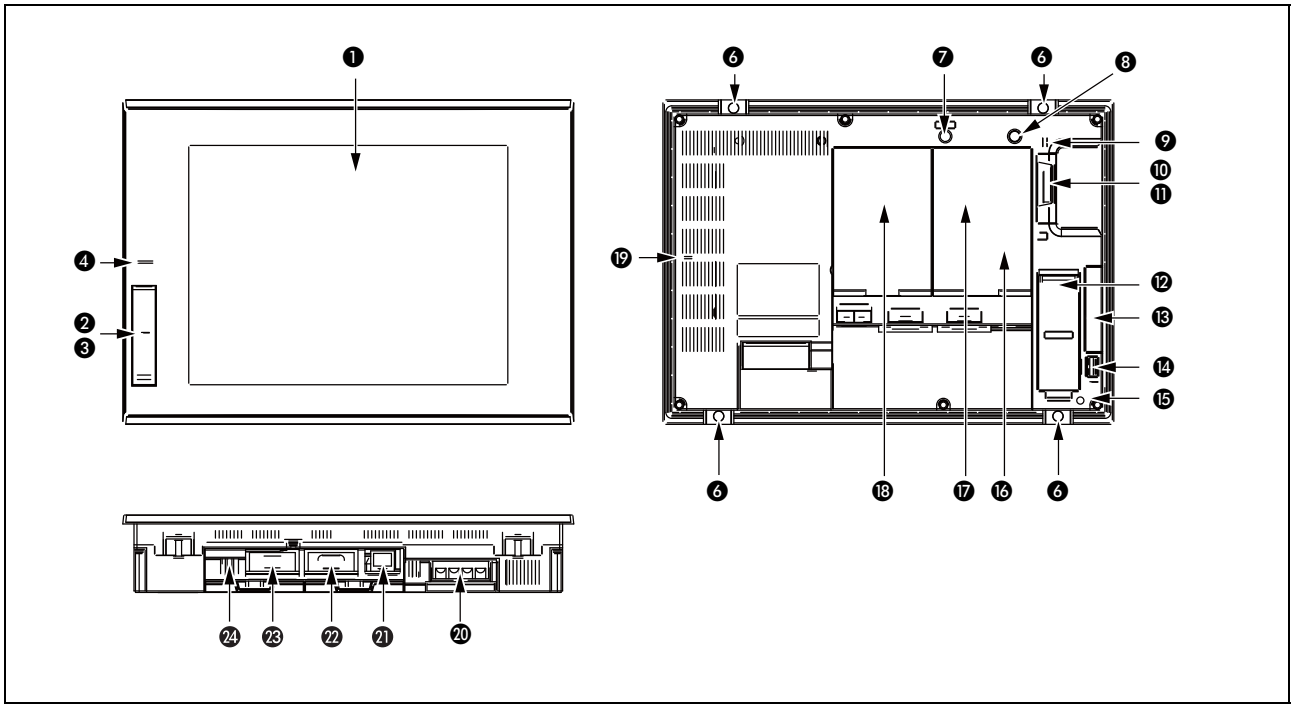


Fig. 3-3: Part names of GT2710-S and GT2710-V

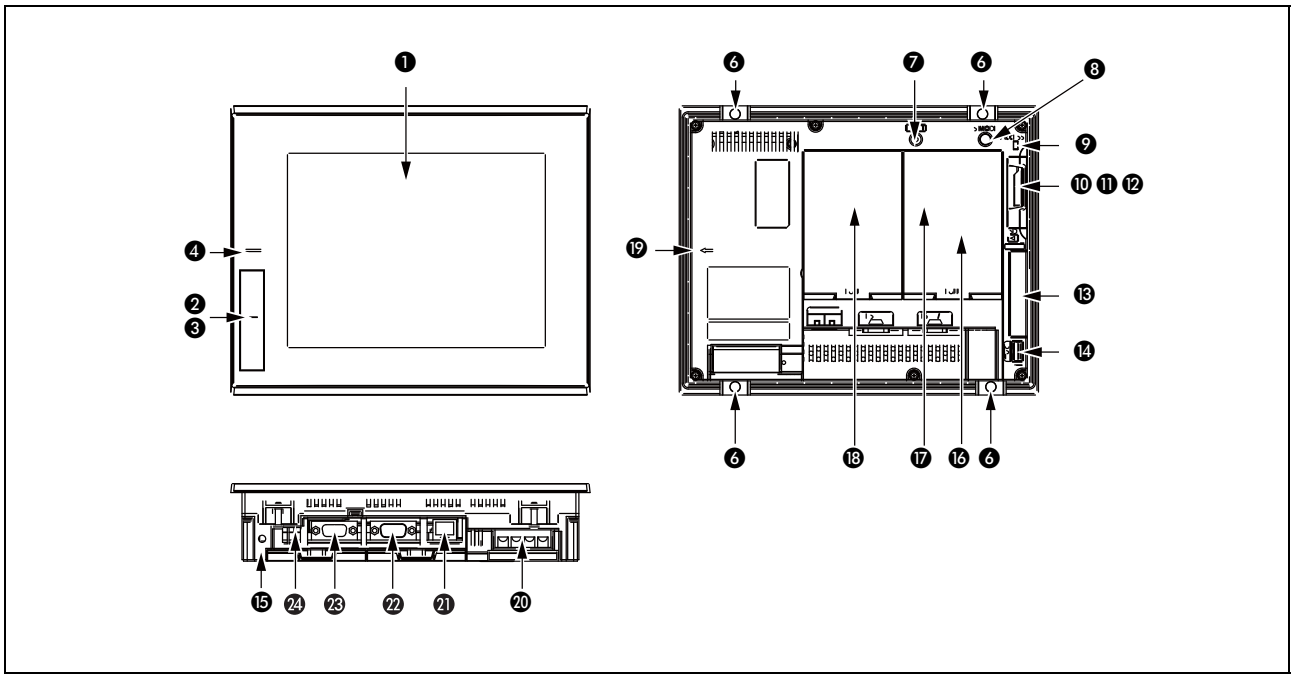


Fig. 3-4: Part names of GT2708-S and GT2708-V

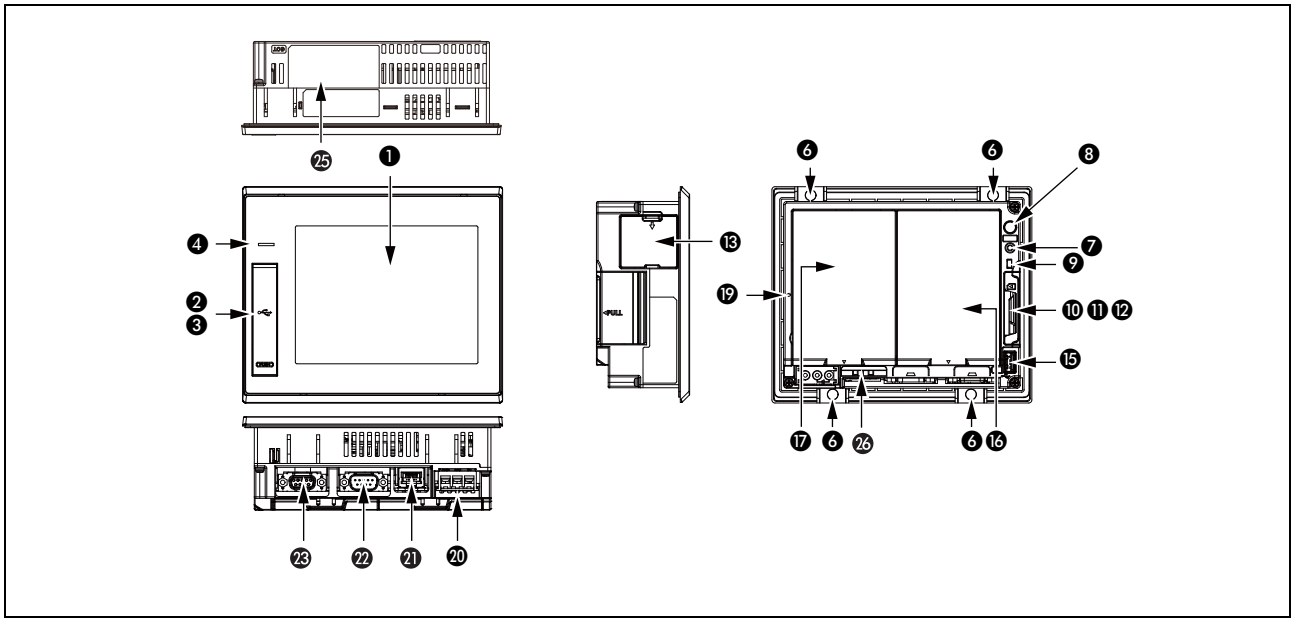


Fig. 3-5: Part names of GT2705-V

No.	Name	Description
❶	Display section/Touch panel	Displays the utility and the user-created screen.
		For operating the touch switches in the utility and the user-created screen
❷	USB interface (Host) (Type A)	For connecting a USB mouse and a USB keyboard, transferring data, and storing data
❸	USB interface (Device) (Type MINI-B)	For connecting a personal computer
❹	POWER LED	– Lit in blue: Power is properly supplied. – Lit in orange: Screen saving – Blinks in orange and blue: Backlight failure – Not lit: Power is not supplied.
❺	Human sensor	Detects human movement.
❻	Unit installation fitting	Mounting fixtures for fixing the GOT to the control panel
❼	Reset switch	Hardware reset switch
❽	S.MODE switch	Used for OS installation at the GOT startup
❾	SD card access LED	– ON: SD card installed – Blink: SD card accessed – OFF: SD card not installed or SD card installed but removal possible.
❿	SD card interface	For installing an SD card
⓫	SD card cover	Has the function to switch the access to the SD card between enabled and disabled states. – When the cover is opened: Access prohibited – When the cover is closed: Access allowed
⓬	Battery	Space for housing the battery
⓭	Side interface	For installing a communication unit
⓮	USB interface (Host/back) (Type A)	For connecting a USB mouse and a USB keyboard, transferring data, and storing data.
⓯	Cable clamp mounting hole	Cable clamp mounting hole as a precaution against a disconnection of the USB cable.
⓰	Terminating resistor setting switch (inside the cover)	Switches the terminating resistor for the RS-422/485 communication port
⓱	Auxiliary extension interface 1	For installing an option unit (only GT27)

Tab. 3-1: *Part names of GT27*

No.	Name	Description
⑱	Auxiliary extension interface 2	For installing a communication unit or an option unit
⑲	Vertical installation arrow mark	For the vertical installation, install the GOT so that the arrow points upward.
⑳	Power terminal	Power input terminal, FG terminal
㉑	Ethernet interface (Type RJ-45 (modular jack))	For communicating with a controller, gateway function
㉒	RS-232 interface (Type D sub 9-pin)	For communicating with a controller or connecting a personal computer
㉓	RS422/485 interface (Type 14-pin (female))	For communication with a controller
㉔	USB interface (Device/back) (Type MINI-B)	For connecting a personal computer
㉕	Rating plate	—
㉖	Ethernet communication status LED	SD/RD LED ON: Data is sent or received SD/RD LED OFF: Data is not sent or received
		SPEED LED ON: Communicating at 100 Mbps SPEED LED OFF: Communicating at 10 Mbps or disconnected

Tab. 3-1: *Part names of GT27*

3.2 GT2510-WX, GT2507-W

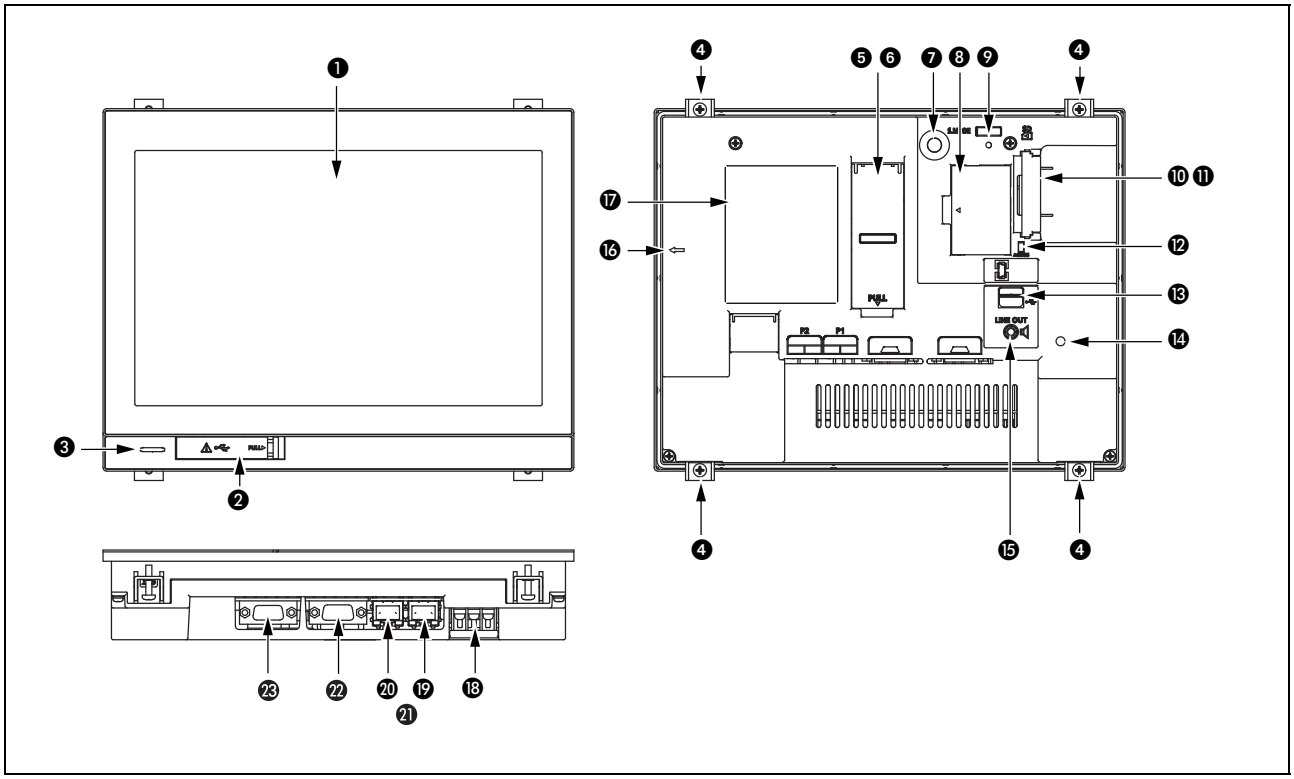


Fig. 3-6: Part names of GT2510-WX

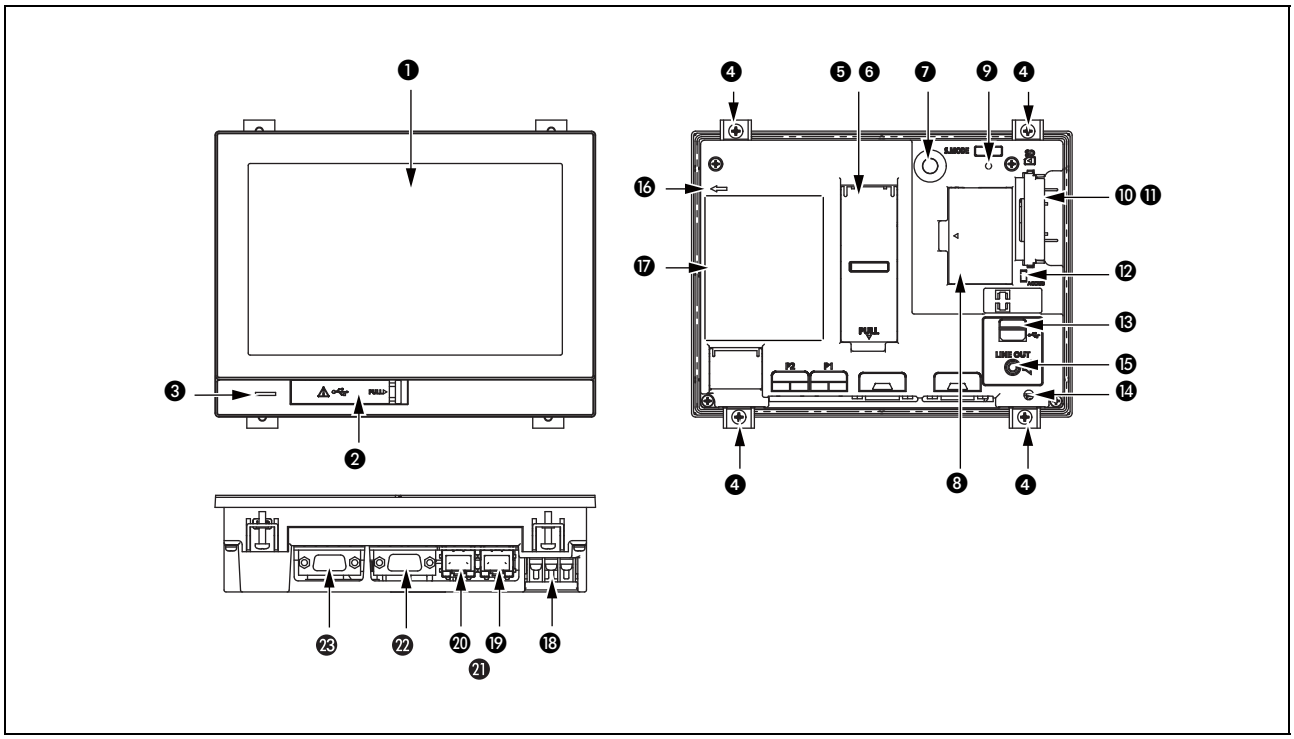


Fig. 3-7: Part names of GT2507-W

No.	Name	Description
❶	Display section/Touch panel	Displays the utility and the user-created screen.
		For operating the touch switches in the utility and the user-created screen
❷	USB interface (Device) (Type MINI-B)	For connecting a personal computer
❸	POWER LED	– Lit in blue: Power is properly supplied. – Lit in orange: Screen saving – Blinks in orange and blue: Backlight failure – Not lit: Power is not supplied.
❹	Unit installation fitting	Mounting fixtures for fixing the GOT to the control panel
❺	Battery (inside the cover)	Space for housing the battery
❻	Terminating resistor setting switch (inside the cover)	Switches the terminating resistor for the RS-422/485 communication port
❼	S.MODE switch	Used for OS installation at the GOT startup
❽	Wireless LAN communication unit interface (inside the cover)	For installing a wireless LAN communication unit
❾	Reset switch	Hardware reset switch
❿	SD card interface	For installing an SD card
⓫	SD card cover	Has the function to switch the access to the SD card between enabled and disabled states. – When the cover is opened: Access prohibited – When the cover is closed: Access allowed
⓬	SD card access LED	– ON: SD card installed – Blink: SD card accessed – OFF: SD card not installed or SD card installed but removal possible.
⓭	USB interface (Host/back) (Type A)	For connecting a USB mouse and a USB keyboard, transferring data, and storing data.
⓮	Cable clamp mounting hole	Cable clamp mounting hole as a precaution against a disconnection of the USB cable.
⓯	Sound output interface (ø 3.5 mm stereo mini-plug)	For connecting sound output devices
⓰	Vertical installation arrow mark	For the vertical installation, install the GOT so that the arrow points upward.
⓱	Rating plate	—
⓲	Power terminal	Power input terminal, FG terminal
⓳	Ethernet interface 2 (Type RJ-45 (modular Jack))	For communicating with a controller or connecting a personal computer
⓴	Ethernet interface 1 (Type RJ-45 (modular Jack))	
㉑	Ethernet communication status LED	SD/RD LED ON: Data is sent or received SD/RD LED OFF: Data is not sent or received
		SPEED LED ON: Communicating at 100 Mbps SPEED LED OFF: Communicating at 10 Mbps or disconnected
㉒	RS422/485 interface (Type D sub 9-pin, female)	For communication with a controller
㉓	RS-232 interface (Type D sub 9-pin, male)	

Tab. 3-2: *Part names of GT25-W*

3.3 GT2507T-W

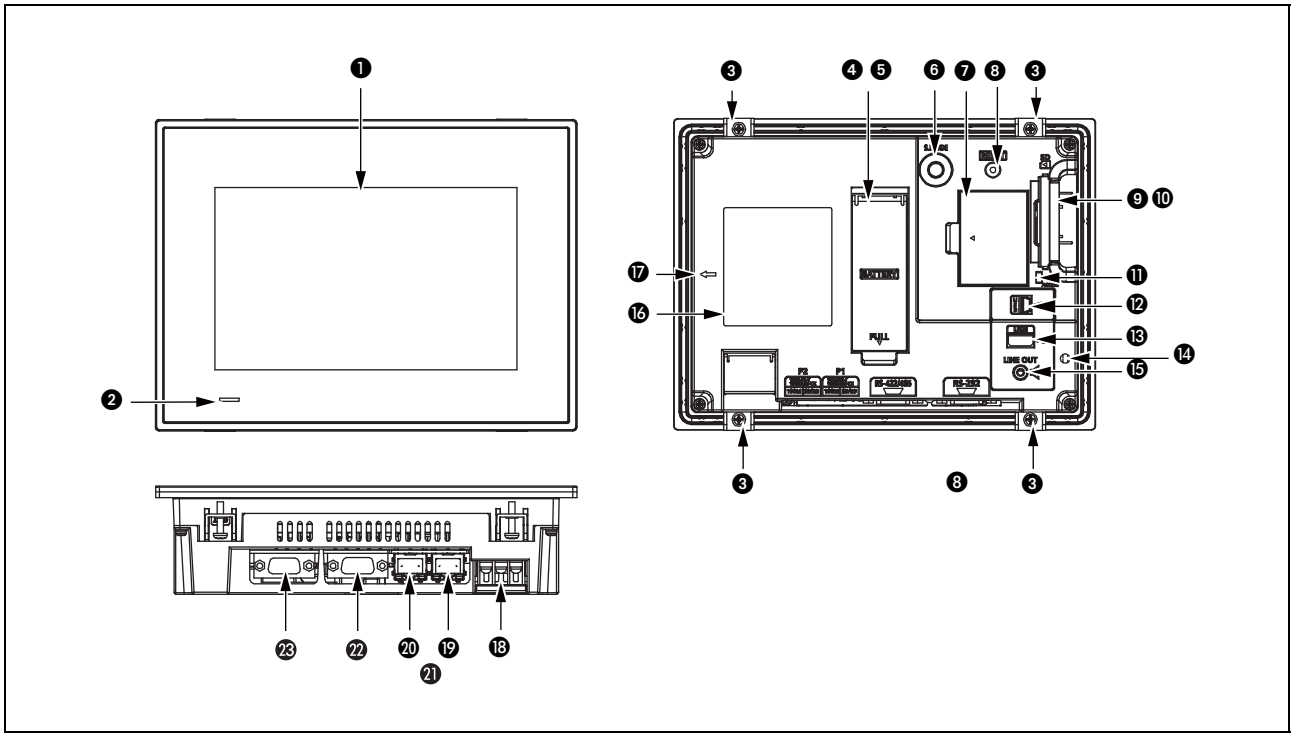


Fig. 3-8: Part names of GT2507T-W

No.	Name	Description
❶	Display section/Touch panel	Displays the utility and the user-created screen.
		For operating the touch switches in the utility and the user-created screen
❷	POWER LED	– Lit in blue: Power is properly supplied. – Lit in orange: Screen saving – Blinks in orange and blue: Backlight failure – Not lit: Power is not supplied.
❸	Unit installation fitting	Mounting fixtures for fixing the GOT to the control panel
❹	Battery (inside the cover)	Space for housing the battery
❺	Terminating resistor setting switch (inside the cover)	Switches the terminating resistor for the RS-422/485 communication port
❻	S.MODE switch	Used for OS installation at the GOT startup
❼	Wireless LAN communication unit interface (inside the cover)	For installing a wireless LAN communication unit
❽	Reset switch	Hardware reset switch
❾	SD card interface	For installing an SD card
❿	SD card cover	Has the function to switch the access to the SD card between enabled and disabled states. – When the cover is opened: Access prohibited – When the cover is closed: Access allowed
⓫	SD card access LED	– ON: SD card installed – Blink: SD card accessed – OFF: SD card not installed or SD card installed but removal possible.
⓬	USB interface (Device) (Type MINI-B)	For connecting a personal computer

Tab. 3-3: *Part names of GT2507T-W*

No.	Name	Description
⑬	USB interface (Host/back) (Type A)	For connecting a USB mouse and a USB keyboard, transferring data, and storing data.
⑭	Cable clamp mounting hole	Cable clamp mounting hole as a precaution against a disconnection of the USB cable.
⑮	Sound output interface (ø 3.5 mm stereo mini-plug)	For connecting sound output devices
⑯	Rating plate	—
⑰	Vertical installation arrow mark	For the vertical installation, install the GOT so that the arrow points upward.
⑱	Power terminal	Power input terminal, FG terminal
⑲	Ethernet interface 2 (Type RJ-45 (modular Jack))	For communicating with a controller or connecting a personal computer
⑳	Ethernet interface 1 (Type RJ-45 (modular Jack))	
㉑	Ethernet communication status LED	SD/RD LED ON: Data is sent or received SD/RD LED OFF: Data is not sent or received
		SPEED LED ON: Communicating at 100 Mbps SPEED LED OFF: Communicating at 10 Mbps or disconnected
㉒	RS422/485 interface (Type D sub 9-pin, female)	For communication with a controller
㉓	RS-232 interface (Type D sub 9-pin, male)	

Tab. 3-3: *Part names of GT2507T-W*

3.4 GT25-S, GT25-V

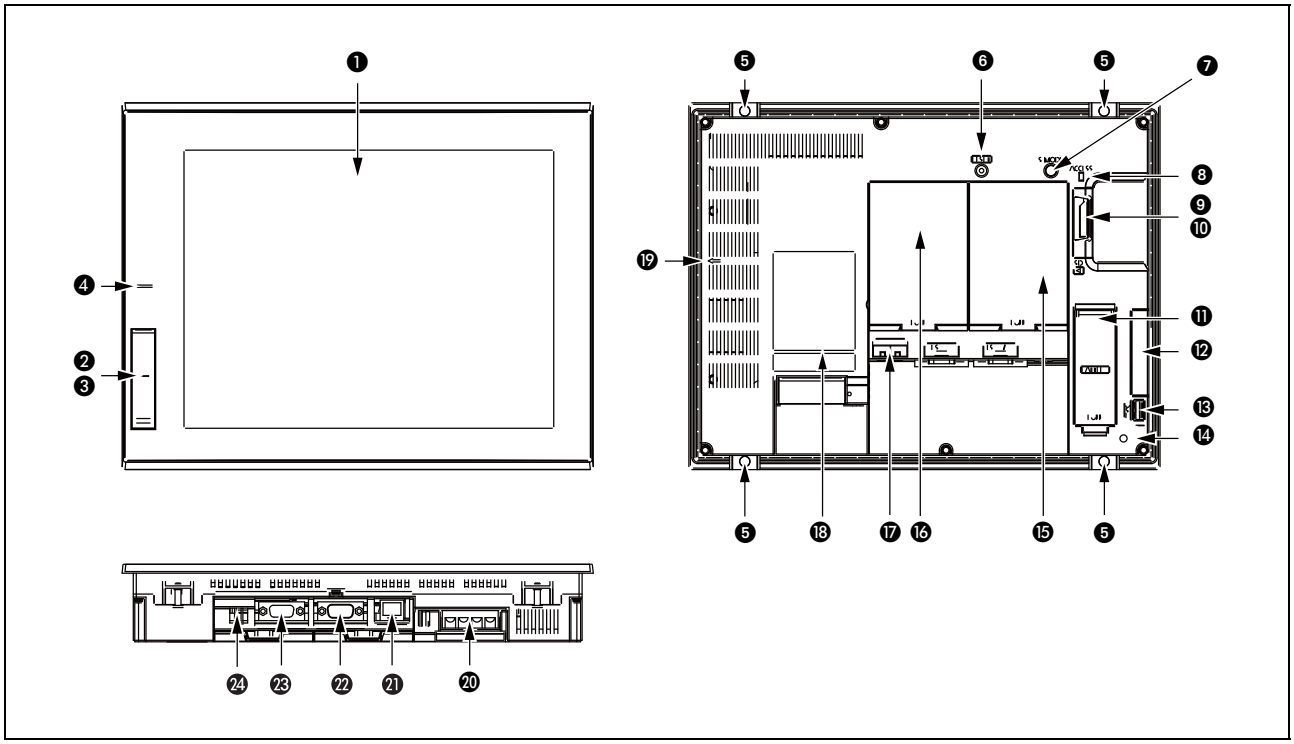


Fig. 3-9: Part names of GT2512-S

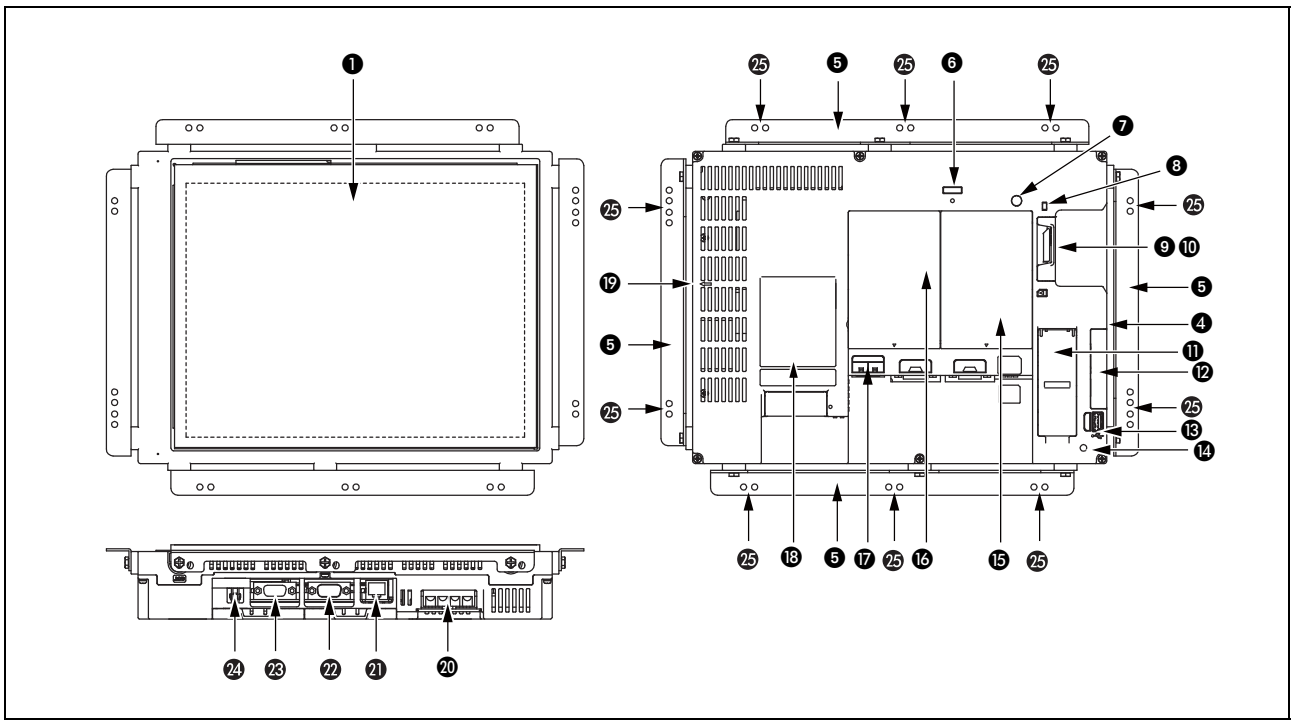


Fig. 3-10: Part names of GT2512F-S

The above figure shows a GOT with the fittings installed on the top, bottom, right, and left. Install the fittings on the top and bottom, or the right and left of the GOT

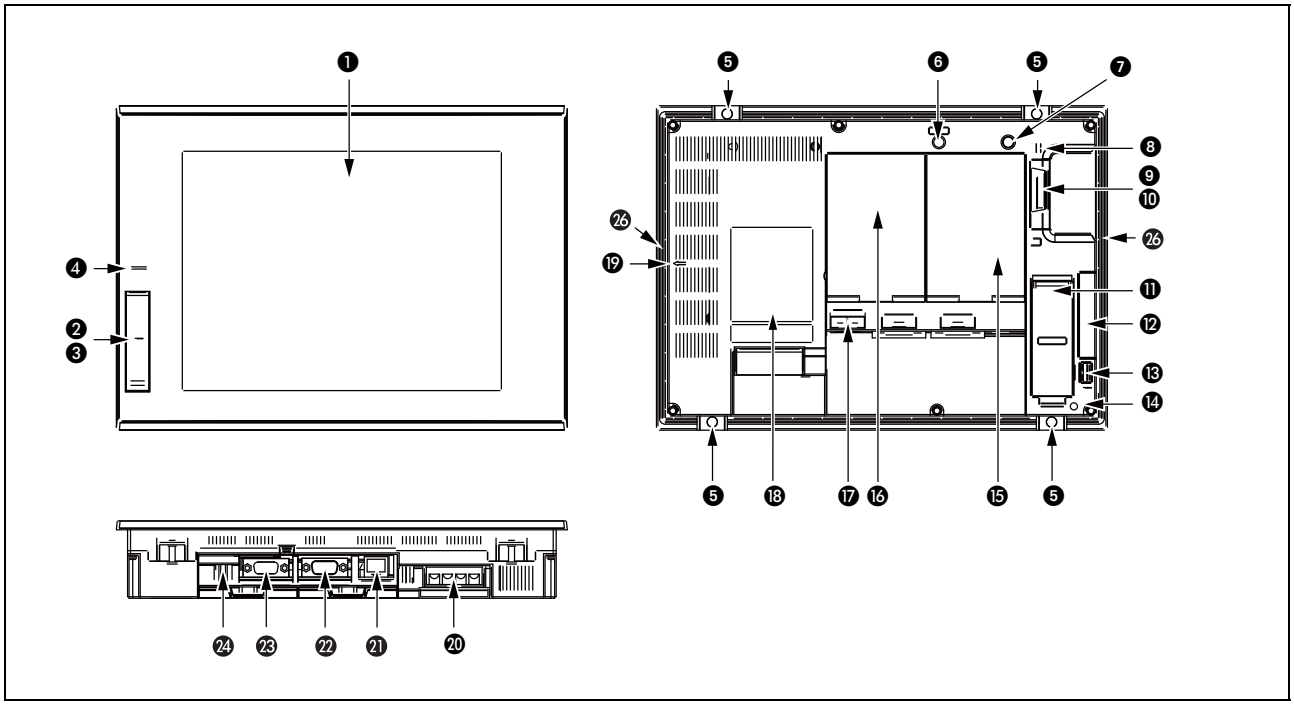


Fig. 3-11: Part names of GT2510-V

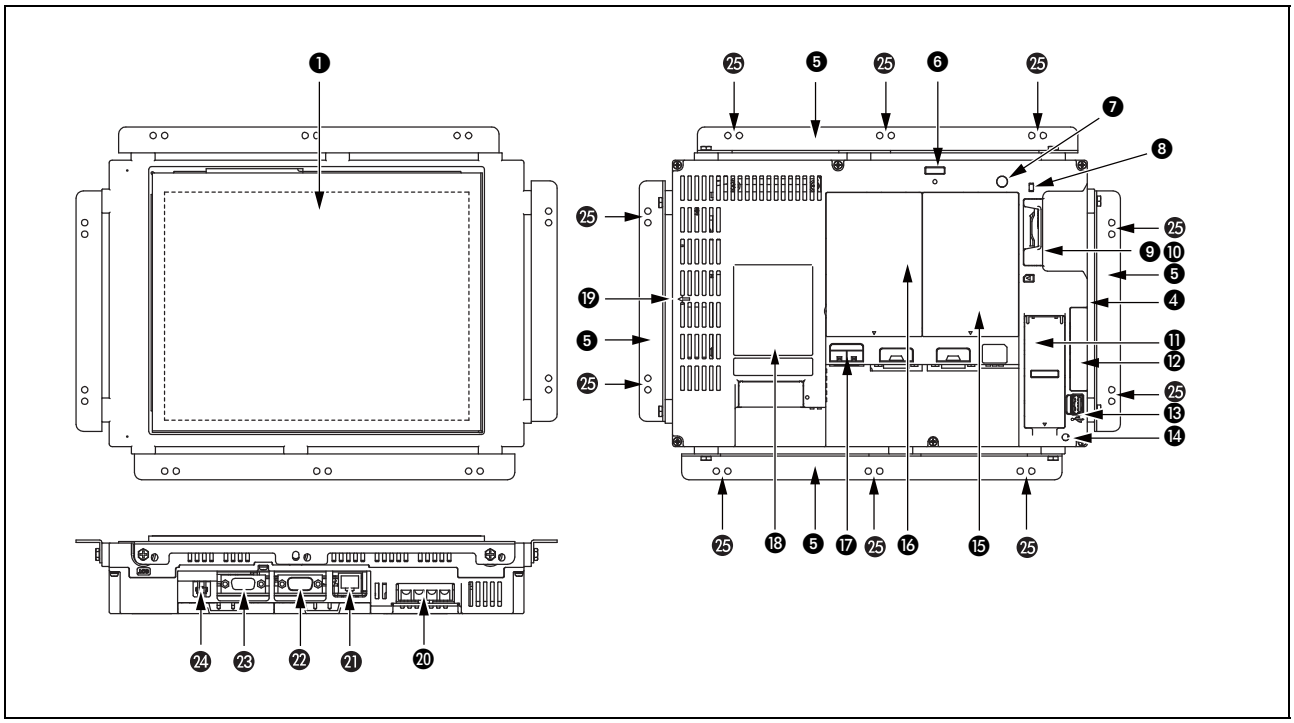


Fig. 3-12: Part names of GT2510F-V

The above figure shows a GOT with the fittings installed on the top, bottom, right, and left. Install the fittings on the top and bottom, or the right and left of the GOT

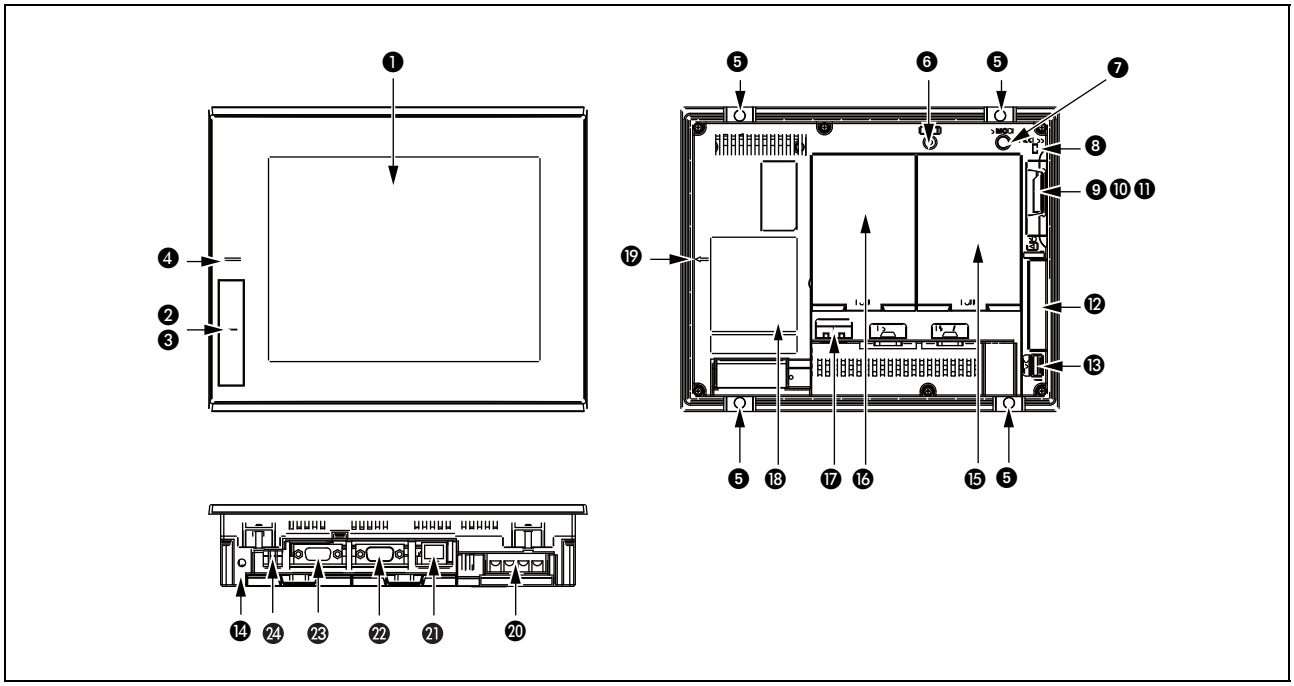


Fig. 3-13: Part names of GT2508-V

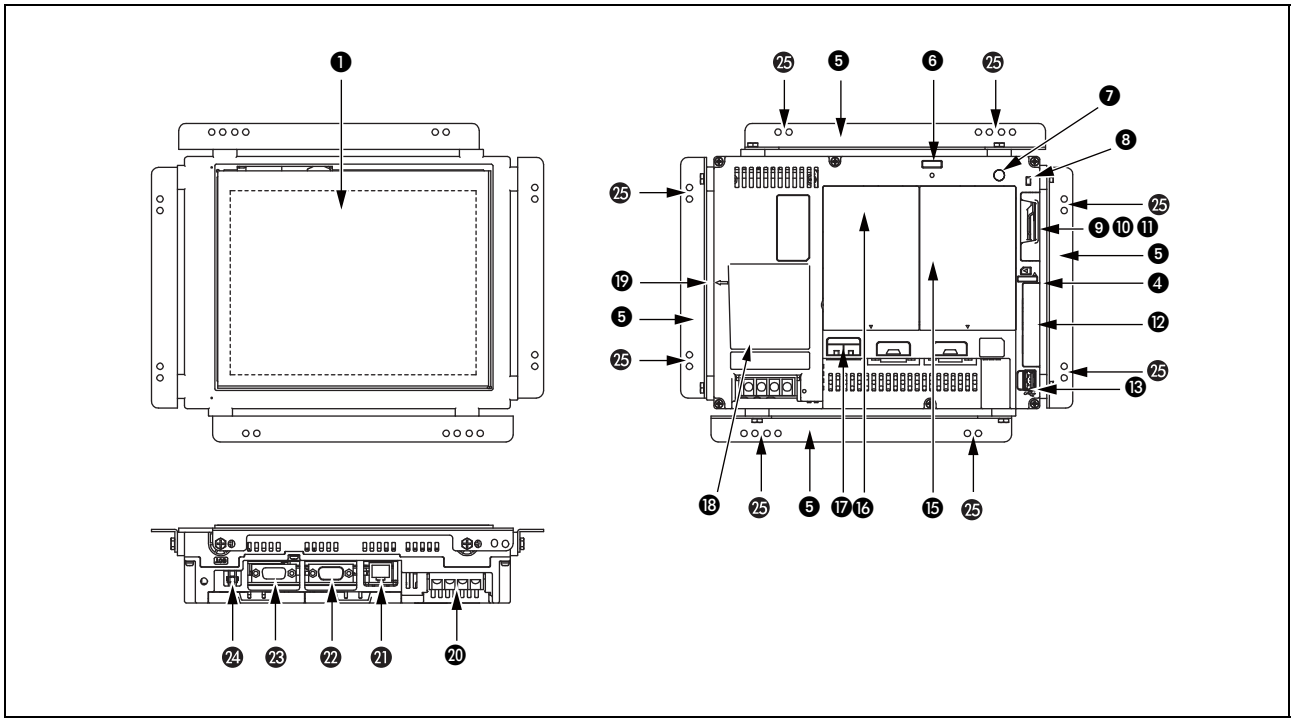


Fig. 3-14: Part names of GT2508F-V

The above figure shows a GOT with the fittings installed on the top, bottom, right, and left. Install the fittings on the top and bottom, or the right and left of the GOT

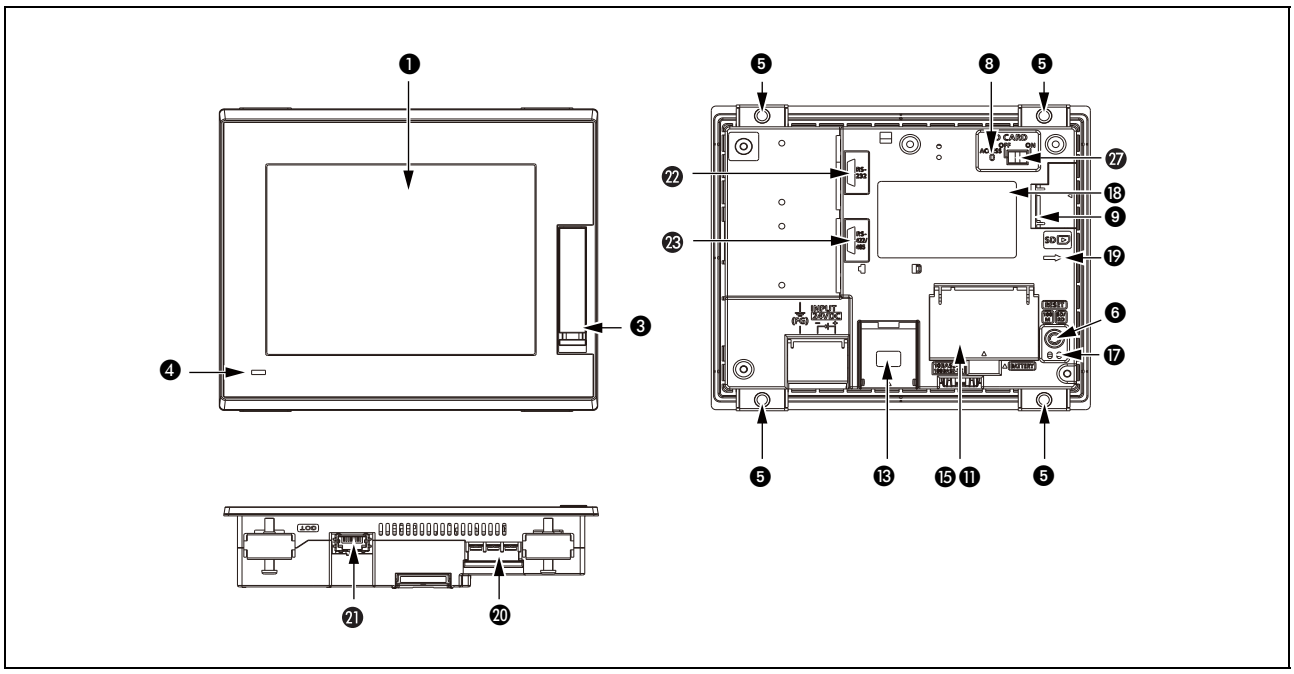


Fig. 3-15: Part names of GT2505-V

No.	Name	Description
❶	Display section/Touch panel	Displays the utility and the user-created screen.
		For operating the touch switches in the utility and the user-created screen
❷	USB interface (Host) (Type A)	For connecting a USB mouse and a USB keyboard, transferring data, and storing data Applicable models: GT2512-STBA/D, GT2510-VTBA/D, GT2508-VTBA/D
❸	USB interface (Device) (Type MINI-B)	For connecting a personal computer Applicable models: GT2512-STBA/D, GT2510-VTBA/D, GT2508-VTBA/D
❹	POWER LED	– Lit in blue: Power is properly supplied. – Lit in orange: Screen saving – Blinks in orange and blue: Backlight failure – Not lit: Power is not supplied.
❺	Unit installation fitting	Mounting fixtures for fixing the GOT to the control panel
❻	Reset switch	Hardware reset switch
❼	S.MODE switch	Used for OS installation at the GOT startup
❽	SD card access LED	– ON: SD card installed – Blink: SD card accessed – OFF: SD card not installed or SD card installed but removal possible.
❾	SD card interface	For installing an SD card
❿	SD card cover	Has the function to switch the access to the SD card between enabled and disabled states. – When the cover is opened: Access prohibited – When the cover is closed: Access allowed
⓫	Battery	Space for housing the battery
⓬	Side interface	For installing a communication unit
⓭	USB interface (Host/back) (Type A)	For connecting a USB mouse or a USB keyboard, transferring data, and storing data.
⓮	Cable clamp mounting hole	Cable clamp mounting hole as a precaution against a disconnection of the USB cable.

Tab. 3-4: *Part names of GT25-S and GT25-V*

No.	Name	Description
⑮	Terminating resistor setting switch (inside the cover)	Switches the terminating resistor for the RS-422/485 communication port
⑯	Extension interface	For installing a communication unit or an option unit
⑰	Ethernet communication status LED	SD/RD LED ON: Data is sent or received SD/RD LED OFF: Data is not sent or received
		SPEED LED ON: Communicating at 100 Mbps SPEED LED OFF: Communicating at 10 Mbps or disconnected
⑱	Rating plate	—
⑲	Vertical installation arrow mark	For the vertical installation, install the GOT so that the arrow points upward.
⑳	Power terminal	Power input terminal, FG terminal, LG terminal (not with GT2505)
㉑	Ethernet interface (Type RJ-45 (modular jack))	For communicating with a controller or connecting a personal computer
㉒	RS422/485 interface (Type D sub 9-pin, female)	For communication with a controller
㉓	RS-232 interface (Type D sub 9-pin, male)	
㉔	USB interface (Device/back) (Type MINI-B)	For connecting a personal computer Applicable models: GT2512F-STNA/D, GT2510F-VTNA/D, GT2510-VTWA/D, GT2508F-VTNA/D, GT2508-VTWA/D
㉕	Fitting installation hole	For fixing the fitting to the control panel Applicable models: GT2512F-STNA/D, GT2510F-VTNA/D, and GT2508F-VTNA/D
㉖	Special fitting installation hole	For fixing the GOT to the control panel to comply with the ATEX directive and KCs regulation Applicable model: GT2510-VTWA/D The special fittings are sold separately. To obtain the special fittings, contact your local sales office.
㉗	SD card access switch	For enabling or disabling the access to the SD card when the SD card is inserted/removed to/from the GOT ON: SD card access allowed (The SD card cannot be removed.) OFF: SD card access prohibited (The SD card can be removed.)

Tab. 3-4: *Part names of GT25-S and GT25-V*

3.5 GT23

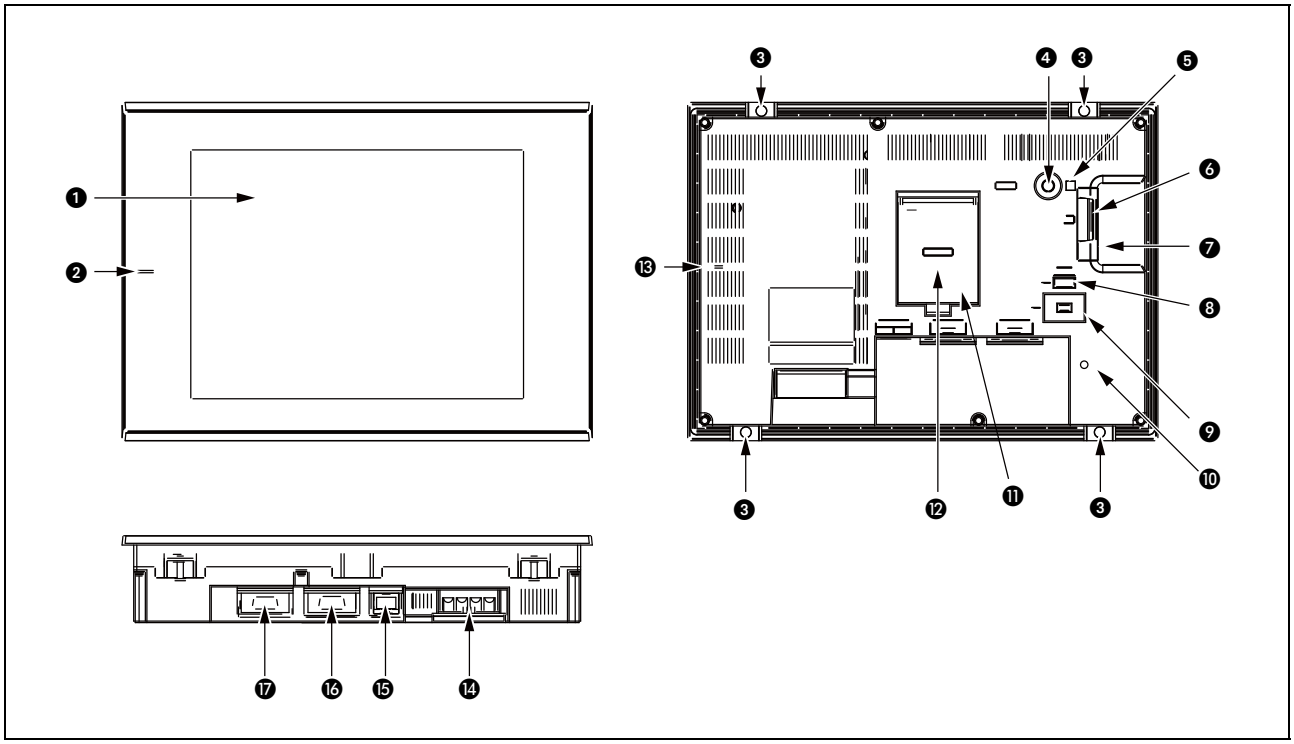


Fig. 3-16: Part names of GT2310-V and GT2308-V

No.	Name	Description
❶	Display section/Touch panel	Displays the utility and the user-created screen.
		For operating the touch switches in the utility and the user-created screen
❷	POWER LED	– Lit in blue: Power is properly supplied. – Lit in orange: Screen saving – Blinks in orange and blue: Backlight failure – Not lit: Power is not supplied.
❸	Unit installation fitting	Mounting fixtures for fixing the GOT to the control panel
❹	S.MODE switch	Used for OS installation at the GOT startup
❺	SD card access LED	– ON: SD card installed – Blink: SD card accessed – OFF: SD card not installed or SD card installed but removal possible.
❻	SD card interface	For installing an SD card
❼	SD card cover	Has the function to switch the access to the SD card between enabled and disabled states. – When the cover is opened: Access prohibited – When the cover is closed: Access allowed
❽	USB interface (Host) (Type A)	For connecting a USB mouse and a USB keyboard, transferring data, and storing data.
❾	USB interface (Device) (Type MINI-B)	For connecting a PC
❿	Cable clamp mounting hole	Cable clamp mounting hole as a precaution against a disconnection of the USB cable.
⓫	Terminating resistor setting switch (inside the cover)	Switches the terminating resistor for the RS-422/485 communication port
⓬	Battery	Space for housing the battery

Tab. 3-5: *Part names of GT23*

No.	Name	Description
⓭	Vertical installation arrow mark	For the vertical installation, install the GOT so that the arrow points upward.
⓮	Power terminal	Power input terminal, FG terminal
⓯	Ethernet interface (Type RJ-45 (modular jack))	For communicating with a controller or connecting a personal computer
⓰	RS-232 interface (Type D sub 9-pin)	For communication with a controller
⓱	RS422/485 interface (Type D sub 9-pin, female)	

Tab. 3-5: *Part names of GT23*

3.6 GT21

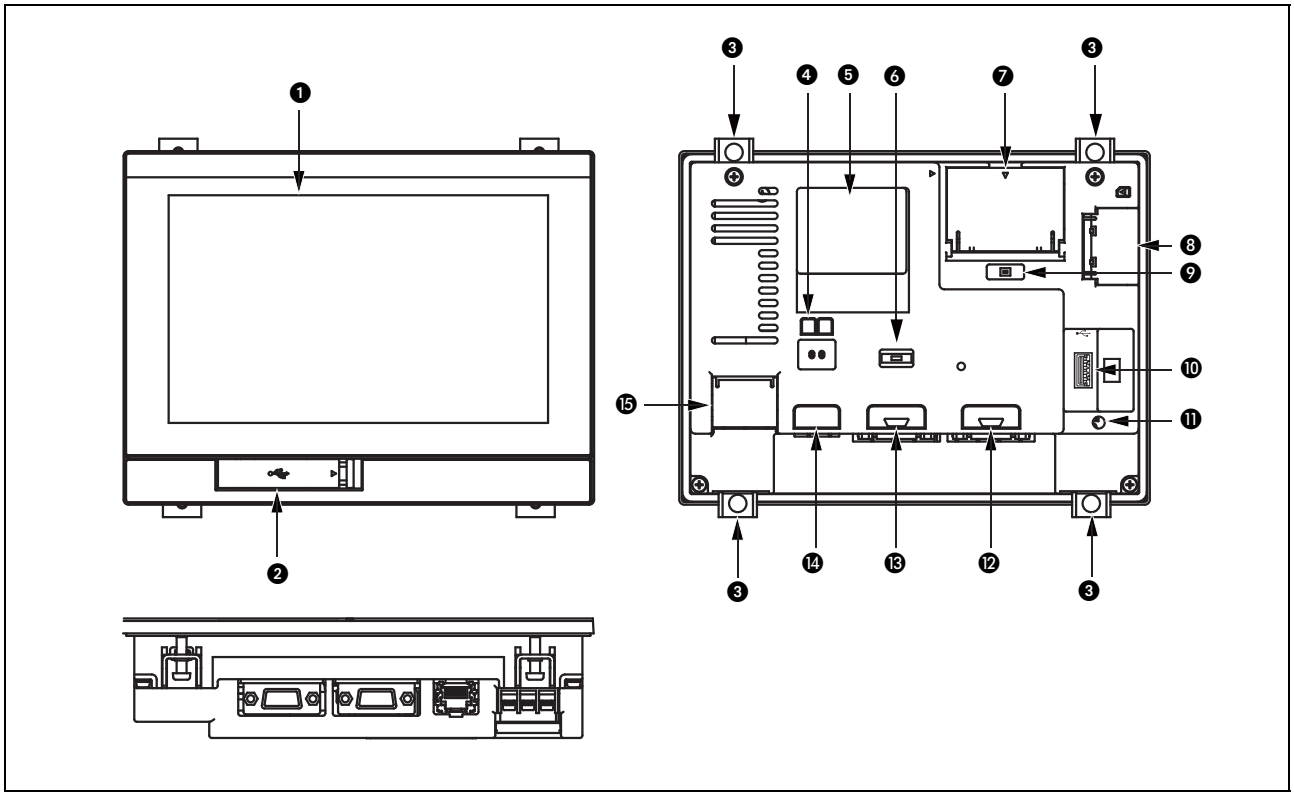


Fig. 3-17: Part names of GT2107-WTSD

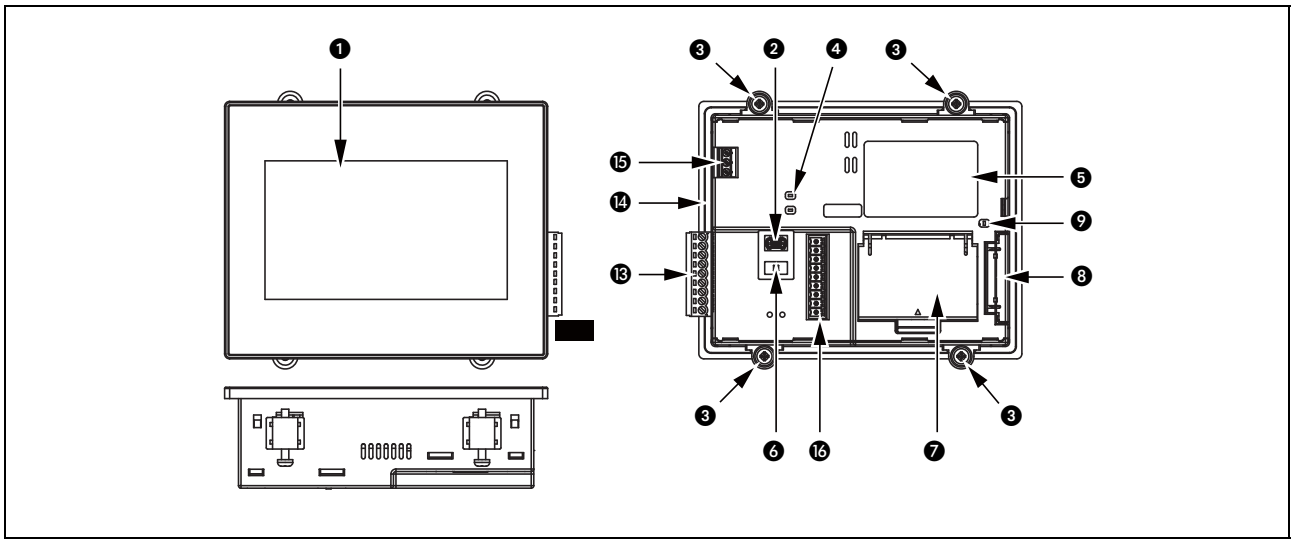


Fig. 3-18: Part names of GT2104-RTBD

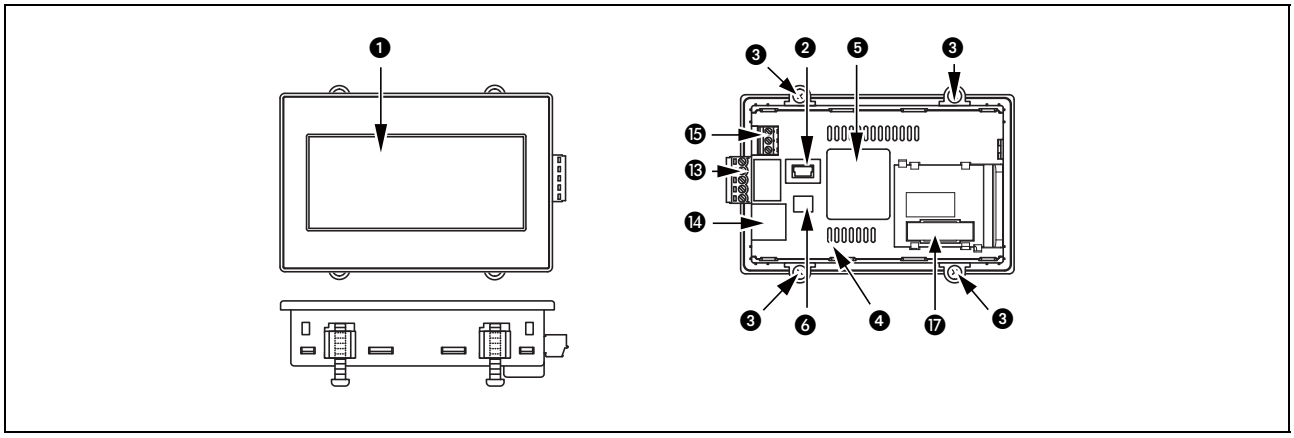


Fig. 3-19: Part names of GT2103-PMBD

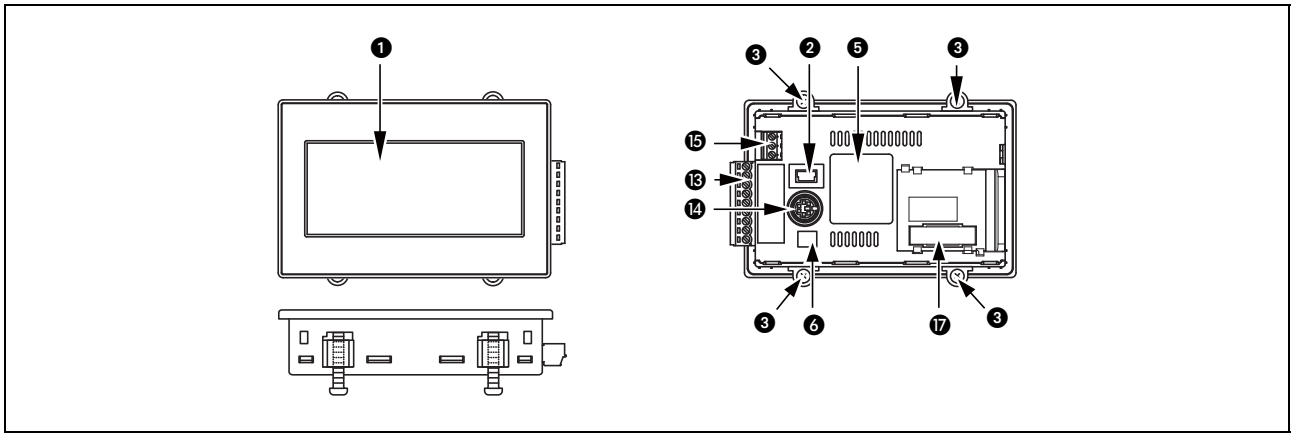


Fig. 3-20: Part names of GT2103-PMBDS

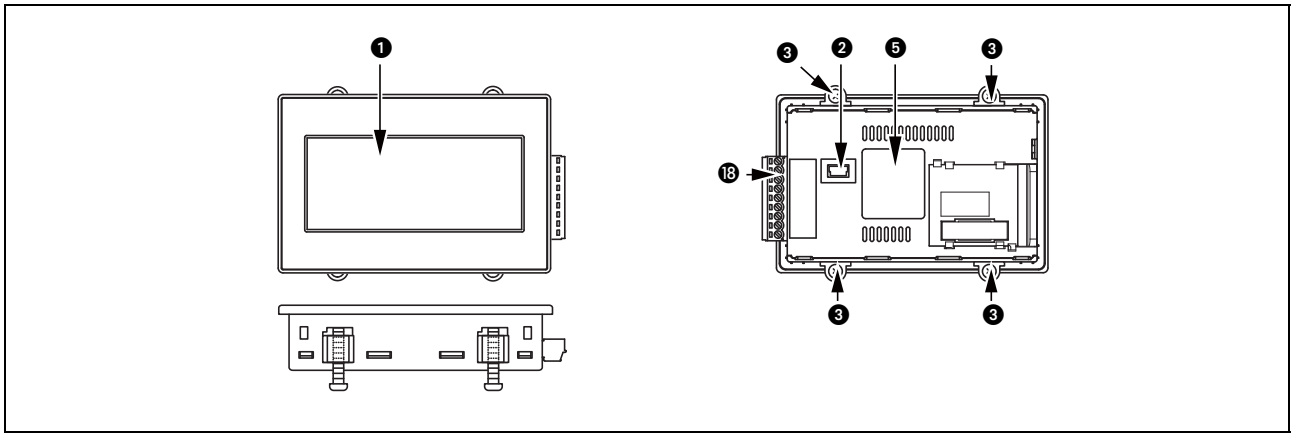


Fig. 3-21: Part names of GT2103-PMBLS

No.	Name	Description
❶	Display section/Touch panel	Displays the utility and the user-created screen.
		For operating the touch switches in the utility and the user-created screen
❷	USB interface (Device) (Type MINI-B)	For connecting a personal computer
❸	Installation fitting	Mounting fitting for fixing the GOT to the control panel
❹	Ethernet communication status LED	SD/RD LED ON: Data is sent or received SD/RD LED OFF: Data is not sent or received
		SPEED LED ON: Communicating at 100 Mbps SPEED LED OFF: Communicating at 10 Mbps or disconnected
❺	Rating plate	—
❻	Terminating resistor setting switch	Switches the terminating resistor for the RS-422/485 communication port
❼	Battery	Space for housing the battery
❽	SD card interface (under the cover)	For installing an SD card
❾	SD card access LED	– ON: SD card installed – Blink: SD card accessed – OFF: SD card not installed or SD card installed but removal possible.
❿	USB interface (Host) (Type A)	For connecting a USB mouse or a USB keyboard, transferring data, and storing data.
⓫	Cable clamp mounting hole	Cable clamp mounting hole as a precaution against a disconnection of the USB cable.
⓬	RS-232 interface (Type D sub 9-pin)	For communicating with a controller or connecting a personal computer (FA transparent function). For connecting multiple GOTs, a barcode reader, a RFID, or a serial printer.
⓭	RS422/485 interface	For communication with a controller Connector shape is different depending on the model of the GT21. – GT2107: D-sub 9-pin, female – GT2104-R: 9-pin connector terminal block – GT2103-P: 9-pin or 5-pin connector terminal block
⓮	Ethernet interface (Type RJ-45 (modular jack))	For communicating with a controller or connecting a personal computer
⓯	Power terminal	Power input terminal, FG terminal
⓰	RS-232 interface (9-pin connector terminal block)	For communicating with a controller or connecting a personal computer (FA transparent function). For connecting multiple GOTs, a barcode reader, a RFID, or a serial printer.
⓱	SD card unit connector (under the cover)	For installing a SD card
⓲	RS-422 interface (9-pin connector terminal block)	For communicating with a controller

Tab. 3-6: *Part names of GT21*

3.7 GS21

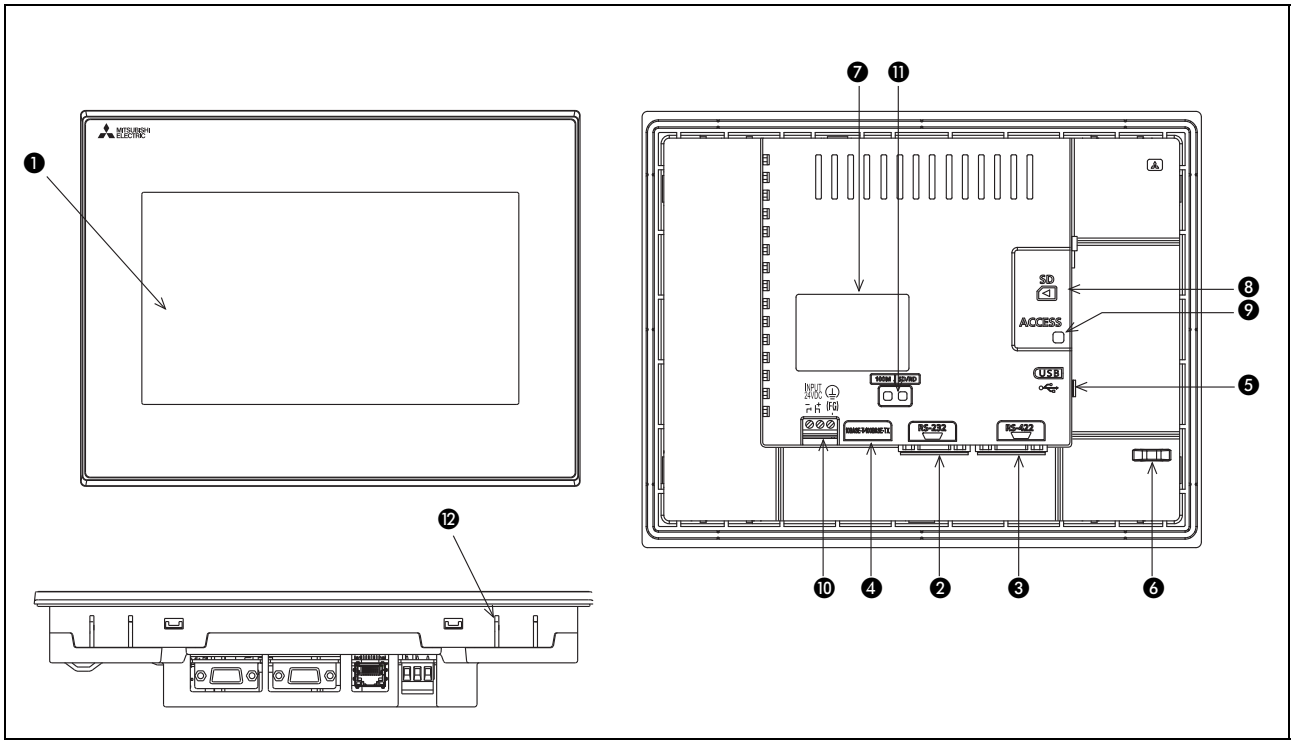


Fig. 3-22: Part names of GS2110

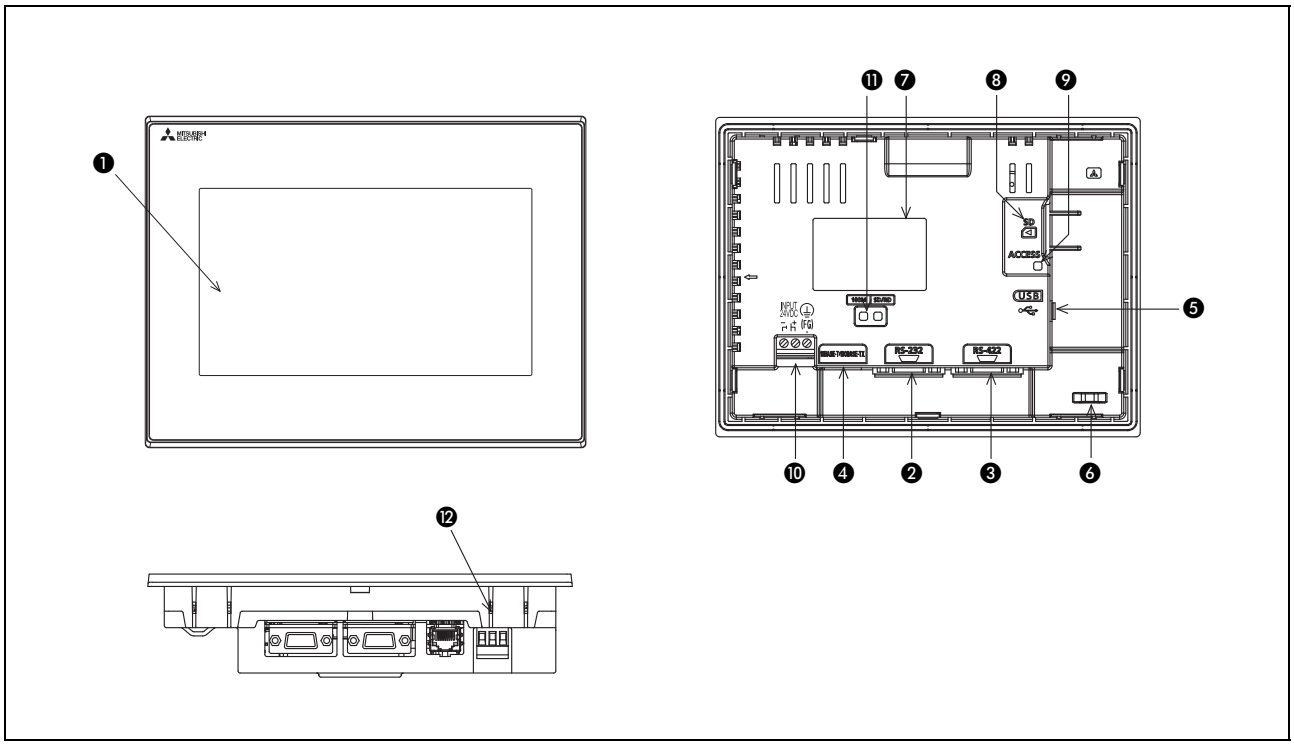


Fig. 3-23: Part names of GS2107

No.	Name	Description
❶	Display section/Touch panel	Displays the utility and the user-created screen.
		For operating the touch switches in the utility and the user-created screen
❷	RS-232 interface (Type D sub 9-pin)	For communicating with a controller or connecting a personal computer
❸	RS422/485 interface (Type 14-pin (female))	For communication with a controller
❹	Ethernet interface (Type RJ-45 (modular jack))	For communicating with a controller, gateway function
❺	USB interface (Host/back) (Type A)	For connecting a USB mouse or a USB keyboard, transferring data, and storing data.
❻	Cable clamp mounting hole	Cable clamp mounting hole as a precaution against a disconnection of the USB cable.
❼	Rating plate	The GOT hardware version, BootOS version, function version, and conforming standards
❽	SD card interface	For installing an SD card
❾	SD card access LED	ON: SD card accessed OFF: SD card not installed or SD card installed but removal possible
❿	Power terminal	Power input terminal, FG terminal
⓫	Ethernet communication status LED	– SD RD: Green light while data are being sent or received – 100M: Green light when the transmission speed is 100 Mbps
⓬	Hole for unit installation fitting	Hole for the inserting installation fittings (accessory) during the GOT installation to the panel (4 holes at top and bottom)

Tab. 3-7: *Part names of GS21*

4 EMC and Low Voltage Directive

For the products sold in European countries, the conformance to the EMC Directive, which is one of the European Directives, has been a legal obligation since 1996. Also, conformance to the Low Voltage. Directive, another European Directives, has been a legal obligation since 1997. Manufacturers who recognize their products must conform to the EMC and Low Voltage Directive are required to declare that their products conform to these Directives and put a "CE mark" on their products.

Authorized representative in Europe

Mitsubishi Electric Europe B.V.
Mitsubishi-Electric-Platz 1
40882 Ratingen, Germany

4.1 Requirements to meet EMC Directive

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

Items 4.1.1 through 4.1.3 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.

4.1.1 Conforming standards in the EMC Directive

Applied standard	Test standard	Test details	Standard value
EN61131-2:2007	EN55011 Radiated noise ①	Electromagnetic emissions from the product are measured.	30–230 MHz: 30 dB (μV/m) Q ②③ (in 30 m) 230–1000 MHz: 37 dB (μV/m) Q ②③ (in 30 m)
	EN55011 Conducted noise	Electromagnetic emissions from the product to the power line is measured.	0.15–0.5 MHz: 79 dB Q②, 66 dB M② 0.5–30 MHz: 73 dB Q②, 60 dB M②
	EN61000-4-2 Electrostatic immunity ①	Immunity test in which static electricity is applied to the cabinet of the equipment	±4 kV (Contact discharge) ±8 kV (Aerial discharge)
	EN61000-4-3 Radiated field amplitude modulation ①	Immunity test in which field is irradiated to the product.	80–1000 MHz: 10 V/m 1.4 GHz–2.0 GHz: 3 V/m 2.0 GHz–2.7 GHz: 1 V/m 80 % AM (1 kHz)
	EN61000-4-4 Fast transient burst noise ①	Immunity test in which burst noise is applied to the power line and signal lines.	• Power line (AC): 2 kV • Digital I/O: 1 kV • Analog I/O: 1 kV • Signal cable: 1 kV
	EN61000-4-5 Surge immunity ①	Immunity test in which lightening surge is applied to the product	AC power type: • Between line and ground: ±2 kV • Between lines ±1 kV DC power type: • Between line and ground: ±0.5 kV • Between lines: ±0.5 kV Data communication port: ±1 kV
	EN61000-4-6 Conducted RF immunity ①	Immunity test in which a noise inducted on the power and signal lines is applied	Power line: 10 V Data communication port: 10 V
	EN61000-4-8 Power supply frequency magnetic field immunity ①	Test for checking normal operations under the circumstance exposed to the ferromagnetic field noise of the power supply frequency (50/60Hz).	30 A/m
	EN61000-4-11 EN61000-4-29 Instantaneous power failure and voltage dips immunity	Test for checking normal operations at instantaneous power failure.	AC power type • 0.5 cycle 0 % (Intervall 1–10 s) • 250/300 cycle 0 % • 10/12 cycle 40 % • 25/30 cycle 70 % DC power type • 10 ms (interval 1–10 s)

Tab. 4-1: *The standards of the EMC Directive*

① 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.
The length of a sound output cable must be 30 m or less.

② QP: Quasi-peak value, Mean: Average value

③ The above test items are conducted in the following conditions.
30–230 MHz: 40 dB (μV/m) Q (measurement range: 10 m)
230–1000 MHz: 47 dB (μV/m) Q (measurement range: 10 m)

4.1.2 Installation according to the EMC Directive

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.

Control panel

- The control panel must be conductive.
- 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.

  Connect the door and box using a thick grounding cable in order to ensure the low impedance under high frequency.
- 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.
- Ground the control panel using a thick grounding cable in order to ensure the low impedance under high frequency.
- The diameter of cable holes in the control panel must be 10 cm or less. 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. Paste an EMI gasket directly on the painted surface to seal the space so that the leak of electric wave can be suppressed. Our test has been carried out on a panel having the damping characteristics of 37 dB max. and 30 dB mean (measured by 3 m method with 30 to 300 MHz).

Connection of power and ground wires

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

- Provide a grounding point near the GOT. Short-circuit the LG and FG terminals of the GOT (LG: line ground, FG: frame ground) and ground them with the thickest and shortest wire possible (The wire length must be 30 cm 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. (A long conductor is an antenna radiating noise more efficiently.)
- 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.

4.1.3 Noise filter (power supply line filter)

A 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 10 MHz or less.)

Usage of the following filters is recommended.

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

Tab. 4-2: *Recommended filter*

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

- 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 filer.

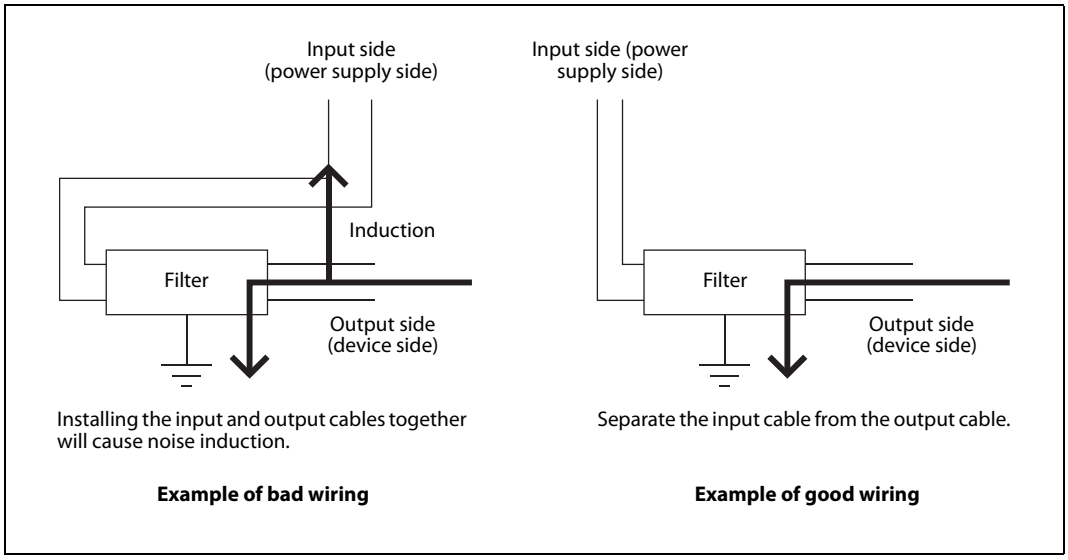


Fig. 4-1: *Do not install the input and output cables of the noise filter together*

- Connect the noise filter's ground terminal to the control panel with the shortest cable as possible (approximately 10 cm).

4.2 Requirements for Compliance with the Low Voltage Directive

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

In the sections from 4.2.1 to 4.2.5 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.

4.2.1 Standard subject to GOT

Standard applied to GOT:

- EN61131-2: Programmable controllers - Equipment requirements and tests
- EN60950-1: Safety of Information Technology Equipment

4.2.2 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.

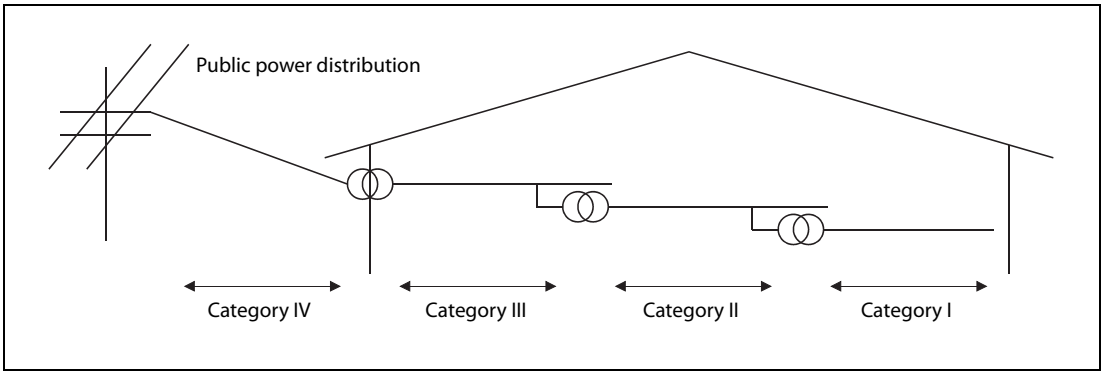


Fig. 4-2: *Installation Category*

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

4.2.3 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.

Electric shock protection

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

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

Dustproof and waterproof features

The control panel also provides protection from dust, water and other substances. Insufficient ingression 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	Description
1	An environment where the air is dry and conductive dust does not exist.
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
3	An environment where conductive dust exits and conductivity may be generated due to the accumulated dust. An environment for a typical factory floor.
4	Continuous conductivity may occur due to rain, snow, etc. For example, an outdoor environment.

Tab. 4-3: *Pollution levels*

4.2.4 Grounding

The following are applicable ground terminals. Use them in the grounded state. Be sure to ground the GOT for ensuring the safety and complying with the EMC Directive.

Protective grounding		Ensures the safety of the GOT and improves the noise resistance.
Functional grounding		Improves the noise resistance.

Fig. 4-3: *Applicable ground terminals*

4.2.5 External wiring

External devices

When a device with a hazardous voltage circuit is externally connected to the GOT, the interface circuit to the GOT must have a reinforced insulation.

Reinforced insulation

The reinforced insulation indicates the insulation with the following withstand voltage.

Rated voltage of hazardous voltage area	Surge withstand voltage (1.2/50 µs)
≤150 V AC	2500 V
≤300 V AC	4000 V

Tab. 4-4:
Reinforced insulation withstand voltage (Source: Installation Category II of IEC664)

4.3 EMC Directive-compliant System Configuration

You can also check the EMC Directive compliance status of the GOT2000 series at the Mitsubishi Electric Factory Automation Website (http://eu3a.mitsubishielectric.com).

4.3.1 Graphic Operation Terminal (GOT)

Use any of the following GOTs with which CE mark logo is printed on the rating plate. In the appendices of this manual you can find a description for how to identify the hardware version of a GOT.

NOTE When using a GOT other than shown below, the system does not conform to the EMC Directive.

GOT	Type	Hardware version of the GOT (Production month and year)
GT2715	GT2715-XTBA	Version A or later (April 2014)
	GT2715-XTBD	
GT2712	GT2712-STBA	Version A or later (August 2013)
	GT2712-STBD	
	GT2712-STWA	
	GT2712-STWD	
GT2710	GT2710-STBA	
	GT2710-STBD	
	GT2710-VTBA	
	GT2710-VTBD	
	GT2710-VTWA	
	GT2710-VTWD	
GT2708	GT2708-STBA	
	GT2708-STBD	
	GT2708-VTBA	
	GT2708-VTBD	
GT2705	GT2705-VTBD	Version A or later (April 2015)
GT2512	GT2512-STBA	Version A or later (October 2014)
	GT2512-STBD	
	GT2512F-STNA	Version A or later (January 2016)
	GT2512F-STND	
GT2510	GT2510-WXTSD	Version A or later (April 2017)
	GT2510-VTBA	Version A or later (April 2014)
	GT2510-VTBD	
	GT2510-VTWA	
	GT2510-VTWD	
	GT2510F-VTNA	Version A or later (January 2016)
	GT2510F-VTND	
GT2508	GT2508-VTBA	Version A or later (April 2014)
	GT2508-VTBD	
	GT2508-VTWA	
	GT2508-VTWD	
	GT2508F-VTNA	Version A or later (January 2016)
	GT2508F-VTND	

Tab. 4-5: *EMC Directive-Compliant GOTs*

GOT	Type	Hardware version of the GOT (Production month and year)
GT2507	GT2507-WTSD	Version A or later (April 2017)
	GT2507T-WTSD	Version A or later (April 2018)
GT2505	GT2505-VTBD	Version A or later (August 2017)
GT2310	GT2310-VTBA	Version A or later (August 2013)
	GT2310-VTBD	
GT2308	GT2308-VTBA	
	GT2308-VTBD	
GT2107	GT2107-WTSD	Version A or later (February 2017)
GT2104	GT2104-RTBD	Version B or later (March 2015)
GT2103	GT2103-PMBD	Version A or later (September 2014)
	GT2103-PMBDS	
	GT2103-PMBLS	Version B or later (April 2016)
GS2110	GS2110-WTBD	Version A or later (January 2014)
GS2107	GS2107-WTBD	

Tab. 4-5: *EMC Directive-Compliant GOTs*

4.3.2 Connection method

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

Connection method ①	GT27	GT25	GT23	GT21	GS21
Bus connection	●	● ③	○	○	○
Direct connection to CPU	●	●	●	●	●
Serial communication connection	●	●	●	○	○
MELSECNET/H connection (PLC to PLC network)	●	● ③	○	○	○
CC-Link IE Controller Network connection	●	● ③	○	○	○
CC-Link IE Field Network connection	●	● ③	○	○	○
CC-Link connection (intelligent device station)	●	● ③	○	○	○
CC-Link connection (via G4)	○	○	○	○	○
Ethernet connection	●	●	●	●	●
GOT multi-drop connection	●	●	●	● ④	○
Other connections	● ②	● ②	● ②	● ②	● ②

Tab. 4-6: *Methods to connect with the GOT*

●: Compliant with EMC Directive; ○: Not compliant with EMC Directive

① For details about each connection method, refer to the following manual:
- GOT2000 Series Connection Manual, GT Works3

② When connecting the GOT to other controllers as a PLC manufactured by other company, create the cable (by the user) and configure the system to meet the EMC Directive specifications for the connected device. (This can also be a PLC (manufactured by other company), microcomputer, temperature controller, inverter, servo amplifier, CNC, MODBUS(R)/RTU or MODBUS(R)/TCP connection.)

③ Not available to GT25-W and GT2505-V

④ Not available to GT2103-PMBLS.

NOTE

When connecting the GOT to a non-Mitsubishi Electric PLC, refer to the manual about the EMC Directive compliance of the connected device (such as a PLC and a microcomputer).

4.3.3 Communication units

Use the following communication unit with the GOT to ensure compliance with the EMC Directive. The GOT does not comply with the EMC Directive when any other than the following communication units is used.

Connection method	Communication unit	Hardware version of the communication unit (Production year and month)
Bus connection	GT15-QBUS	Version D or later (October 2005)
	GT15-QBUS2 GT15-ABUS GT15-ABUS2	Version C or later (October 2005)
	GT15-75QBUSL GT15-75QBUS2L GT15-75ABUSL GT15-75ABUS2L	Version G or later (March 2005)
Direct connection to CPU	GOT RS-232 interface	—
	GOT RS-422/485 interface	—
	GT15-RS2T4-9P	Version A or later
	GT15-RS2-9P GT15-RS4-9S	Version D or later (January 2006)
Serial communication connection	GOT RS-232 interface	—
	GOT RS-422/485 interface	—
	GT15-RS2T4-9P	Version A or later
	GT15-RS2-9P GT15-RS4-9S	Version D or later (January 2006)
MELSECNET/H connection (PLC to PLC network)	GT15-J71LP23-25 GT15-J71BR13	Version C or later (January 2006)
CC-Link IE Controller Network connection	GT15-J71GP23-SX	Version A or later (December 2007)
CC-Link IE Field Network connection	GT15-J71GF13-T2	Version A or later (December 2011)
CC-Link connection (Intelligent device station)	GT15-J61BT13	Version C or later (September 2006)
Ethernet connection	GOT Ethernet interface	—
	GT25-J71E71-100	Version A or later (September 2016)
Microcomputer connection (Serial)	GOT RS-232 interface	—
	GOT RS-422/485 interface	—
	GT15-RS2-9P GT15-RS4-9S	Version D or later (January 2006)
Microcomputer connection (Ethernet)	GOT Ethernet interface	—
Non-Mitsubishi Electric PLC connection	GOT RS-232 interface	—
	GOT RS-422/485 interface	—
	GT15-RS2-9P GT15-RS4-9S	Version D or later (January 2006)
Temperature controller connection	GOT RS-232 interface	—
	GOT RS-422/485 interface	—
	GT15-RS2-9P GT15-RS4-9S GT15-RS4-TE	Version D or later (January 2006)
Inverter connection	GOT RS-422/485 interface	—
	GT15-RS4-9S	Version D or later (January 2006)

Tab. 4-7: *Suitable communication units*

Connection method	Communication unit	Hardware version of the communication unit (Production year and month)
Servo amplifier connection	GOT RS-232 interface	—
	GOT RS-422/485 interface	—
	GT15-RS2-9P GT15-RS4-9S	Version D or later (January 2006)
CNC connection	GOT RS-232 interface	—
	GOT RS-422/485 interface	—
	GT15-RS2-9P GT15-RS4-9S	Version D or later (January 2006)
	GT15-J71LP23-25 GT15-J61BT13	Version C or later (September 2006)
	GOT Ethernet interface	—
MODBUS®/RTU connection	GOT RS-232 interface	—
	GOT RS-422/485 interface	—
	GT15-RS2-9P GT15-RS4-9S	Version D or later (January 2006)
MODBUS®/TCP connection	GOT Ethernet interface	—

Tab. 4-7: *Suitable communication units*

4.3.4 Option units

To meet the EMC Directive, use the following option units. When any other than the following option units is used, the GOT does not comply with the EMC Directive.

Option unit	Model name	Hardware version of option unit (Production month and year)
Multimedia unit	GT27-MMR-Z	Version A or later (August 2013)
Video/RGB input unit	GT27-V4R1-Z	Version A or later (August 2013) GT2715: Version B or later (April 2014)①
Video input unit	GT27-V4-Z	
RGB input unit	GT27-R2-Z	
	GT27-R2	Version A or later (April 2015)
RGB output unit	GT27-ROUT	Version A or later (April 2015)
	GT27-ROUT-Z	Version A or later (August 2013)
Printer unit	GT15-PRN	Version B or later (February 2006)
Sound output unit	GT15-SOUT	Version B or later (May 2007)
External I/O unit	GT15-DIO	Version B or later (May 2007)
	GT15-DIOR	Version B or later (July 2008)
SD card unit	GT21-03SDCD	— (October 2014)

Tab. 4-8: *Suitable option units*

① When using with the GT2715 the hardware version of the GT16M-V4R1-Z/GT16M-V4-Z/GT16M-R2-Z and GT27-IF1000 also has to be version B or higher.

4.3.5 Cables

Cables used

- MELSECNET/H and video connection

  For the MELSECNET/H connection (coaxial cable) and video connection, use double shield coaxial cables. The 5C-2V connector plug is applicable to double-shielded coaxial cable. Connect the 5C-2V connector plug to the coaxial cable inside a double-shielded coaxial cable. Ground the shielded part outside a double-shielded coaxial cable.

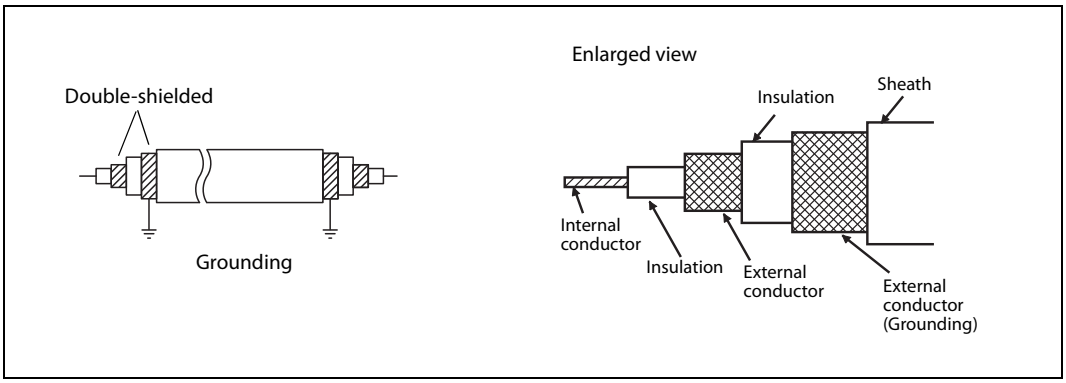


Fig. 4-4: *Double-shielded coaxial cable 5C-2V*

- CC-Link IE Field Network

  For the CC-Link IE Field Network connection, use the cable SC-E5EW-S□M.

- Other connections

  For details of the cables used for connections other than the above, refer to the following manual:

  – GOT2000 Series Connection Manual, GT Works3

Adjusting a cable for the EMC Directive compliance

Modify the cables (including user-produced cable) to ensure compliance with the EMC Directive. For details, refer to section 4.4.2.

4.4 Wiring/Connecting the EMC Directive-compliant Product Line

Wire and connect GOT2000 series equipments as instructed below. If the GOT2000 series equipment is configured in a way different from the following instructions, the system may not comply with EMC directives.

4.4.1 Power and ground wires wiring method

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

Lead the power wire and ground wire as shown in section 4.1.2.

Be sure to ground the LG cable and FG cable.

GT2705-VTBD, GT25-W, GT2505-VTBD, and GT21 do not have the LG ground terminal.

100-240 V AC GOT power supply section

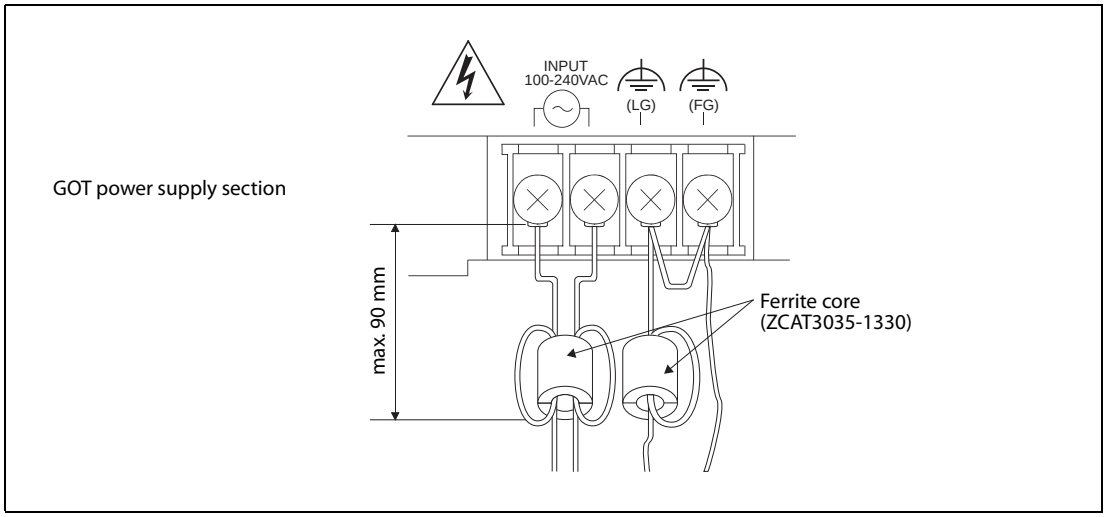


Fig. 4-5: *100-240 V AC GOT power section*

24 V DC GOT power supply section

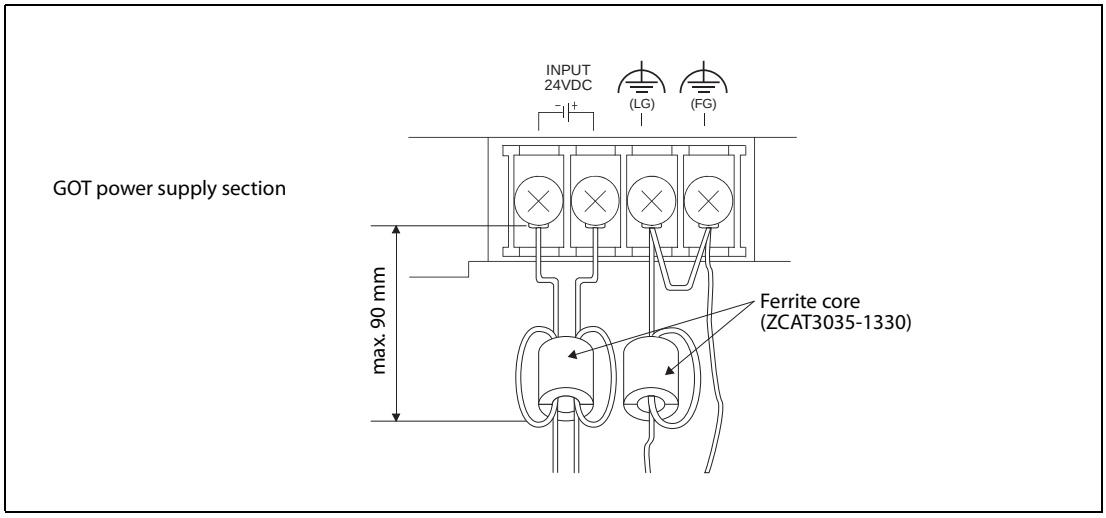


Fig. 4-6: *24 V DC GOT power section*

4.4.2 Processing connection cables

Process the cable used with the GOT with the following method.

When processing the cable, ferrite core, cable clamp and shielding material are required. The cable clamp used by Mitsubishi Electric for the EMC specification compatibility test is shown below:

– Ferrite core: ZCAT3035-1330 (Manufacturer: TDK)

– Cable clamp: AD75CK (Manufacturer: Mitsubishi Electric)

– Zipper tube type SHNJ (Manufacturer: Zippertubing)

BUS connection cable

● GT15-QC□B, GT15-QC□BS

Peel the sheath (with the length 40 mm) at both ends of the cable, and expose the shield braided wire for grounding. (For grounding with cable clamps AD75CK refer to section 4.4.3.)

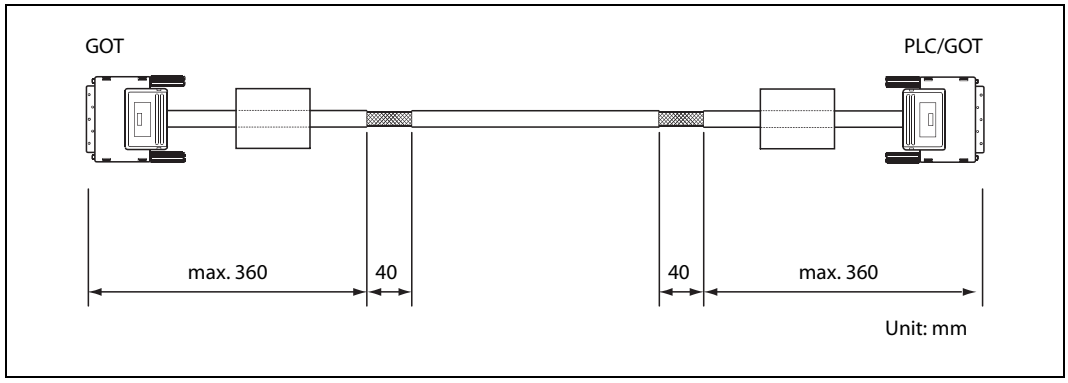


Fig. 4-7: *Processing cables GT15-QC□B and GT15-QC□BS*

● GT15-C□BS

– Cut the connection wire protruding from both ends of the cable to 280 mm.

– Attach the ferrite core to the cable in the position as illustrated below and insert the ground wire into the ferrite core.

– Peel the sheath (with the length 40 mm) at both ends of the cable, and expose the shield braided wire for grounding. (For grounding with cable clamps AD75CK refer to section 4.4.3.)

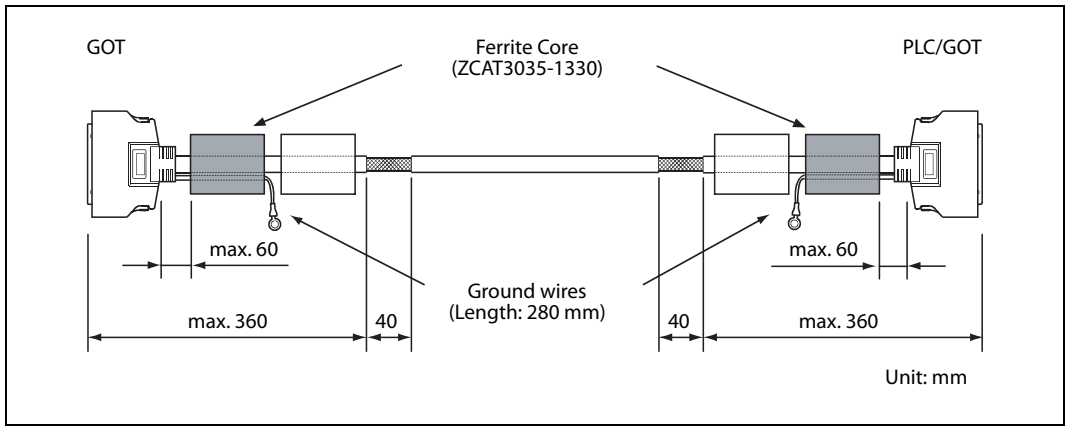


Fig. 4-8: *Processing cables GT15-QC□B and GT15-QC□BS*

- Other bus connection cables
  - Wind cable shield material around the cable, and pull out the grounding braided wire of the cable shield material with the length shown below.
  - Attach the ferrite core to the cable in the position as illustrated below and insert the braided wire for grounding into the ferrite core.

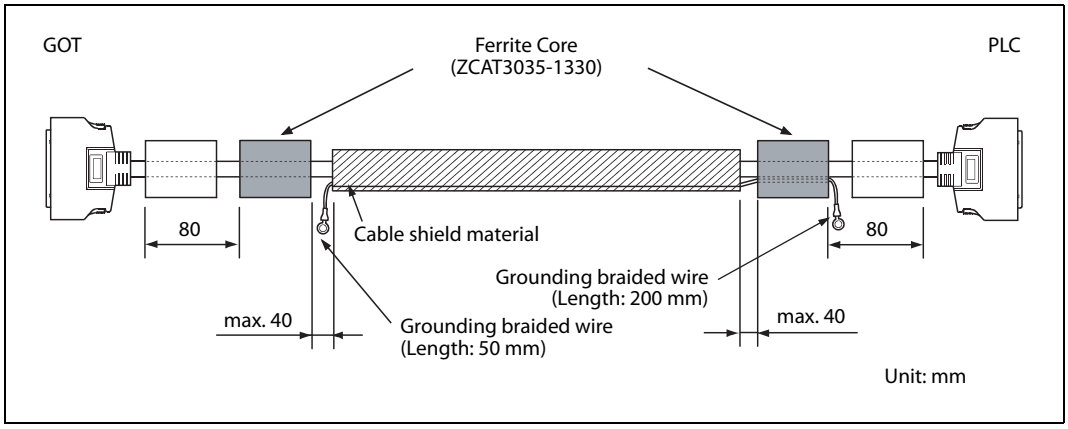


Fig. 4-9: *Processing other bus connection cables*

CPU direct connection

Attach the ferrite core to the cable in the position as illustrated below.

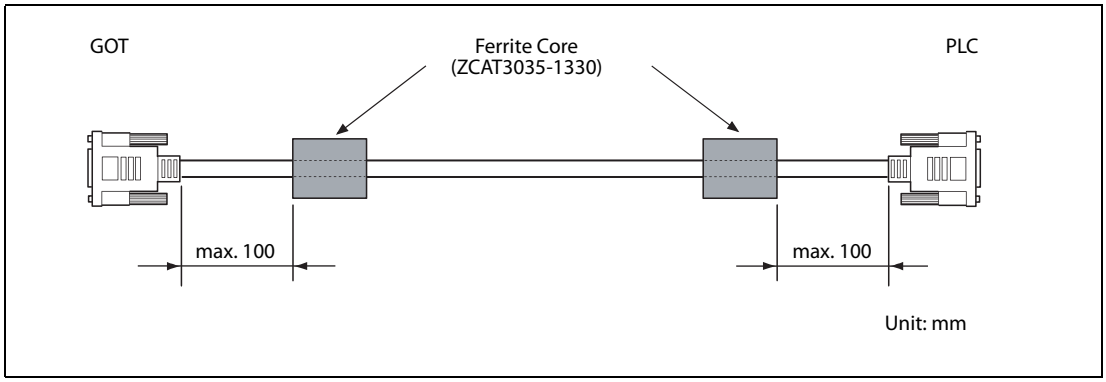


Fig. 4-10: *Processing RS-232 and RS-422 cables for direct connection and computer link connection*

Serial communication connection

Peel the sheath (with the length 40 mm) at both ends of the cable, and expose the shield braided wire for grounding. (For grounding with cable clamps AD75CK refer to section 4.4.3.)

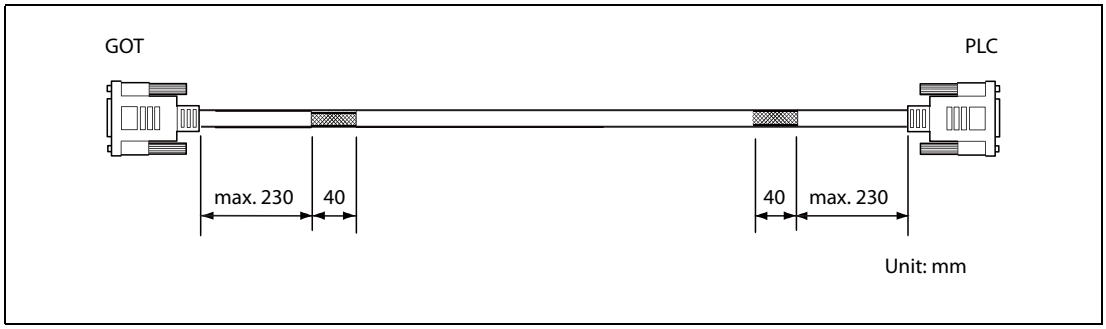


Fig. 4-11: *Processing RS-232 and RS-422 cables for serial communication connection*

For MELSECNET/H connection (PLC to PLC network)

– Strip the outer insulation layer at both ends of the cable (with the length 40 mm) to expose the braided shield for grounding. (For grounding with cable clamps AD75CK refer to section 4.4.3.)

– Attach two ferrite cores to the cable in the positions as illustrated below.

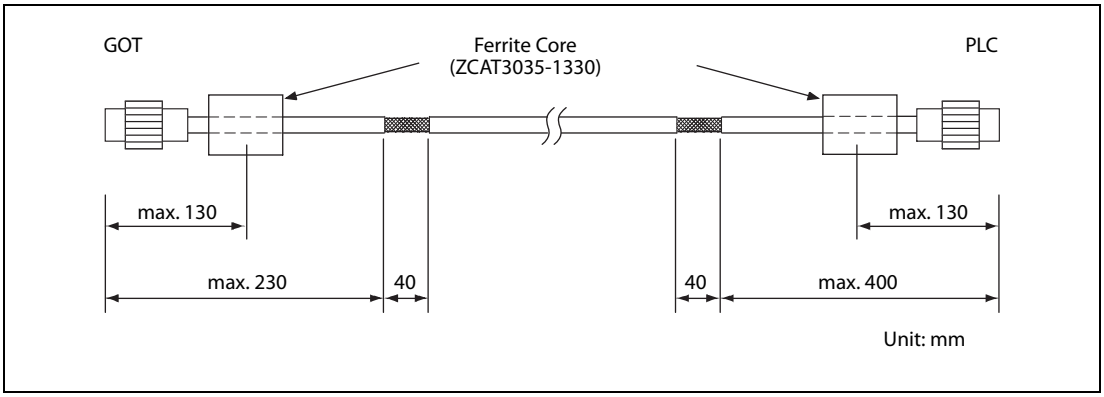


Fig. 4-12: *Processing coaxial cables for MELSECNET/H*

NOTE For optical fiber cable: Processing of the cable is not required.

CC-Link connection (Intelligent device station)

– Strip the outer insulation layer at both ends of the cable (with the length 40 mm) to expose the braided shield for grounding. (For grounding with cable clamps AD75CK refer to section 4.4.3.)

– Attach two ferrite cores to the cable in the positions as illustrated below.

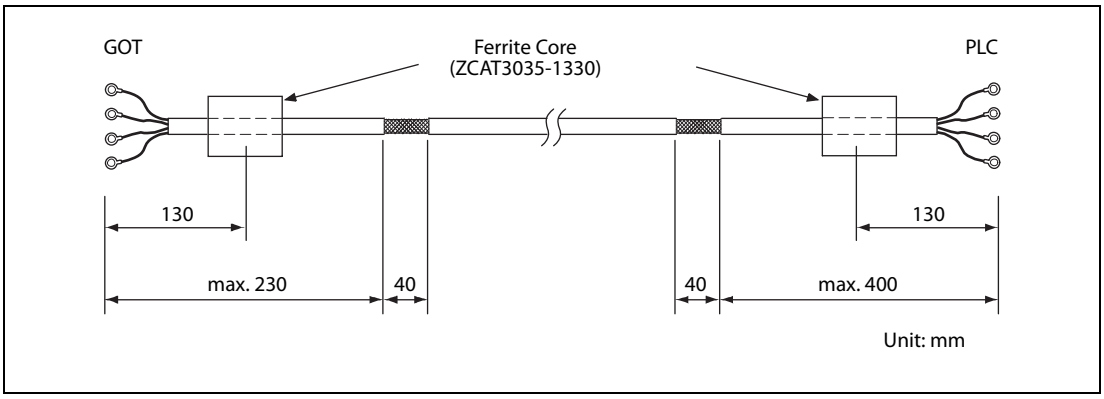


Fig. 4-13: *CC-Link dedicated cable for connecting the GOT and PLC*

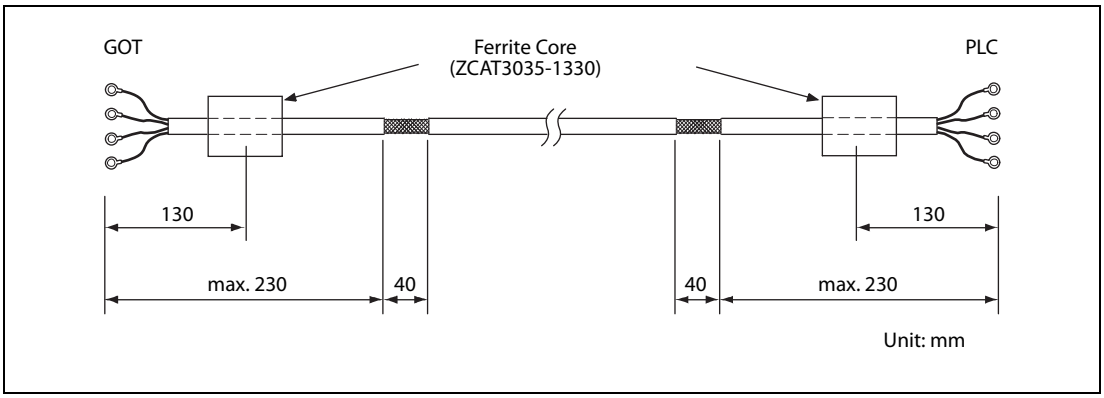


Fig. 4-14: *CC-Link dedicated cable for connecting the GOT and GOT*

CC-Link IE Field Network connection

– Strip the outer insulation layer at both ends of the cable (with the length 40 mm) to expose the braided shield for grounding. (For grounding with cable clamps AD75CK refer to section 4.4.3.)

– Attach a ferrite core to the cable in the positions as illustrated below.

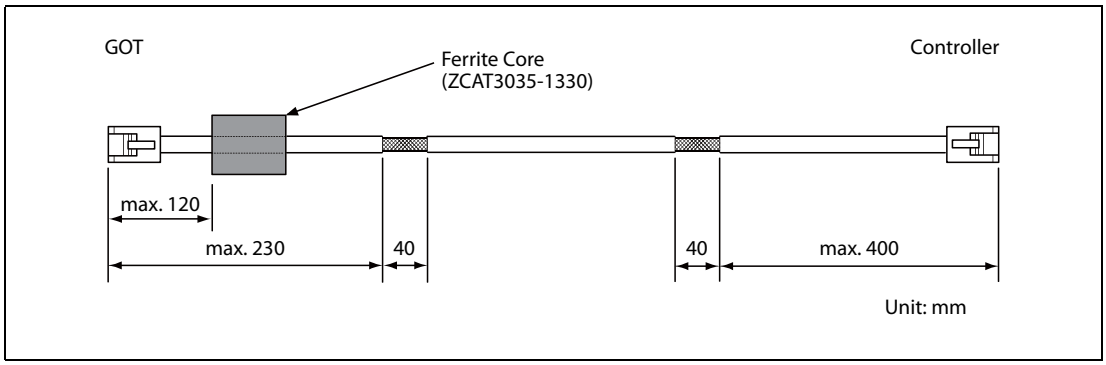


Fig. 4-15: *Processing cables for CC-Link IE Field Network connection*

Ethernet connection

● Ethernet connection

– Strip the outer insulation layer of the cable (with the length 40 mm) to expose the braided shield for grounding. (For grounding with cable clamps AD75CK refer to section 4.4.3.)

– Attach two ferrite cores to the cable in the positions as illustrated below.

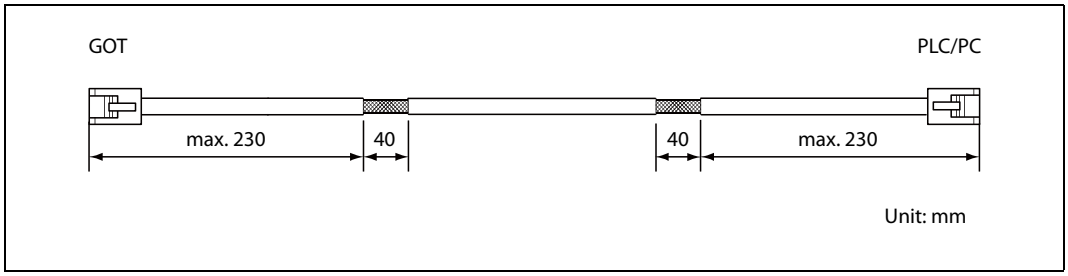


Fig. 4-16: *Processing cables for connection to the Ethernet interface of the GOT or the Ethernet communication unit (GT25-J71E71-100)*

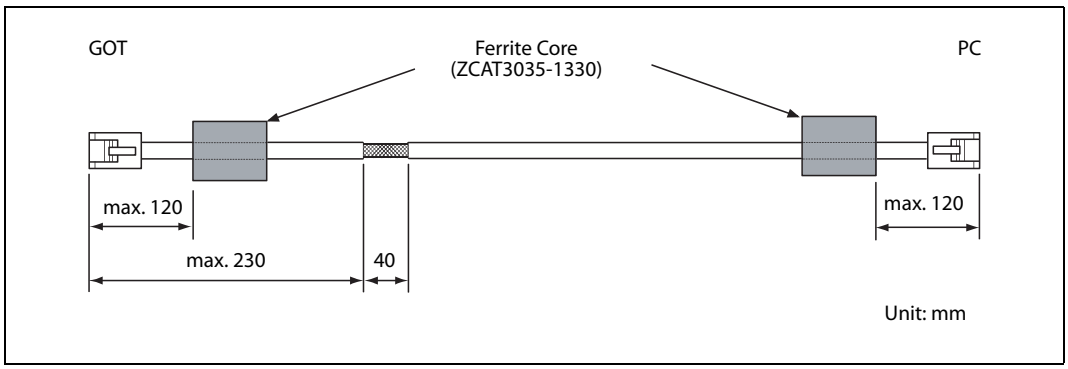


Fig. 4-17: *Processing cables for connection to the multimedia unit (GT27-MMR-Z)*

External I/O device connection

– Strip the outer insulation layer at both ends of the cable (with the length 40 mm) to expose the braided shield for grounding. (For grounding with cable clamps AD75CK refer to section 4.4.3.)

– Connect the braided shield to the connector with the connector cover.

– Twist power cables.

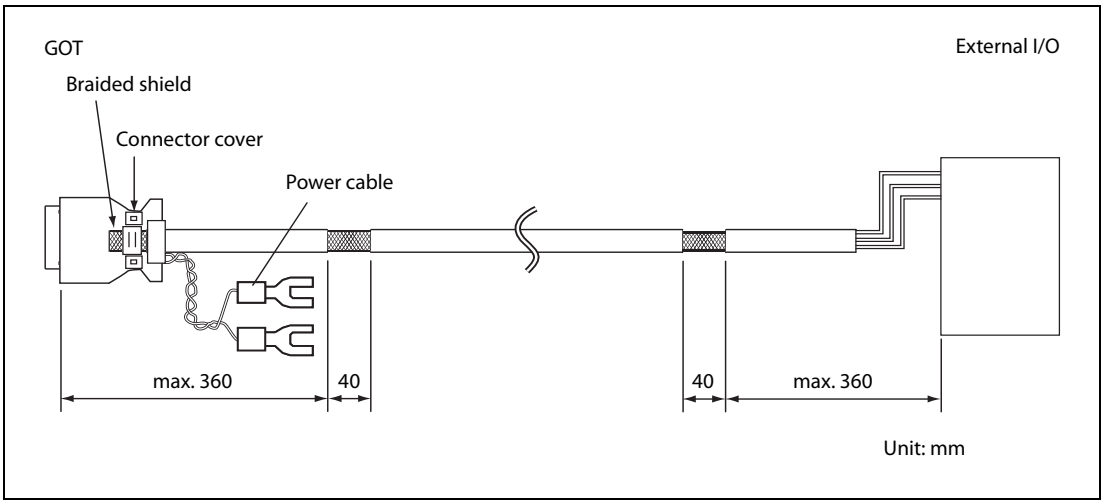


Fig. 4-18: *Processing cables for external I/O device connection*

Video/RGB connection

● Video input

– Strip the outer insulation layer at both ends of the cable (with the length 40 mm) to expose the braided shield for grounding. (For grounding with cable clamps AD75CK refer to section 4.4.3.)

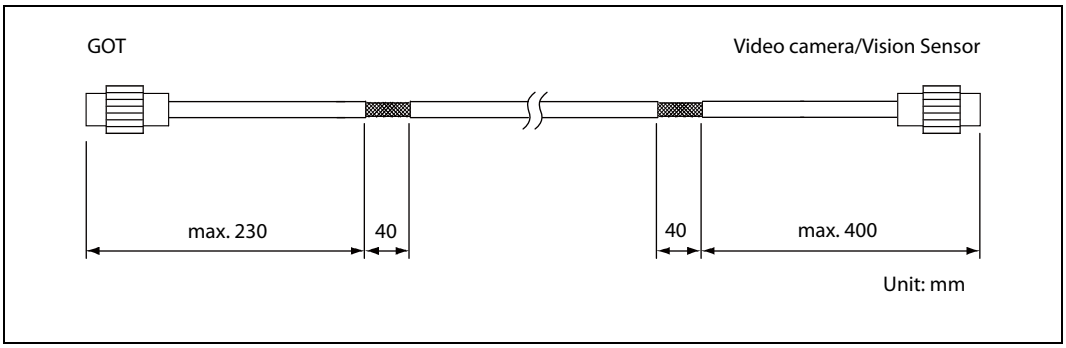


Fig. 4-19: *Processing cables for video input*

- RGB input
  - Wind cable shield material around the cable, and pull out the grounding braided wire of the cable shield material with the length shown below.
  - Attach a ferrite core to the cable in the positions as illustrated below.

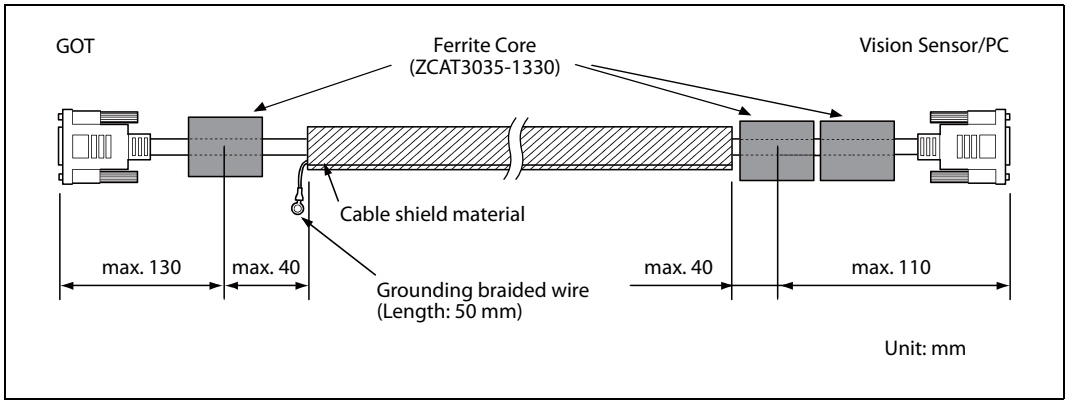


Fig. 4-20: *RGB input cable for GT2715*

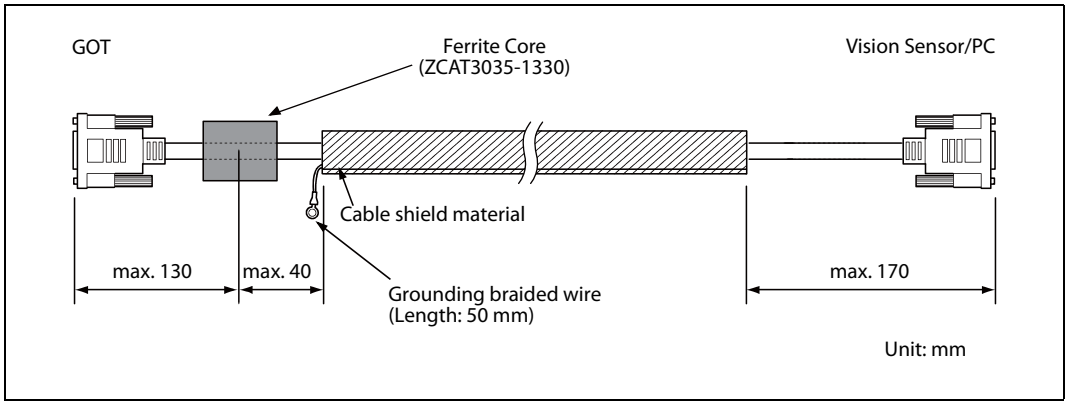


Fig. 4-21: *RGB input cable for GT2712,GT2710 and GT2708*

- RGB output
  - Wind cable shield material around the cable, and pull out the grounding braided wire of the cable shield material with the length shown below.
  - Attach ferrite cores to the cable in the positions shown below.

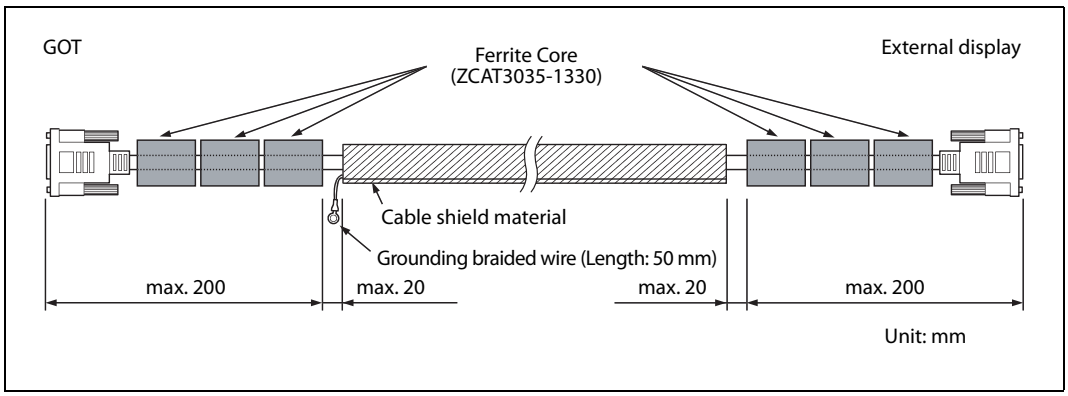


Fig. 4-22: *Processing cables for RGB output*

Sound output device connection (GT25-W only)

Attach ferrite cores to the cable in the positions shown below.

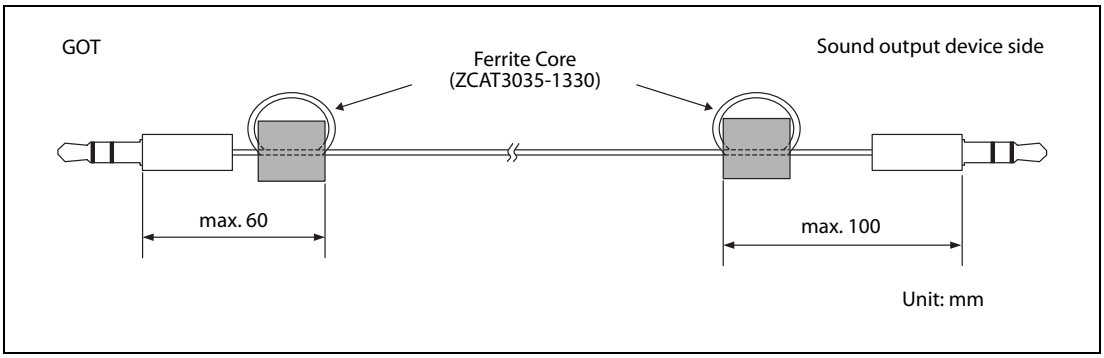


Fig. 4-23: *Sound output cable for GT25-W*

Cables for connection to other devices

Produce the cable (RS-232 cable, RS-422 / 485 cable) for connecting the GOT to other devices* than the above listed devices with reference to the following manual.

– GOT2000 Series Connection Manual

* For example PLC (manufactured by other company), microcomputer, temperature controller, inverter, servo amplifier, CNC, MODBUS(R)/RTU or MODBUS(R)/TCP connection.

● Notes for connecting the cables

Configure the system to meet the EMC Directive specifications for the connected device when connecting the GOT to a controller.

The following gives the instructions to ensure the machinery comply with the EMC Directive. However, the manufacturer of the machinery must finally determine how to make it comply with the EMC Directives and if it is actually compliant with the EMC Directives.

– For RS-232 cable

Twist each signal wire (except SG and FG wires) with the SG wire.

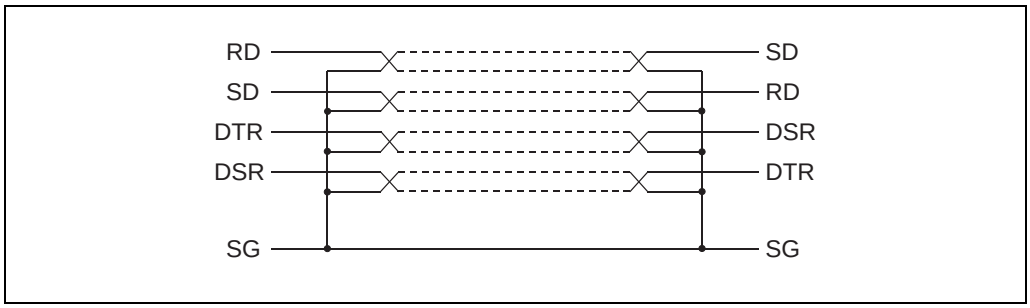


Fig. 4-24: *Assignment of the individual cores of a RS232 cable*

– For RS-422/485 cable

Use a twisted pair style for each signal wire as shown below.

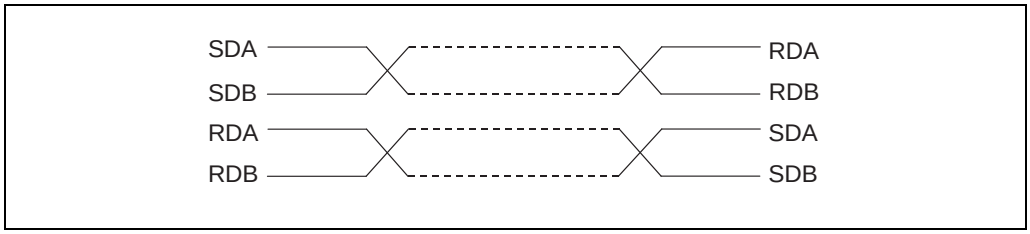


Fig. 4-25: *Assignment of the individual cores of a RS422/485 cable*

Attach two ferrite cores to the cable in the position as illustrated below.

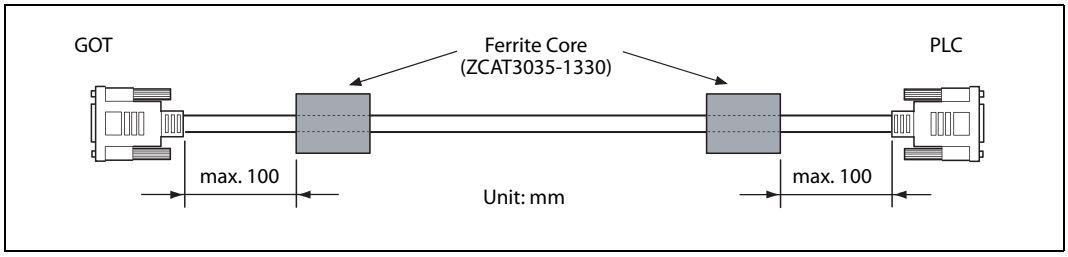


Fig. 4-26: *Ferrite core position (RS-232 or RS-422/485 cable)*

4.4.3 Grounding the cable

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

Ground the braided shield portion of the cable (see section 4.4.2) to the control panel with the cable clamp (AD75CK).

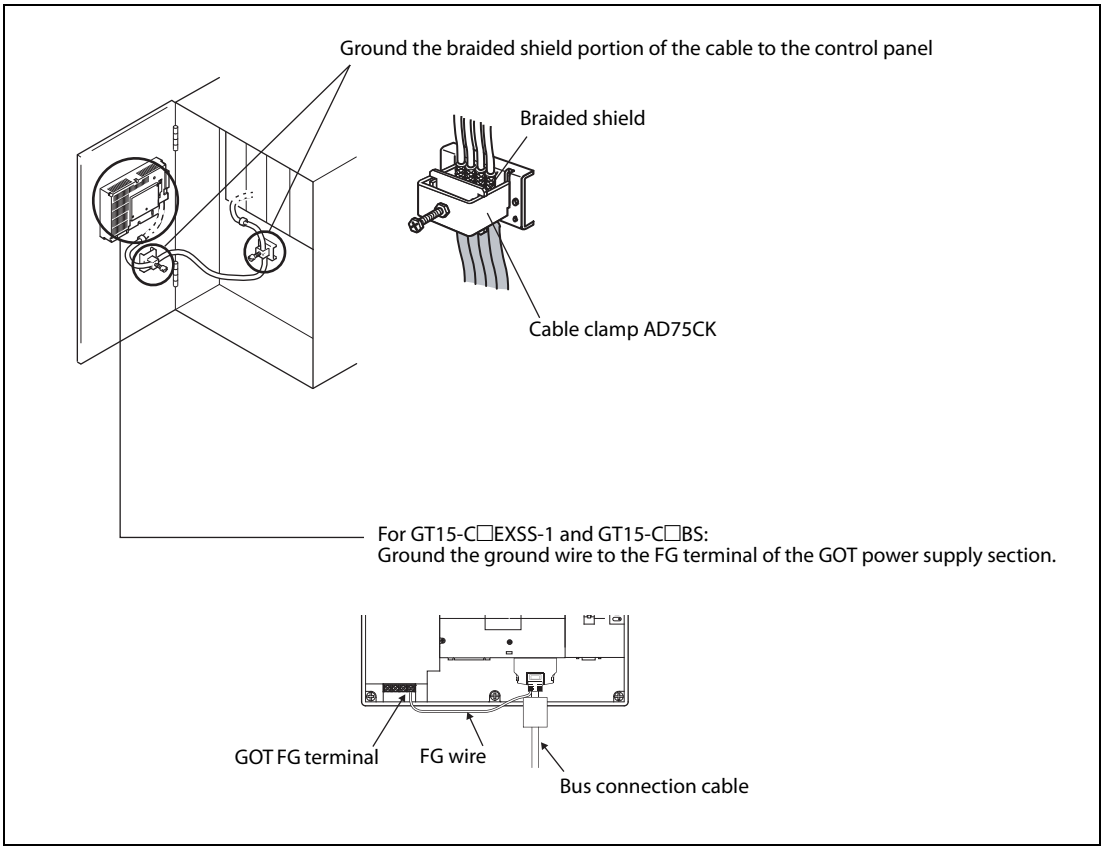


Fig. 4-27: *Grounding the cable*

Do not arrange the cable clamp adjacent to other cables which do not clamp. Noise from the control panel may access the GOT from the cable clamp and cause adverse effects

5 Installation

Use the GOT in the environment that satisfies the general specifications described in this manual. Do not expose the GOT to dust, lamp soot, conductive dust, corrosive gas, or combustible gas; high-temperature, condensing, wind or rain; or to vibrations and impact.

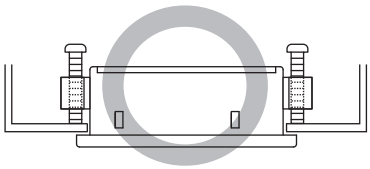
Failure to do so can cause an electric shock, fire, malfunction or product damage or deterioration.

NOTES

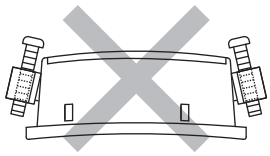
Do not drop chips or wire scraps near the ventilation window of the GOT when processing screw holes or wiring. Failure to do so can cause a fire, failure or malfunction.

Tighten mounting screws within the specified torque range.
Undertightening can cause the GOT to drop.
In addition, waterproof effect or oilproof effect may not be obtained.
Tightening the screws with more than the specified torque range may damage the GOT or distort the panel, causing wrinkles on the surface of the display section. The wrinkles may lower visibility and lead to an incorrect input to the touch panel.
Waterproof effect or oilproof effect may not be obtained because of distortion of the GOT or panel.

When tightening the mounting screws, tighten each of the screws gradually and evenly.
Tightening a fitting with excessive concentration of force may damage the GOT or distort the panel.
– Tighten the mounting screws at right angles to the surface of the panel. (See the left figure below.)
– If mounting screws are not at right angles to the surface of the panel, excessive force will be applied and may damage the GOT. (See right figure below.)



Good example



Bad example

Make sure to install the connection cable to the connector specified and to execute the assembly and disassembly of an option card during the power OFF.
Failure to do so may cause a malfunction due to the poor contact.

5.1 Installation on the Control Panel

Install the GOT and the SD card extension unit on the control panel out of the way for the equipment inside the control panel. Do not install the GOT and the unit in prohibited areas for the installation.

Determine the panel thickness considering the panel strength. (For example, even though the panel has thickness within the range, the strength may be insufficient depending on the material and size. Insufficient panel strength may result in warpage depending on the installation position of the GOT and other devices.)

NOTE

Some cables may need to be longer than the specified dimensions when connecting to the GOT. Therefore, consider the connector dimensions and bending radius of the cable as well for installation.

5.2 Panel Cut Dimensions

Open an installation hole on the control panel with the dimensions as shown below.

5.2.1 GT27

GT2715-X

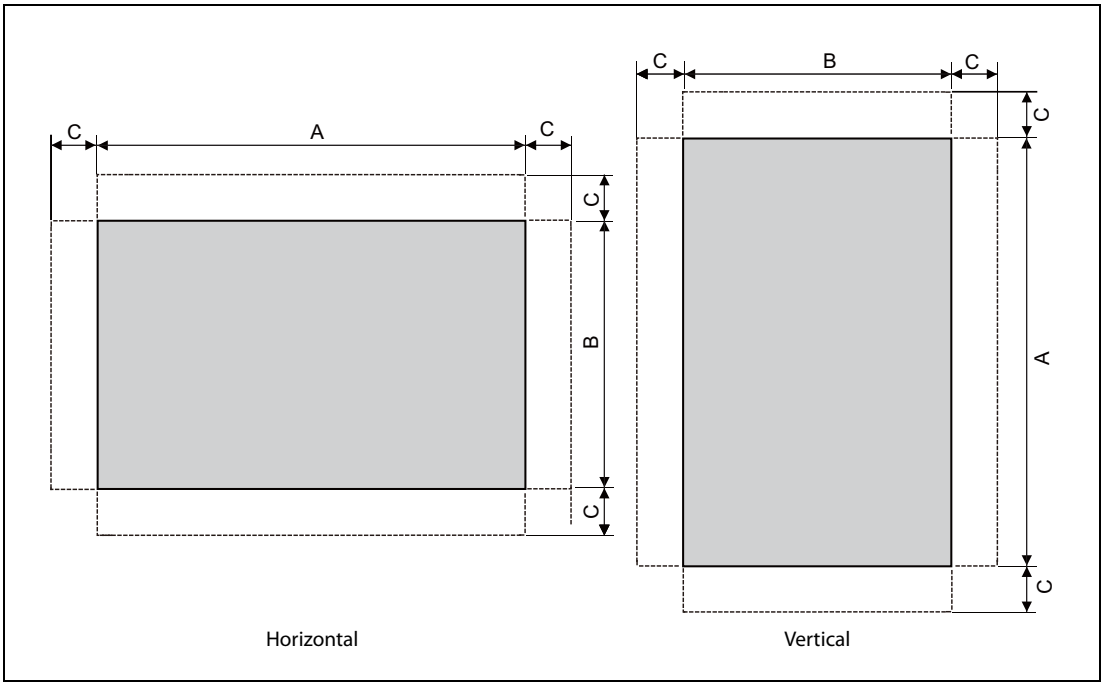


Fig. 5-1: *Panel cut out for GT2715-X*

GOT Model	A [mm]	B [mm]	C [mm]	Panel thickness [mm]
GT2715-X	383.5 (+2.0)	282.5 (+2.0)	10 or more	1.6 to 4

Tab. 5-1: *Panel cut dimensions for GT2715-X*

The C dimension shows the measurements for installing fittings on the control panel.

GT2712-S, GT2710-S, GT2710-V, GT2708-S, GT2708-V, GT2705-V

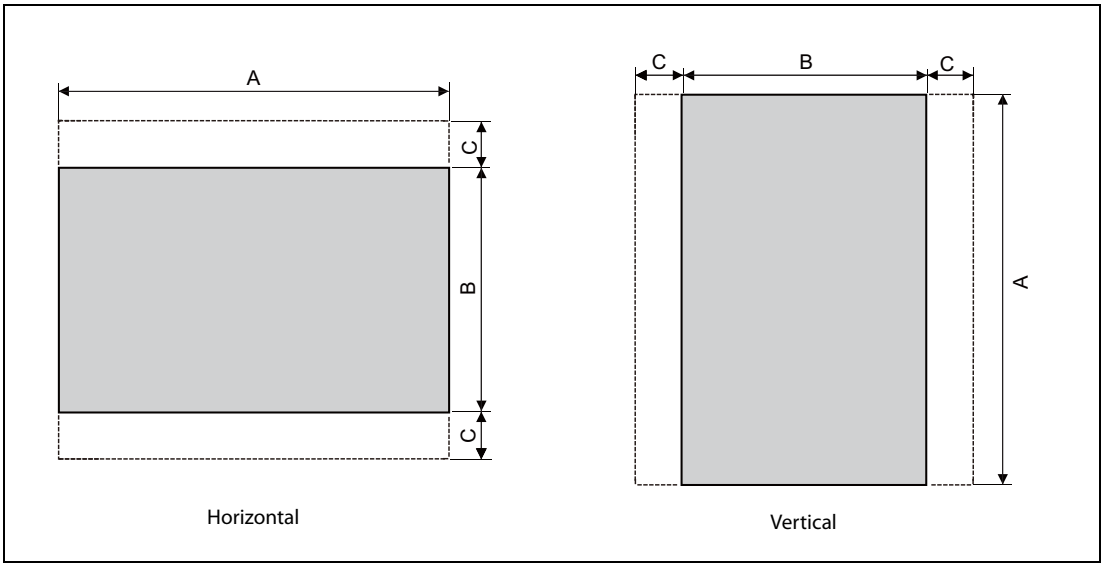


Fig. 5-2: *Panel cut out for GT27 (except GT2715-X)*

GOT Model	A [mm]	B [mm]	C [mm]	Panel thickness [mm]
GT2712-S	302.0 (+2.0)	228.0 (+2.0)	10 or more	1.6 to 4
GT2710-S, GT2710-V	289.0 (+2.0)	200.0 (+2.0)		
GT2708-S, GT2708-V	227.0 (+2.0)	176.0 (+2.0)		
GT2705-V	153.0 (+2.0)	121.0 (+2.0)		

Tab. 5-2: *Panel cut dimensions for GT2712-S, GT2710-S, GT2710-V, GT2708-S, GT2708-V, GT2705-V*

The C dimension shows the measurements for installing fittings on the control panel.

5.2.2 GT2510-WX, GT2507-W, GT2507T-W

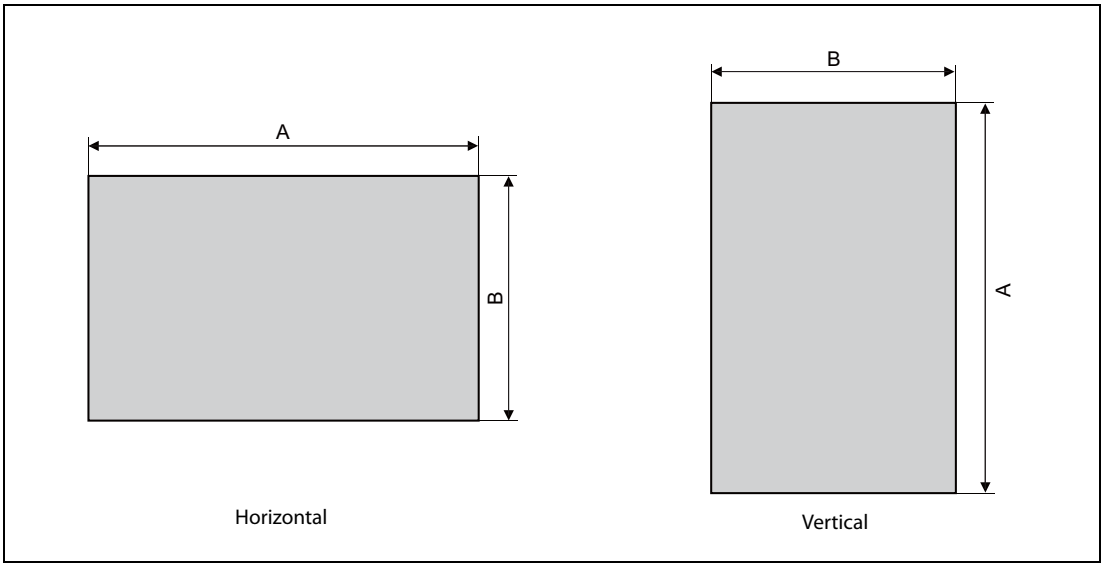


Fig. 5-3: *Panel cut out for GT2510-WX, GT2507-W and GT2507T-W*

GOT Model	A [mm]	B [mm]	Panel thickness [mm]
GT2510-WX	243.5 (+1.0)	185.5 (+1.0)	1.6 to 4
GT2507-W	180.5 (+1.0)	133.5 (+1.0)	
GT2507T-W	197 (+1.0)	141 (+1.0)	

Tab. 5-3: *Panel cut dimensions for GT2510-WX, GT2507-W and GT2507T-W*

5.2.3 GT25-S, GT25-V

GT2512-S, GT2510-V, GT2508-V, GT2505-V

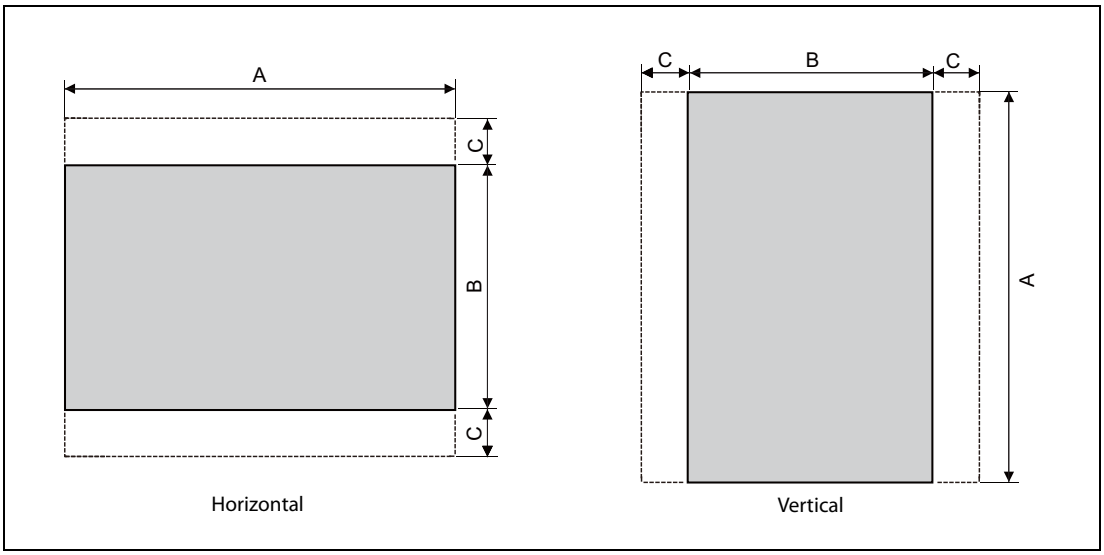


Fig. 5-4: *Panel cut out for GT2512-S, GT2510-V, GT2508-V and GT2505-V*

GOT Model	A [mm]	B [mm]	C [mm]	Panel thickness [mm]
GT2512-S	302.0 (+2.0)	228.0 (+2.0)	10 or more	1.6 to 4
GT2510-V	289.0 (+2.0)	200.0 (+2.0)		
GT2508-V	227.0 (+2.0)	176.0 (+2.0)		
GT2505-V	153.0 (+2.0)	121.0 (+2.0)		

Tab. 5-4: *Panel cut dimensions for GT2512-S, GT2510-V, GT2508-V and GT2505-V*

The C dimension shows the measurements for installing fittings on the control panel.

GT2512F-S, GT2510F-V, GT2508F-V

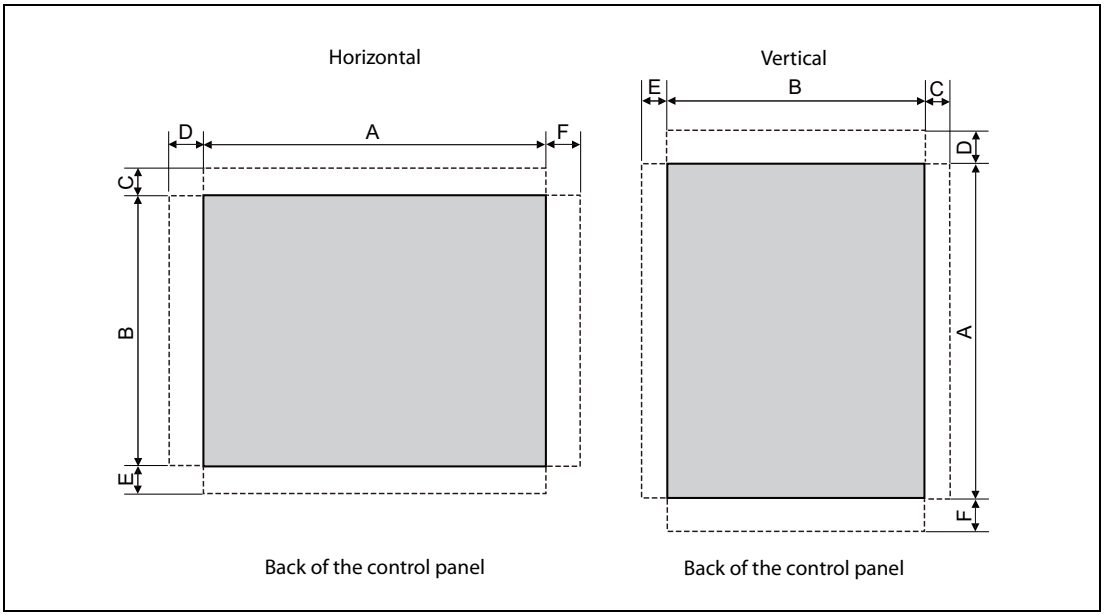


Fig. 5-5: *Panel cut out for GT2512F-S, GT2510F-V and GT2508F-V*

Fitting installation on the long side of the GOT

GOT Model	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Panel thickness [mm]
GT2512F-S	269 (+2.0)	214 (+2.0)	28	17	36	26	1.5 to 4
GT2510F-V	234 (+2.0)	187 (+2.0)	28	33	32	33	
GT2508F-V	194 (+2.0)	158 (+2.0)	28	14	32	29	

Tab. 5-5: *Panel cut dimensions for GT2512F-S, GT2510F-V and GT2508F-V (Fittings on long side)*

Fitting installation on the short side of the GOT

GOT Model	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Panel thickness [mm]
GT2512F-S	269 (+2.0)	214 (+2.0)	10	35	18	44	1.5 to 4
GT2510F-V	234 (+2.0)	187 (+2.0)	10	51	14	51	
GT2508F-V	194 (+2.0)	158 (+2.0)	10	32	14	47	

Tab. 5-6: *Panel cut dimensions for GT2512F-S, GT2510F-V and GT2508F-V (Fittings on short side)*

The C to F dimensions show the measurements for installing fittings on the control panel.

Additionally, install studs on the control panel. For information on how to install studs, refer to section 5.3.

5.2.4 GT23

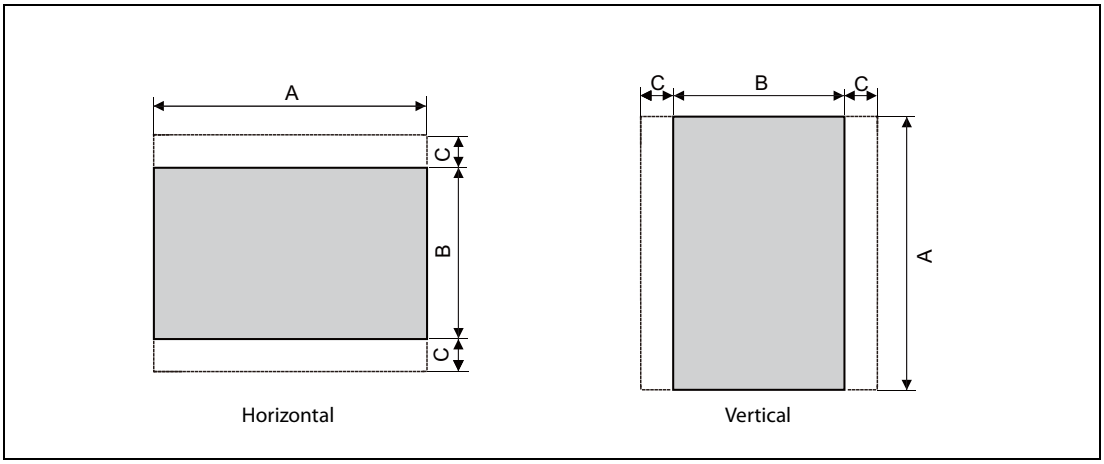


Fig. 5-6: *Panel cut out for GT23*

GOT Model	A [mm]	B [mm]	C [mm]	Panel thickness [mm]
GT2310	289.0 (+2.0)	200.0 (+2.0)	10 or more	1.6 to 4
GT2308	227.0 (+2.0)	176.0 (+2.0)		

Tab. 5-7: *Panel cut dimensions for GT23*

The C dimension shows the measurements for installing fittings on the control panel.

5.2.5 GT21

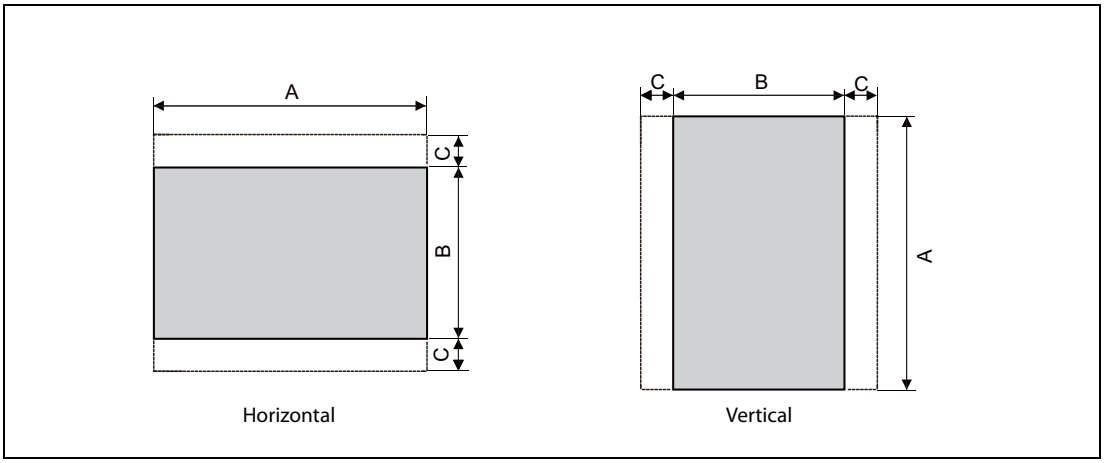


Fig. 5-7: *Panel cut out for GT21*

GOT Model	A [mm]	B [mm]	C [mm]	Panel thickness [mm]
GT2104-R	118 (+1.0)	92 (+1.0)	13 or more	1.0 to 4
GT2103-P	105 (+1.0)	66 (+1.0)		

Tab. 5-8: *Panel cut dimensions for GT21*

The C dimension shows the measurements for installing fittings on the control panel.

5.2.6 GS21

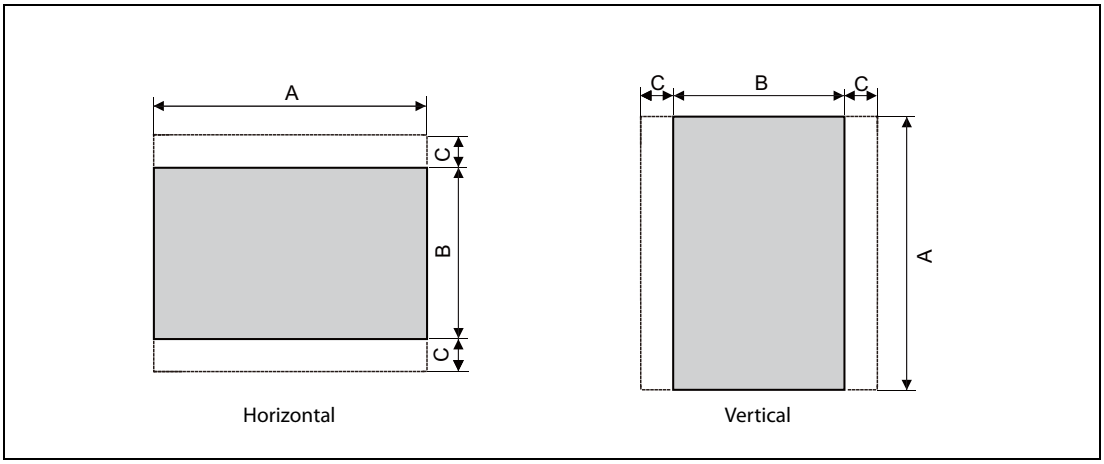


Fig. 5-8: *Panel cut out for GS21 (Simple GOT)*

GOT Model	A [mm]	B [mm]	C [mm]	Panel thickness [mm]
GS2110	258.0 (+2.0)	200.0 (+2.0)	10 or more	1.6 to 4
GS2107	191.0 (+2.0)	137.0 (+2.0)		

Tab. 5-9: *Panel cut dimensions for GS21 (Simple GOT)*

The C dimension shows the measurements for installing fittings on the control panel.

5.3 Stud (GT2512F-S, GT2510F-V and GT2508F-V only)

To mount a GT2512F-S, GT2510F-V or GT2508F-V on the control panel, studs are necessary.

Align the studs with the installation holes of the fittings, and install the studs. The fittings must be installed on the top and bottom, or the right and left of the GOT.

For GT2512F it is recommended to install the fittings on the long sides of the GOT.

5.3.1 Stud specifications

Use studs that satisfy the following specifications:

- Diameter (thread): M4
- Length: 10 mm or more

The studs on the control panel must have strength adequate to withstand a tightening torque of 0.9 Nm or more.

Make sure that no foreign matter such as welding waste is at and around the bases of the studs.

Tighten nuts on the studs in the specified torque range (0.8 N•m to 0.9 N•m) with a wrench for M4 nuts.

5.3.2 Distance between studs

Measurements based on the screen center

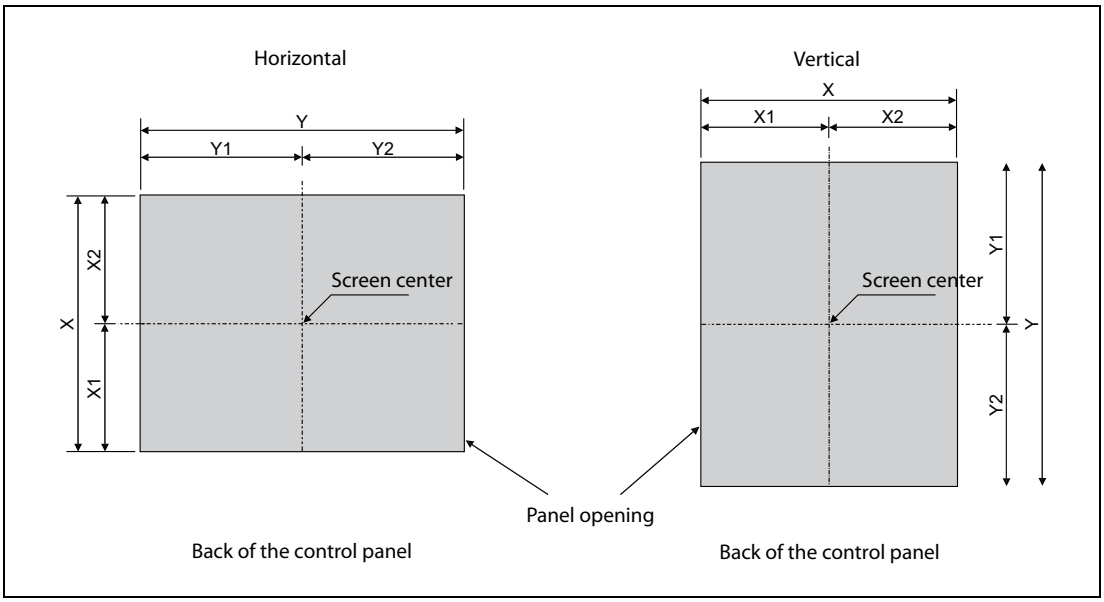


Fig. 5-9: *Distances based on the screen center*

GOT Model	X [mm]	X1 [mm]	X2 [mm]	Y [mm]	Y1 [mm]	Y2 [mm]
GT2512F-S	214 (+2.0)	103 (+2.0)	(111)	269 (+2.0)	134.5 (+1.0)	(134.5)
GT2510F-V	187 (+2.0)	89.5 (+1.0)	(97.5)	234 (+2.0)	117 (+1.0)	(117)
GT2508F-V	158 (+2.0)	75.25 (+1.0)	(82.75)	194 (+2.0)	97.5 (+1.0)	(96.5)

Tab. 5-10: *Measurements based on the screen center*

Measurements for a horizontally-oriented GOT with fittings on its top and bottom

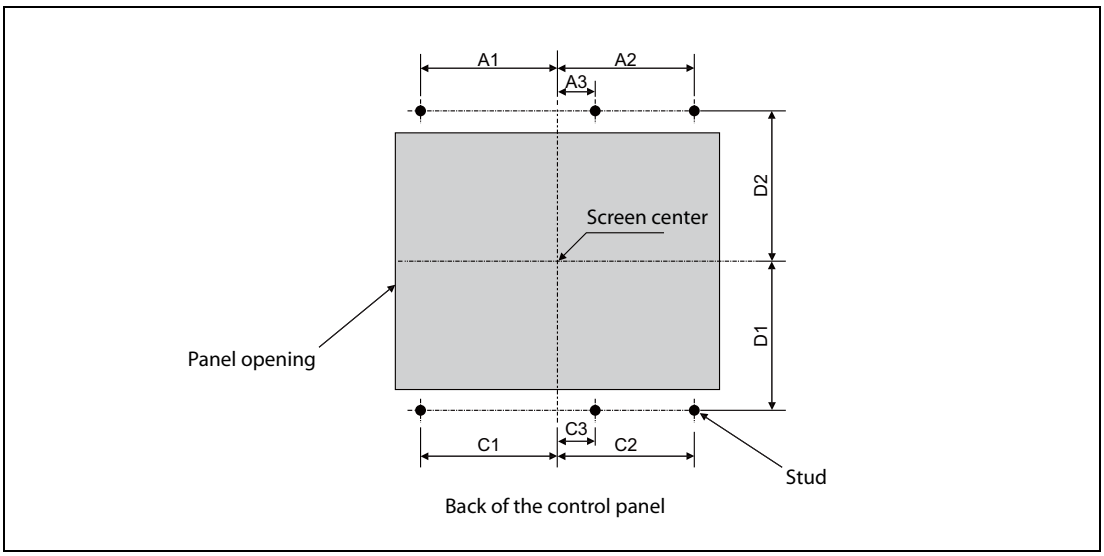


Fig. 5-10: *Distances for a horizontally-oriented GOT (fittings on its top and bottom)*

GOT Model	A1 [mm]	A2 [mm]	A3 [mm]	C1 [mm]	C2 [mm]	C3 [mm]	D1 [mm]	D2 [mm]
GT2512F-S	98 (±0.15)	113 (±0.15)	7.5 (±0.15)	98 (±0.15)	113 (±0.15)	7.5 (±0.15)	128 (±0.15)	132.5 (±0.15)
GT2510F-V	105.5 (±0.15)		0	105.5 (±0.15)		0	114.5 (±0.15)	118.5 (±0.15)
GT2508F-V	64.5 (±0.15)	75.5 (±0.15)	—	64.5 (±0.15)	74.5 (±0.15)	—	104.5 (±0.15)	

Tab. 5-11: *Measurements for a horizontally-oriented GOT (fittings on its top and bottom)*

Measurements for a horizontally-oriented GOT with fittings on its right and left

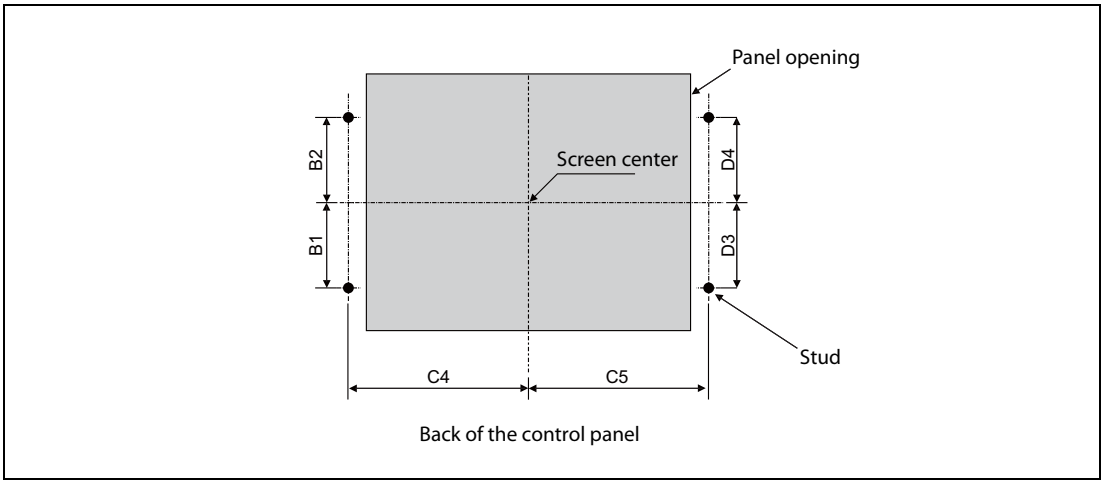


Fig. 5-11: *Distances for a horizontally-oriented GOT (fittings on its right and left)*

GOT Model	B1 [mm]	B2 [mm]	C4 [mm]	C5 [mm]	D3 [mm]	D4 [mm]
GT2512F-S	75.5 (±0.15)	79.5 (±0.15)	160 (±0.15)	175 (±0.15)	75.5 (±0.15)	79.5 (±0.15)
GT2510F-V	58 (±0.15)		161 (±0.15)		58 (±0.15)	
GT2508F-V	58 (±0.15)		126 (±0.15)	134 (±0.15)	58 (±0.15)	

Tab. 5-12: *Measurements for a horizontally-oriented GOT (fittings on its right and left)*

Measurements for a vertically-oriented GOT with fittings on its top and bottom

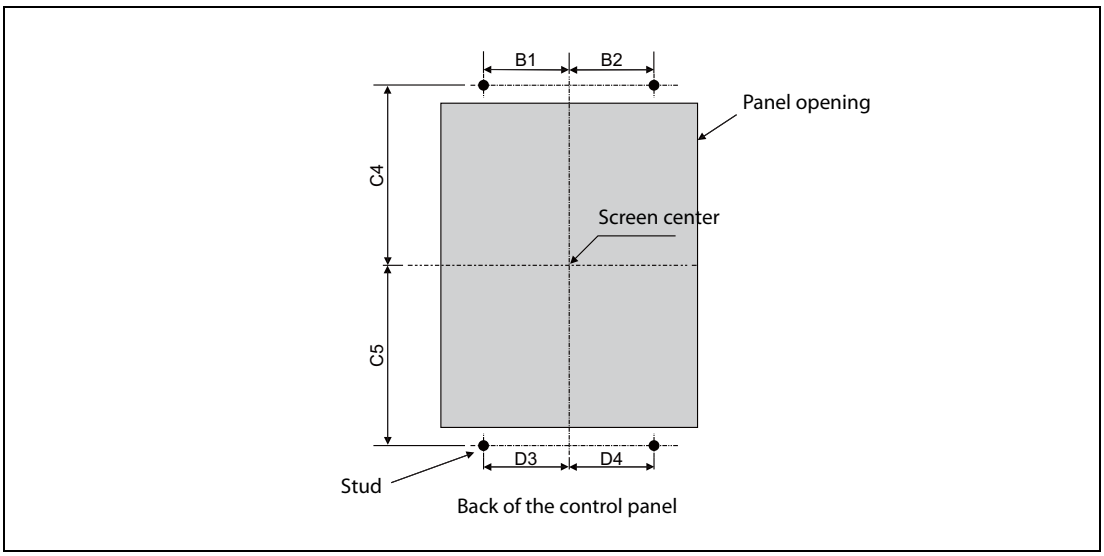


Fig. 5-12: *Distances for a vertically-oriented GOT (fittings on its top and bottom)*

GOT Model	B1 [mm]	B2 [mm]	C4 [mm]	C5 [mm]	D3 [mm]	D4 [mm]
GT2512F-S	75.5 (±0.15)	79.5 (±0.15)	160 (±0.15)	175 (±0.15)	75.5 (±0.15)	79.5 (±0.15)
GT2510F-V	58 (±0.15)		161 (±0.15)		58 (±0.15)	
GT2508F-V	58 (±0.15)		126 (±0.15)	134 (±0.15)	58 (±0.15)	

Tab. 5-13: *Measurements for a vertically-oriented GOT (fittings on its top and bottom)*

Measurements for a vertically-oriented GOT with fittings on its right and left

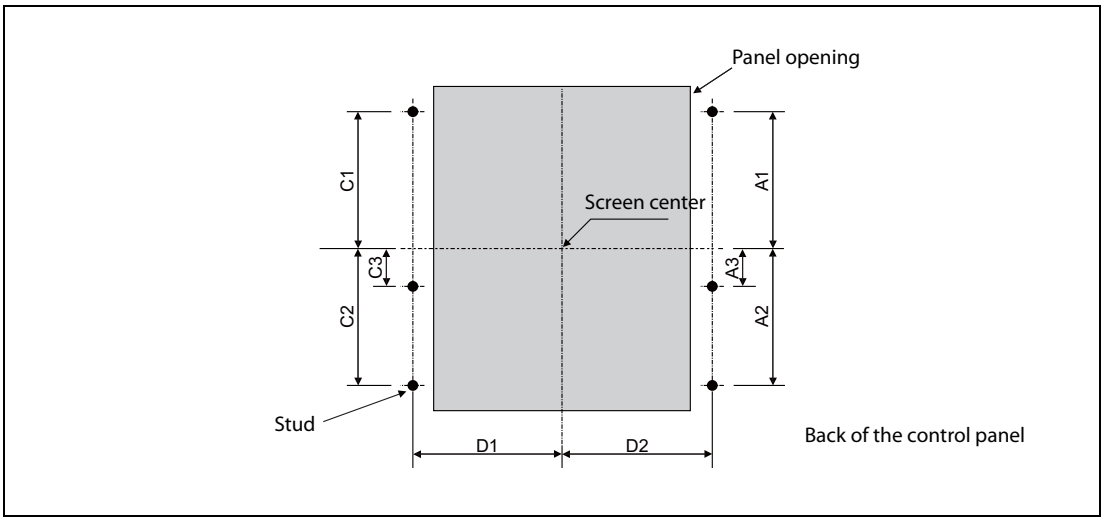


Fig. 5-13: *Distances for a vertically-oriented GOT (fittings on its right and left)*

GOT Model	A1 [mm]	A2 [mm]	A3 [mm]	C1 [mm]	C2 [mm]	C3 [mm]	D1 [mm]	D2 [mm]
GT2512F-S	98 (±0.15)	113 (±0.15)	7.5 (±0.15)	98 (±0.15)	113 (±0.15)	7.5 (±0.15)	128.5 (±0.15)	132.5 (±0.15)
GT2510F-V	105.5 (±0.15)		0	105.5 (±0.15)		0	114.5 (±0.15)	118.5 (±0.15)
GT2508F-V	64.5 (±0.15)	74.5 (±0.15)	—	64.5 (±0.15)	74.5 (±0.15)	—	104.5 (±0.15)	

Tab. 5-14: *Measurements for a vertically-oriented GOT (fittings on its right and left)*

5.4 Distance required between the GOT and other Devices

When mounting the GOT, some distance is required between the GOT and other devices. Depending on the units and cables connected to the GOT, clearances more than the described dimensions may be required. Install the GOT with consideration of the connector dimensions and the cable bend radius.
For the vertical installation, install the GOT so that the vertical installation arrow printed on the GOT rear face points upward.
According to the dimensions in the following tables, leave clearances between the GOT and other devices. The values enclosed in square brackets apply to the case where no other equipment generating radiated noise (such as a contactor) or heat is installed near the GOT. However, keep the ambient temperature of the GOT to 55 °C or lower (65 °C or lower for GT2507T-W).

5.4.1 Distances for GT27

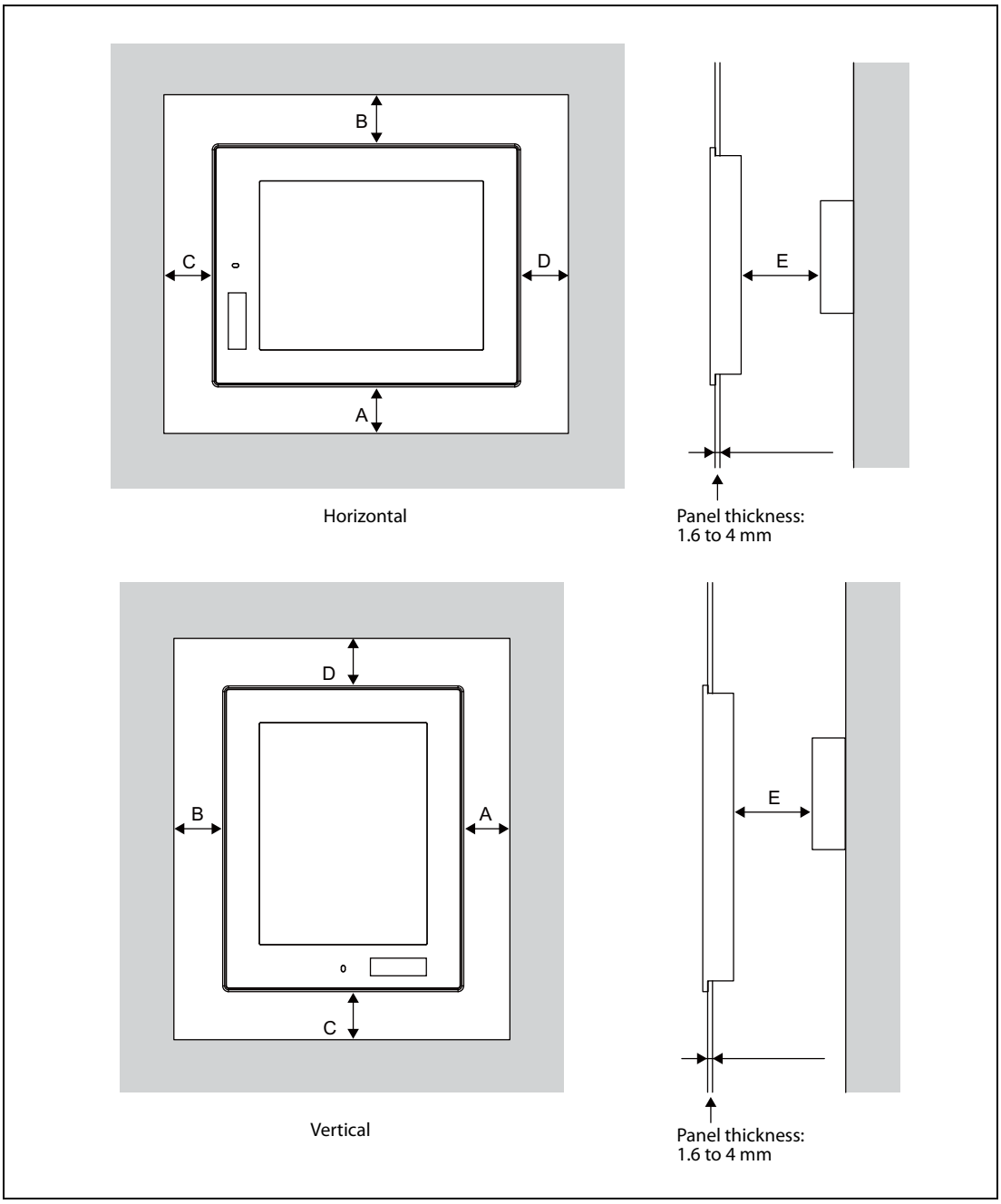


Fig. 5-14: *Distance between the GT27 and other devices.*

Clearance	Condition	GT27				
		GT2715-X	GT2712-S	GT2710-S GT2710-V	GT2708-S GT2708-V	GT2705-V
A	GOT only	48 [18]			48 [29]	59
	Ethernet communication unit fitted	48 [18]				
	Bus connection unit is fitted	48 [18]			23 [29]	48
	Serial connection unit is fitted	48 [18]				47
	CC-Link communication unit (GT15-J61BT13) fitted	48 [18]				50 [22]
	MELSECNET/H communication unit (coaxial) fitted①	48 [18]	48 [38]	48 [45]	67	81
	MELSECNET/H communication unit (optical) fitted②	48 [18]				77
	CC-Link IE Controller Network communication unit fitted	48 [18]				55
	CC-Link IE Field Network communication unit fitted	48 [18]				55
	Video input unit fitted①	48 [18]	48 [38]	48 [45]	67	—
	RGB input unit fitted③	48 [18]				—
	Video/RGB input unit fitted①③	48 [18]	48 [38]	48 [45]	67	—
	RGB output unit fitted③	48 [18]				—
	Multimedia unit fitted①	48 [18]	48 [38]	48 [45]	67	—
	Printer unit fitted	48 [18]				
	External I/O unit fitted	48 [18]				
	Sound output unit fitted	48 [18]				
B		Horizontal: 78 [18] Vertical: 48 [18]				
C	When the SD card is used	50 [20]			50	100
	When the SD card is not used	50 [20]				
D		Horizontal: 50 [20] Vertical: 80 [20]				
E④		100 [20]				

Tab. 5-15: *Minimum clearances [mm] required between the GT27 and other devices.*

① This value is for use of the coaxial cable 3C-2V (JIS C 3501). For specifications of the cable, refer to the GOT2000 Series Connection Manual for a controller used.

② This value differs depending on the cable used.

③ This value differs depending on the cable used. If the bending radius of the cable used is greater than the value specified above, apply the value of the cable used.

④ When opening or closing the battery cover: 72 mm or more

5.4.2 Distances for GT2510-WX, GT2507-W and GT2507T-W

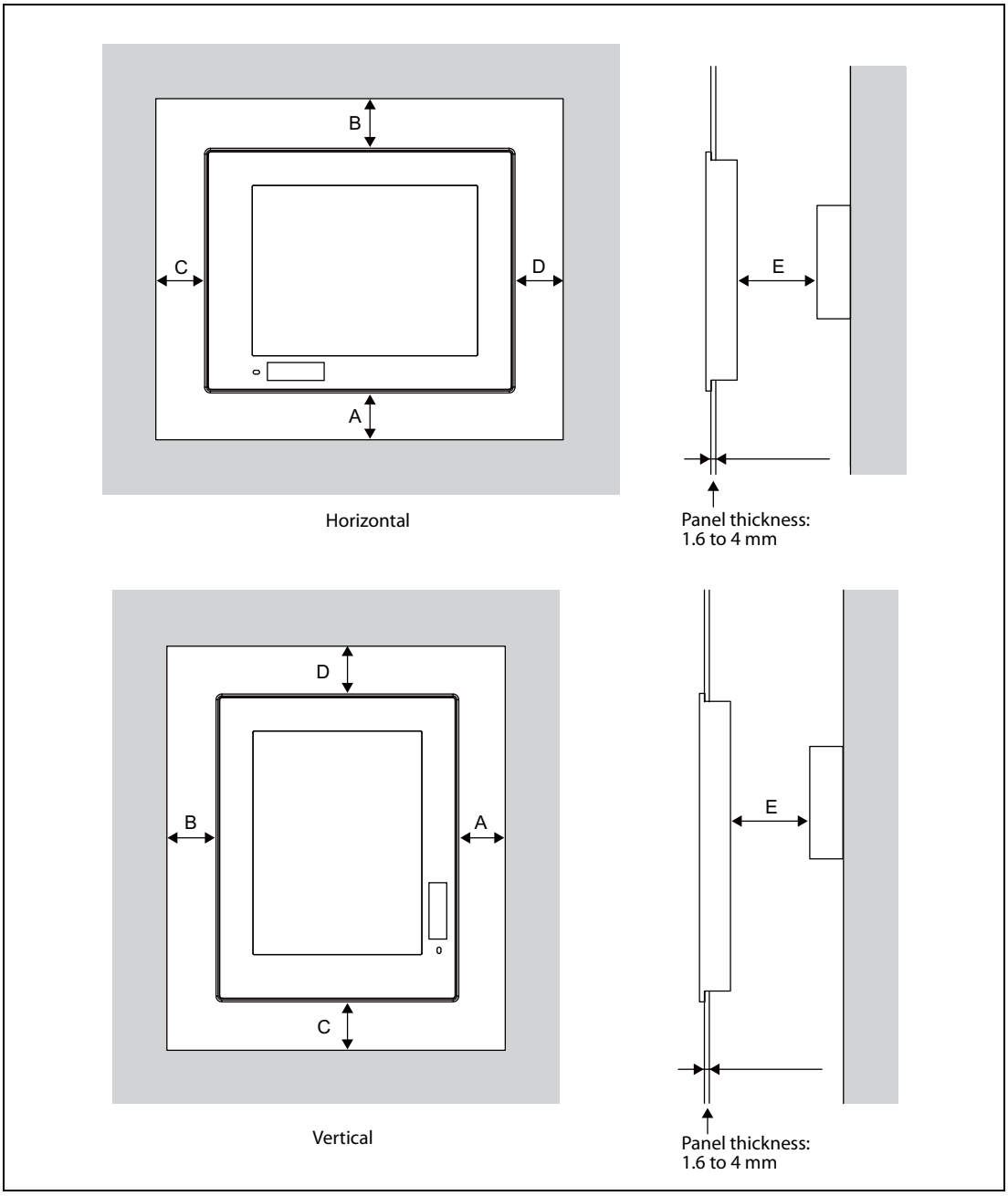


Fig. 5-15: *Distances between the GT2510-WX, GT2507-W or GT2507T-W and other devices.*

Clearance	GT25		
	GT2510-WX	GT2507-W	GT2507T-W
A	51 [23]	64	64
B	Horizontal: 81 [23] Vertical: 53 [23]		
C	53 [23]	53 [32]	53 [32]
D	Horizontal: 53 [23] Vertical: 81 [23]		
E	100 [20] (When opening or closing the battery cover: 72 mm or more)		

Tab. 5-16: *Minimum clearances [mm] required between the GOT and other devices.*

5.4.3 Distances for GT25

GT2512-S, GT2510-V, GT2508-V

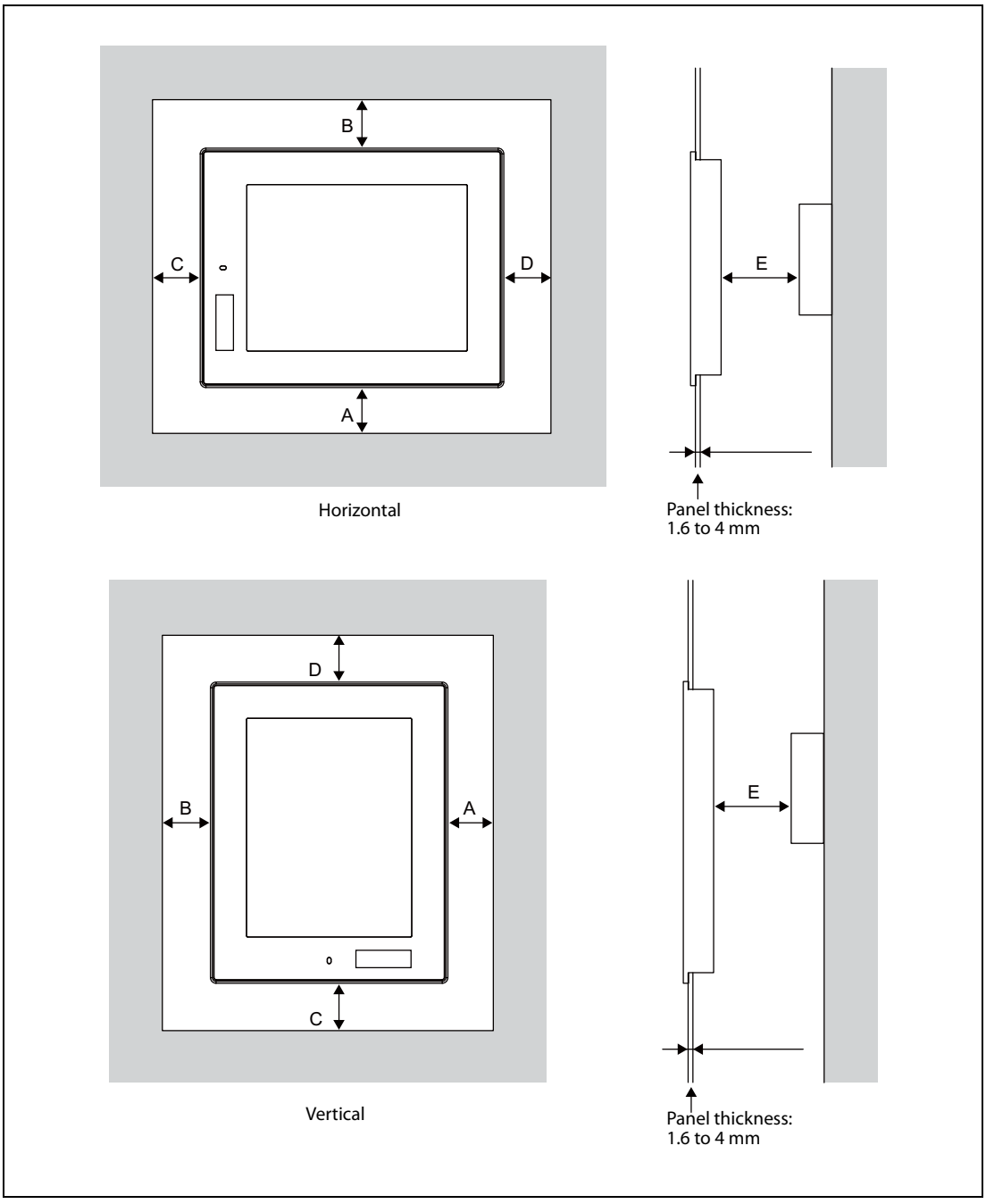


Fig. 5-16: *Distances between the GT2512-S, GT2510-V or GT2508-V and other devices.*

GT2505-V

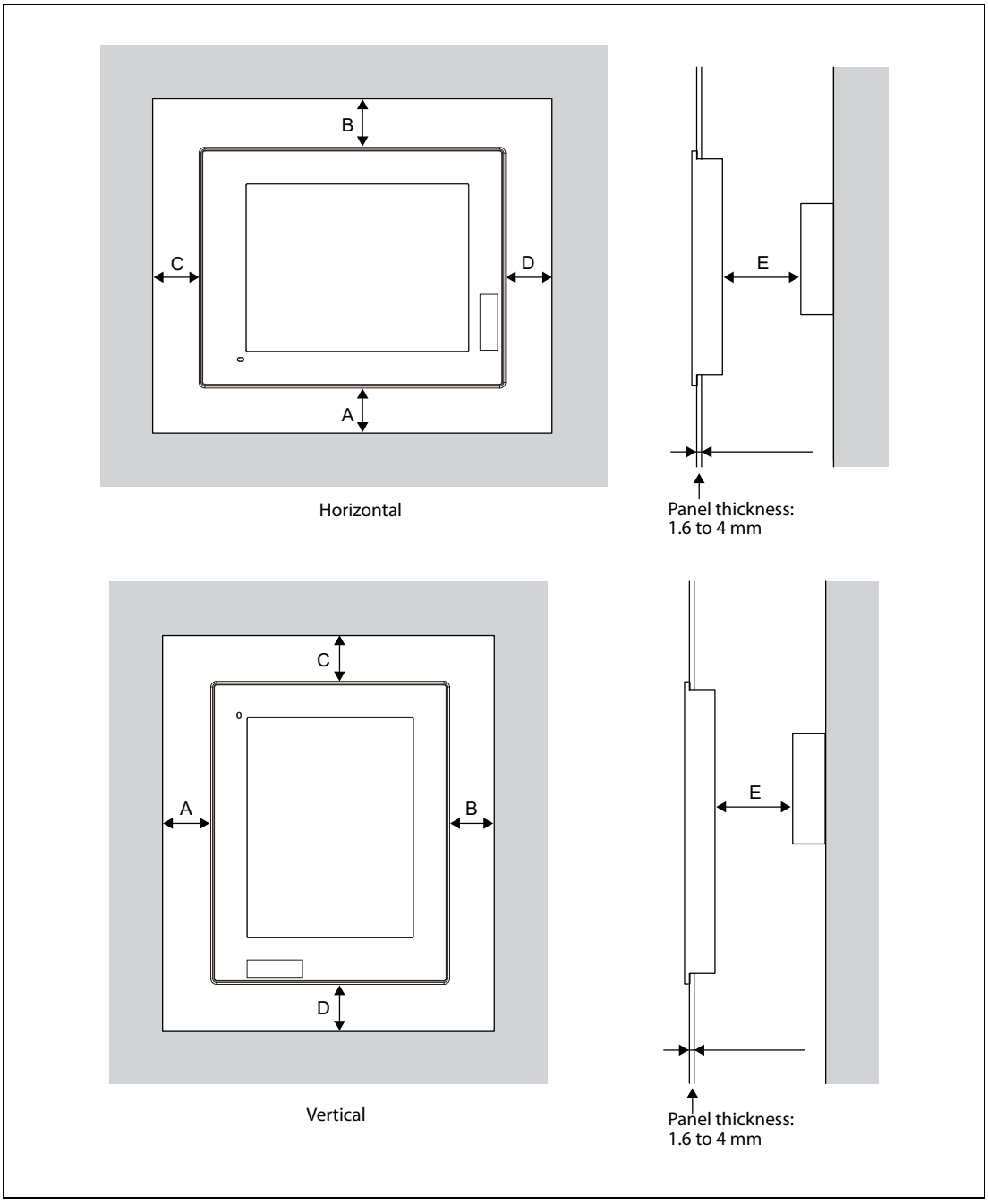


Fig. 5-17: *Distances between the GT2505-V and other devices.*

Clearance	Condition	GT25			
		GT2512-S	GT2510-V	GT2508-V	GT2505-V
A	GOT only	48 [18]		48 [29]	50 [20]
	Ethernet communication unit fitted	48 [18]			—
	Bus connection unit is fitted	48 [18]		23 [29]	—
	Serial connection unit is fitted	48 [18]			—
	CC-Link communication unit (GT15-J61BT13) fitted	48 [18]			—
	MELSECNET/H communication unit (coaxial) fitted①	48 [38]	48 [45]	67	—
	MELSECNET/H communication unit (optical) fitted②	48 [18]			—
	CC-Link IE Controller Network communication unit fitted	48 [18]			—
	CC-Link IE Field Network communication unit fitted	48 [18]			—
	Printer unit fitted	48 [18]			—
	External I/O unit fitted	48 [18]			—
	Sound output unit fitted	48 [18]			—
B		Horizontal: 78 [18] Vertical: 48 [18]			Horizontal: 80 [20] Vertical: 50 [20]
C	When the SD card is used	50 [20]		50	Horizontal: 50 [20] Vertical: 80 [20]
	When the SD card is not used	50 [20]			
D		Horizontal: 50 [20] Vertical: 80 [20]			50 [20]
E③		100 [20]			

Tab. 5-17: *Minimum clearances [mm] required between the GT25-S or GT25-V and other devices.*

① This value is for use of the coaxial cable 3C-2V (JIS C 3501). For specifications of the cable, refer to the GOT2000 Series Connection Manual for a controller used.

② This value differs depending on the cable used.

③ When opening or closing the battery cover: 72 mm or more

GT2512F-S, GT2510F-V, GT2508F-V

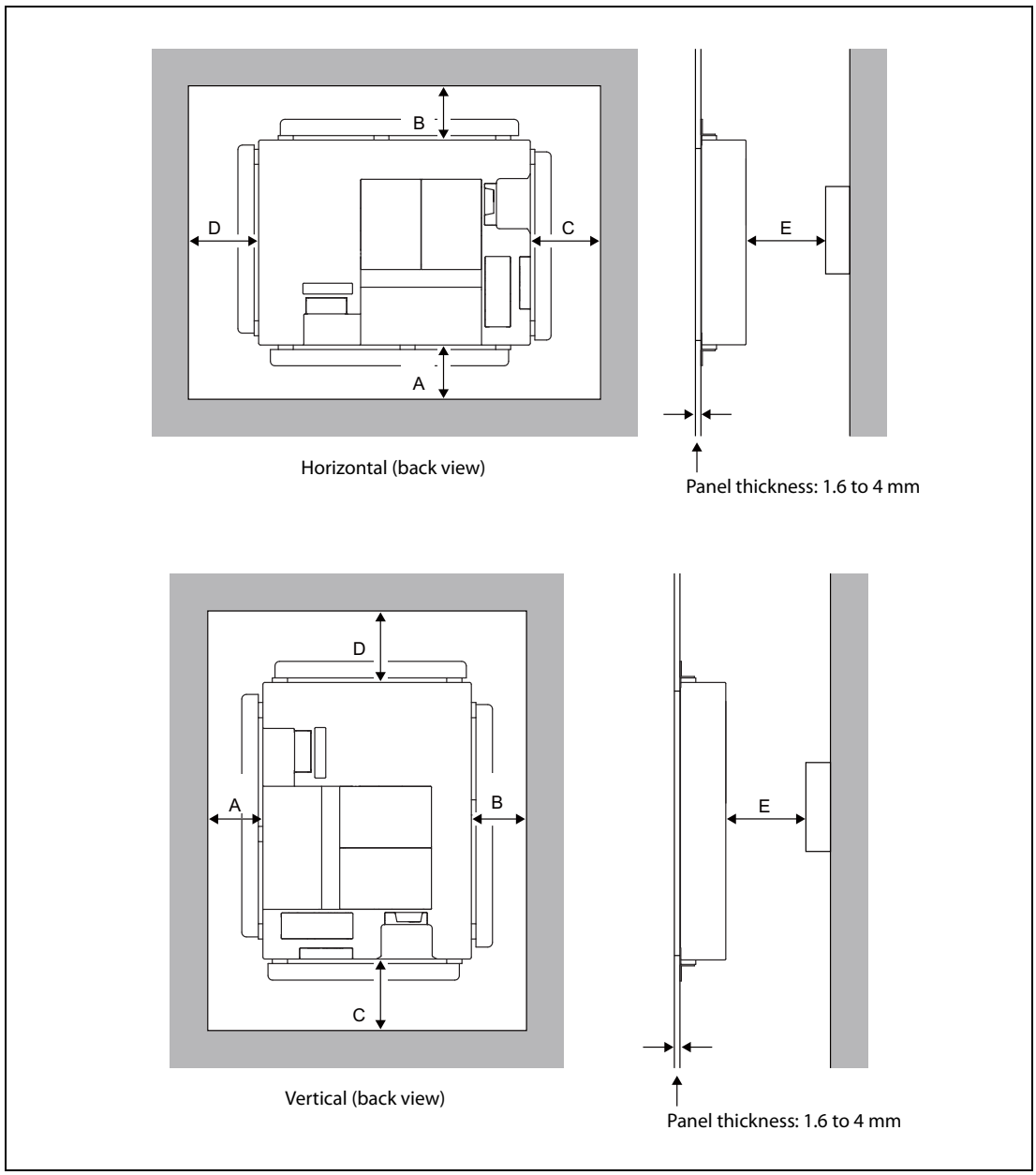


Fig. 5-18: *Distances between the GT2512F-S, GT2510F-V or GT2508F-V and other devices.*

Clearance	Condition	GT25		
		GT2512F-S	GT2510F-V	GT2508F-V
A	GOT only	58 [28]		58 [39]
	Ethernet communication unit fitted	58 [28]		
	Bus connection unit is fitted	58 [28]		33 [39]
	Serial connection unit is fitted	58 [28]		
	CC-Link communication unit (GT15-J61BT13) fitted	58 [28]		
	MELSECNET/H communication unit (coaxial) fitted①	58 [48]	58 [55]	77
	MELSECNET/H communication unit (optical) fitted②	58 [28]		
	CC-Link IE Controller Network communication unit fitted	58 [28]		
	CC-Link IE Field Network communication unit fitted	58 [28]		
	Printer unit fitted	58 [28]		
	External I/O unit fitted	58 [28]		
	Sound output unit fitted	58 [28]		
B		Horizontal: 88 [28] Vertical: 58 [28]		
C	When the SD card is used	58 [28]		58
	When the SD card is not used	58 [28]		
D		Horizontal: 58 [28] Vertical: 88 [28]		
E③		100 [20]		

Tab. 5-18: *Minimum clearances [mm] required between the GT2512F-S, GT2510F-V or GT2508F-V and other devices.*

① This value is for use of the coaxial cable 3C-2V (JIS C 3501). For specifications of the cable, refer to the GOT2000 Series Connection Manual for a controller used.

② This value differs depending on the cable used.

③ When opening or closing the battery cover: 72 mm or more

5.4.4 Distances for GT23

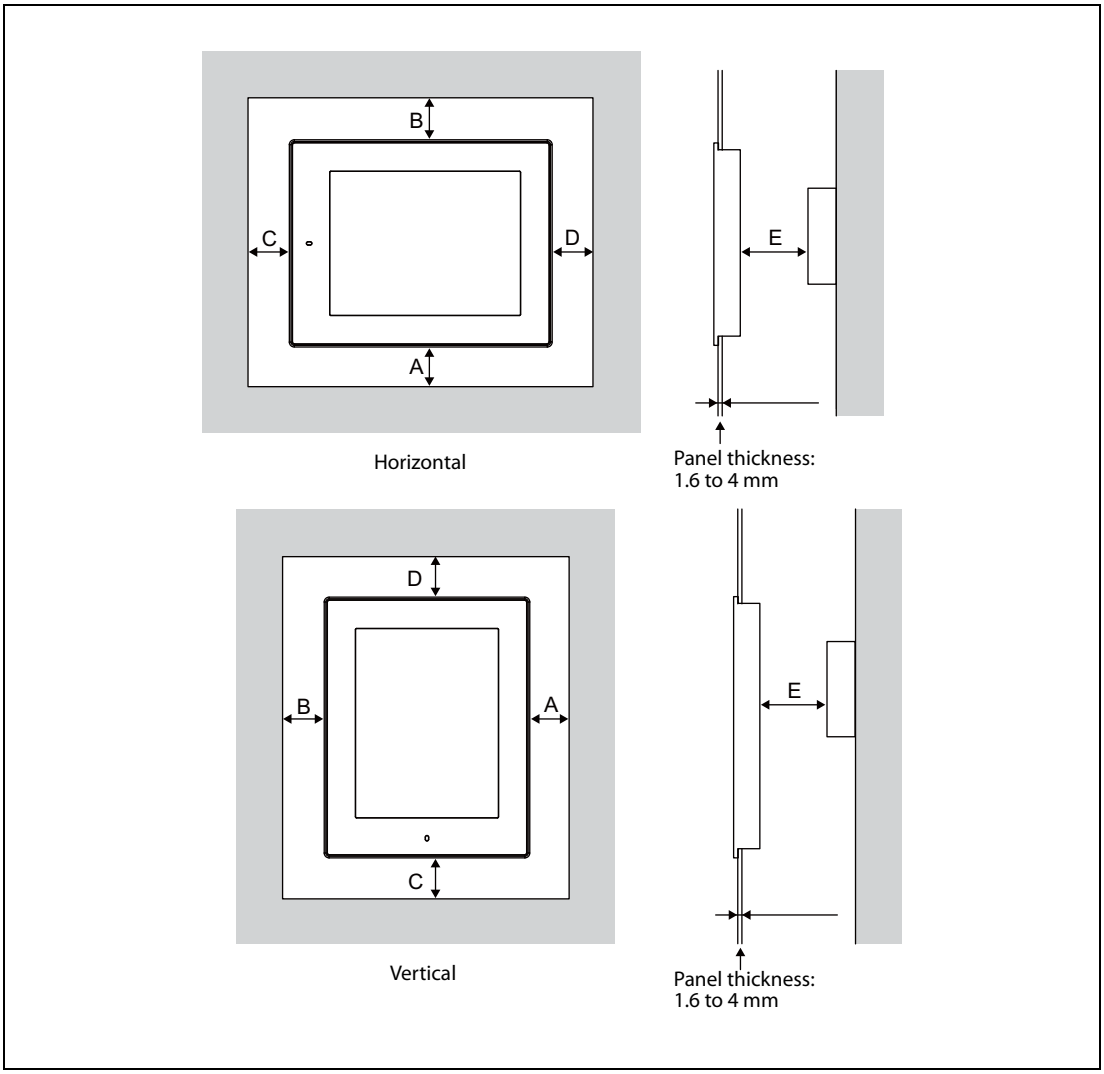


Fig. 5-19: *Distances between the GT23 and other devices*

Clearance	Condition	GT23	
		GT2310-V	GT2308-V
A		48 [18]	
B		Horizontal: 78 [18] Vertical: 50 [20]	
C	When the SD card is used	Horizontal: 50 [20] Vertical: 80 [20]	Horizontal: 50 Vertical: 80 [50]
	When the SD card is not used	Horizontal: 50 [20] Vertical: 80 [20]	
D		50 [20]	
E①		100 [20]	

Tab. 5-19: *Minimum clearances [mm] required between the GT23 and other devices*

① When opening or closing the battery cover: 72 mm or more.

5.4.5 Distances for GT21

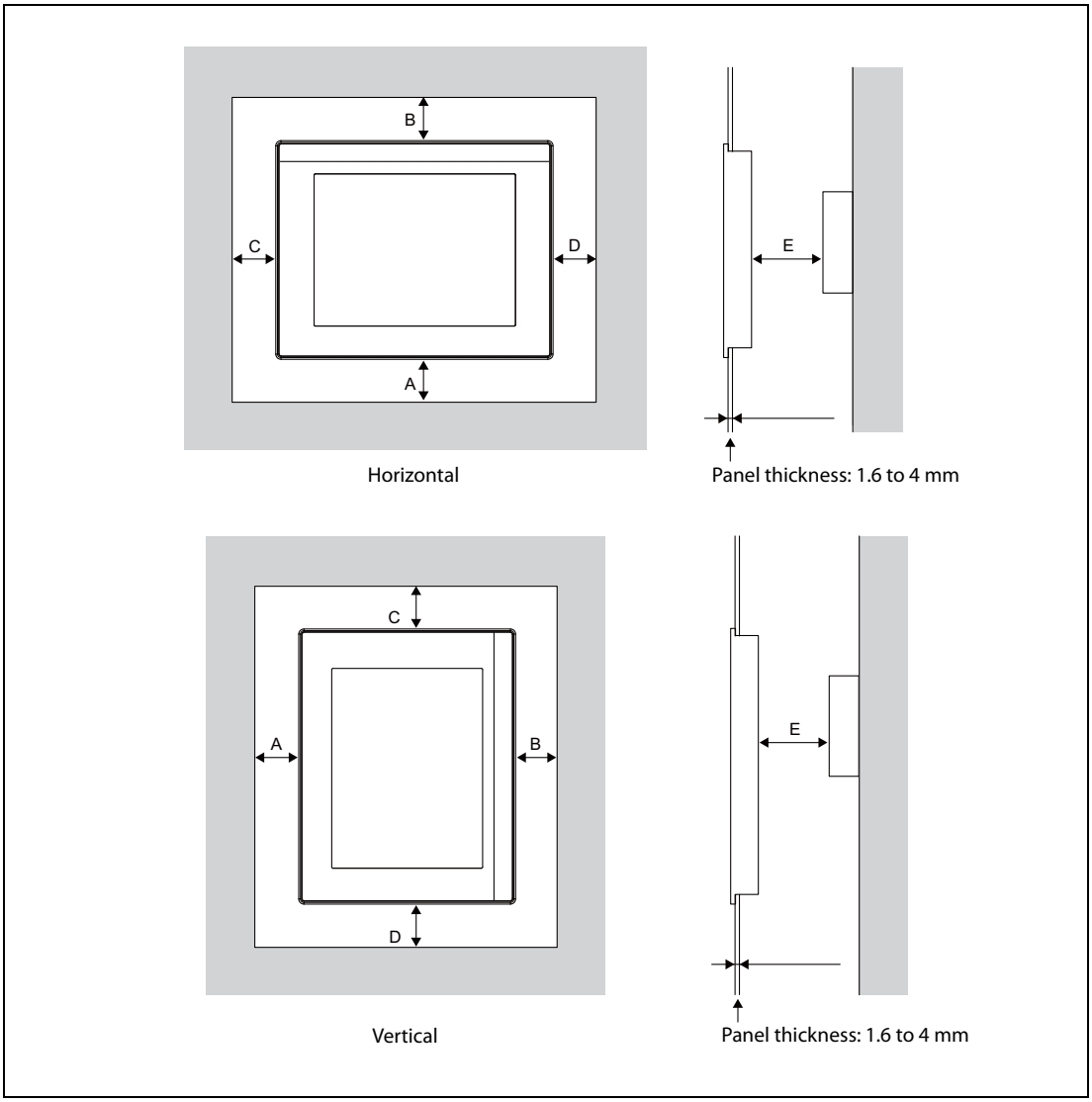


Fig. 5-20: *Distances between the GT21 and other devices*

Clearance	Condition	GT21
		GT2107, GT2104-R, GT2103-P
A①		50 [20]
B		50 [20]
C	When the SD card is used	50
	When the SD card is not used	50 [20]
D		50
E②		80 [20]

Tab. 5-20: *Minimum clearances [mm] required between the GT21 and other devices*

① For GT2107, a distance of 60 mm or more is required to connect an RS-485 cable or RS-232 cable.

② For GT2104-RTBD and GT2103-PMBDS a distance of 80 mm or more is required to connect an RS-232 cable or personal computer connection cable to the GOT rear face. When a user-created RS-232 cable is connected to the connector terminal block at the rear face of GT2104-RTBD, a distance of 20 mm or more is required.

5.4.6 Distances for GS21

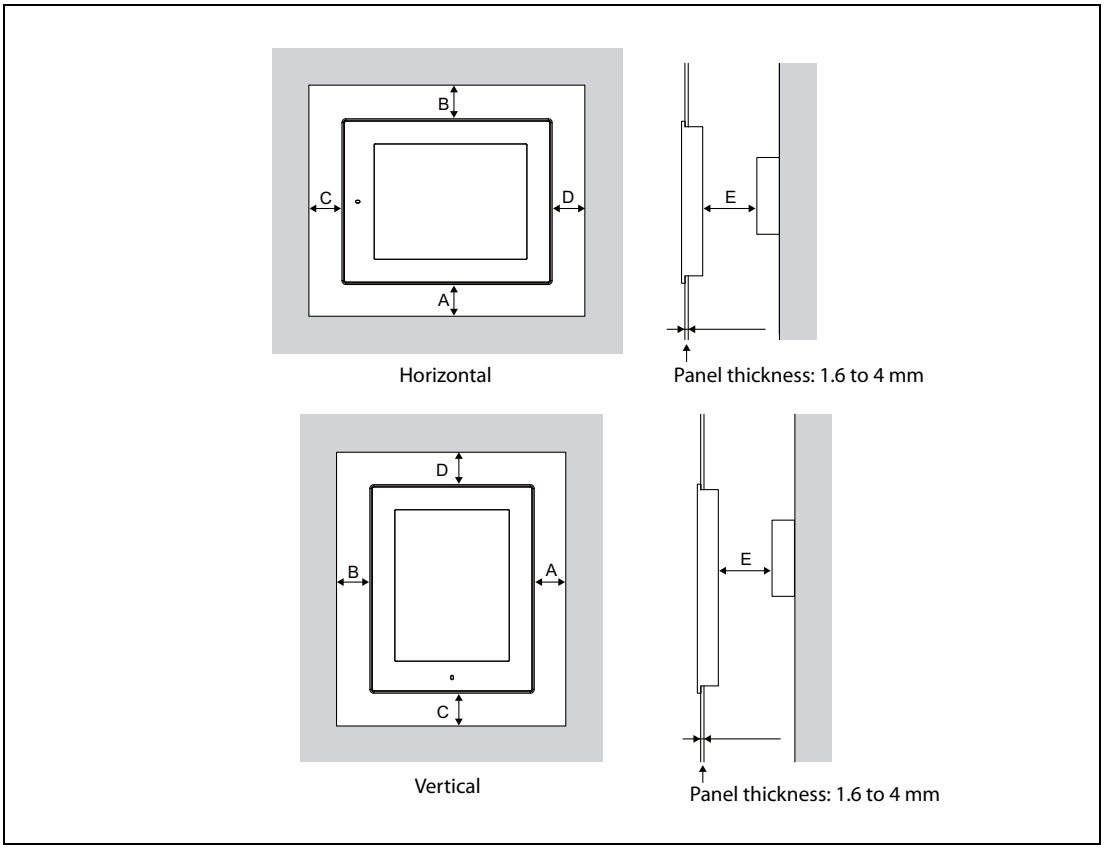


Fig. 5-21: *Distances between the GS21 and other devices*

Clear-ance	Condition	GS2110, GS2107	
		In the presence of radiated-noise or heat-generating equipment nearby	In the absence of radiated-noise or heat-generating equipment nearby
A		50	20
B	Horizontal format	80	
	Vertical format	50	
C	Horizontal format	50	
	Vertical format	80	
D	Horizontal format	50	
	Vertical format	80	
E		100	

Tab. 5-21: *Minimum clearances [mm] required between the GS21 and other devices*

5.5 Control Panel inside Temperature and Installation Angle

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

Using the GOT with the installation angle other than the following accelerates the deterioration of the GOT

5.5.1 GT27, GT25

Horizontal installation

When the temperature inside the control panel is 40 to 55 °C (50 to 65 °C for GT2507T-W), the mounting angle should be in the range 60 to 105 degrees.

When the maximum temperature is 40 °C (50 °C for GT2507T-W), the GOT can be installed at any other angle.

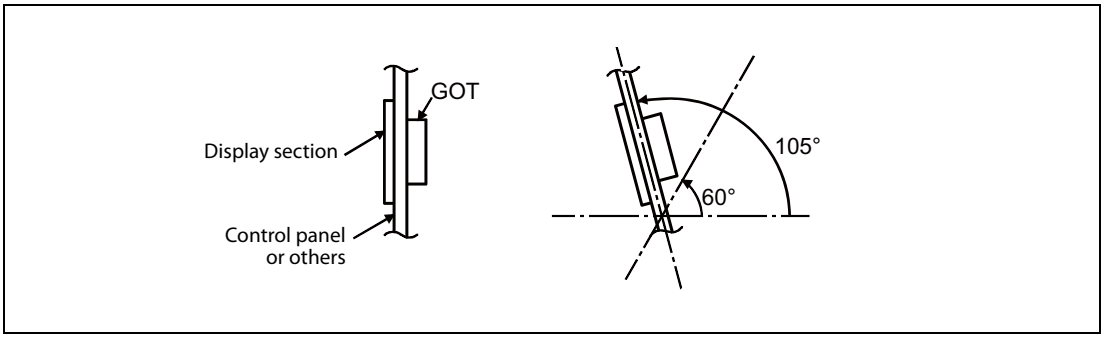


Fig. 5-22: *Mounting angle (horizontal installation)*

Vertical installation

When the temperature inside the control panel is 40 to 55 °C (50 to 65 °C for GT2507T-W, 40 to 50 °C for GT2505), the mounting angle should be 90 degrees.

When the maximum temperature is 40 °C (50 °C for GT2507T-W), the GOT can be installed at any other angle.

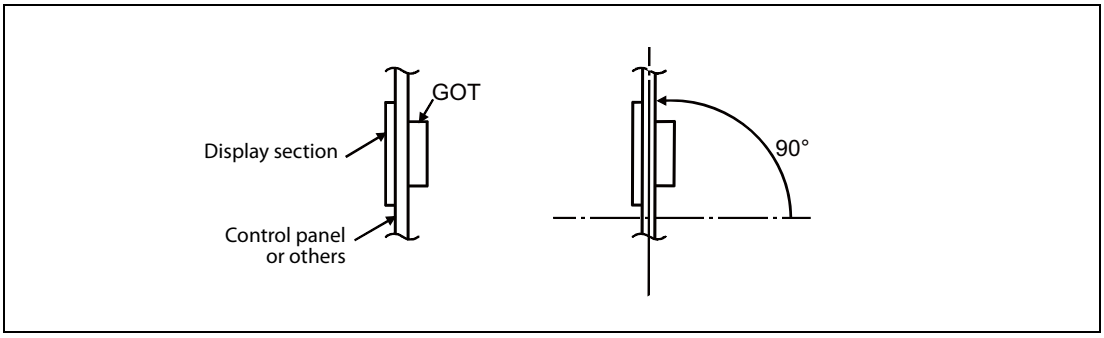


Fig. 5-23: *Mounting angle (vertical installation)*

NOTE

For GT27, GT2512-S, GT2510-V, GT2508-V, GT2505-V, GT2512F-S, GT2510F-V, GT2508F-V:
When a multimedia unit (GT27-MMR-Z), MELSECNET/H communication unit (GT15-J71LP23-25, GT15-J71BR13), or CC-Link communication unit (GT15-J61BT13) is mounted, the operating ambient temperature must be 5 °C lower than the maximum temperature described above.

5.5.2 GT23, GS21

Horizontal installation

Regardless of the installation orientation, install the GT23 or GS21 so that the following conditions are satisfied. When the GOT is installed at any angle from 60 ° to 105 °, the control panel inside temperature must be within 40°C to 55 °C.

When the maximum temperature is 40 °C, the GOT can be installed at any other angle.

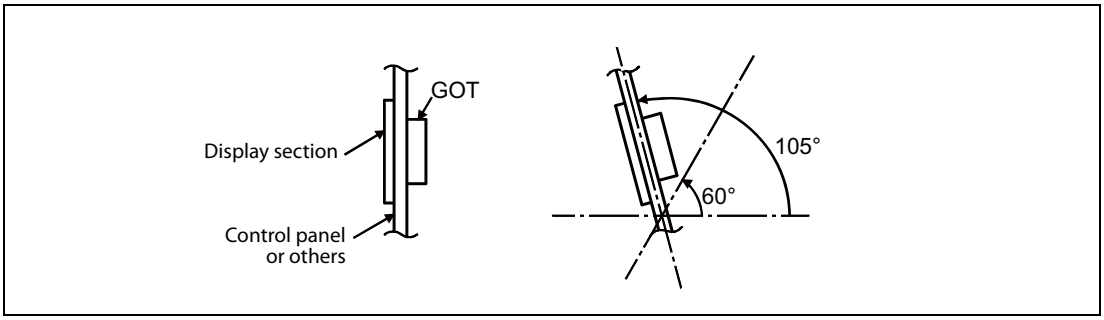


Fig. 5-24: *Mounting angle (horizontal and vertical installation)*

5.5.3 GT21

Horizontal installation

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

When the maximum temperature is 40 °C, the GOT can be installed at any other angle.

Vertical installation

When the temperature inside the control panel is 40 to 50 °C, the mounting angle should be 90 degrees.

When the maximum temperature is 40 °C, the GOT can be installed at any other angle.

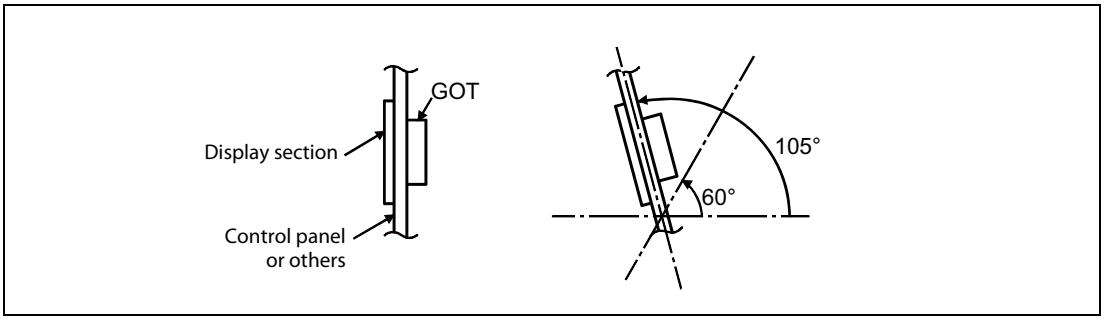


Fig. 5-25: *Mounting angle (horizontal and vertical installation)*

5.6 Mounting

Install the GOT in the following procedure.

For the panel cut dimensions for the GOT, refer to section 5.2.

Install a battery to the GOT before the first startup.

5.6.1 Installing the battery

Battery

- GT27, GT25

  GT27 and GT25 come with a battery in the battery holder. Before using GT27 and GT25, connect the battery connector to the GOT connector.

  For GT2505 the battery is connected to the GOT before shipment.

- GT23

  Batteries for GT23 (GT11-50BAT) are sold separately.

  Purchase a battery before using GT23, mount it to the GOT, and connect the GOT connector to battery connector.

- GT21

  The GT2104-R comes with a battery in the battery holder. The battery is connected to the GOT before shipment.

  For GT2103-P, installing a battery is not required. (GT2103-P holds the data by the built-in flash ROM.)

- GS21

  The GS21 comes with a battery in the battery holder. The battery is connected to the GOT before shipment.

Installing the battery to GT2715, GT2712, GT2710, GT2512, GT2510-V, or GT2510F

① Make sure that the GOT power is off.

② Open the battery cover and install the battery to the GOT rear face.

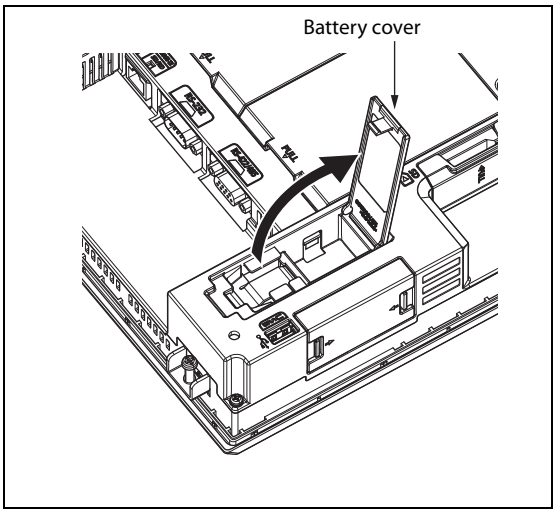


Fig. 5-26:
Open the battery cover

③ The GOT-side connector depends on whether the GOT has a battery extension cable.

- Without a battery extension cable:
  Insert the battery connector to the GOT connector.
- With a battery extension cable:
  Insert the battery connector to the battery extension cable connector of the GOT.

The existence of a battery extension cable depends on the model version. From September 2014 on the devices do not use a battery extension cable any more.

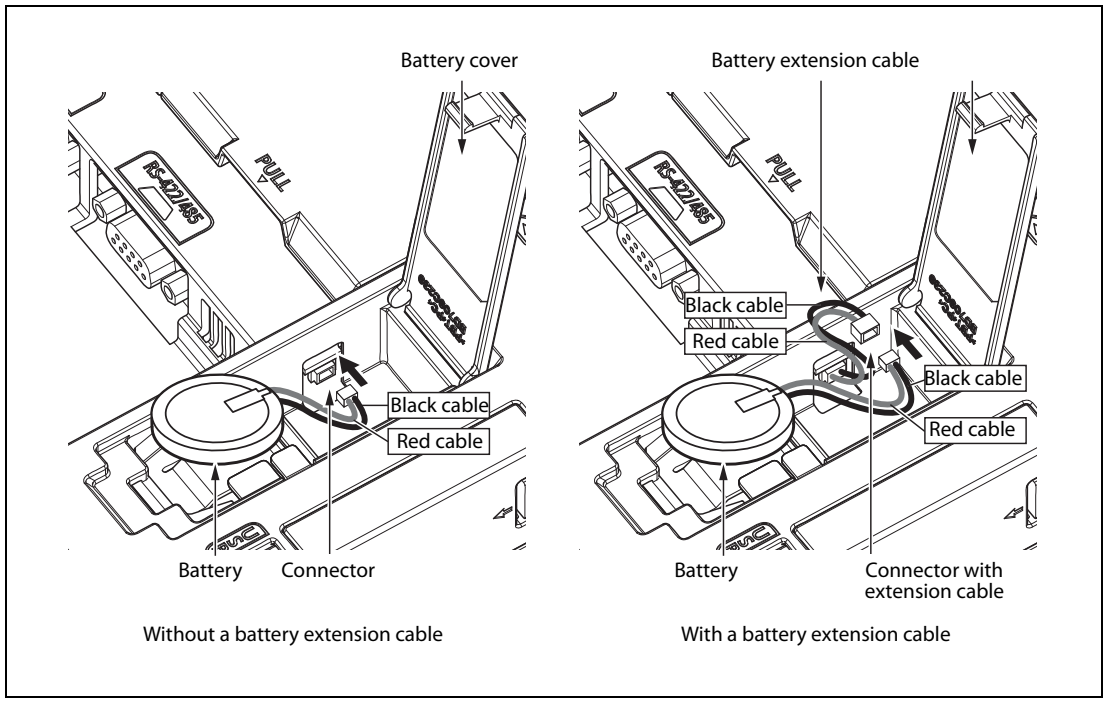


Fig. 5-27: *Connection of the battery*

④ After installing the battery to the battery holder of the GOT, close the battery cover until it clicks.

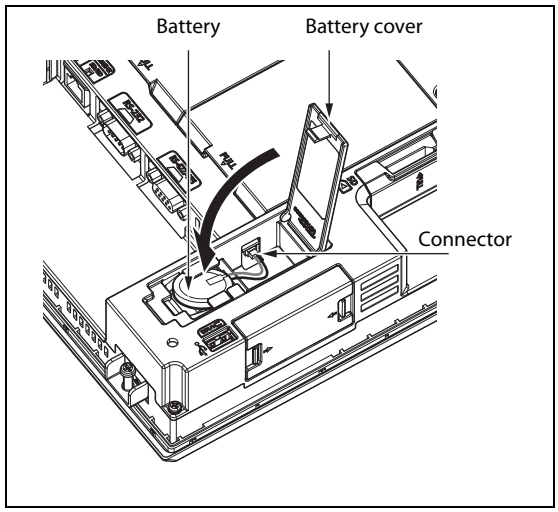


Fig. 5-28:
Close the battery cover

Installing the battery to GT2708, GT2705 and GT2508

① Make sure that the GOT power is off.

② Install the battery inside the SD card cover on the side of the GOT.

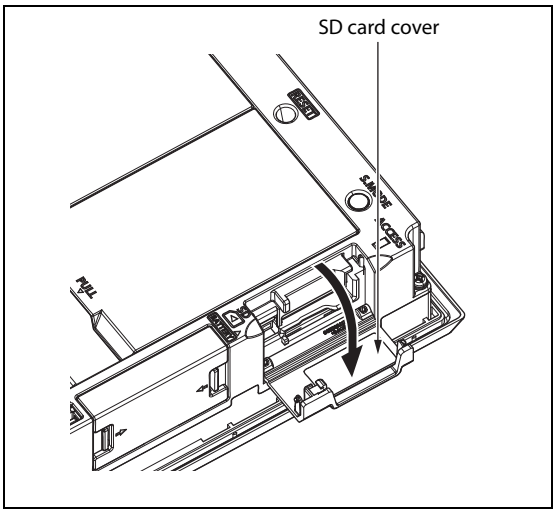


Fig. 5-29:
Open the SD card cover

③ After confirming the battery is stored in the battery holder, insert the battery connector into the connector of the GOT.

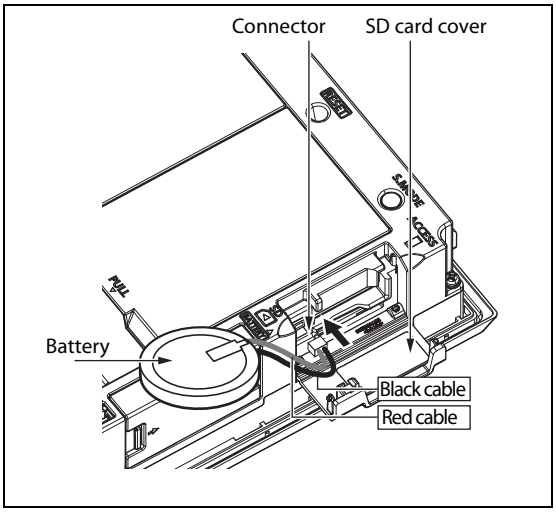


Fig. 5-30: *Insert the battery connector*

④ Close the SD card cover until it clicks.

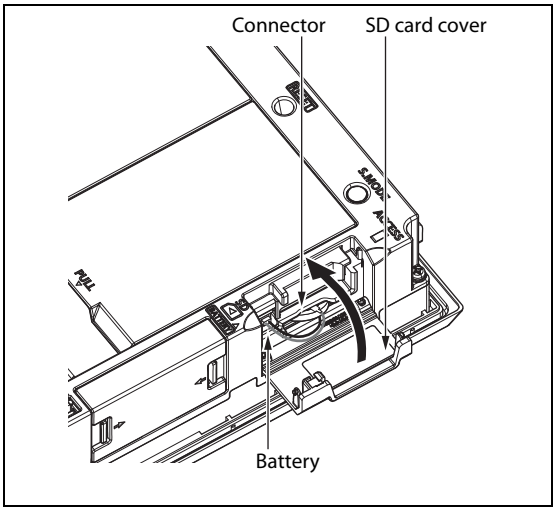


Fig. 5-31:
Close the SD card cover

Installing the battery to GT2510-WX, GT2507-W, or GT2507T-W

① Make sure that the GOT power is off.

② Open the battery cover.

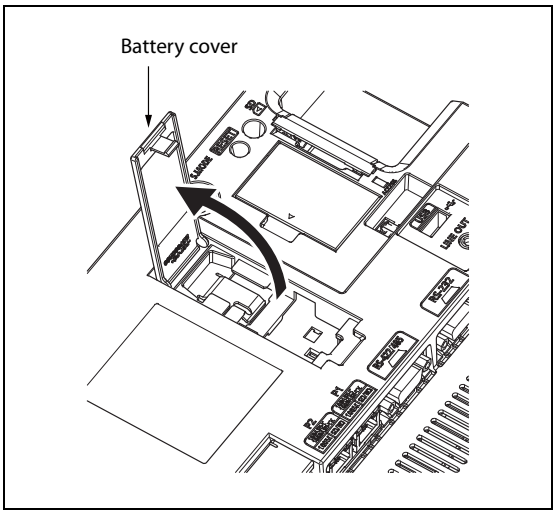


Fig. 5-32:
Open the battery cover

③ Insert the battery connector to the GOT connector.

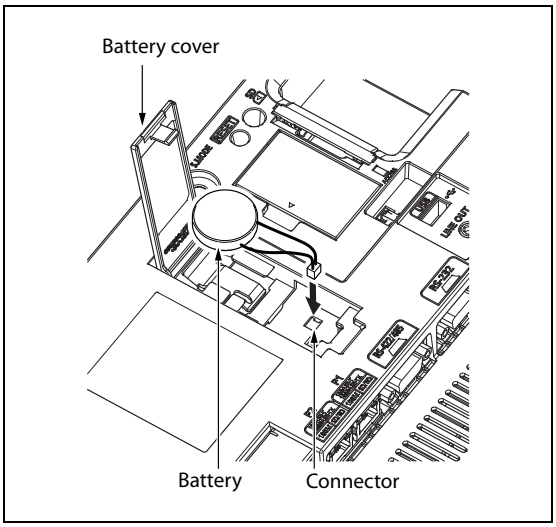


Fig. 5-33:
Insert the battery connector

④ After installing the battery to the battery holder of the GOT, close the battery cover until it clicks.

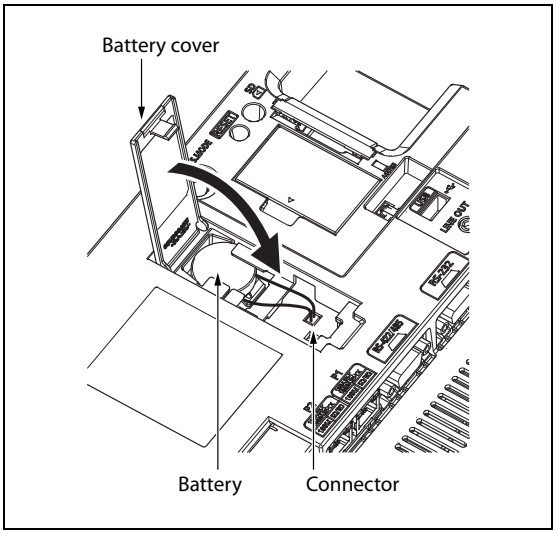


Fig. 5-34:
Close the battery cover

Installing the battery to GT2310 and GT2308

① Make sure that the GOT power is off.

② Open the battery cover and install the battery to the GOT rear face.

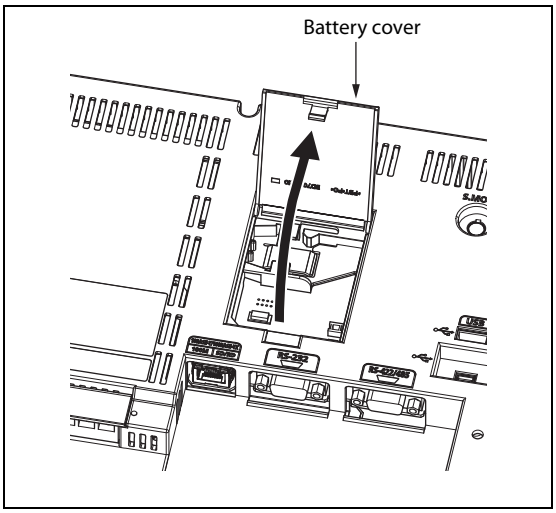


Fig. 5-35:
Open the battery cover

③ After confirming the battery is stored in the battery holder, insert the battery connector into the connector of the GOT.

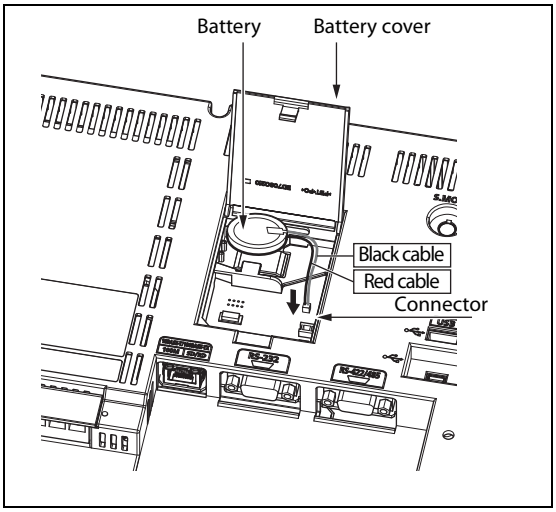


Fig. 5-36:
Insert the battery connector

④ Close the battery cover until it clicks.

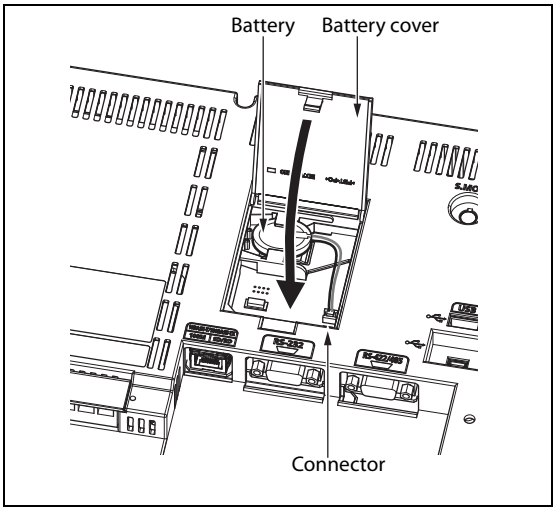


Fig. 5-37:
Close the battery cover

5.6.2 Installing the GOT

GT27, GT2512-S, GT2510-WX, GT2510-V, GT2508-V, GT2507-W, GT2507T-W, GT23 and GS21

① Insert the GOT rear face into the panel opening.

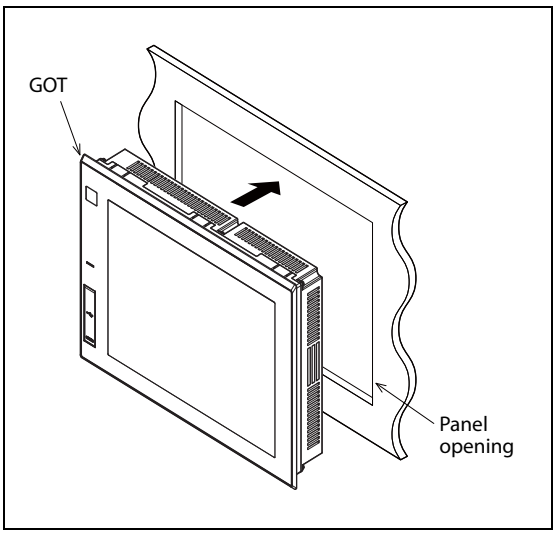


Fig. 5-38:
Insert the GOT rear face into the panel opening.

② While positioning a fitting on the mounting hole of the GOT, tighten the screws within the specified torque range (0.36 N·m to 0.48 N·m).

Tightening the screws with a torque exceeding the specified torque range may deform the GOT front panel, causing the protective sheet to become crinkled.)

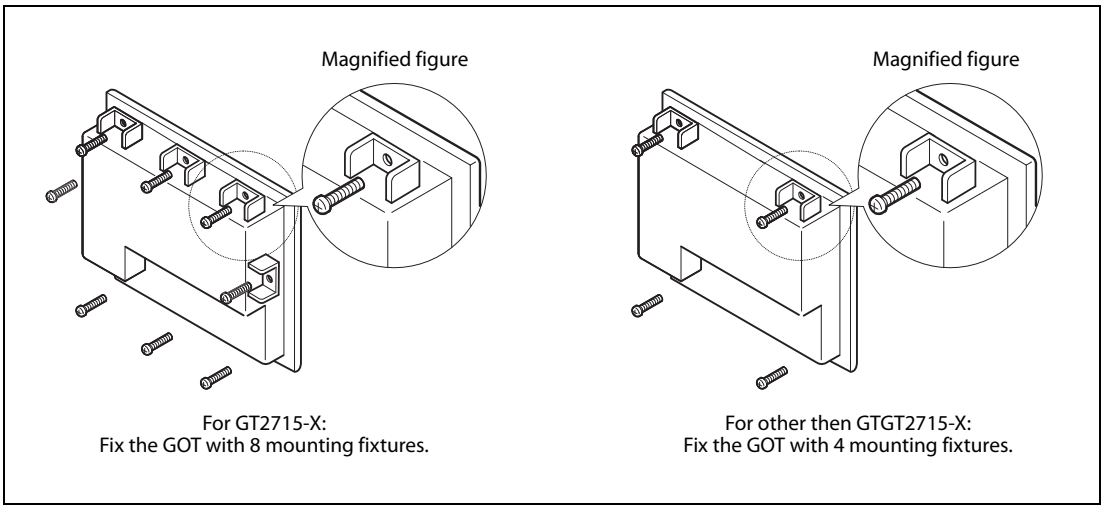


Fig. 5-39: *Installing the GOT*

③ A protection film is attached on the display section of GOT prior to shipment. Remove the film when the installation is completed. When the user continues using the GOT with the protective film, the film may not be removed.

NOTE

Make sure to turn on the GOT power supply once upon completion of battery connection. Failure to do so may decrease the battery life.

GT2512F-S, GT2510F-V, GT2508F-V

To fasten the fittings on the control panel, studs are necessary.

For the details of panel cutting dimensions, refer to section 5.2.

For the position of the studs, refer to section 5.3.

The following table shows the material and surface treatment of the control panel recommended for attaching the environmental protection sheet.

Item	Description
Material	Stainless steel① or aluminium① or steel②
Surface roughness	Ra0.2 to 0.5 (μm)

Tab. 5-22: Material and surface treatment of the control panel

① When you coat the environmental protection sheet, use melamine resins or acrylic resins.

② The environmental protection sheet must be coated with melamine resins or acrylic resins.

Check that no dirt or damage is on the control panel on which the environmental protection sheet is attached.

Since the environmental protection sheet cannot be reattached, make sure to check the attachment method and attach the sheet carefully.

After removing the protective film from the GOT, make sure that no dust or other substances adhere to the display section.

Check that the GT25 open frame model is installed properly, and then remove the protective film from the GOT.

Do not conduct this work in a dusty place, or foreign substances may adhere to the display section.

The following shows the procedure for installing GT2512F-S as an example. In this example, the supplied fittings are installed on the top and bottom of the GOT, and the control panel thickness is 3 mm.

① Install the supplied fittings on the top and bottom of the GOT with screws.

Each fitting has two types of holes as shown below.Use the appropriate type of holes according to the control panel thickness.

- Hole A: for the control panel thickness 1.5 mm to 3.0 mm
- Hole B: for the control panel thickness 2.0 mm to 4.0 mm

When installing the fittings on the GOT, you are recommended to put a cloth or others under the GOT to prevent the display section from being damaged.

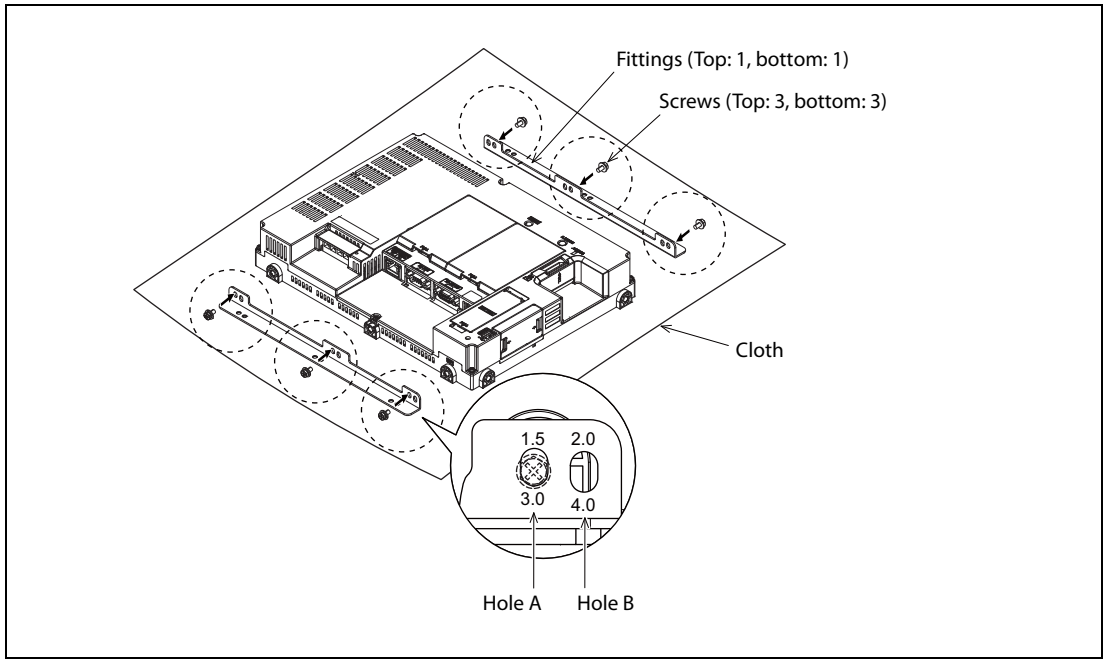


Fig. 5-40: *Installation of the fittings*

② Align the installation holes of the fittings with the studs, and insert the studs in the holes.

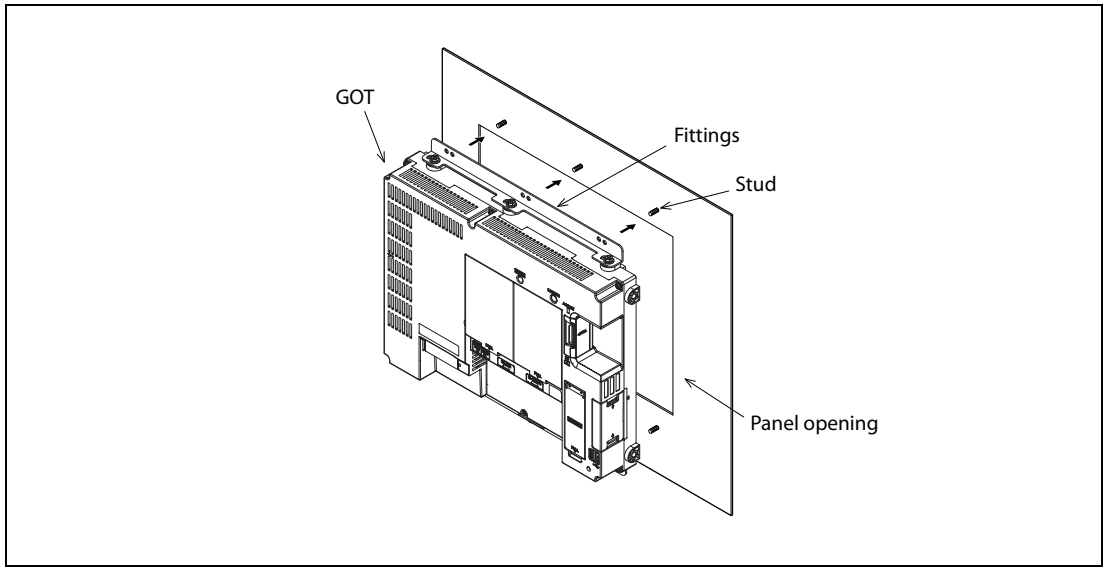


Fig. 5-41: *Installing the GOT*

③ Tighten nuts on the studs in the specified torque range (0.8 Nm to 0.9 Nm) with a wrench for M4 nuts.

Loosen the screws in the slotted holes of the fittings, and adjust the positions of the screws to make the GOT display section and the control panel surface be in the same plane.

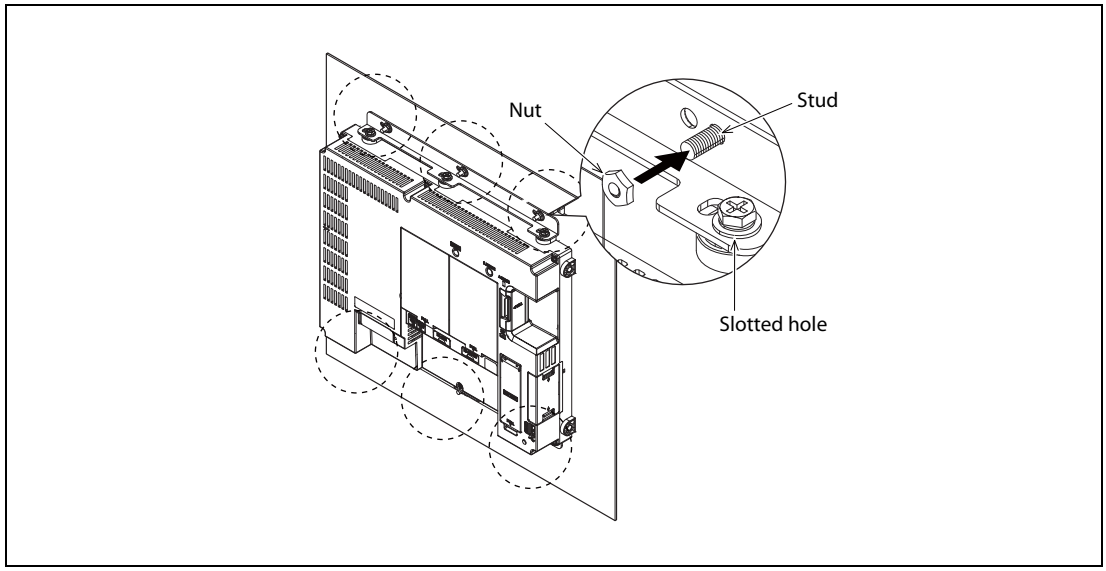


Fig. 5-42: *Installing the nuts*

To attach the environmental protection sheet (sold separately), proceed to the next step.

To attach a user-prepared environmental protection sheet, follow the manual of the sheet used.

④ Remove the inner part of the supplied stencil.

Position the stencil on the panel opening, and attach the stencil using backside double-sided tape in four places.

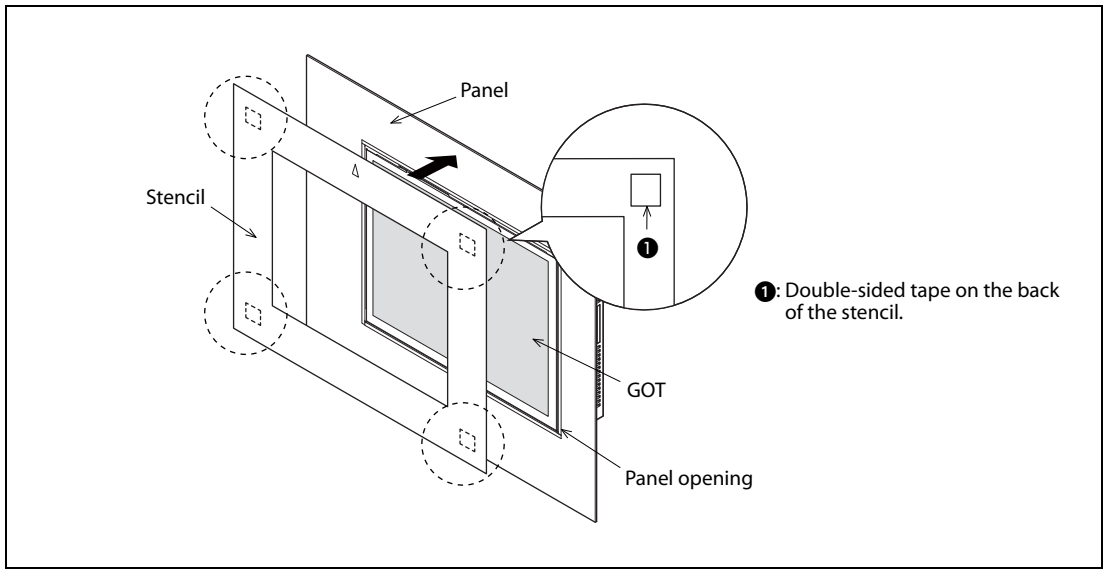


Fig. 5-43: *Applying the stencil*

Check that the arrow on the stencil points in the direction as shown below.

- For the horizontally-oriented GOT, the arrow on the stencil must point upward.
- For the vertically-oriented GOT, the arrow on the stencil must point leftward.

⑤ Mark the four corners of the stencil on the control panel with a pencil or others. Remove the stencil.

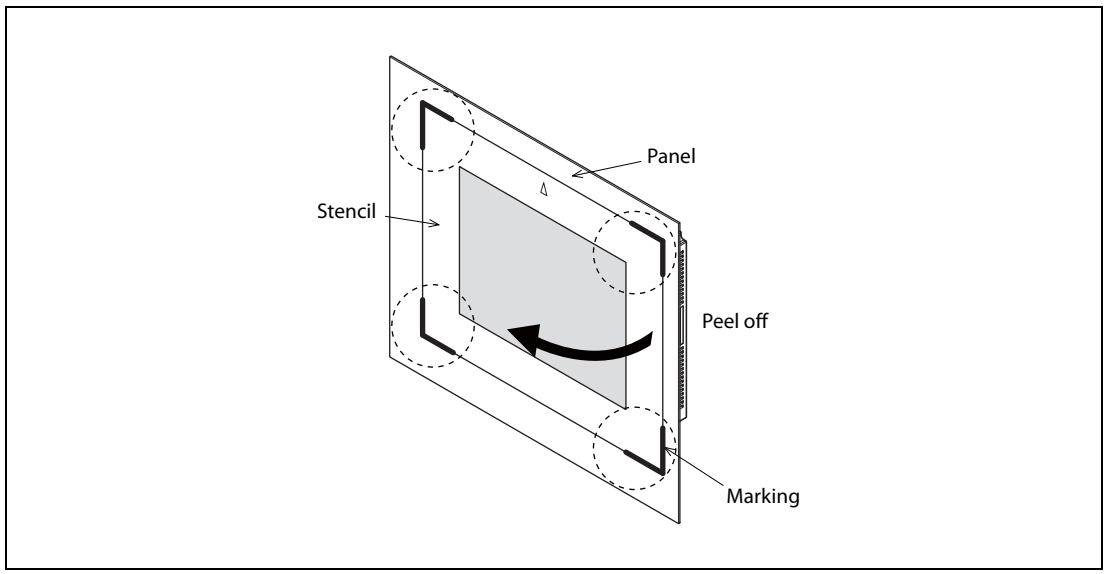


Fig. 5-44: *Marking the corners of the stencil*

⑥ Remove the protective film from the GOT, and make sure that no dust or other substances adhere to the display section.

⑦ Peel off a part of the release paper on the back of the environmental protection sheet. Do not touch the adhesive part of the sheet where the release paper is peeled off. Align the sheet with the four markings on the control panel, and attach the peeled off part of the sheet to the control panel.

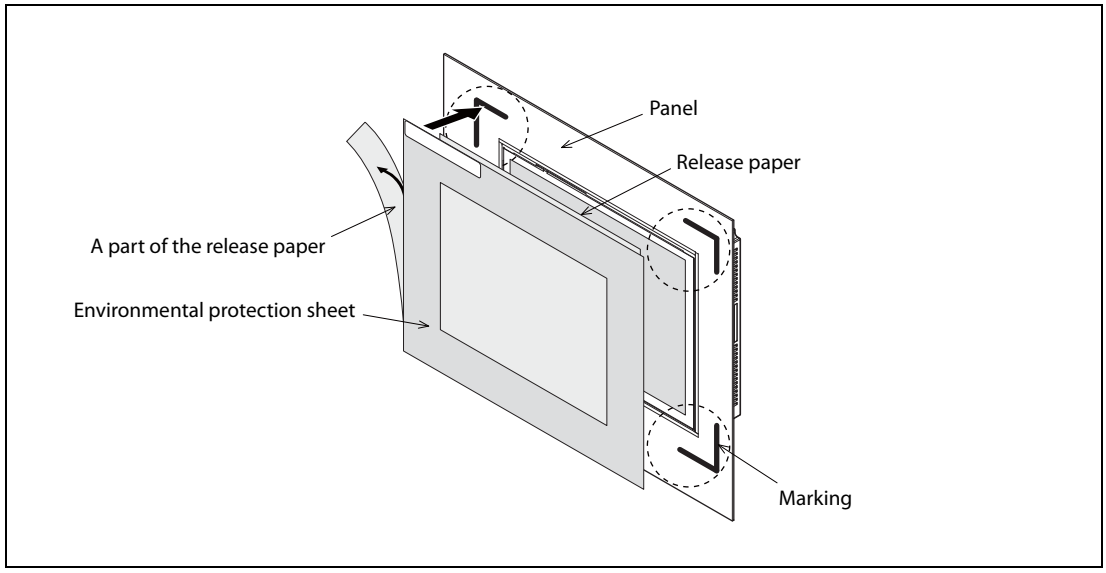


Fig. 5-45: *Installing the environmental protection sheet*

⑧ Peel off the remainder of the release paper, and attach the whole environmental protection sheet to the control panel.

Make sure to attach the sheet from the attached part in step 7, and fit the sheet onto the control panel without leaving any air between them.

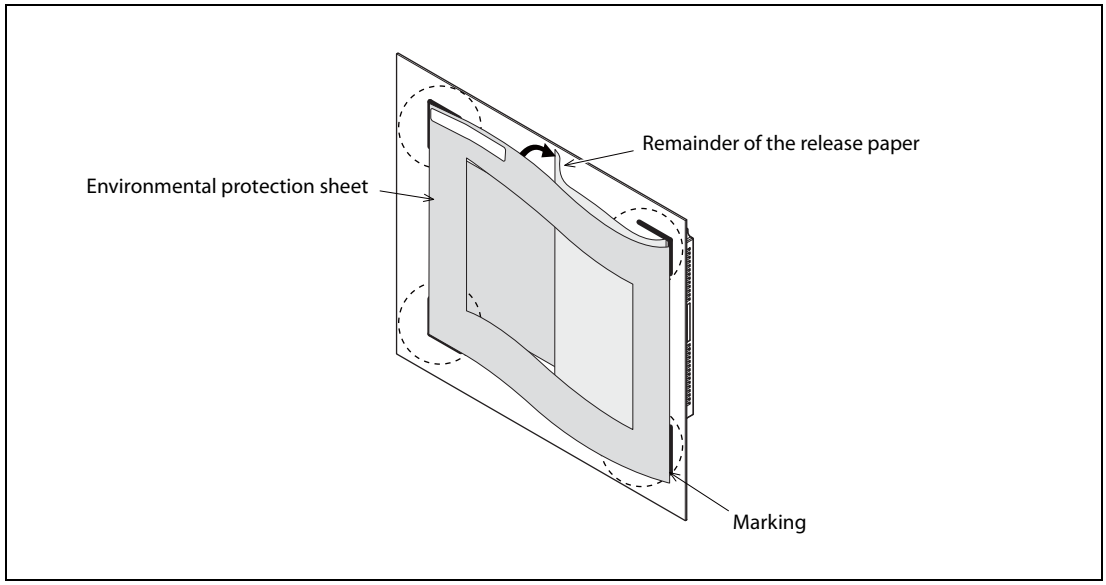


Fig. 5-46: *Attaching the environmental protection sheet*

⑨ Erase the markings.

⑩ Apply enough pressure to the adhesive part of the environmental protection sheet. (Roll a roller back and forth two times with a load of 2 kg.)

To ensure adequate adhesive strength, you are recommended to use the GOT about 24 hours later after the environmental protection sheet is attached.

Check that the environmental protection sheet has no wrinkle, dirt, or others, and then remove the protective film from the sheet.

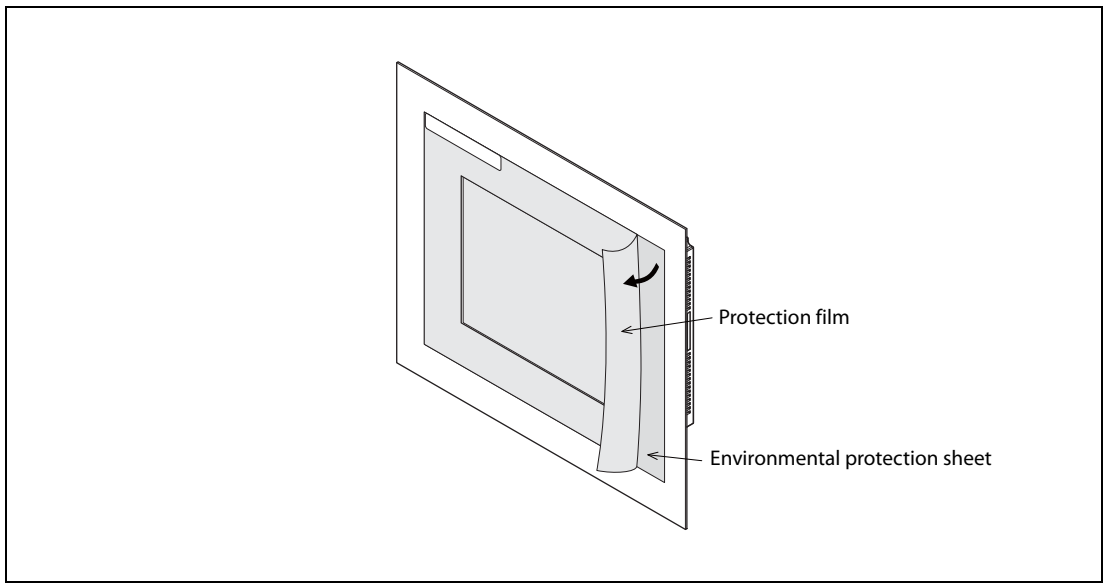


Fig. 5-47: *Removing the protection film*

GT2505-V

For the vertical installation, check that the vertical installation arrow mark on the GOT rear face points upward.

① Install a gasket to the gasket installation groove on the GOT rear face.

Fit the thin side of the gasket in the gasket installation groove.

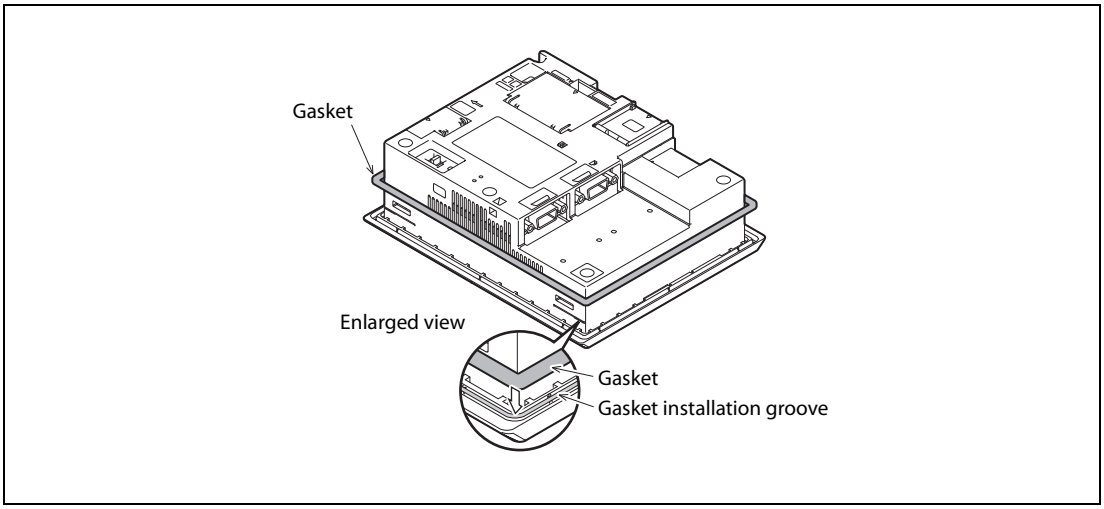


Fig. 5-48: *Installing the gasket*

② Insert the GOT rear face into the panel opening.

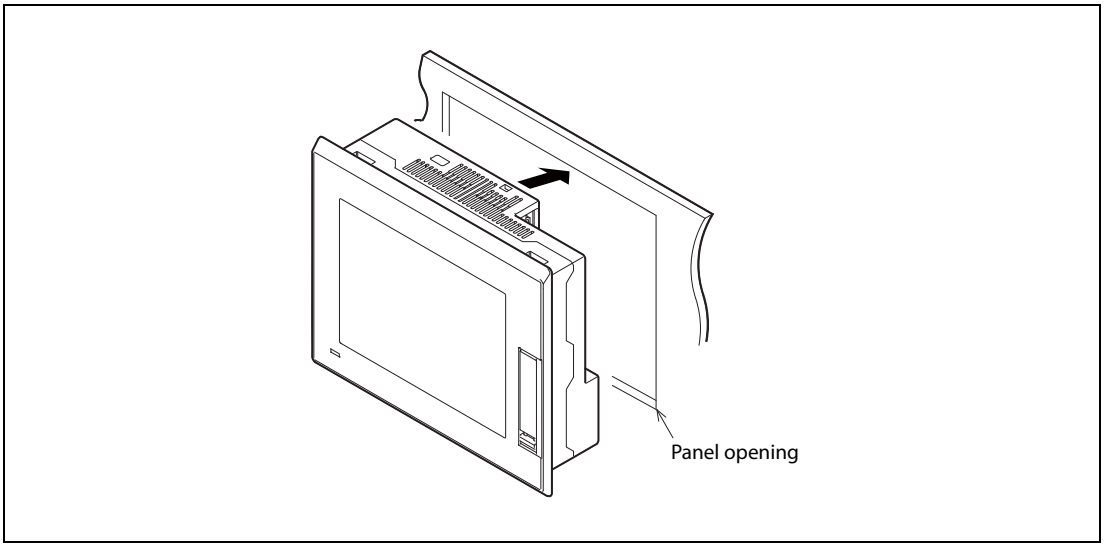


Fig. 5-49: *Installing the GOT*

③ Fix the GOT.

- Insert the hook of an installation fitting (supplied) into the mounting hole of the GOT.
- Tighten the supplied screws within the specified torque range (0.36 Nm to 0.48 Nm) to fix the GOT.

Fix the GOT using 4 fittings at the top and the bottom of the GOT.

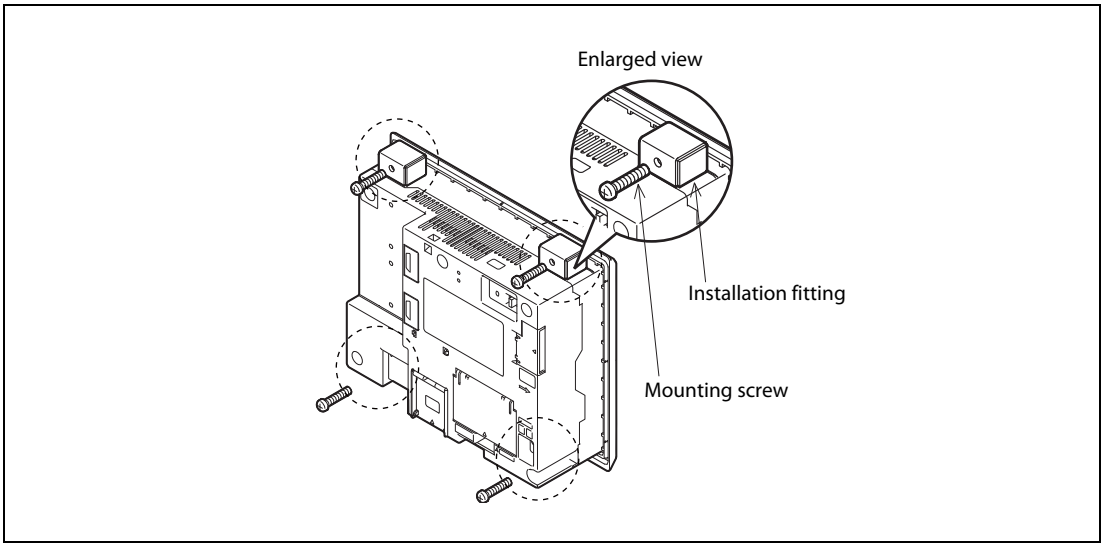


Fig. 5-50: *Fixing the GOT*

④ The GOT in the factory shipment state has a protective film on the display section. After installing the GOT, remove the film.

GT21

① Install a gasket to the gasket installation groove on the GOT rear face.

Fit the thin side of the gasket in the gasket installation groove.

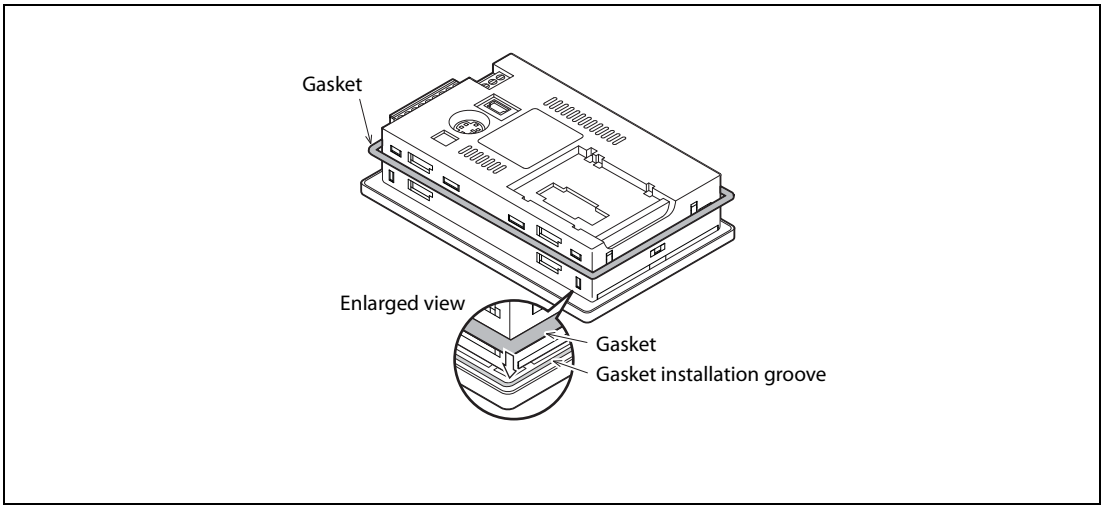


Fig. 5-51: *Installing the gasket*

② Insert the GOT rear face into the panel opening.

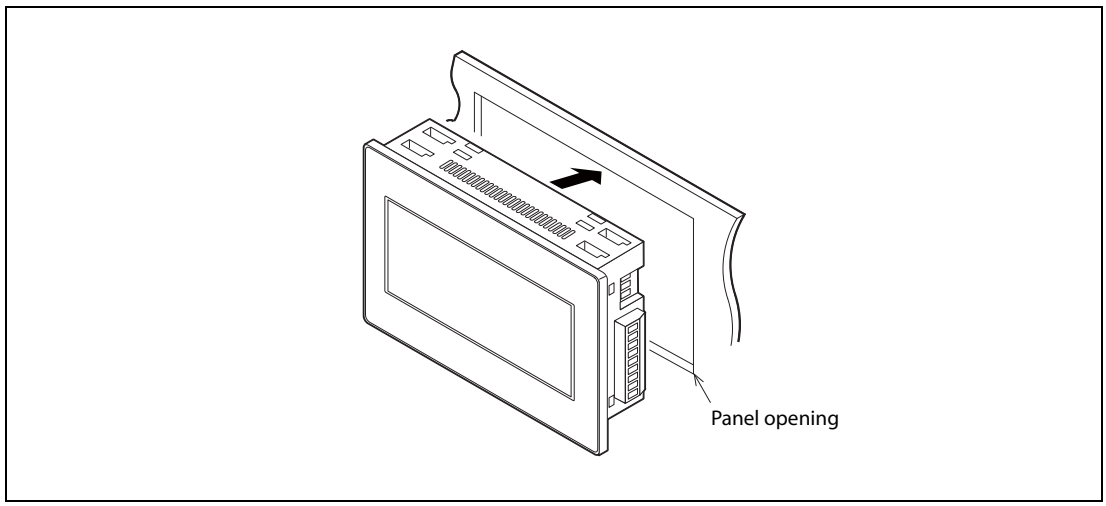


Fig. 5-52: *Installing the GOT*

③ Insert the hook of an installation fitting (supplied) into the mounting hole of the GOT ("A" in the following figure). Slide the installation fitting toward the GOT rear face ("B" in the following figure).

Then, viewing from the GOT rear face, slide the fitting to the left to fix ("C" in the following figure), and tighten a screw within the specified torque range (0.20 Nm to 0.25 Nm).

Fix the GOT using 4 fittings at the top and the bottom of the GOT.

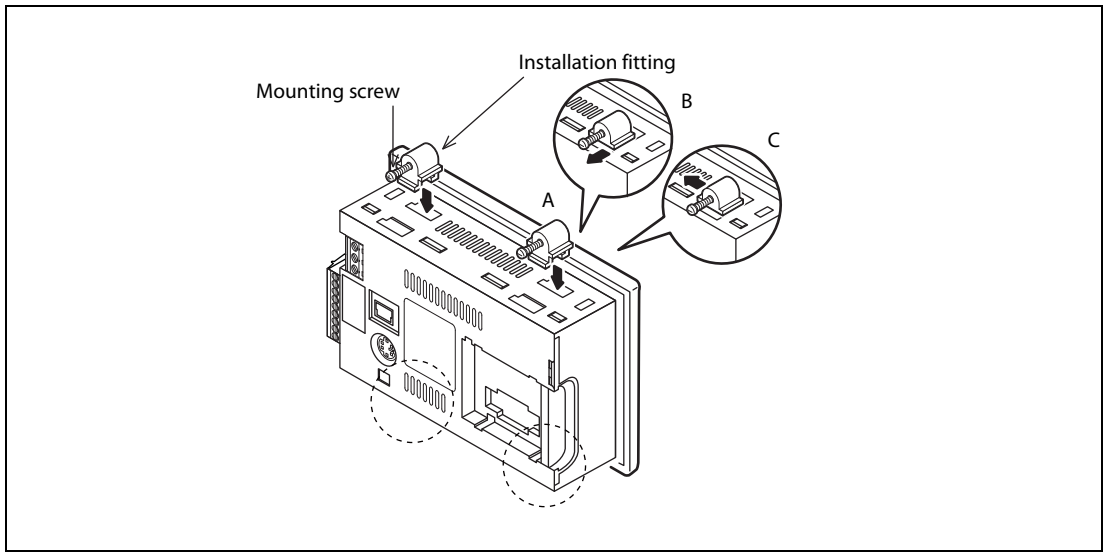


Fig. 5-53: *Fixing the GOT*

④ The GOT in the factory shipment state has a protective film on the display section. After installing the GOT, remove the film.

5.6.3 Installing an extension unit

For installing and removing a single extension unit, refer to the user's manual included in each extension unit.

NOTE

Installing the extension interface relay board
Installing any of the following communication units to the GOT does not require the extension interface relay board to be installed.
- Bus connection unit (GT15-QBUS2, GT15-ABUS2)
- MELSECNET/H communication unit
- CC-Link IE Controller Network communication unit
- CC-Link IE Field Network communication unit
- CC-Link communication unit.

For installing/removing a wireless LAN communication unit to/from GT27 or GT25, refer to the following manual:

– GOT2000 Series Wireless LAN Communication Unit User's Manual

For installing/removing an SD card to/from GT21, refer to the following manual:

– GT21-03SDCD General Description

Installing an extension unit on an mounted extension unit (GT27, GT25)

① Make sure that the GOT power is off.

② Remove the connector cover and the stickers from the mounted extension unit.

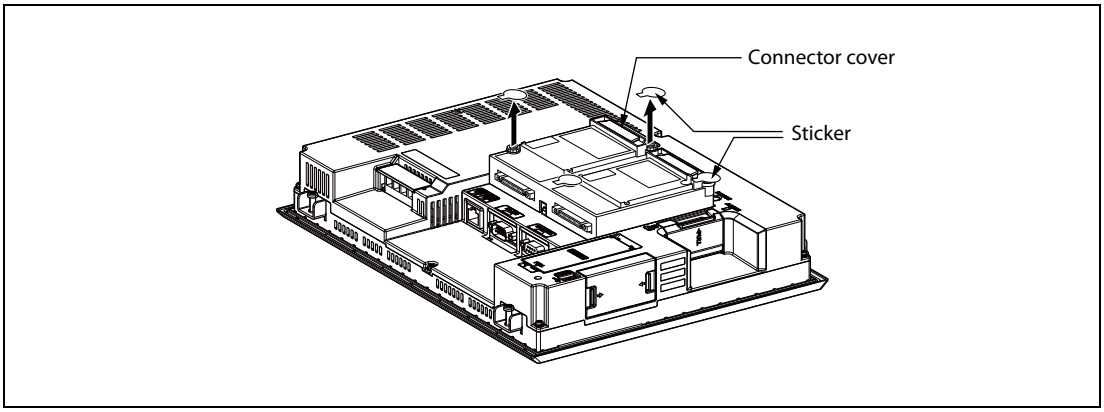


Fig. 5-54: *Preparation for mounting an additional extension unit*

③ Mount an extension unit on the mounted extension unit.

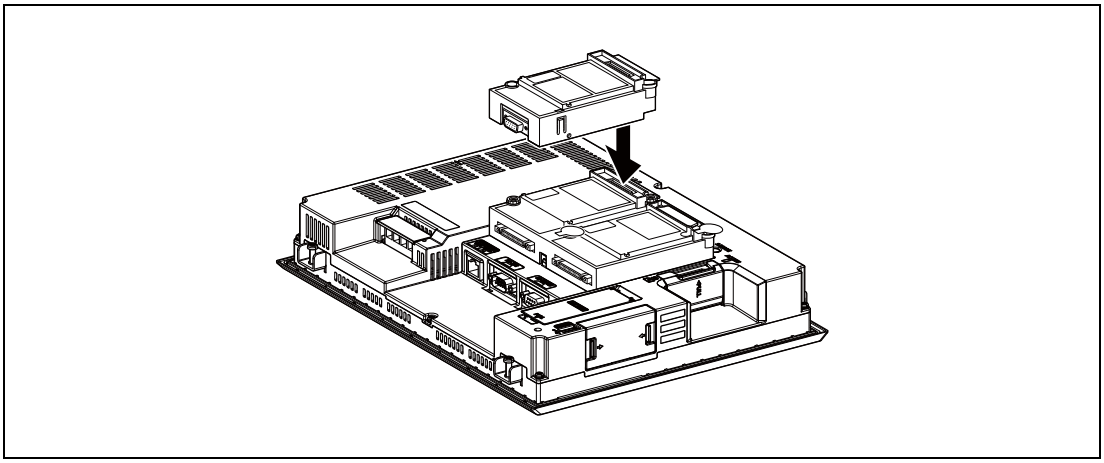


Fig. 5-55: *Mounting an additional extension unit*

④ Tighten the screws within the specified torque range (0.36 Nm to 0.48 Nm).

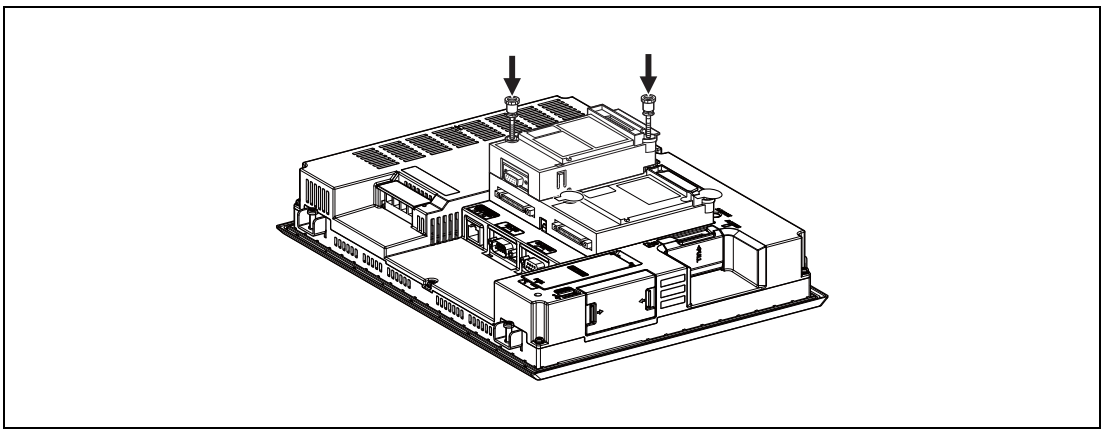


Fig. 5-56: *Tightening the screws*

⑤ To mount another extension unit, repeat Step ② and Step ③.

When you do not mount another extension unit, cover the screws with the accessory stickers to avoid static electricity.

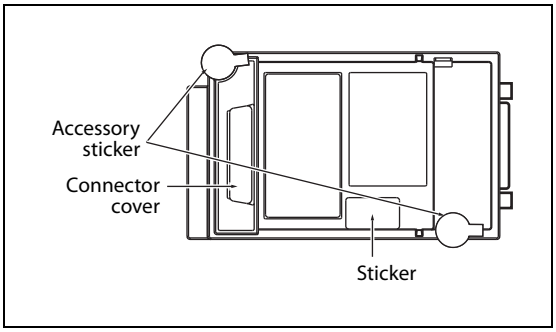


Fig. 5-57:
Keep the connector cover and the stickers attached.

NOTES

Mounting position of a communication unit that occupies two extension interfaces
The following communication units occupy two extension interfaces. These units must be mounted to the GOT directly.
These communication unit cannot be mounted on other communication units.
When a video/RGB unit or a multimedia unit is mounted to the GOT, mount a communication unit on the video/RGB unit or the multimedia unit.
• Bus connection unit (GT15-QBUS2, GT15-ABUS2, GT15-75QBUS2L, and GT15-75ABUS2L only)
• MELSECNET/H communication unit
• CC-Link IE Controller Network communication unit
• CC-Link IE Field Network communication unit
• CC-Link communication unit (GT15-J61BT13)

Mounting GT15-75QBUSL, GT15-75QBUS2L, GT15-75ABUSL, and GT15-75ABUS2L
These units cannot be mounted on a video/RGB unit or a multimedia unit.
When connecting these units by the bus connection, use GT15-QBUS, GT15-QBUS2, GT15-ABUS, or GT15-ABUS2.

5.6.4 Installing a SD Card

CAUTION:

- ***Turning off the GOT while it accesses the SD card results in damage to the SD card and files.***
- ***When using the GOT with an SD card inserted, check the following items.***
  - ***GT27, GT25 (Except for GT2505), GT23***
    When inserting a SD card into the GOT, make sure to close the SD card cover.
    Failure to do so causes the data not to be read or written.
  - ***GT2505-V***
    After inserting an SD card into the GOT, turn on the SD Card Access Switch.
    Not doing so causes the data not to be read or written.
  - ***GT21***
    When inserting an SD card into the SD card unit, make sure to enable the SD card access in the GOT utility in advance.

The SD card installation procedure differs depending on the GOT model.

GT27, GT25 (except GT25-W and GT2505-V), and GT23

① Open the SD card cover as shown below.

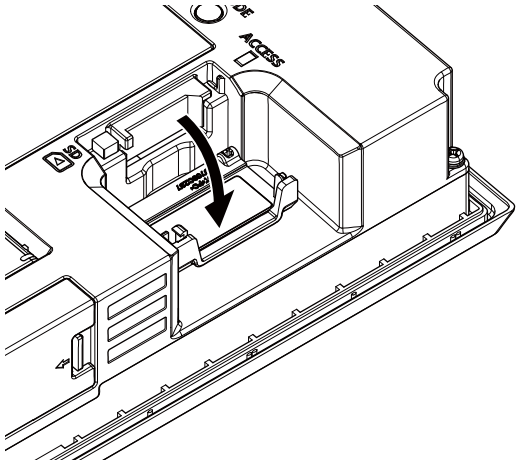


Fig. 5-58: *Opening the SD card cover*

② After making sure that SD card access LED is off with SD card cover 90 degrees or more open, insert an SD card with its front side facing up.

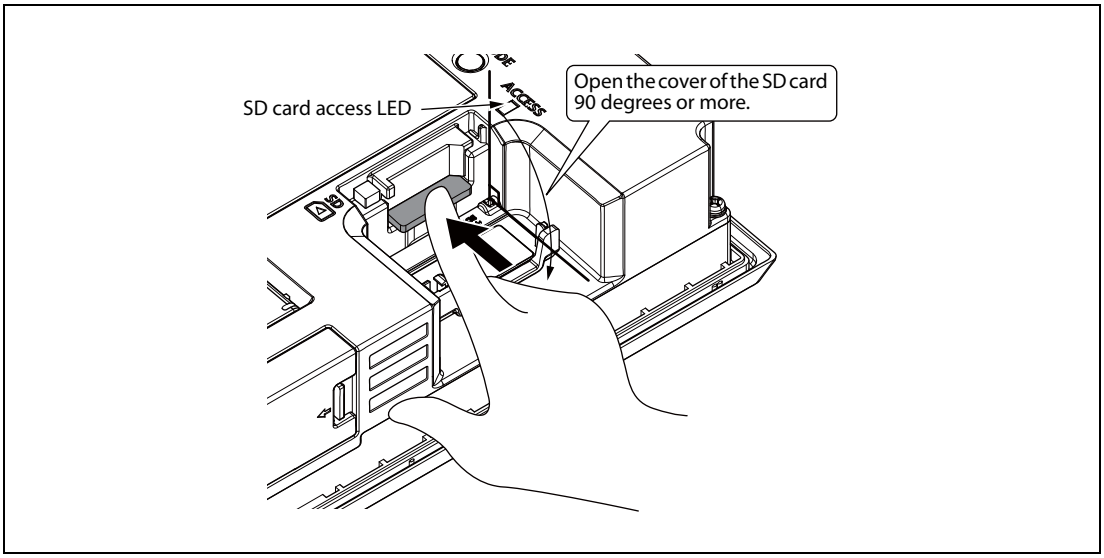


Fig. 5-59: *Insertion of a SD card*

③ Push and close the SD card cover until it clicks.

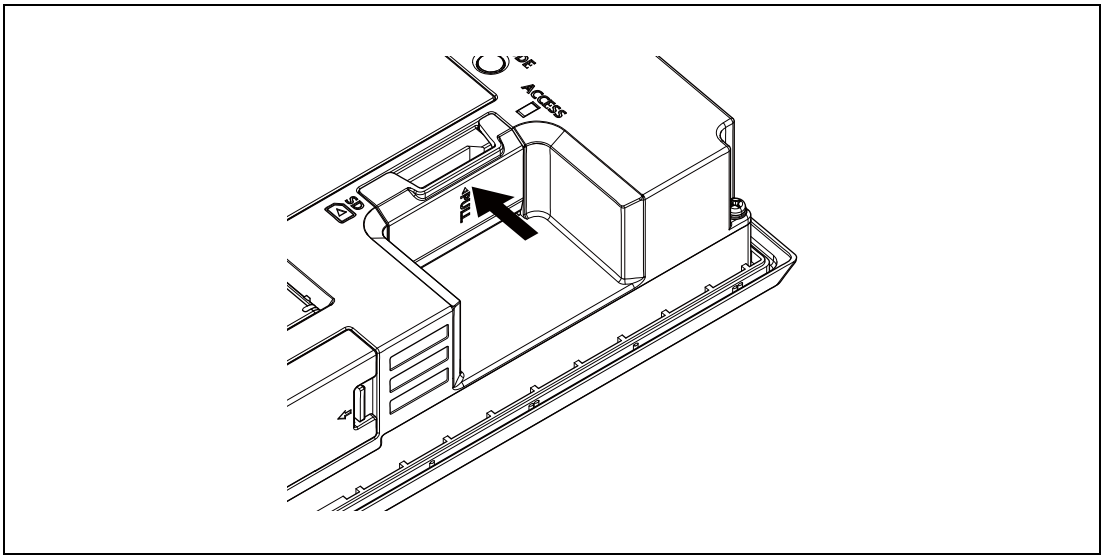


Fig. 5-60: *Closing the SD card cover*

④ When the SD card cover is closed, the access to the SD card is allowed.

GT25-W

① Open the SD card cover as shown below.

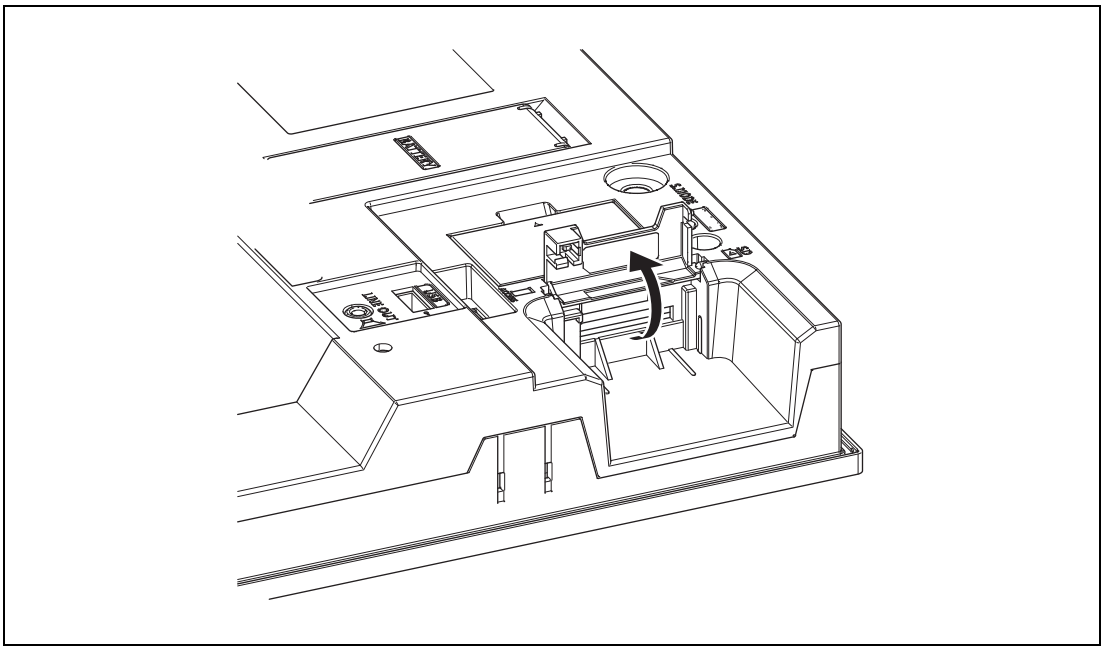


Fig. 5-61: *Opening the SD card cover*

② Open the SD card cover completely, and check that the SD card access LED is off. Then, hold an SD card with its front side facing up, and insert the card into the SD card interface.

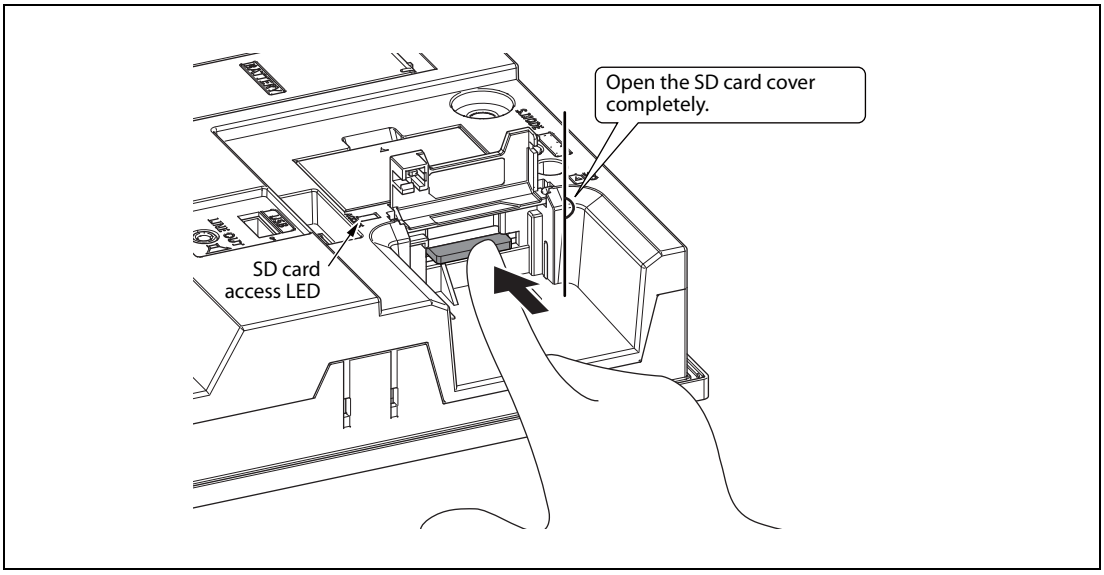


Fig. 5-62: *Insertion of a SD card*

③ Push and close the SD card cover until it clicks.

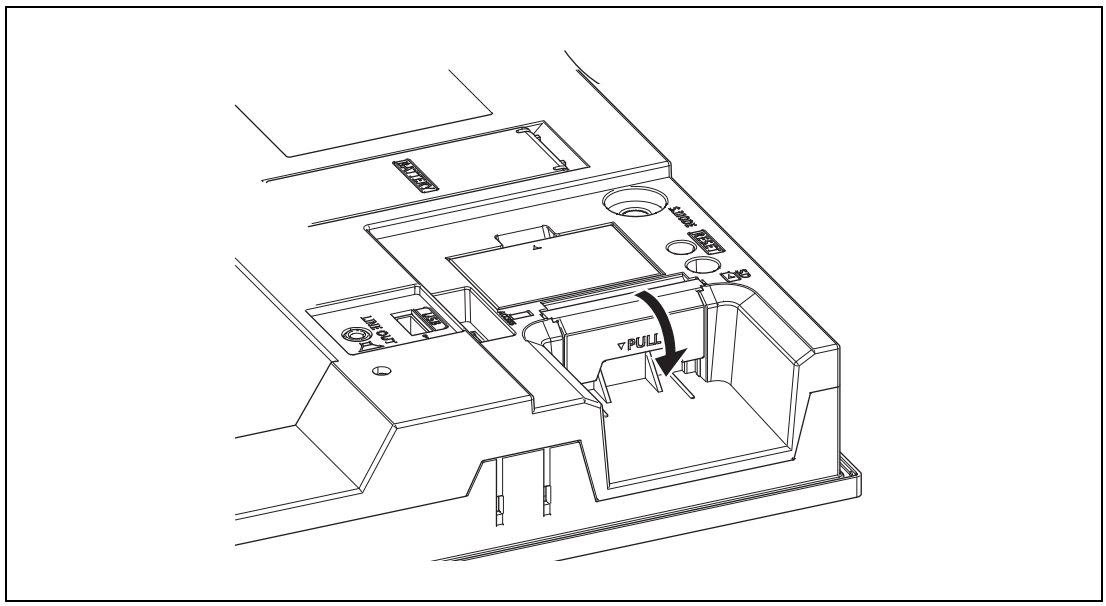


Fig. 5-63: *Closing the SD card cover*

④ When the SD card cover is closed, the access to the SD card is allowed.

GT2505-V

① Turn off the SD card access switch, and check that the SD card access LED turns off.

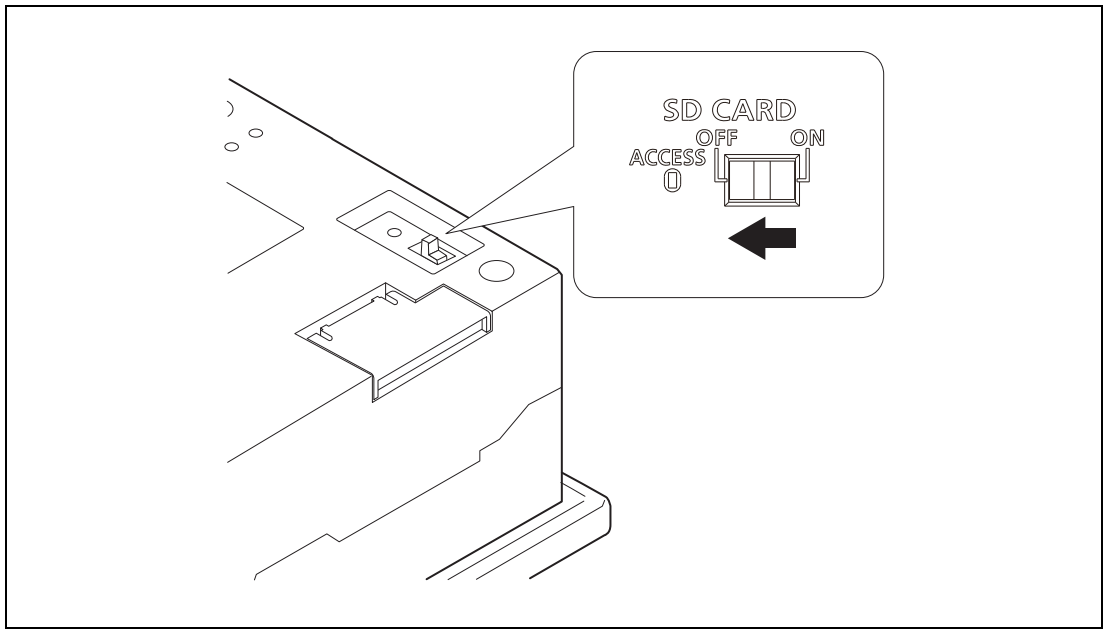


Fig. 5-64: *Turning off the SD card access switch*

② Open the SD card cover. Insert an SD card into the SD card interface with its front side (label side) facing toward the side of the GOT.

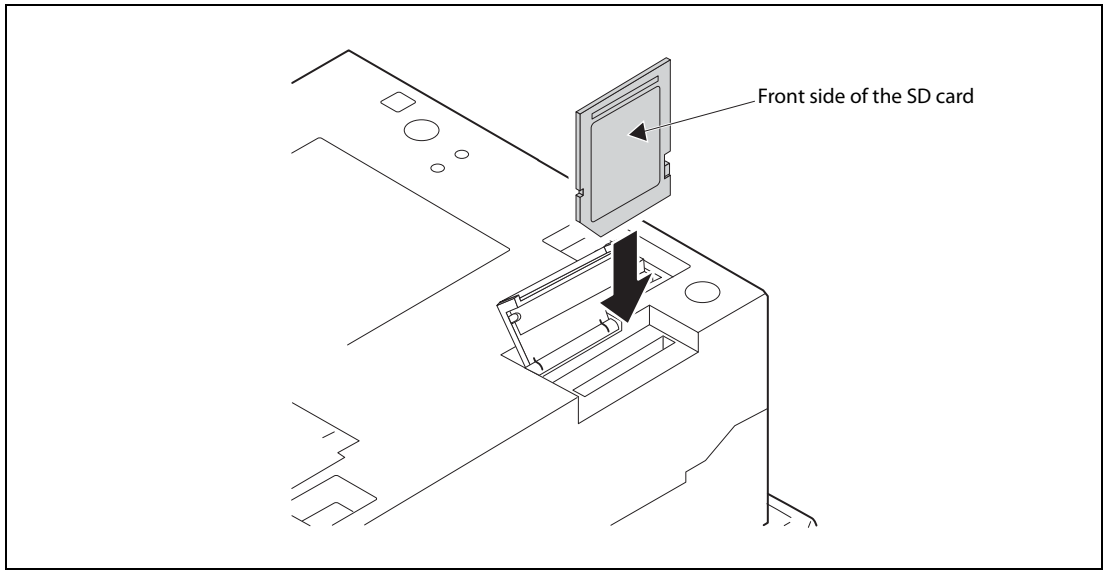


Fig. 5-65: *Insertion of a SD card*

③ Close the SD card cover, and turn on the SD card access switch. The SD card becomes accessible afterward.

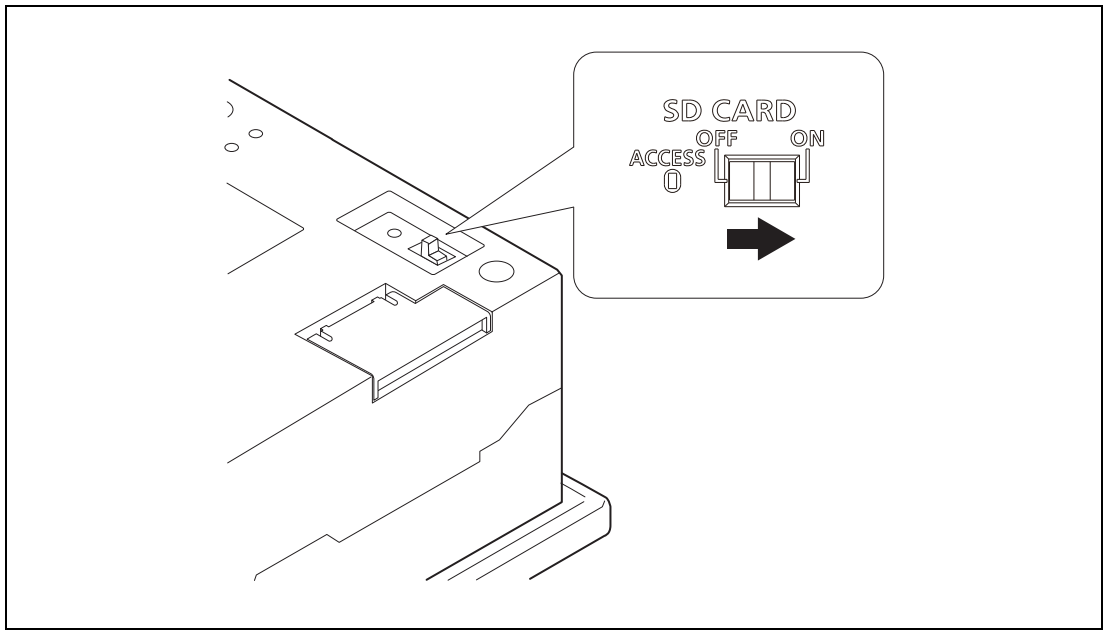


Fig. 5-66: *Turning on the SD card access switch*

GT21

Before inserting or removing an SD card, turn off the GOT or select [Access inhibit] in the SD card access setting of the GOT.

① Touch [Utility main menu] → [Data control] → [SD card access] → [Permissions], and select [Access inhibit].

– Fore more information, please refer to the GOT2000 Series User's Manual (Utility).

Check that the SD card access LED turns off.

When the LED is off, the SD card can be inserted or removed at the GOT power-on.

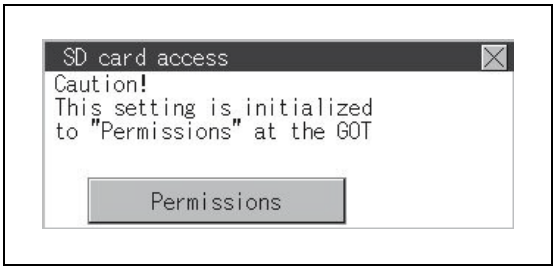


Fig. 5-67: *SD card access setting*

② Open the SD card cover, and insert the SD card with its front side (name plate side) facing outward. Close the SD card cover.

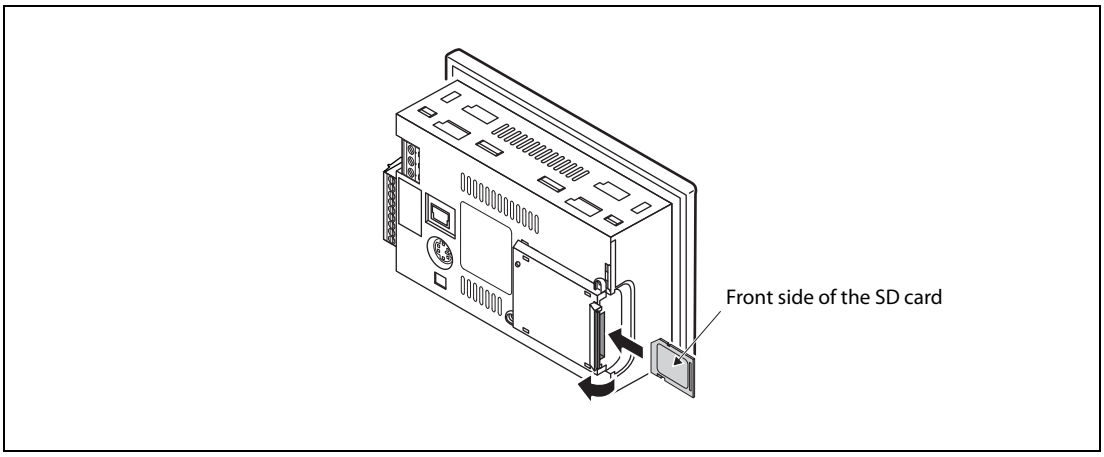


Fig. 5-68: *Insertion of a SD card*

③ Touch [SD card access] → [Access inhibit], and select [Permissions].

Check that the SD card access LED turns on.

6 Wiring



WARNING:

Be sure to shut off all phases of the external power supply used by the system before wiring.

Failure to do so may result in an electric shock, product damage or malfunctions.



CAUTION:

- ***Make sure to ground the FG terminal (and LG terminal if provided) of the GOT power supply section solely for the GOT (ground resistance: 100 Ω or less, ground cable diameter: 1.6 mm or more). (For GT2103-PMBLS, grounding is unnecessary.)***

  Not doing so may cause an electric shock or malfunction.
- ***Correctly wire the GOT power supply section 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 the GOT.***
- ***Exercise care to avoid foreign matter such as chips and wire offcuts entering the GOT. Not doing so can cause a fire, failure or malfunction.***

This section describes wiring to the GOT power supply section.

For the connection to a controller, refer to the following manual:

– GOT2000 Series Connection Manual For GT Works3

General preventive measures against noise

There are two kinds of noises: Radiated noise that is transmitted into the air and Conductive noise that is directly transmitted along connected lines. Countermeasures must be taken considering both kinds of noises and referring to the following 3 points.

- Protecting against noise
  - Keep signal lines away from noise sources such as a power cable or a high-power drive circuit.
  - Shield the signal lines.
- Reducing generated noise
  - Use a noise filter, etc. to reduce the level of the noise generated due to a source such as a high-power motor drive circuit.
  - Attach a surge suppressor on the terminal of the moulded case circuit breaker (MCCB), electromagnetic contactor, relay, solenoid valve, or induction motor to suppress the noise.
- Releasing noise to the ground
  - Make sure to connect the ground cable to the ground.
  - Use a short and thick cable to lower its ground resistance.
  - Ground the power system and the control system separately

Please also consider the information concerning the EMC directive in chapter 4.

6.1 Wiring to the Terminal

6.1.1 GT27, GT25, GT23, GT2107

Use commercially available terminal ends for M3 screws for connection of the power supply.

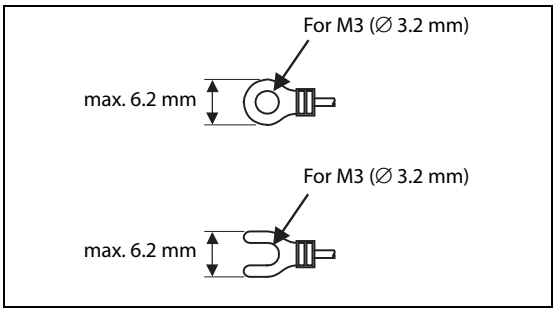


Fig. 6-1:
Terminal ends for M3 screws

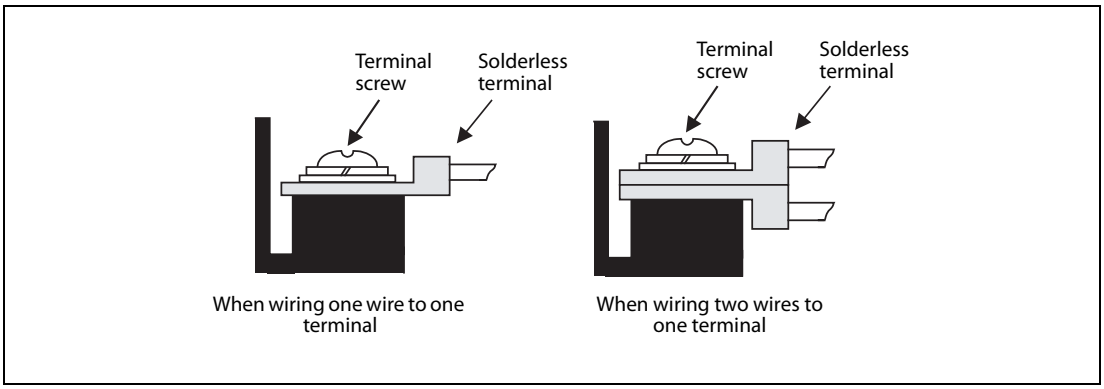


Fig. 6-2: *Wiring to the terminal*

6.1.2 GT2104-R, GT2103-P

Connect a stranded wire or a solid wire directly, or use a rod terminal with an insulation sleeve.

When connecting a stranded wire or a solid wire directly

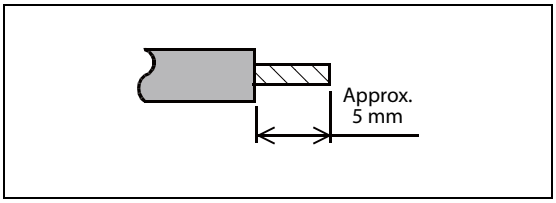


Fig. 6-3:
Twist the end of the stranded wire to prevent the elemental wires from protruding. Do not apply solder plating on the wire terminal.

When using a rod terminal with an insulation sleeve.

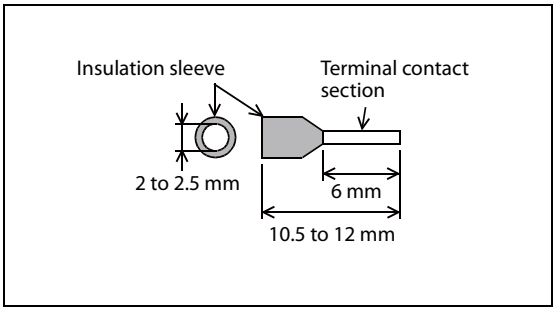


Fig. 6-4:
A wire with a thick sheath cannot enter the insulation sleeve smoothly. Select a wire referring to the figure of external dimensions on the left.

6.1.3 GS21

Use commercially available ferrules with plastic sleeve for connection of the power supply.

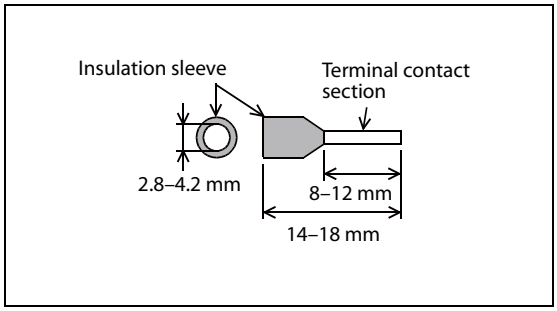


Fig. 6-5:
Using a ferrules with plastic sleeve to connect GS21

6.2 Power Supply

- Carry out wiring so that the power supply system is separated into the GOT, I/O equipment, and power equipment as shown below.
- When frequent noise is identified, connect an isolation transformer.

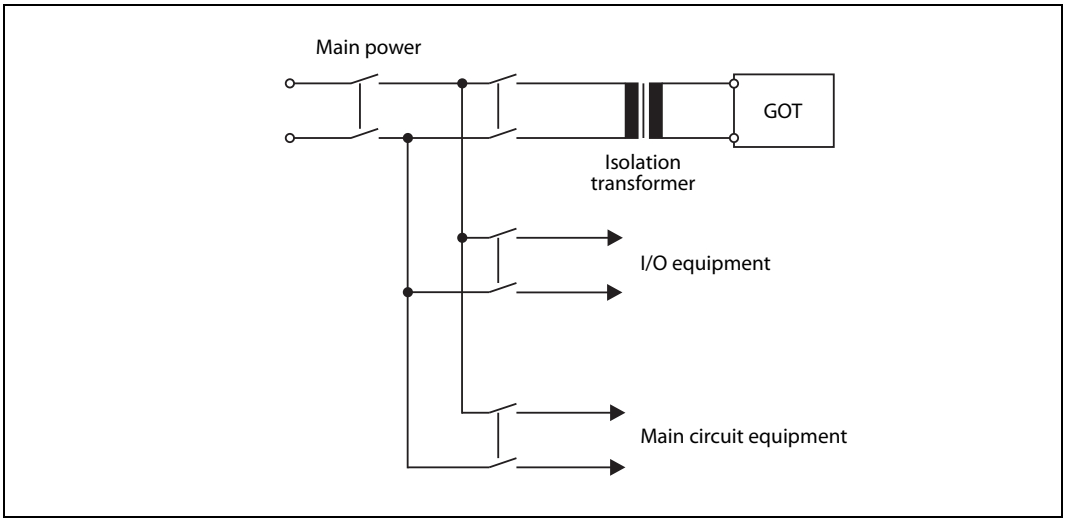


Fig. 6-6: *Power supply system is separated into the GOT, I/O equipment, and power equipment*

- Treatment on power cables

  Twist 100 V AC, 200 V AC, and 24 V DC cables as closely as possible, and connect the cables with the minimum length between the power supply and each device.

  – For GT27, GT25, GT23, and GT2107

    Use thick wires (cross-sectional area: about 0.75 mm^2 to 2 mm^2) for less voltage drop.

    Use solderless terminal for M3, and tighten the terminal firmly with a torque of 0.5 Nm to 0.8 Nm.

  – For GT2104-R and GT2103-P

    Connect a stranded wire or a single wire directly, or use rod terminals with an insulation sleeve.

    Tighten the terminal firmly with a torque of 0.22 Nm to 0.25 Nm.

- Separate the 100 V AC, 200 V AC, and 24 V DC cables from the main circuit lines (high voltage, large current) and I/O signal lines. Separate them with a distance of 100 mm or more as a guide.

- As measures against surge due to lightning, connect a lightning surge absorber as shown below.

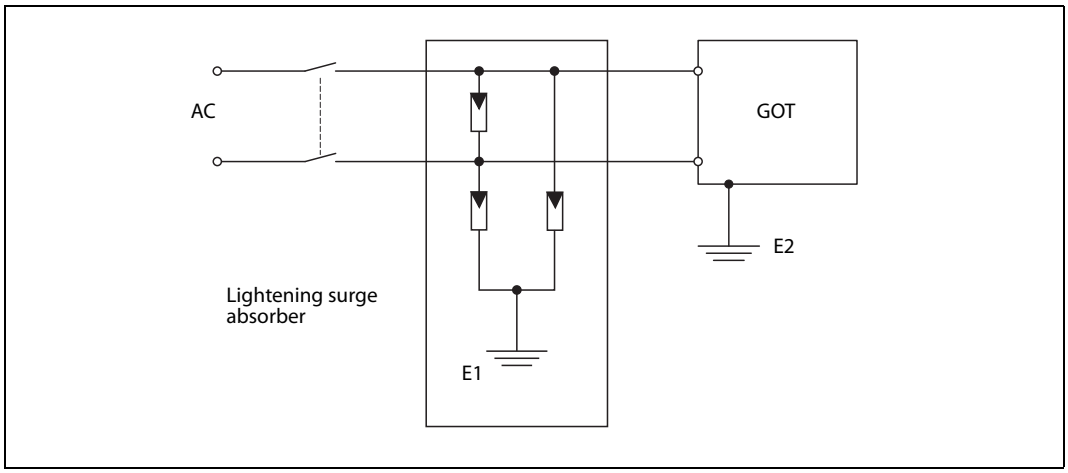


Fig. 6-7: *Lightening surge absorber*

CAUTION:

- ***Separate the grounding of the lightning surge absorber (E1) from the grounding of the GOT (E2).***
- ***Select an appropriate lightning surge absorber that has the maximum allowable circuit voltage withstanding the maximum power supply voltage.***

6.3 Power Supply Wiring to the GOT

CAUTION: (GT27, GT25, GT23):

- ***For 110/230 V AC and 24 V DC cables, use thick wires as much as possible (Cable cross section: 0.75 mm^2 to 2 mm^2), and make sure to twist them to the terminals.***

  To prevent a short circuit due to loose screws, use a solderless terminal with an insulation sleeve.

- ***When connection is made between LG and FG terminals, be sure to connect them to the ground. Otherwise, the system becomes susceptible to noise.***

  Since the LG terminal has potential equal to a half of the input voltage, touching the terminal may lead to an electric shock.

  For GT2705-V and GT25-W ground only the FG terminal because the models do not have the LG terminal.

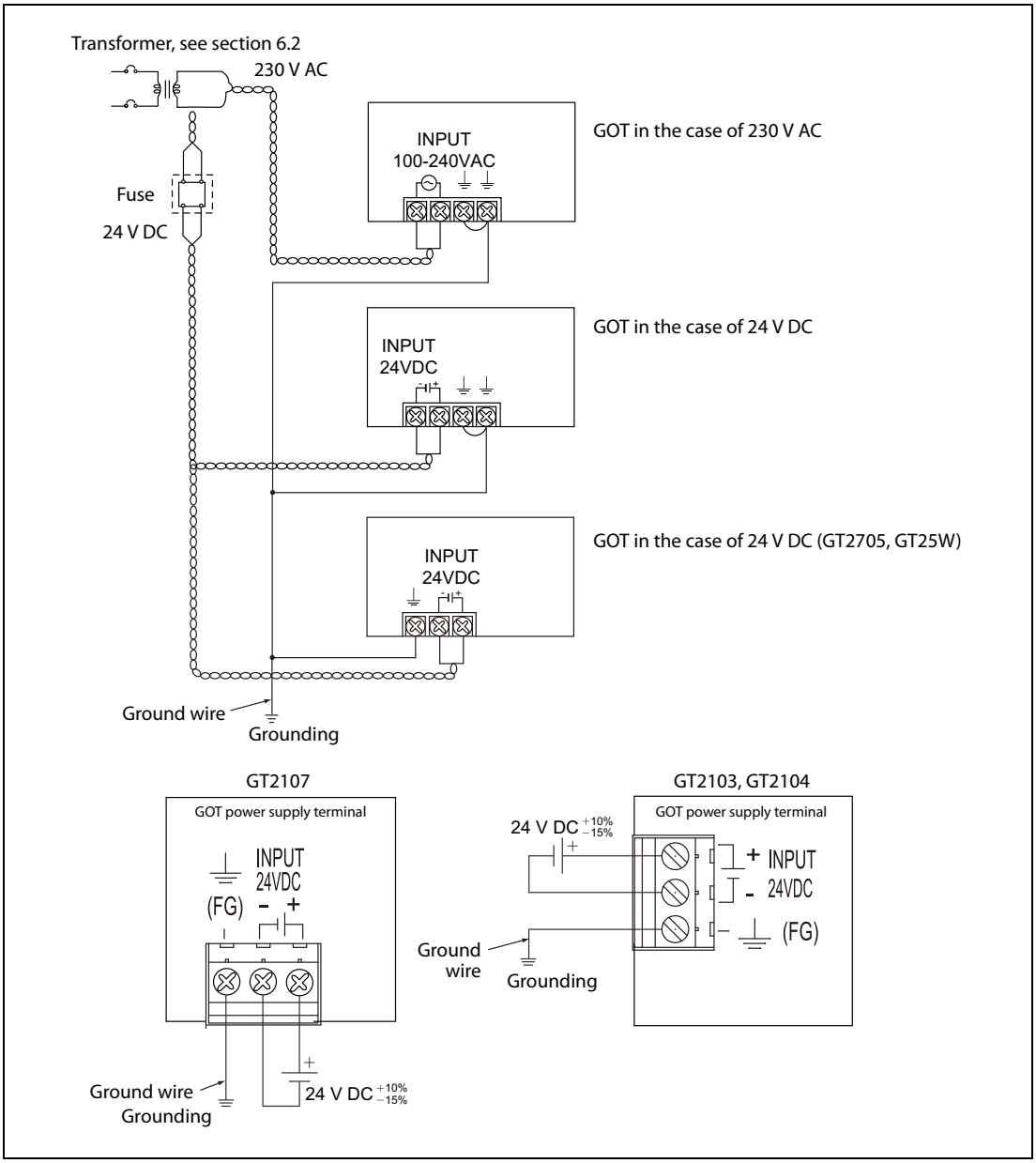


Fig. 6-8: *Power supply wiring to the GOT*

6.4 Grounding

Each GOT has the following ground terminals.

• GT27 (except GT2705-V), GT25 (except GT25-W), GT23: FG terminal and LG terminal

• GT2705-V, GT25-W, GT21: FG terminal

6.4.1 Grounding the GOT

Grounding method

Ground the GOT as shown below.

- Use independent grounding as much as possible for the GOT. Ground the GOT with a ground resistance of 100 Ω or less.
- When independent grounding cannot be applied for the GOT, use shared grounding.

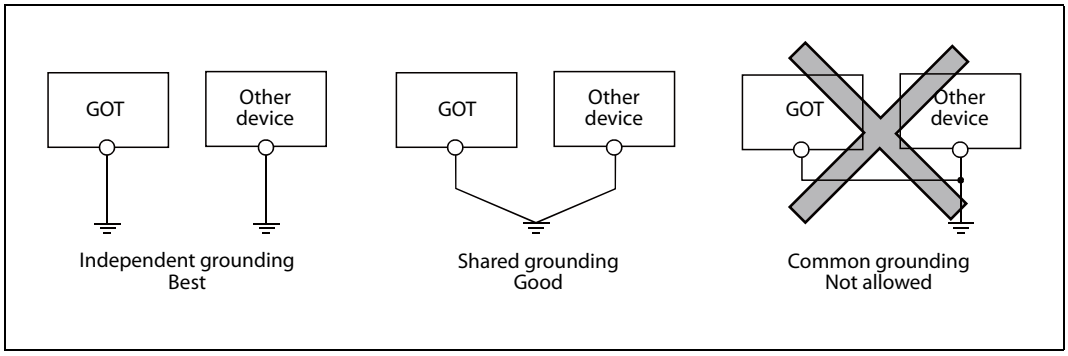


Fig. 6-9: *Grounding methods*

- For the grounding use a cable with the largest possible cross section. Make a ground point near the GOT as much as possible to shorten the ground cable.

Grounding examples

- Independent grounding (Best)

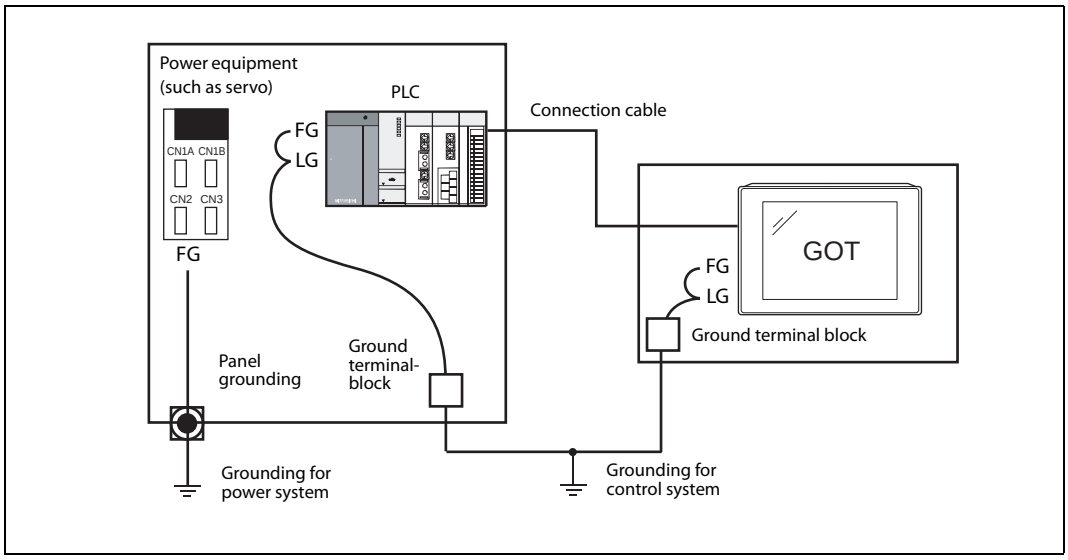


Fig. 6-10: Independent grounding example

For grounding for control system, ground the system at one end. Especially for the control devices communicating each other, ground the system at one end.

- Shared grounding (Good)

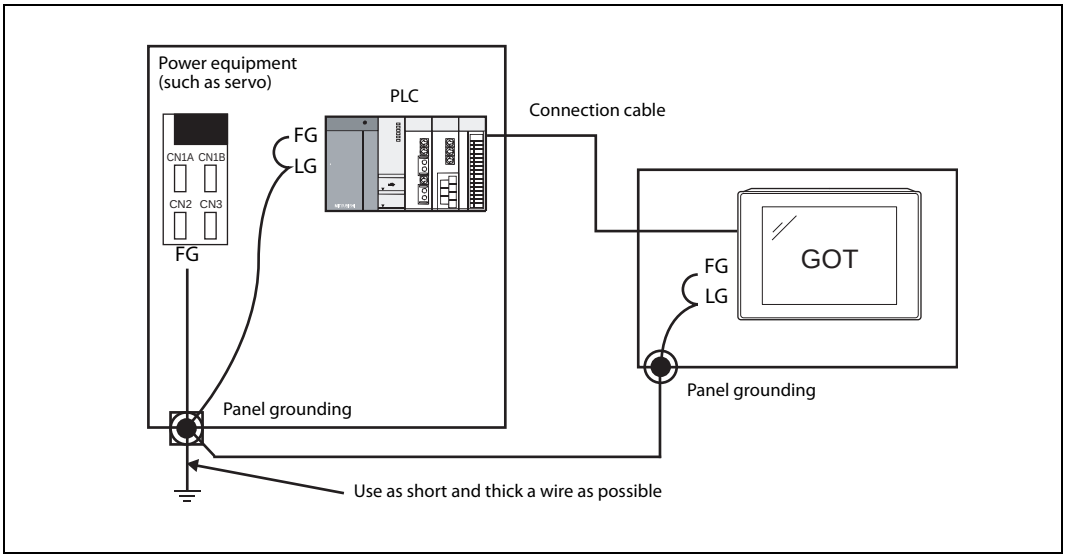


Fig. 6-11: *Shared grounding example*

To prevent noise from entering the GOT, use a short and thick wire for grounding between the ground and the control panel to lower ground resistance.

- Common grounding (Not allowed))

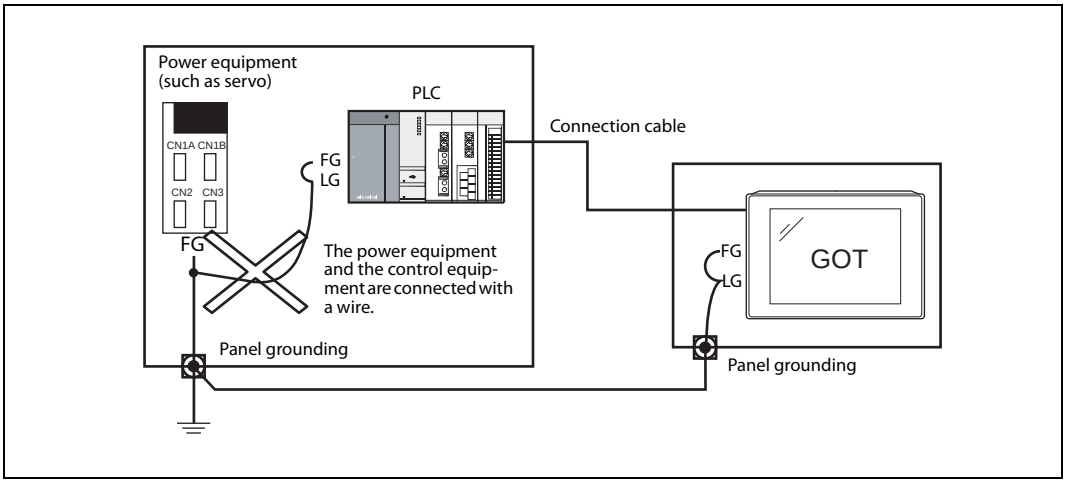


Fig. 6-12: Common grounding example (not allowed)

Do not connect the ground cables of the power equipment and control equipment with a wire. When the cables are connected, noise from the power equipment may affect the control equipment, causing a malfunction.

6.4.2 Causes of wiring-related malfunction and countermeasure examples

Causes of a malfunction due to grounding of the GOT include potential difference caused by grounding and noise.

The following measures may reduce potential difference and noise.

Wiring of the ground cable and power line of the GOT

When the ground cable and power line of the GOT are installed together, the GOT may malfunction due to noise.

Separating the ground cable and power line of the GOT in wiring reduces the influence of noise.

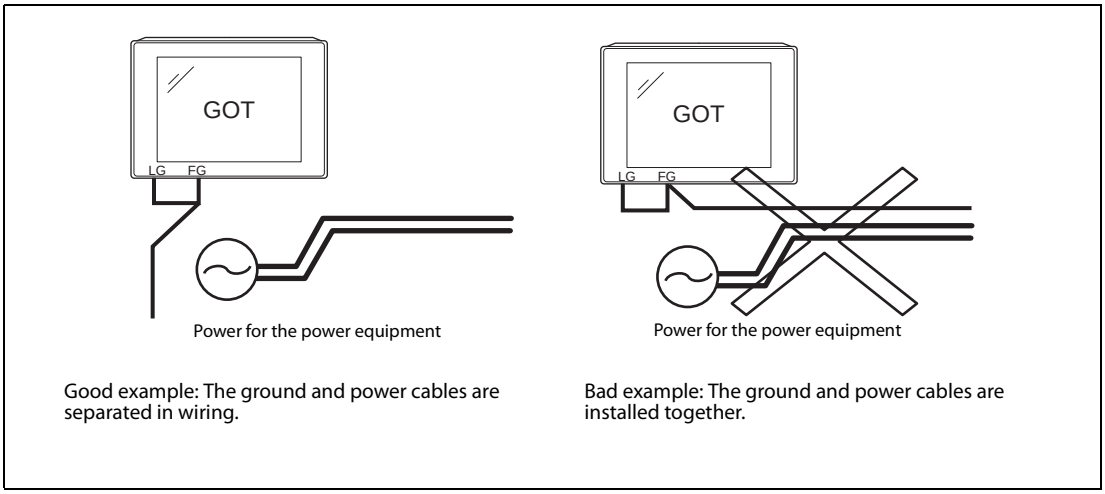


Fig. 6-13: *Separating the ground cable and power line reduces noise*

When leading the ground cable from the control panel having control equipment into the control panel having the GOT

When a single ground cable is led from the control panel having control equipment, including a PLC, into the control panel having the GOT, the cable may be directly connected to the power terminal of the GOT.

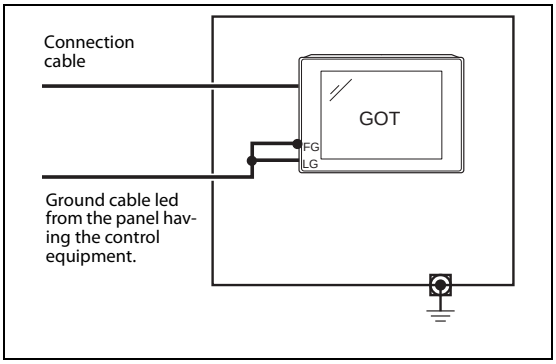


Fig. 6-14:
Ground cable directly connected to the power terminal of the GOT

The malfunction due to the potential difference caused by the grounding in such a case may be prevented by reducing the voltage as shown in countermeasure example 1 below.

- Countermeasure example 1

When any potential difference between the ground cable and the control panel having the GOT affects the GOT, also connect the ground cable to the control panel.

When Countermeasure example Fig. 6-15 (left side) is difficult to be taken, such as the wiring is impossible, carry out wiring as shown in countermeasure example Fig. 6-15 (right side).

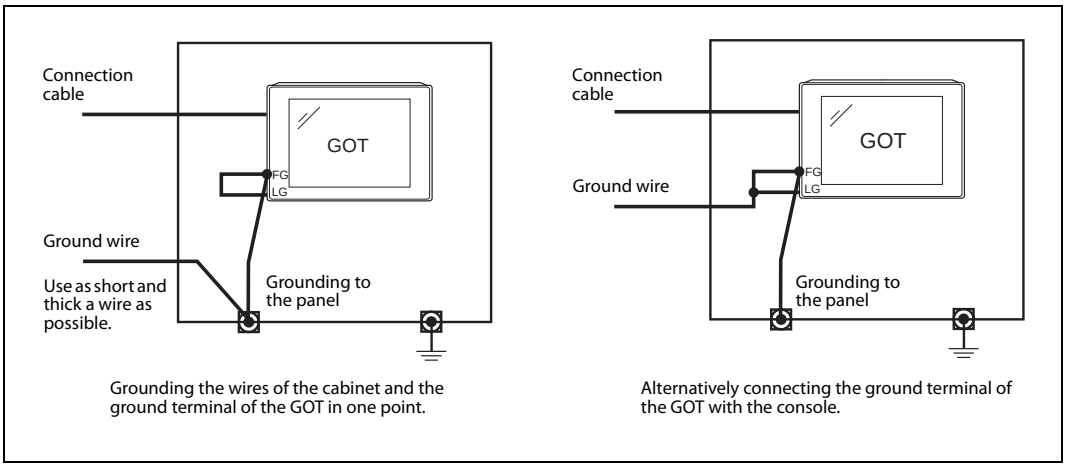


Fig. 6-15: *To avoid potential differences also connect the ground terminal to the console*

If noise further affects the GOT by taking Countermeasure example 1, Countermeasure example 2 may reduce the influence of noise.

- Countermeasure example 2

If the noise from the control panel having the GOT adversely affects the GOT even after Countermeasure example 1 is taken, attach the ferrite core (KITAGAWA INDUSTRIES CO.,LTD. RFC-H13 or equivalent). When attaching a ferrite core, insert the cable through the ferrite core several times (approximately three times).

When countermeasure example Fig. 6-16 (left side) is difficult to be taken, such as the wiring is impossible, carry out wiring as shown in countermeasure example Fig. 6-16 (right side).

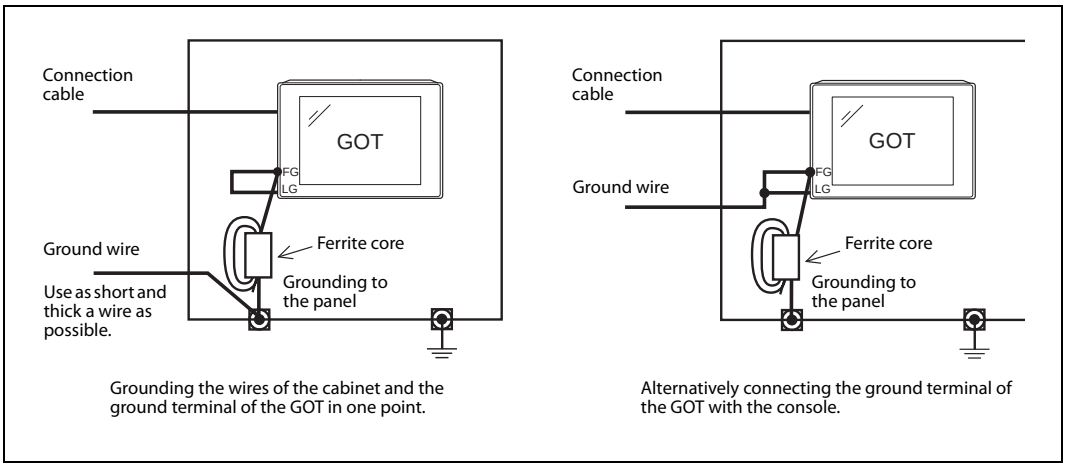


Fig. 6-16: *To avoid potential differences also connect the ground terminal to the console*

6.5 Wiring Inside and Outside the Control Panel

6.5.1 Control panel inside wiring

As shown in the following figure, power lines, including power cables and servo amplifier driving cables, and communication cables, including bus connection cables and network cables, must not be mixed.

Mixing the power lines and communication cables may cause a malfunction due to noise.

When devices that generate surge noise, including a molded case circuit breaker (MCCB), electromagnetic contactor (MC), relay (RA), solenoid valve, and induction motor, are used, a surge suppressor is effective. For the surge suppressor, refer to chapter 6.6.

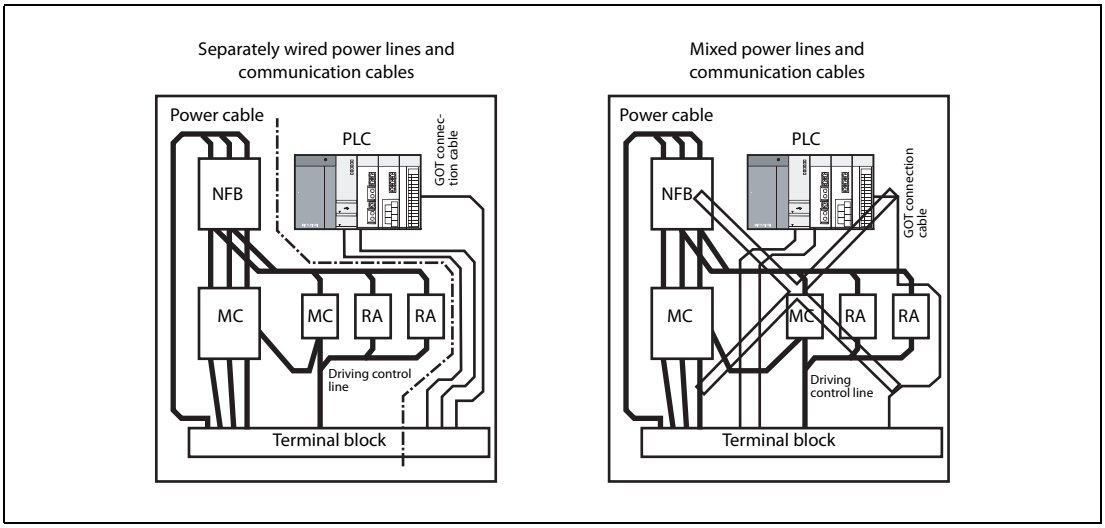


Fig. 6-17: *Cables must not be mixed to reduce the noise influence*

6.5.2 Control panel outside wiring

To lead the power line and the communication cable outside the control panel, open cable holes at two separate places to lead the cables separately out.

When the cables are led out through the same cable hole for wiring reasons, the cables are more easily affected by noise.

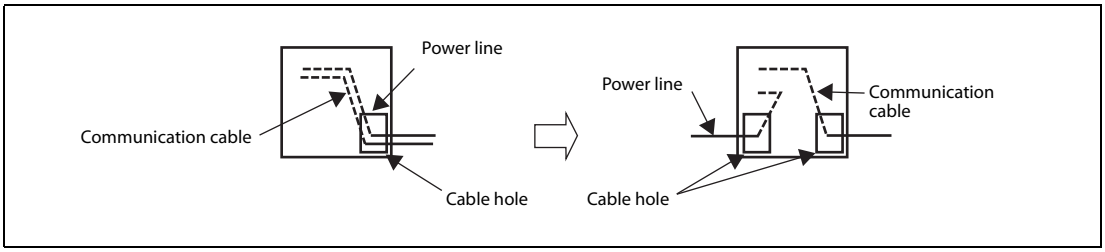


Fig. 6-18: *Lead the cables separately out to reduce the noise influence*

Separate the power line and communication cable each other 100 mm or more in the duct. When the cables are close each other for wiring reasons, use a separator (made of metal). Doing so reduces the noise influence.

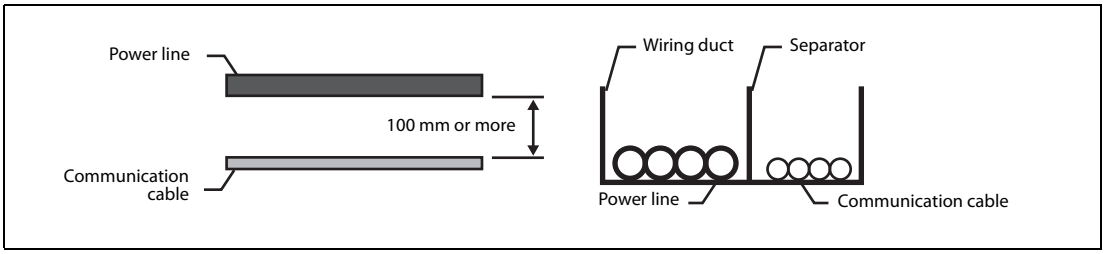


Fig. 6-19: *Wiring of power line and communication cable in the duct*

6.6 Surge suppressor against inductive load

When the GOT fails to work properly, for example a communication error occurs, in synchronization with the ON/OFF status of the specific control equipment, including a moulded case circuit breaker, electromagnetic contactor, relay, solenoid valve, and induction motor (hereinafter described as load), the GOT may be affected by surge noise.

In such a case, separate the ground cable and the communication cable from the load. When the ground cable or communication cable has to be installed close to the load, attaching a surge suppressor is effective.

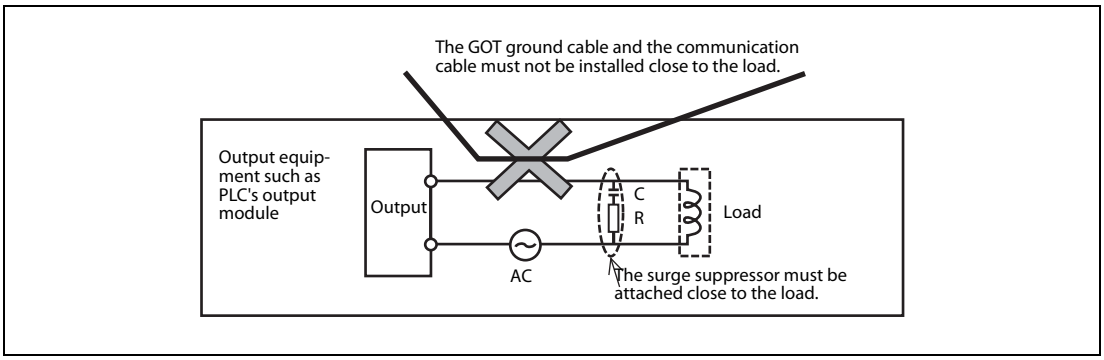


Fig. 6-20: *Measures against AC inductive load*

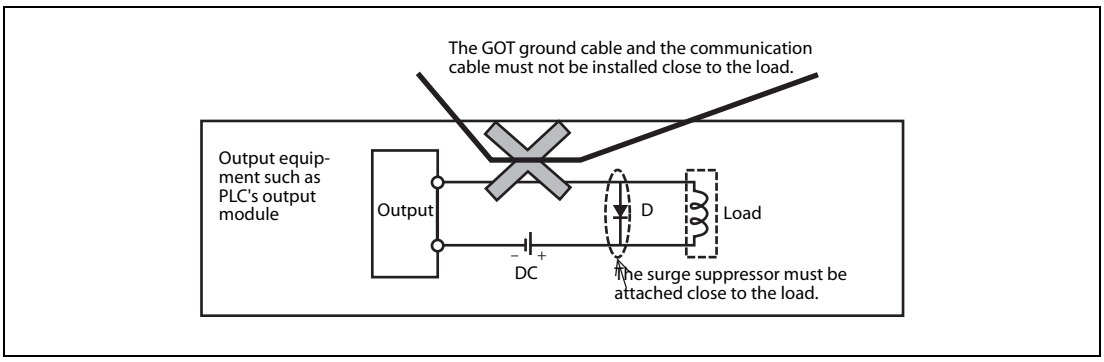


Fig. 6-21: *Measures against DC inductive load*

NOTE Attach a surge suppressor closest to the load.

6.7 Grounding the extension unit

6.7.1 Wiring of the FG cable of a bus connection cable

This section explains wiring of FG cables when a GOT is connected to a PLC CPU with bus connection cables.

NOTE

Do not install the connection cable together with or close to the main circuit lines (high voltage, large current) or I/O signal lines.

Connecting the GOT and PLC CPU or motion controller CPU of MELSEC System Q

Grounding of the FG cable for the QCPU and motion controller CPU (Q series) is unnecessary since they have no FG cable.

Connecting the GOT and QnACPU, ACPU or motion controller CPU of MELSEC A series

Ground a GOT as shown below when GT15-C☐EXSS-1* or GT15-C☐BS is used.

* The GT15-C☐EXSS-1 is a set consisting of the wires GT15-EXCNB and GT15-C☐BS.

NOTES

Layout of terminal blocks of a GOT differs depending on the GOT model. Check the terminal layout of the GOT to be used and perform wiring.

Up to two ground cables can be connected to each of LG and FG of the GOT. When three or more ground cables need to be connected, connect the third and later cables to the LG.

- Grounding for GT15-C☐EXSS-1

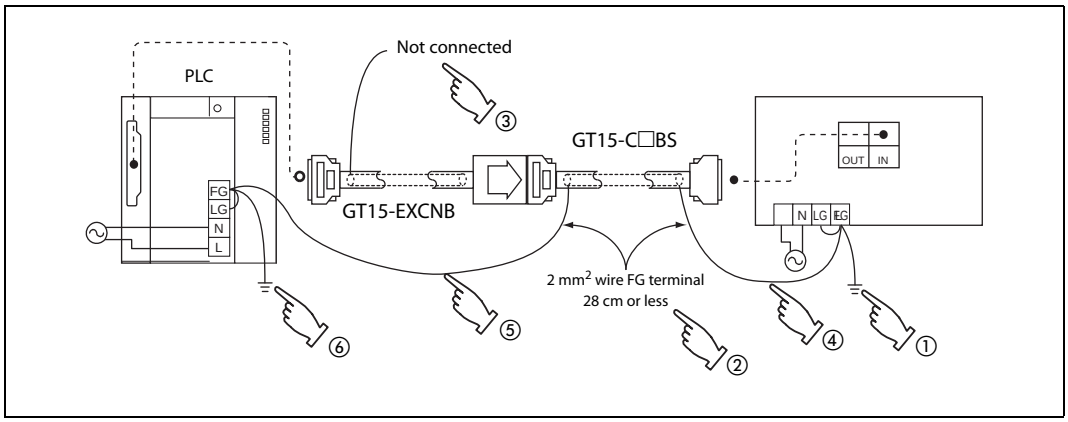


Fig. 6-22: *Connecting the GOT and GT15-C☐EXSS-1*

① Connect the LG and FG of the GOT power supply at the terminal block and ground them with one cable.

② Wire the FG cable of the GT15-C☐BS. The length of the cable must be 28 cm or shorter.

③ Do not connect the ground cable for FG of the GT15-EXCNB.

④ Connect the FG cable of the GT15-C☐BS at the GOT side to FG of the power terminal block of the GOT.

⑤ Connect the other ground cable of the GT15-C☐BS to the FG terminal of the power supply module of the PLC.

⑥ Connect the LG and FG of the PLC at the terminal block and ground them with one cable.

- Grounding for GT15-C□BS

  Respectively connect one ground cable to the FG terminal of a GOT. For the both side GOTs, connect the LG and FG terminals of the terminal block on the GOT unit power and ground them with a cable.

7 Operating the GOT

7.1 Outline Procedure to Start the GOT

This section explains the outline procedure to operate the GOT.

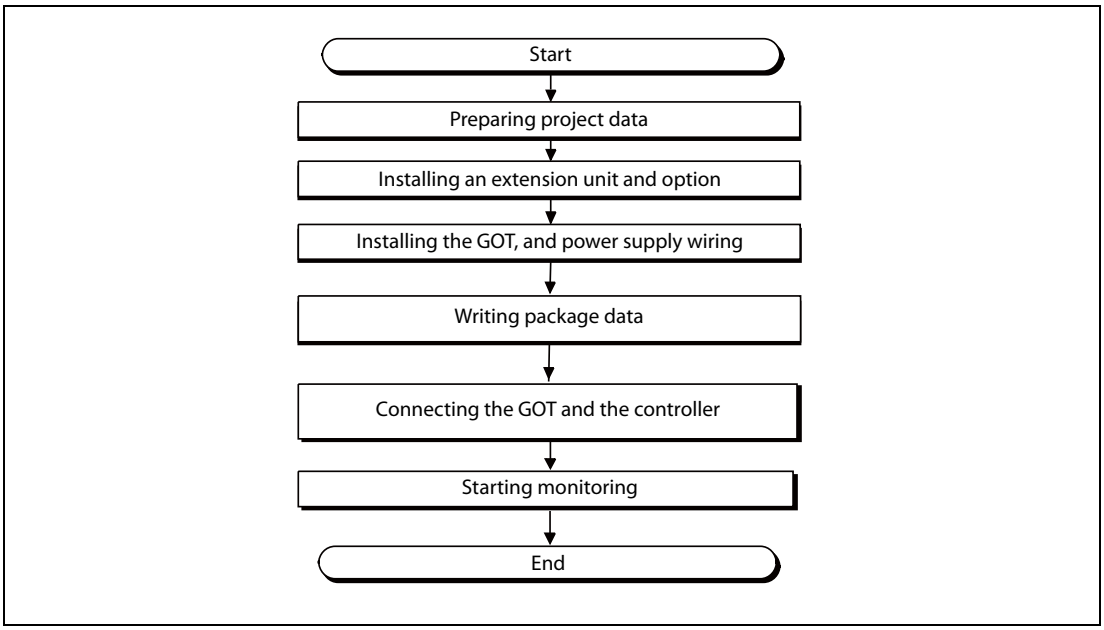


Fig. 7-1: *Procedure to operate the GOT*

7.1.1 Preparing project data

① Install GT Designer3 on the personal computer.

For how to install GT Designer3 refer to the following manual:

– GT Works3 Version1 Installation Instructions

② Create project data with GT Designer3.

For how to use GT Designer3 and create project data, refer to the following manual:

– GT Designer3 (GOT2000) Screen Design Manual

7.1.2 Installing an extension unit and option

① Install options other than the SD card and USB memory to the GOT.

For how to install options, refer to the following:

– Section 5.6.1 (Installing the Battery)
– User's Manual of each option

② Install an extension unit to the GOT.

For how to install extension units, refer to the following:

– Section 5.6.3 (Installing an extension unit)

7.1.3 Installing the GOT, and power supply wiring

① Install the GOT to the control panel.

For how to install the GOT, refer to the following.

– Section 5.6.2 (Installing the GOT)

② Carry out wiring of power cables for the GOT.

For the wiring of power cables, refer to the following.

– Section 6.3 (Power supply wiring to the GOT)

7.1.4 Writing package data

Write package data with GT Designer3. For how to write the package data, refer to the following:

– GT Designer3 (GOT2000) Screen Design Manual

The writing procedure differs depending on the data writing method.

NOTES

Terms

– Basic Software
The basic software is equivalent to an operating system of the GOT.
A GOT in which no basic software is written cannot be started.

– Package data
The package data contains project data and applications necessary to execute the project data.
Writing the package data into the GOT enables you to use the user-created project data on the GOT.

Writing package data directly from a personal computer to the GOT

① Connect the personal computer and GOT.

– USB:
Connect the USB interface (Device) and the USB port of the personal computer with a USB cable.

– Ethernet:
Connect the Ethernet interface and the Ethernet port of the personal computer with an Ethernet cable. To write the package data to the GOT by Ethernet, install the basic software to the GOT and configure the communication settings to enable the communication between the GOT and the personal computer by Ethernet in advance.

– Via PLC (GT27 and GT25 only):
Connect the GOT and the personal computer via the PLC connected to the GOT.

For each connection setting, refer to the following:

– GT Designer3 (GOT2000) Screen Design Manual

② Turn on the GOT

③ Write the package data with GT Designer3.

Writing package data from the data storage to the GOT

Write the package data to the GOT using the data storage such as an SD card.

① Install a data storage such as an SD card to the personal computer

② Write the package data to the data storage with GT Designer3.

③ Install the data storage to the GOT.

- SD card (drive A) should be installed to the SD card interface (refer to section 5.6.4 (Installing a SD card)).
- Data storage (drive B, E, F, or G) (GT27, GT25 and GT23) should be installed to the USB interface (Host)

④ Turn on the GOT

To start the GOT with the built-in flash memory (Drive C), write the package data to the built-in flash memory (Drive C) of the GOT.

To start the GOT with the data storage (Drive A, B, D to G), writing the package data to the built-in flash memory (Drive C) of the GOT is not required.

7.1.5 Connecting the GOT and the controller

① Check the communication settings in the utility screen of the GOT.

Refer to: GOT2000 Series User's Manual (Utility)

② Turn off the power of the GOT.

③ Connect the GOT and controller with a cable.

Refer to: GOT2000 Series Connection Manual For GT Works3 Version1 compatible for a controller used.

7.1.6 Starting monitoring

① Turn on the GOT and the connected system.

② The GOT starts monitoring.

When the startup source is the SD card (Drive A), do not open the cover of the SD card interface during the GOT startup. Doing so causes the GOT to fail to start normally.

7.2 Creating Project Data

Create project data with GT Designer3.

For how to operate GT Designer3, refer to the following:

– GT Designer3 (GOT2000) Screen Design Manual

8 Utility

8.1 Utility for GT27/GT25/GT23

Utility is a function which carries out connection of GOT and controller, screen display and operation method settings, program/data control and self-check.

To execute the GOT utility, install the BootOS① and system applications on the C drive (built-in flash memory) of the GOT, or set the boot drive of the system application to [A: Built-in SD card] and insert an SD card with system applications into the GOT.

① BootOS is installed in the GOT at factory shipment. It is not necessary to install BootOS when upgrading of it is unnecessary.

8.1.1 Utility execution

There are the following three methods for installing BootOS and basic system application.

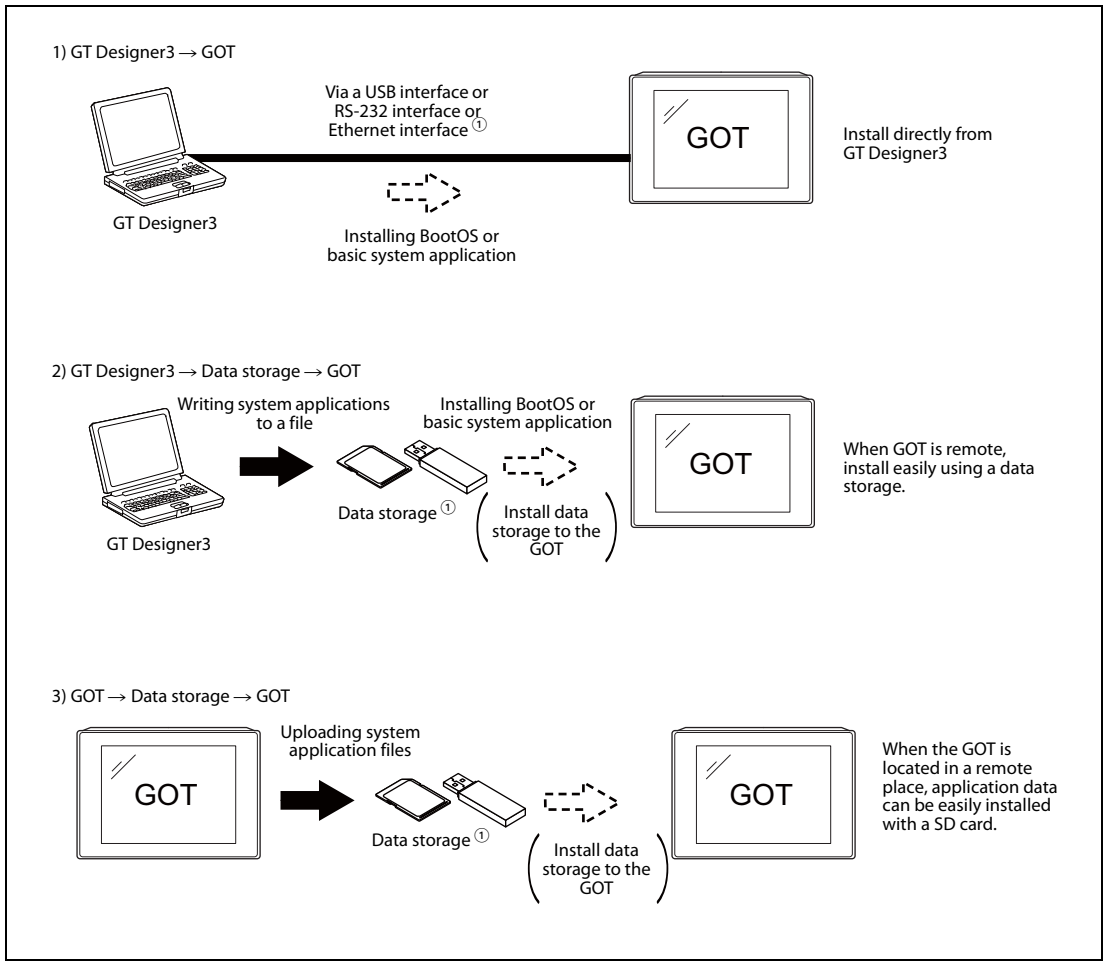


Fig. 8-1: *Methods for installing BootOS and basic system application*

① When installing the BootOS and basic system application, standard monitor OS has to be installed in GOT in advance.

Refer to the following for the installation which uses GT Designer3:

– GT Designer3 (GOT2000) Screen Design Manual

Refer to the following for the installation which uses GOT:

– GT2000 User's Manual (Utility)

8.1.2 Utility function list

The items in the following list can be set/operated on the utility screens. For GT Designer3 of an old version, displayed screens, setting items and others may differ from those described in the manual.

●: Supported, ✖: Not supported

Function			Function overview	GT27	GT25	GT23
GOT basic setting	Display		Setting the startup screen display time and screen saving time	●	●	●
			Setting the battery alarm display to ON or OFF	●	●	●
			Setting the detect level/detect time of human sensor	●	✖	✖
			Adjusting brightness	●	●	●
	Language		Switching message languages	●	●	●
	Unique information		Setting the GOT ID number	●	●	●
	IP address		• Setting the GOT IP address, subnet mask, and default gateway • Setting the GOT operation when a device with the same IP address as that of the GOT is added to the network afterwards.	●	●	●
	IP filter setting		Setting IP addresses from which access to the GOT is allowed or blocked	●	●	●
	Operation		• Setting the buzzer volume and window move buzzer • Setting a musical interval for the buzzer sound ① • Setting the key sensitivity and key reaction speed • Setting the access switch for the drive A	●	●	●
	Utility call key		Setting the utility call keys	●	●	●
	USB host		Setting the USB mouse/keyboard	●	●	●
	Time		Displaying and setting the clock current time	●	●	●
	Controller	Assign Ethernet I/F	Setting the assign Ethernet I/F	●	●	●
		Channel - Driver assign	Displaying the communication driver assigned to each channel	●	●	●
		Changing assignment	Changing the assigned communication driver			
		5 V power supply	Setting 5 V power supply for channel No. 1	●	●	✖
		Communication detail setting	Setting communication parameters, setting or deleting sequence program protection key words, cancelling sequence program protection status (When connecting to FX series CPU)	●	●	●
	Ethernet communication		Displaying the contents of Ethernet setting, changing the host	●	●	●
	Transparent mode		Setting the channel No. to be used for the communication for the FA transparent function	●	●	●
	GOT internal device monitor		Setting whether to use the GOT internal device monitor of the GOT diagnostics function	●	●	●
	Security	Security level authentication	Authenticating security levels	●	●	●

Tab. 8-1: *Utility function list (1)*

Function				Function overview	GT27	GT25	GT23
Extended function setting	SoftGOT-GOT link function			Setting the SoftGOT-GOT link function	●	●	✖
	VNC server function			Setting the VNC server function	●	●	✖
	Sequence program monitor			Starting the sequence program monitor	●	●	✖
	Backup/restoration setting			Setting the backup and restoration	●	●	●
		Trigger backup setting		Setting the trigger backup	●	●	●
			Trigger time setting	Setting the trigger time	●	●	●
	License management			Displaying the screen for registering and releasing the license	●	●	✖
	Video/RGB			Displaying the screen for setting the video/RGB I/O unit	●②	✖	✖
	Multimedia			Displaying the screen for setting the multimedia	●②	✖	✖
	Wireless LAN connection function			Setting the wireless LAN connection function	●	●③	✖
	System launcher			Configuring a setting to enable the online module change in the system launcher function	●	●	●
	iQSS utility			Setting a drive for a data storage containing the profile data of iQSS-compatible equipment	●	●	✖
	ANDON connection			Setting the IP address of a client targeted for the ANDON connection	●	●	✖
Maintenance	Operator authentication	Operator management		Managing operator	●	●	●
		Password change		Changing a password			
		Function setting		Setting the operator authentication function			
	Batch self check			Executing various diagnostics collectively and copying the result to a data storage	●	●	●
	USB device management			Displaying the status of USB device	●	●	●
	Cleaning			Displaying the screen for cleaning the display	●	●	●
	Touch panel calibration			Adjusting the touch panel	●	●	●
	System alarm			Displaying the system alarm	●	●	●
	Drawing check			Checking the drawing	●	●	●
	Font check			Checking the font	●	●	●
	Touch panel check			Checking the touch panel	●	●	●
	I/O check			Checking the I/O of RS-232 interface	●	●	●
	Ethernet status check			Checking the connection status of Ethernet	●	●	●
	GOT information			Displaying the GOT information	●	●	●
	GOT Mobile information			Displaying the GOT Mobile function settings	●	●	✖

Tab. 8-1: *Utility function list (2)*

Function		Function overview	GT27	GT25	GT23
Monitor	System launcher	Starting the system launcher	●	●	●
	Device monitor	Starting the device monitor	●	●	●
	Sequence program monitor (Ladder)	Starting the QCPU or LCPU sequence program monitor	●	●	✖
	Sequence program monitor (iQ-R ladder)	Starting the RCPU sequence program monitor	●	●	✖
	FX ladder monitor	Starting the FX ladder monitor	●	●	✖
	Network monitor	Starting the network monitor	●	●	✖
	Intelligent module monitor	Starting the intelligent module monitor	●	●	✖
	Servo amplifier monitor	Starting the servo amplifier monitor	●	●	✖
	Q motion monitor	Starting the Q motion monitor	●	●	✖
	R motion monitor	Starting the R motion monitor	●	●	✖
	CNC monitor	Starting the CNC monitor	●⑤	●⑥	✖
	CNC monitor 2	Starting the CNC monitor 2	●	●⑦	✖
	Sequence program monitor (SFC)	Starting the SFC monitor	●	●	✖
	Motion SFC monitor	Starting the motion SFC monitor	●	●	✖
	Log viewer	Starting the log viewer	●	●	✖
	Network status display	Starting the network status display	●	●	✖
	FX list editor	Starting the FX list editor	●	●④	✖
	CNC machining program edit	Starting the CNC machining program edit	●⑤	●⑥	✖
	CNC data I/O	Starting the CNC data I/O	●⑤	●⑥	✖
	Motion Program Editor	Starting the motion program editor	●⑤	●⑥	✖
	Motion Program I/O	Starting the motion program I/O	●⑤	●⑥	✖
	MELSEC-L troubleshooting	Starting the MELSEC-L troubleshooting	●	●	✖
	iQSS utility	Starting the iQSS utility	●	●	✖
	Drive recorder	Starting the drive recorder	●	●	✖
	CC-Link IE Field Network diagnostics	Starting the CC-Link IE Field Network diagnostics	●	●	✖

Tab. 8-1: *Utility function list (3)*

Function		Function overview	GT27	GT25	GT23
Data management	Alarm information	Deleting or copying alarm log files	●	●	●
		Converting alarm log files in G2A format → CSV/TXT format			
	Image file management	Deleting/copying image files, changing image file names	●	●	●
	Recipe information	Converting recipe files in G2P → CSV/TXT format, deleting/copying/moving/creating recipe files, deleting/moving/changing recipe folder names, writing/reading/verifying record values with the recipe record list, deleting device values	●	●	●
	Logging information	Converting logging files in G2L format → CSV/TXT format	●	●	●
		Deleting/copying/moving logging files, changing logging file names			
	Operation log information	Converting operation log files in G20 → CSV/TXT format	●	●	●
		Deleting, copying, moving, or renaming an operation log file, deleting or creating an operation log folder			
	File manager	Deleting, copying, moving or renaming a folder or file, sorting the list of folders and files, or creating a folder	●	●	●
	Package data management	Installing/uploading package data, checking the property	●	●	●
	Backup/restoration	Starting the backup/restoration function	●	●	●
	SRAM management	Confirming the SRAM user area usage, backing up or restoring the data in the SRAM user area, and initializing the SRAM user area	●	●	●
	Memory card format	Formatting a data storage	●	●	●
	Memory check	Write/read check of a data storage and built-in flash memory	●	●	●
	GOT data package acquisition	Copying the data stored in the GOT to an SD card in a batch	●	●	●

Tab. 8-1: *Utility function list (4)*

●: Supported, ✖: Not supported

① Not available to GT23.
② GT2705-V does not support
③ Not available to GT2505-V.
④ Not available to GT25-W
⑤ Available to GT27-X and GT27-S.
⑥ Only available to GT25-S.
⑦ Not available to GT25-W and GT2505-V.

8.1.3 Utility display

To display each setting screen of the utility, the main menu has to be displayed first

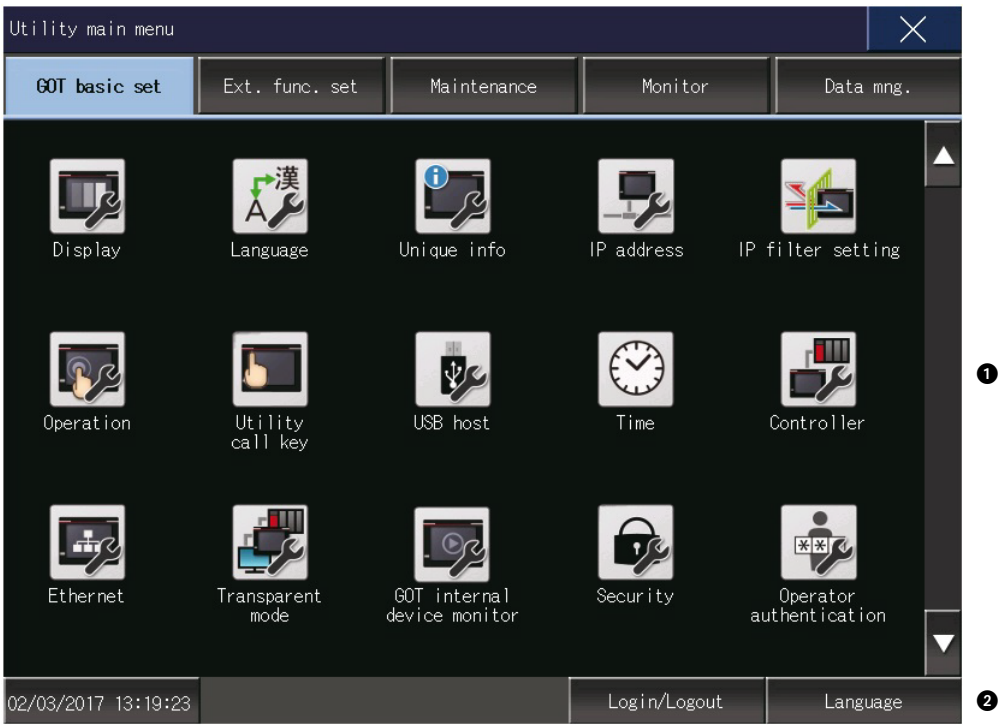


Fig. 8-2: *Utility main menu*

❶ Main menu

The menu items that can be set at the GOT utility are displayed.

Touching a menu item in the main menu will display the setting screen or following selection screen for the item.

❷ System language

This button switches the language used for the utility or system alarms.

When touching the button ***Language***, the Select Language screen is displayed.

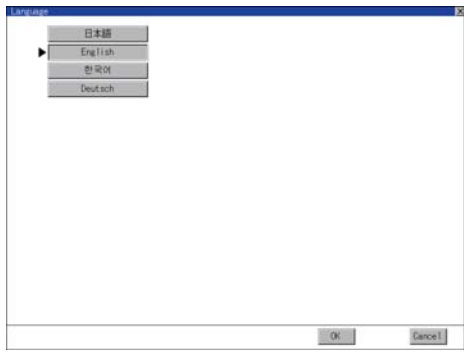


Fig. 8-3:
Language screen

① Touch the button of the language to be displayed.

② Touching the ***OK*** button restarts the GOT and the language on the utility is switched to the selected one.

To cancel the setting, touch the ***Cancel*** button to return to the main menu.

NOTE

When starting the GOT without selecting any language or the selected language and the installed fonts are not matched, the following screen will be displayed.

Touching the button of a desired language restarts the GOT and the language is switched to the selected one.



Selectable languages

The system message switch button is displayed only for the selectable languages. The selectable languages differ depending on the fonts installed in the GOT. For the relation between the selectable languages and the fonts, refer to the following:

– GT Designer3 (GOT2000) Screen Design Manual

The system language can be switched using the system language switching device set with GT Designer3.

For the setting method of the system language switching device, refer to the following:

– GT Designer3 (GOT2000) Screen Design Manual

8.1.4 Display operation of main menu

The following three types of operation can display the main menu. (Display the main menu after installing the basic system application from GT Designer3 to the GOT built in flash memory.)

When project data is undownloaded

If the power supply of GOT turns ON, the main menu is displayed automatically after title display

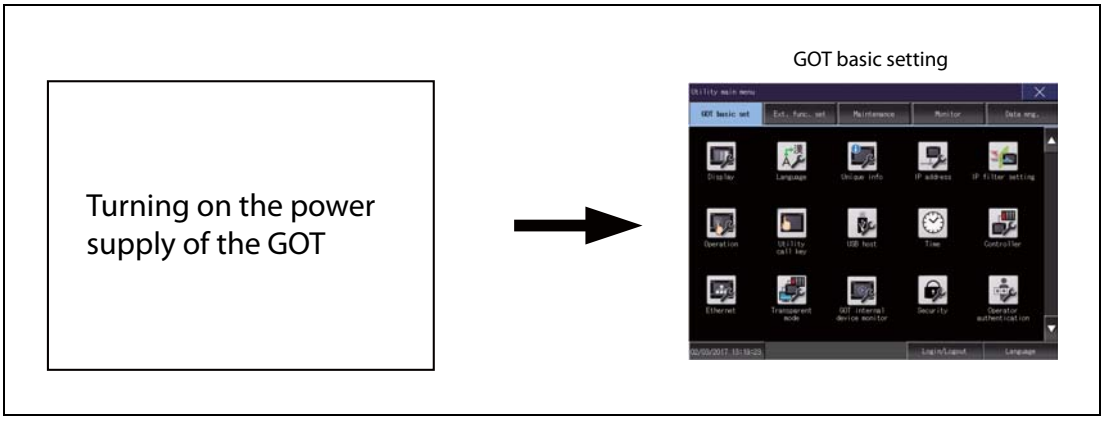


Fig. 8-4: *Main menu display at power on*

When touching menu call key

If you touch the menu call key while an user-created screen is displayed, the main menu is displayed. The menu call key is set in the position on the GOT screen upper left corner at factory shipment.

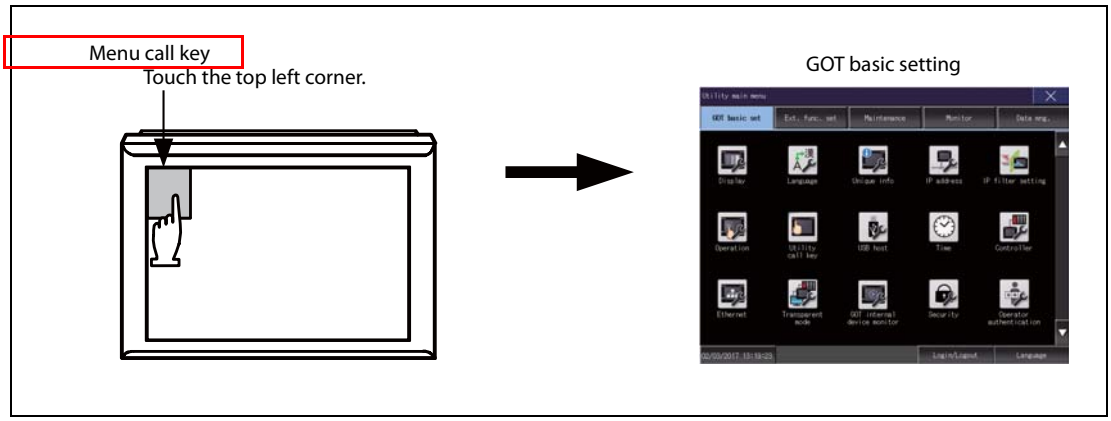


Fig. 8-5: *Main menu is displayed by menu call key*

The menu call key can be set by the GOT utility or GT Designer3. For the setting method of the utility call key, refer to the following.

– GT Designer3 (GOT2000) Screen Design Manual

NOTES

Do not touch 2 points or more on the GOT screen simultaneously. Touching 2 points or more simultaneously may activate a part other than the touched point.

When having set **Pressing time** of the menu call key setting screen to other than "0 (s)", keep pressing the touch panel for the period set to **Pressing time** or more before leaving the finger from the touch panel.

For menu call key setting, refer to the following.

– GT Designer3 (GOT2000) Help

When touching special function switch (utility)

If you touch the special function switch (utility) while an user-created screen is displayed, the main menu is displayed. The special function switch (utility) can be set as a touch switch that is displayed on an user-created screen by GT Designer3.

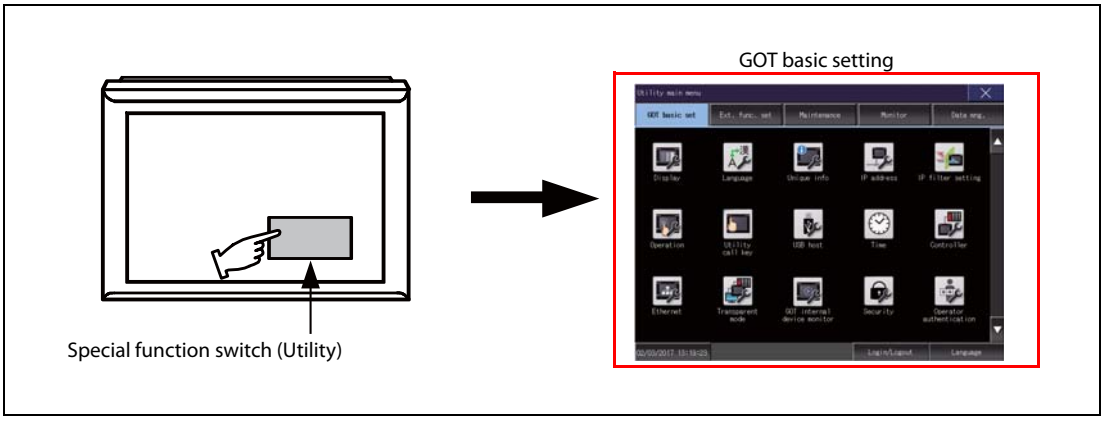


Fig. 8-6: *Main menu is displayed by special function switch (utility)*

For the details of the special function switch, refer to the following.

– GT Designer3 (GOT2000) Screen Design Manual

Locking the utility display by password

When you try to display the utility main menu while the password is set to the GOT by GT Designer3, the display for password input will be appeared. (Set a password from the common setting menu.)

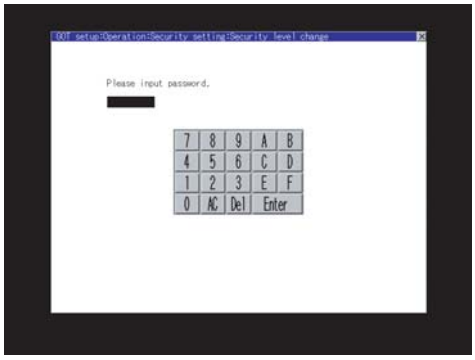


Fig. 8-7:
Password input

When the password is not matched, the error message is displayed.



Fig. 8-8:
Error message

When touching the ***OK*** button, the screen returns to the monitor screen.

- Input operation of password
  - ① Input the password after touching ***0*** to ***9*** and ***A*** to ***F***.
  - ② Define the password by touching ***Enter*** key, after password input.
  - ③ To correct the input character, touch ***Del*** key to delete the correcting character and reinput/retype the new character.

- Password input cancel operation

  When the ☒ button is touched, it returns to the monitor screen.

  Refer to the following for the details related to the password setting.

  – GT Designer3 (GOT2000) Screen Design Manual

8.1.5 Utility basic configuration

The basic configuration of utility is as follows.

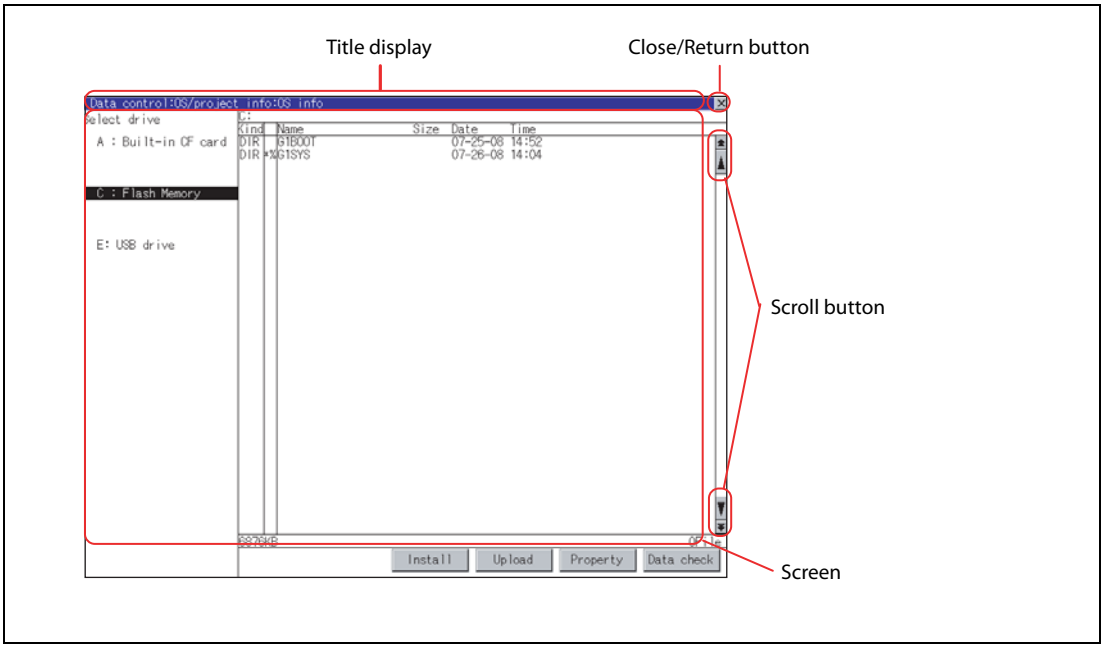


Fig. 8-9: *Basic configuration of utility*

Title display

The screen title name is displayed in title display part.
As the screen is composed of multiple layers, the title including these layers is displayed.

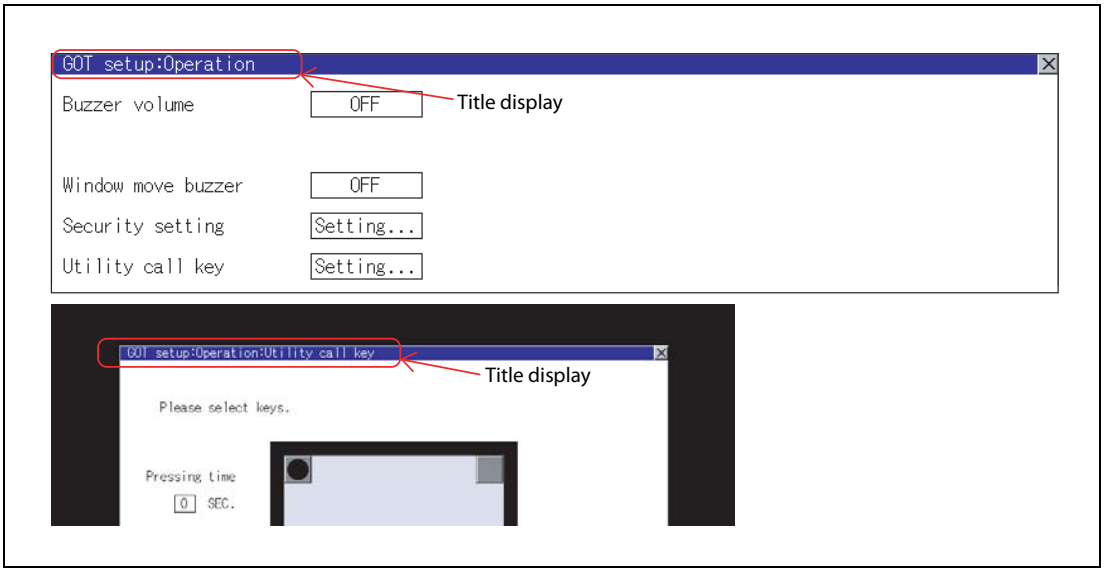


Fig. 8-10: *Title display*

Close/Return button

When a middle screen of the layers is displayed, if the ⊠ (***Close/return***) button in the right corner of the screen is touched, returns to the previous screen. If this button is touched when directly displayed from monitor screen, the screen is closed and returns to monitor screen.

Scroll button

For screens in which the content does not fit on one screen page, there is a right or down scroll button on the screen.


Scroll one line/column.


Scroll window

8.1.6 Basic operation of settings change

Change of setting value

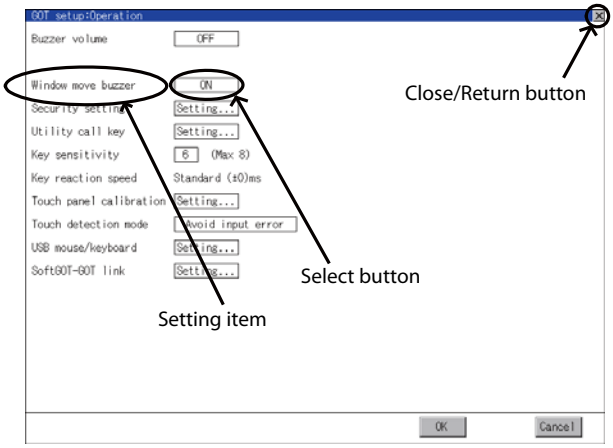


Fig. 8-11: *Example: [Operation] screen*

- Setting item, select button

  Touch the select button (setting point) to change the settings.

  According to the setting item, the button requires selecting the setting value, inputting value or displaying other setting screen.

  - ***ON/OFF*** Key: This is a key for selecting the setting value. Changes with each touch between ON and OFF resp. OFF and ON.
  - ***Numerical*** Key: This is a key for inputting a numerical value. It displays the keyboard on the bottom of the screen when touched.
  - ***Setting*** key: Touch the button to move to another setting screen

  In the above mentioned screen example, there is no setting item which displays the keyboard. For the operation of keyboard refer to the next page.

  For the setting method of each setting item, refer to the setting operation of each setting screen.

- ***OK*** button

  Touch this button to reflect the changed settings and return to the previous screen. Depending on the setting item, the GOT restarts.

- ***Cancel*** button

  Touch this button to cancel the changed settings and return to the previous screen.

- ☒ button

  If this button is touched without touching the **OK** button first, the dialog box below is displayed. (If no setting is changed, the dialog is not displayed.)

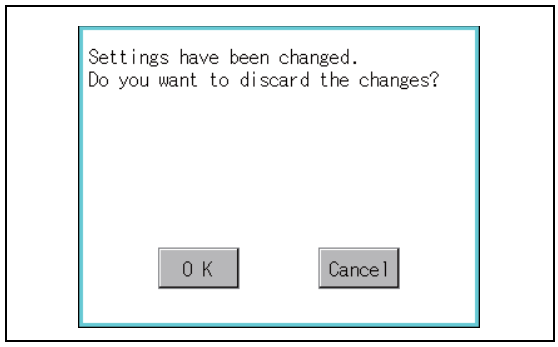


Fig. 8-12:
Confirmation of changes

Keyboard operations

① Touch the numerical value to be changed.

② The keyboard for entering numerical values and a cursor are displayed. The display position of the keyboard differs depending on the position of the touched numerical value. The keyboard is displayed at a position that does not disturb users to input numerical values.

③ Input numerical value by the keyboard

- ***0*** to ***9*** key: Enter numerical values
- ***Enter*** key: Completes the numerical value input and closes the keyboard
- ***Cancel*** key: Cancels the numerical value input and closes the keyboard
- Cursor key: Moves the cursor left or right side
- ***Del*** key: Deletes one character.
- * key: This key and the keys which are not mentioned do not function.

④ Touching the **Enter** key completes the numerical value input and closes the keyboard.

8.2 Utility for GT21

Utility is a function which carries out connection of GOT and controller, screen display and operation method settings, program/data control and self-check.

To execute the GOT utility, install the BootOS① and system applications on the C drive (built-in flash memory) of the GOT, or set the boot drive of the system application to [A: Built-in SD card] and insert an SD card with system applications into the GOT.

① BootOS is installed in the GOT at factory shipment. It is not necessary to install BootOS when upgrading of it is unnecessary.

8.2.1 Utility execution

There are following two methods for installing BootOS and package data.

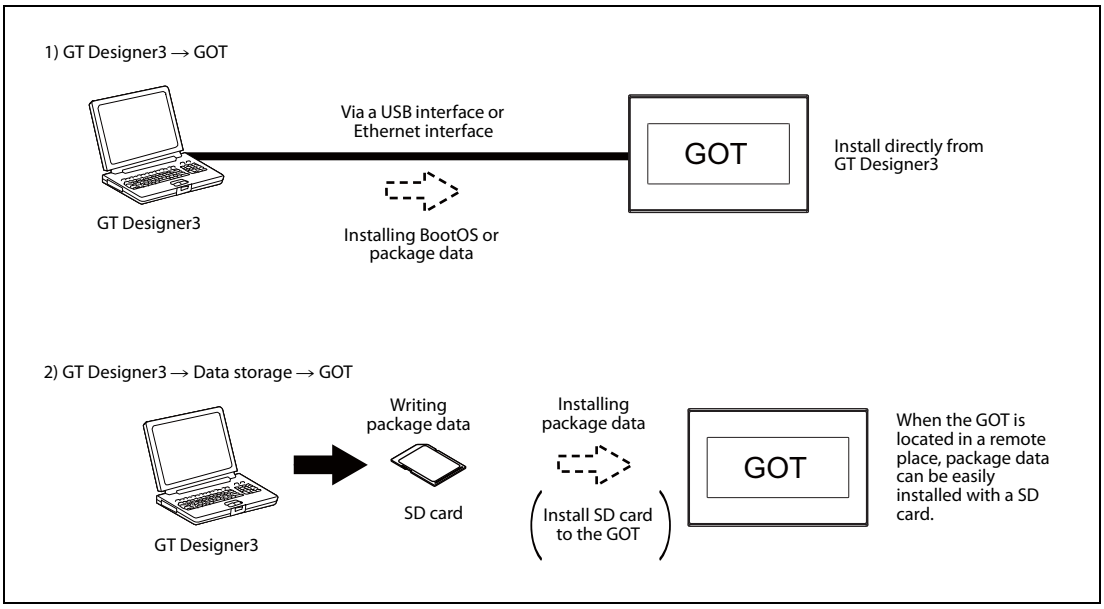


Fig. 8-13: *Methods for installing BootOS and package data application*

Refer to the following for the installation which uses GT Designer3:

– GT Designer3 (GOT2000) Screen Design Manual

For the installation methods of package data with an SD card, refer to the following:

– GT2000 User's Manual (Utility)

8.2.2 Utility function list

The items in the following list can be set/operated on the utility screens.

Function		Function overview
Language		Switching message languages
Communication setting	Standard I/F setting	Assigning channel number and communication driver to communication interface
	GOT IP Address ①	Configuring GOT Ethernet setting
	Ethernet communication ①	Displaying the contents of Ethernet setting, changing the host
	Comm. Monitor	Checking the serial communication port communication
	Ethernet check ①	Checking the Ethernet communication port communication
	Transparent setting	Setting the channel No. to be used for the communication for the FA transparent function
	Keyword	Setting or deleting sequence program protection key words and cancelling sequence program protection status for the FXCPU connection
GOT Setup	Display settings	Setting the title display period
		Setting the screen save time
		Adjusting brightness
	Operation	Setting the buzzer sound
		Setting the window move buzzer
		Setting the key reaction speed
		Touch panel calibration
		Setting the utility call keys
	Unique information	Setting the GOT ID No.
	GOT internal device monitor	Setting the Use/Disuse the GOT internal device monitor of GOT diagnostics
	VNC server function	Setting the VNC server function (GT2107-W)
	License Management	Display screen for Register or delete the license (GT2107-W)
	USB host	Setting the USB mouse/keyboard (GT2107-W)
	Backup/restoration	Setting the storage location for backup and restoration (GT2107-W)
Security setting	Security level authentication	Changing the security level
	Operator Authentication	Operator management
		Password change
		Function setting
	Login/Logout	
Time setting	Time setting	

Tab. 8-2: *Utility function list (1)*

Function			Function overview
Data control	OS information		OS information
	Resource data	Alarm Information	• Deleting or copying alarm log files • Converting alarm log files in G2A format → CSV/TXT format
		Recipe Information	• Converting recipe files in G2P format → CSV/TXT format • Converting CSV/TXT format → Recipe files in G2P format • Deleting or copying recipe files
		Logging Information	Deleting or copying logging files
		Image File Management	Deleting or copying hard copy files
	SD card access		Setting the access permission of the SD card
	SD card format		Formatting the SD card
	Clear data		Clearing the project data and resource data on the GOT
	Data copy		Installing or updating package data
	Backup/restore		Backing up or restoring sequence programs, parameters, and setting values
	USB device management		Displaying the status of USB device (GT2107-W)
Debug	Device monitor		Device monitor of PLC, test function, current value change of the buffer memory and the buffer memory monitor of intelligent module
	FX list editor		Changing parameters and sequence program of FX PLC
	FX3U-ENET-ADP communication setting function		Configuring the communication setting for FX3U-ENET-ADP stored in the FXCPU
Maintenance	Touch panel calibration		Adjusting the touch panel
	Touch panel check		Checking the touch panel operation
	Clean		Displaying the screen for cleaning the display
Extended function setting	SoftGOT-GOT link function		Setting the SoftGOT-GOT link function
	VNC server function		Setting the VNC server function
	Sequence program monitor		Starting the sequence program monitor
	Backup/restoration setting		Setting the backup and restoration
		Trigger backup setting	Setting the trigger backup
		Trigger time setting	Setting the trigger time
	License management		Displaying the screen for registering and releasing the license
	Video/RGB		Displaying the screen for setting the video/RGB I/O unit
	Multimedia		Displaying the screen for setting the multimedia
	Wireless LAN connection function		Setting the wireless LAN connection function
	System launcher		Configuring a setting to enable the online module change in the system launcher function
	iQSS utility		Setting a drive for a data storage containing the profile data of iQSS-compatible equipment
	ANDON connection		Setting the IP address of a client targeted for the ANDON connection

Tab. 8-2: *Utility function list (2)*

① Only available to Ethernet models

8.2.3 Utility display

To display setting screens for each utility, the main menu has to be displayed first.

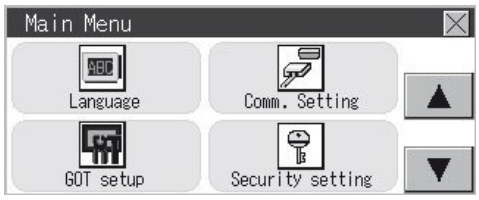


Fig. 8-14:
Main menu of GT2103-P

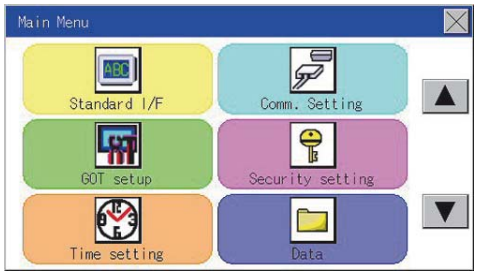


Fig. 8-15:
Main menu of GT2104-R



Fig. 8-16:
Main menu of GT2107-W

Main menu

The menu items that can be set at the GOT utility are displayed.

Touching a menu item in the main menu will display the setting screen or following selection screen for the item.

System message switch button

This button switches the language used for the utility or system alarms.

Touching the ***Language*** button displays the Language screen.



Fig. 8-17:
Language screen

① Touch the language button of a desired language and touch the ***OK*** button to select the language.

② Touching the ⊠ button switches the utility language to the selected language.

NOTE

When starting the GOT without selecting any language or the selected language and the installed fonts are not matched, the following screen will be displayed.

Touching the button of a desired language restarts the GOT and the language is switched to the selected one.



Selectable languages

The system message switch button is displayed only for the selectable languages. The selectable languages differ depending on the fonts installed in the GOT. For the relation between the selectable languages and the fonts, refer to the following:

– GT Designer3 (GOT2000) Help

The system language can be switched using the system language switching device set with GT Designer3.

For the setting method of the system language switching device, refer to the following:

– GT Designer3 (GOT2000) Help

8.2.4 Display operation of main menu

The following four types of operation can display the main menu. (Display the main menu after installing the package data from GT Designer3 to the GOT built in flash memory.)

When project data is undownloaded

After the GOT is turned on, a dialog box for notifying of absence of project data is displayed. After the dialog box is displayed, touch the ***OK*** button to display the main menu.

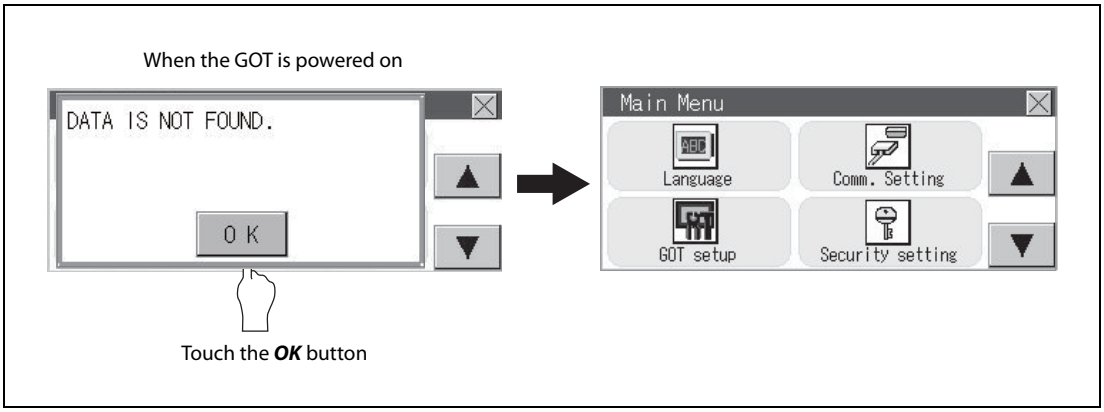


Fig. 8-18: *Main menu display at power on*

When touching utility call key

If you touch the utility call key while an user-created screen is displayed, the main menu is displayed. The utility call key is set in the position on the GOT screen upper left corner at factory shipment.

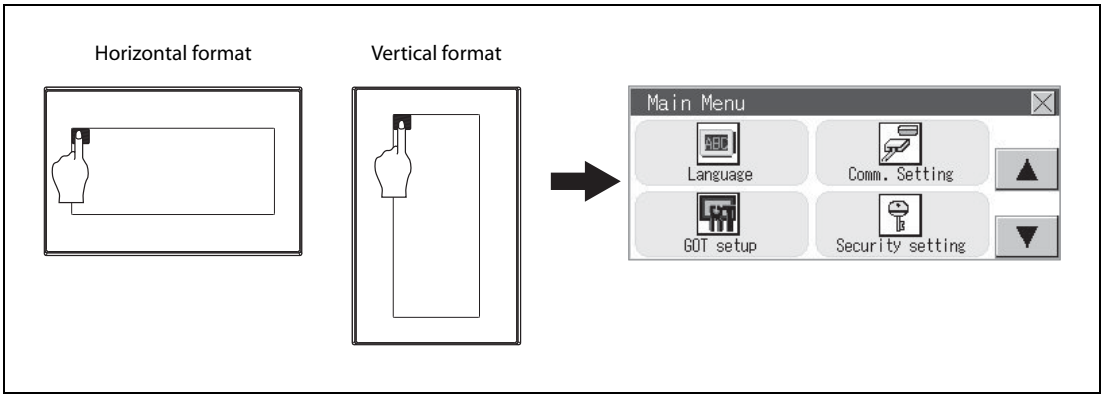


Fig. 8-19: *Main menu is displayed by utility call key*

NOTE The utility function windows appears in the horizontal format, and this format cannot be changed.

The utility call key can be set by the GOT utility or GT Designer3. For the setting method of the utility call key, refer to the following.

– GT Designer3 (GOT2000) Help

NOTES

Do not touch 2 points or more on the GOT screen simultaneously. Touching 2 points or more simultaneously may activate a part other than the touched point.

When having set **Pressing time** of the menu call key setting screen to other than "0 (s)", keep pressing the touch panel for the period set to **Pressing time** or more before leaving the finger from the touch panel.

For menu call key setting, refer to the following.

– GT Designer3 (GOT2000) Help

Even when the utility call key is not set (set to the zero point), you can display the main menu by performing the following operation.

• Pressing the special function switch set on the user-created screen

• Selecting ***Utility*** from the startup mode selection screen

When touching special function switch (utility)

If you touch the special function switch (utility) while an user-created screen is displayed, the main menu is displayed. The special function switch (utility) can be set as a touch switch that is displayed on an user-created screen by GT Designer3.

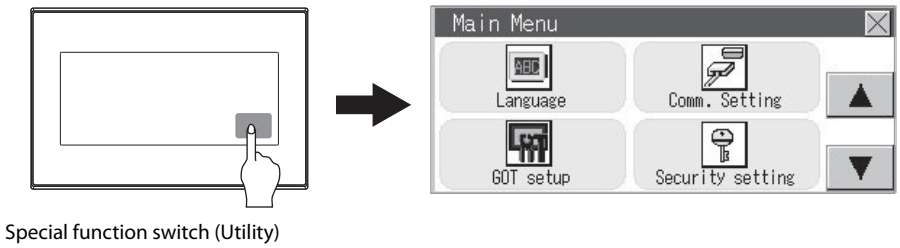


Fig. 8-20: *Main menu is displayed by special function switch (utility)*

For the details of the special function switch, refer to the following.

– GT Designer3 (GOT2000) Help

NOTE

When limiting the display and operating users, set a password to the GOT using GT Designer3. If a user tries to display the main menu of the utility, the password is displayed.

Refer to the following for the details related to the password setting.

– GT Designer3 (GOT2000) Help

8.2.5 Utility basic configuration

The basic configuration of utility is as follows.

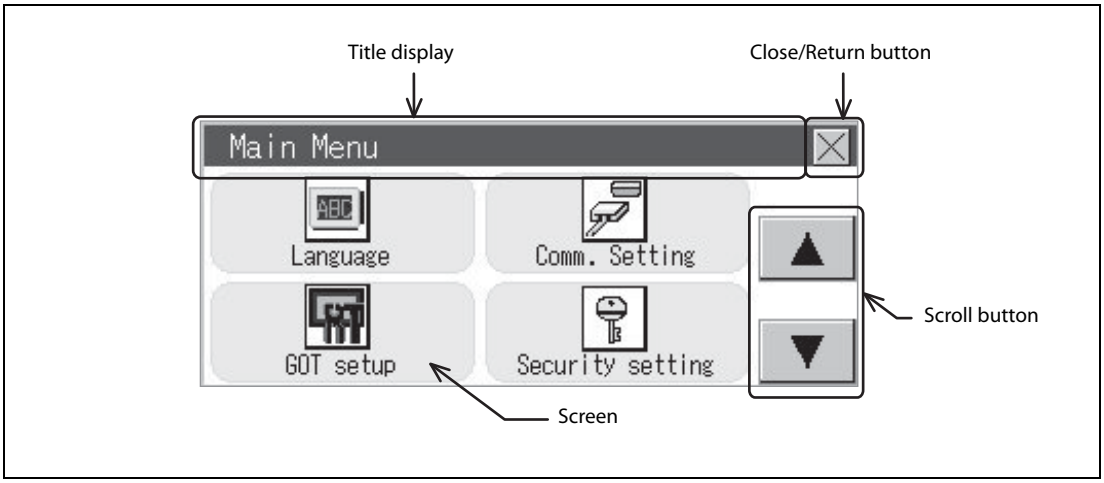


Fig. 8-21: *Basic configuration of utility*

Title display

The screen title name is displayed in title display part.

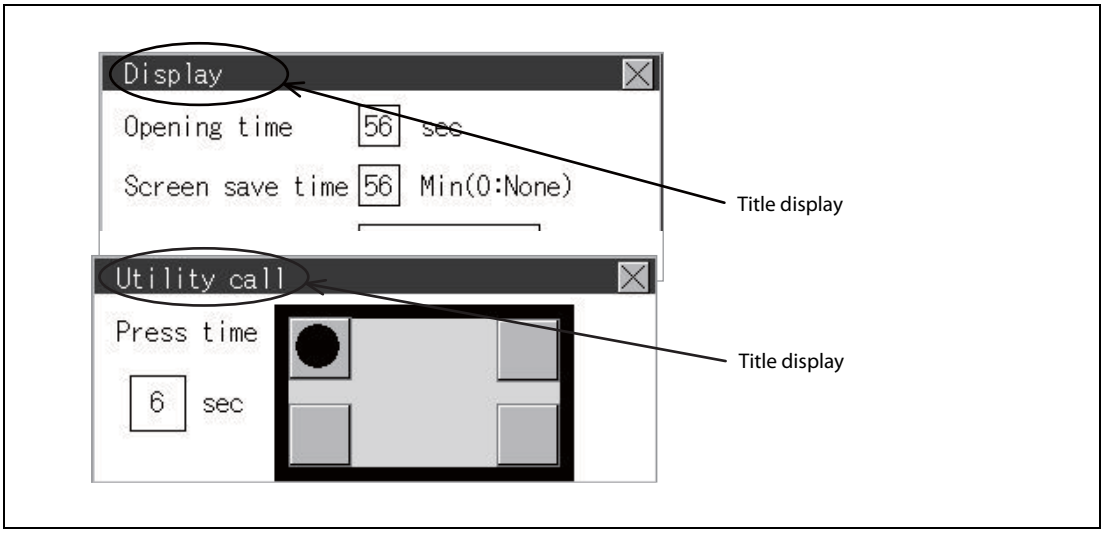


Fig. 8-22: *Title display*

Close/Return button

When a middle screen of the layers is displayed, if the ☒ (***Close/return***) button in the right corner of the screen is touched, returns to the previous screen.

If this button is touched when directly displayed from monitor screen, the screen is closed and returns to monitor screen.

Scroll button

For screens in which the content does not fit on one screen page, there is a up/ down scroll button on the screen.

▲▼ Scroll one line/column.

8.2.6 Basic operation of settings change

Change of setting value

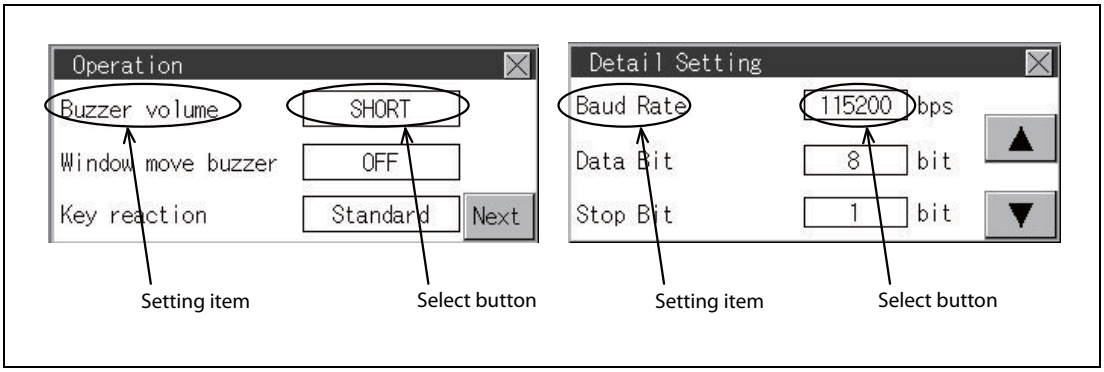


Fig. 8-23: *Example for setting items and select buttons*

- Setting item, select button

  Touch the select button to change the settings.

  According to the setting item, the button requires selecting the setting value, inputting value or displaying other setting screen.

  – ***ON/OFF*** Key: This is a key for selecting the setting value. Changes with each touch between ON and OFF resp. OFF and ON.

  – ***Numerical*** Key: This is a key for inputting a numerical value. It displays the keyboard on the screen when touched (see next page).

  – ***Setting*** key: Touch the button to move to another setting screen

  For the setting method of each setting item, refer to the setting operation of each setting screen.

- ☒ button

  If this button is touched without touching the **OK** button first, the dialog box below is displayed. (If no setting is changed, the dialog is not displayed.)

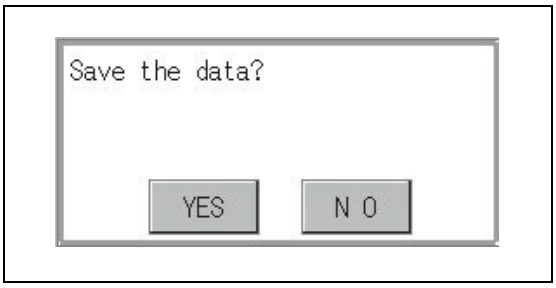
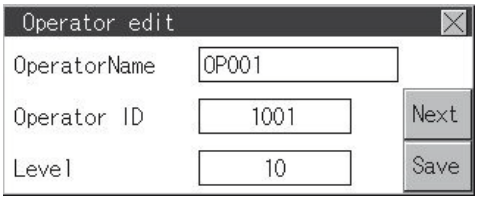


Fig. 8-24:
Confirmation of changes

NOTE

In a setting screen having the ***Save*** button shown below, touching the ☒ button does not show the save message screen shown above and returns to the previous screen when the setting is changed.To save the setting contents, always touch the ***Save*** button.



Keyboard operations

① Touch the numerical value to be changed.

② The keyboard for entering numerical values and a cursor are displayed.

The display position of the keyboard differs depending on the position of the touched numerical value. The keyboard is displayed at a position that does not disturb users to input numerical values.

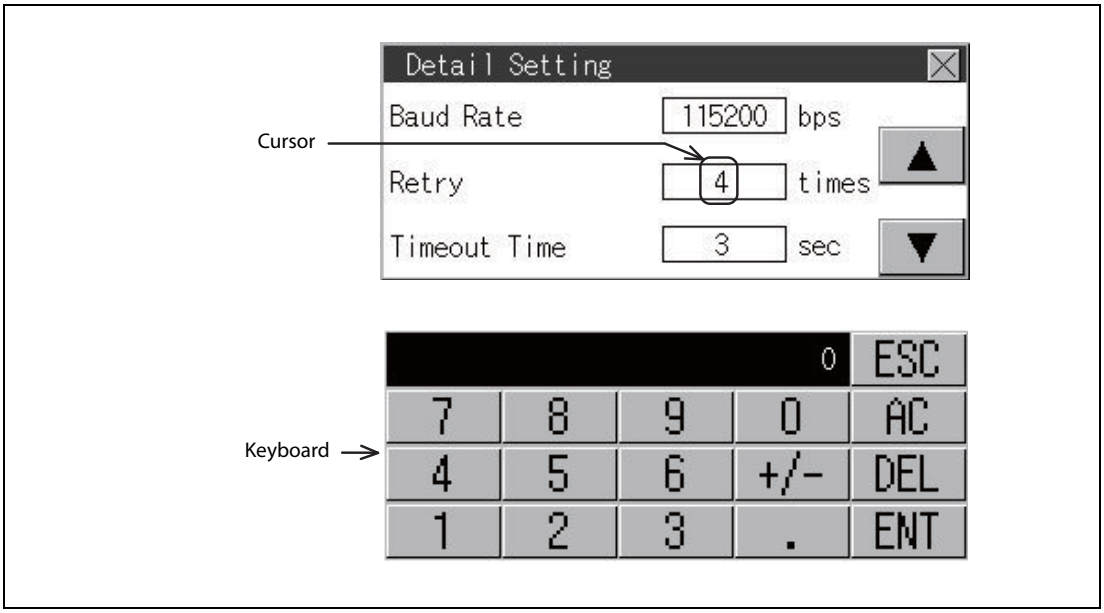


Fig. 8-25: *A keyboard and a cursor are displayed*

③ Input numerical value by the keyboard

- ***0*** to ***9*** key: Enter numerical values
- ***Enter*** key: Completes the numerical value input and closes the keyboard
- ***Cancel*** key: Cancels the numerical value input and closes the keyboard
- ***Del*** key: Deletes one character.
- ***AC*** key: Deletes all characters.

④ Touching the **Enter** key completes the numerical value input and closes the keyboard.

9 GOT Basic Settings for GT27/GT25/GT23

The utility function can be used to set up the GOT (refer to section 8.1). Some of the settings can also be done in GT Designer3.

In the following you will find the description of a number of exemplary functions. For further details refer to the following manuals.

- GOT2000 Series User's Manual (Utility)
- GT Designer3 (GOT2000) Screen Design Manual
- GT Designer3 (GOT2000) Help

9.1 Display

9.1.1 Display setting

The items which can be set are shown below. When each item part is touched, the respective setting becomes possible.

Items	Description	Setting range
Opening screen time	The title display period at the main unit boot can be set.	0 to 60 seconds ① Factory setting: 0 seconds
Screen save time	The period from the user stops the touch panel operation till the screen save function starts can be set.	0 to 60 minutes ① Factory setting: 0 minutes
Battery alarm display	Whether to display system alarm when the voltage of the GOT internal battery has dropped can be specified.	***ON*** or ***OFF*** Factory setting: ***OFF***
Human sensor	Screen saver status cancel by human sensor can be set to Effective or Invalid.	Valid/Invalid Factory setting: Invalid
Sensor detect level ②	The sensor detect level can be set.	0 to 10 Factory setting: 10
Sensor detect time ②	The time corresponding to the [Sensor detect level] is displayed. (setting is disabled) When the [Sensor detect level] is changed, the corresponding time is reflected by touching ***OK*** button.	0 to 4 [s] Factory setting: 0 [s]
Sensor off delay	The time period from when the human sensor detects no human movement until the Human Sensor Detection Signal (System Signal 2-1.b5) turns OFF can be set.	0 Min. 10 Sec. to 60 Min. 0 Sec. Factory setting: 0 Min. 10 Sec.
Brightness adjustment mode ③	The brightness adjustment mode can be set to the standard or low intensity mode.	Standard/Low ④⑤ Factory setting: Standard
Brightness adjustment	The brightness can be adjusted.	1 to 32 ⑥ Factory setting: 32
POWER LED ⑦	Turning on/off the POWER LED can be set.	Turning on/off Factory setting: Turning on

Tab. 9-1: *Display setting functions*

① If setting 0, the title screen is not hidden. The title screen is always displayed for 4 seconds or longer (which changes depending on the project data contents).

② The monitoring time corresponding to the sensor detect level (0 to 10) is as follows. As the sensor detect level becomes greater, the sensitivity of the human sensor becomes higher).

Sensor detect level	10	9	8	7	6	5	4	3	2	1	0
Sensor detect time [s]	0	0.1	0.2	0.4	0.8	1	1.5	2	2.5	3	4

③ For BootOS version D or earlier, the [Standard] mode is specified.

④ In the [Low] mode, the GOT cannot detect the backlight shutoff.
To detect the backlight shutoff, set the brightness adjustment mode to [Standard].

⑤ In the [Low] mode, the screen may flicker, or the screen display may turn off.
If you do not use the GOT in a dark place, set the brightness adjustment mode to [Standard].
When the utility screen is difficult to see in the [Low] mode, touch the upper-left corner of the main menu for two seconds to change the mode to the [Standard] mode.
When the utility screen transitions to a user-created screen, the mode is returned to the [Low] mode.

⑥ For GT23, the brightness can be adjusted in 16 levels.
The following table shows the correspondences between values set in the utility and the brightness in 16 levels.

Setting value	1	2	3	4	5	6	7	8	···	25	26	27	28	29	30	31	32
Brightness adjustment (16 levels)	1		2		3		4		···	13		14		15		16	

⑦ GT23 does not support.

9.1.2 Display operation of display setting

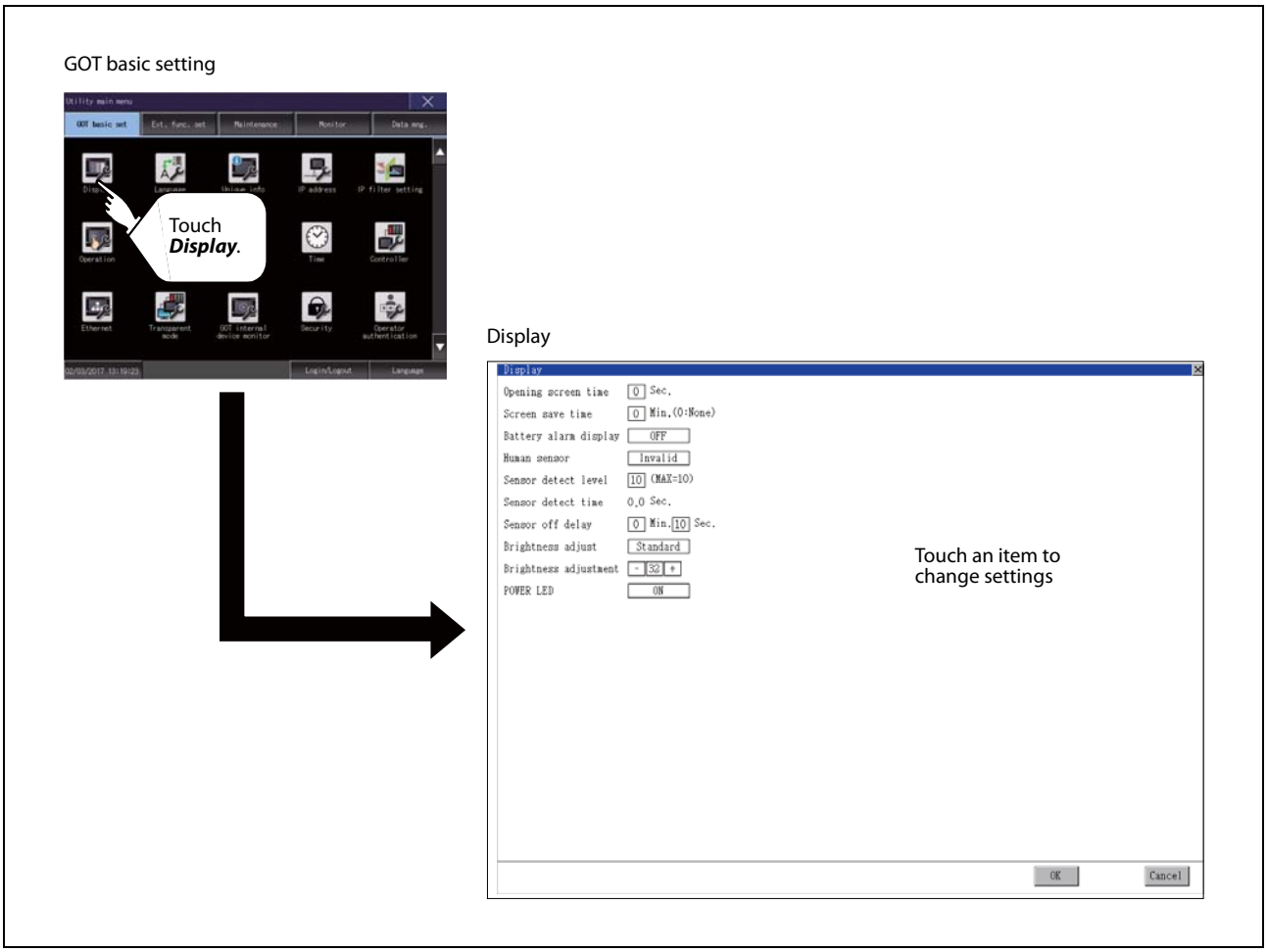
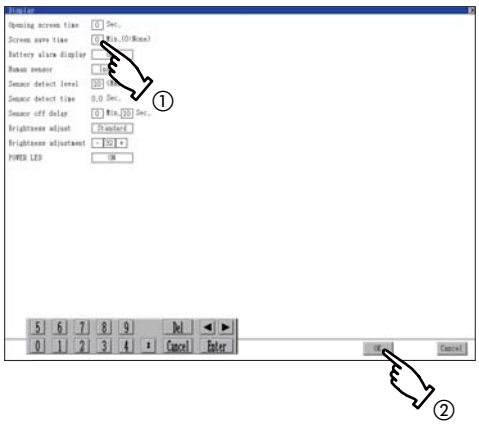


Fig. 9-1: Display operation of display setting

9.1.3 Display setting operations

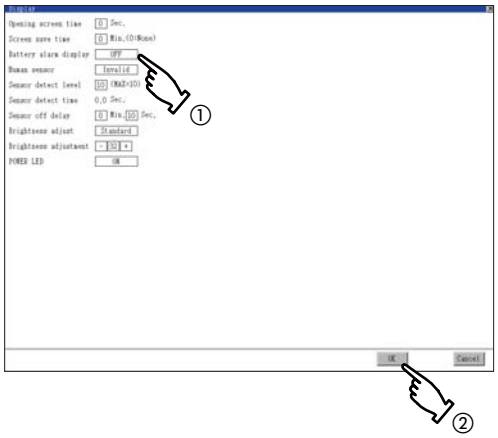
Opening screen, screen save time



① Touch the setting item (numeral) to display a software keyboard. Input a value with the keyboard.

② If the ***OK*** button is touched, the GOT restarts and operates with the changed settings.
If the ***Cancel*** button is touched, the changed settings are cancelled and the screen returns to the Main Menu.

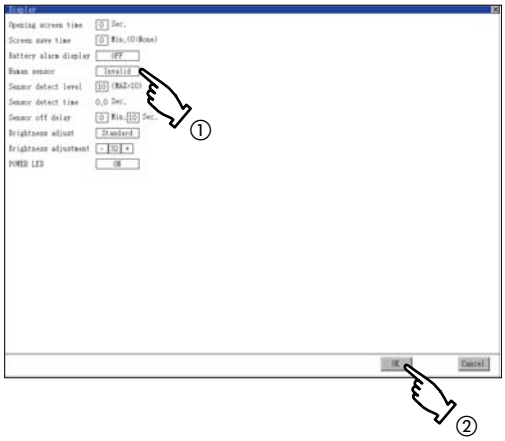
Battery alarm display



① Touch the setting item to change the selection. (ON → OFF → ON a.s.o.)

② If the ***OK*** button is touched, the GOT restarts and operates with the changed settings.
If the ***Cancel*** button is touched, the changed settings are cancelled and the screen returns to the Main Menu.

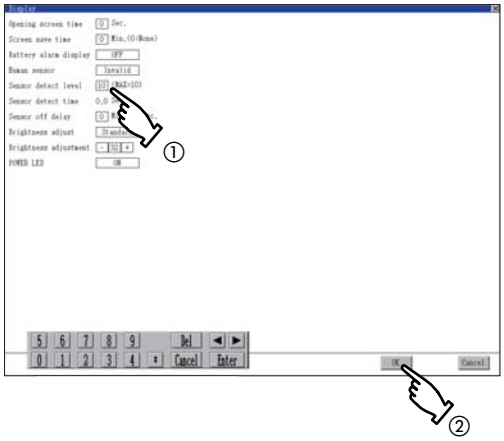
Human sensor



① Touch the setting item to change the selection. (Valid → Invalid → Valid a.s.o.)

② If the ***OK*** button is touched, the GOT restarts and operates with the changed settings.
If the ***Cancel*** button is touched, the changed settings are cancelled and the screen returns to the Main Menu.

Sensor detect level, sensor off delay



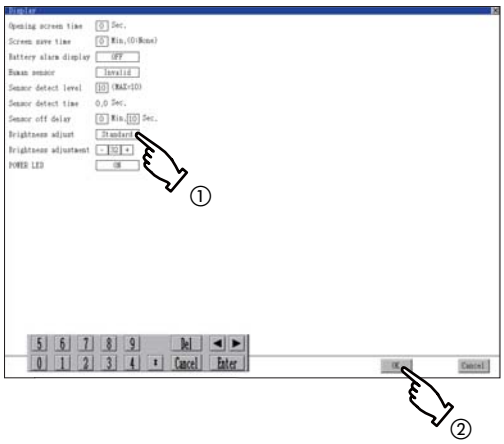
① Touch the setting item (numeral) to display a software keyboard. Input a value with the keyboard.

To move the cursor, touch the ◀ or ▶ button.

② If the ***OK*** button is touched, the GOT restarts and operates with the changed settings.

If the ***Cancel*** button is touched, the changed settings are cancelled and the screen returns to the Main Menu.

Brightness adjustment mode

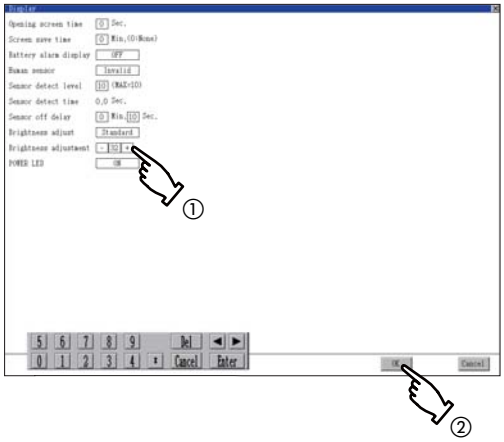


① Touch the setting item to change the selection. (Standard → Low → Standard a.s.o.)

② If the ***OK*** button is touched, the GOT restarts and operates with the changed settings.

If the ***Cancel*** button is touched, the changed settings are cancelled and the screen returns to the Main Menu.

Brightness adjustment



① Touch the **+** or **–** key to adjust the brightness.

② If the ***OK*** button is touched, the GOT restarts and operates with the changed settings.

If the ***Cancel*** button is touched, the changed settings are cancelled and the screen returns to the Main Menu.

9.2 Language

9.2.1 Language setting

Item	Description	Setting range
Language ①	Confirmation of the current language and switching language can be performed regarding with the language displayed by utility and dialog box.	日本語 (Japanese) English (English) 中文(简体) (Chinese (Simplified)) 中文(繁體) (Chinese (Traditional)) 한국어 (Korean) Deutsch (German)

Tab. 9-2: *Language setting function*

① Only selectable languages are displayed. The selectable languages differ depending on the fonts installed in the GOT. For details of the fonts, refer to the following manual:
– GT Designer3 (GOT2000) Screen Design Manual

9.2.2 Display operation of language display

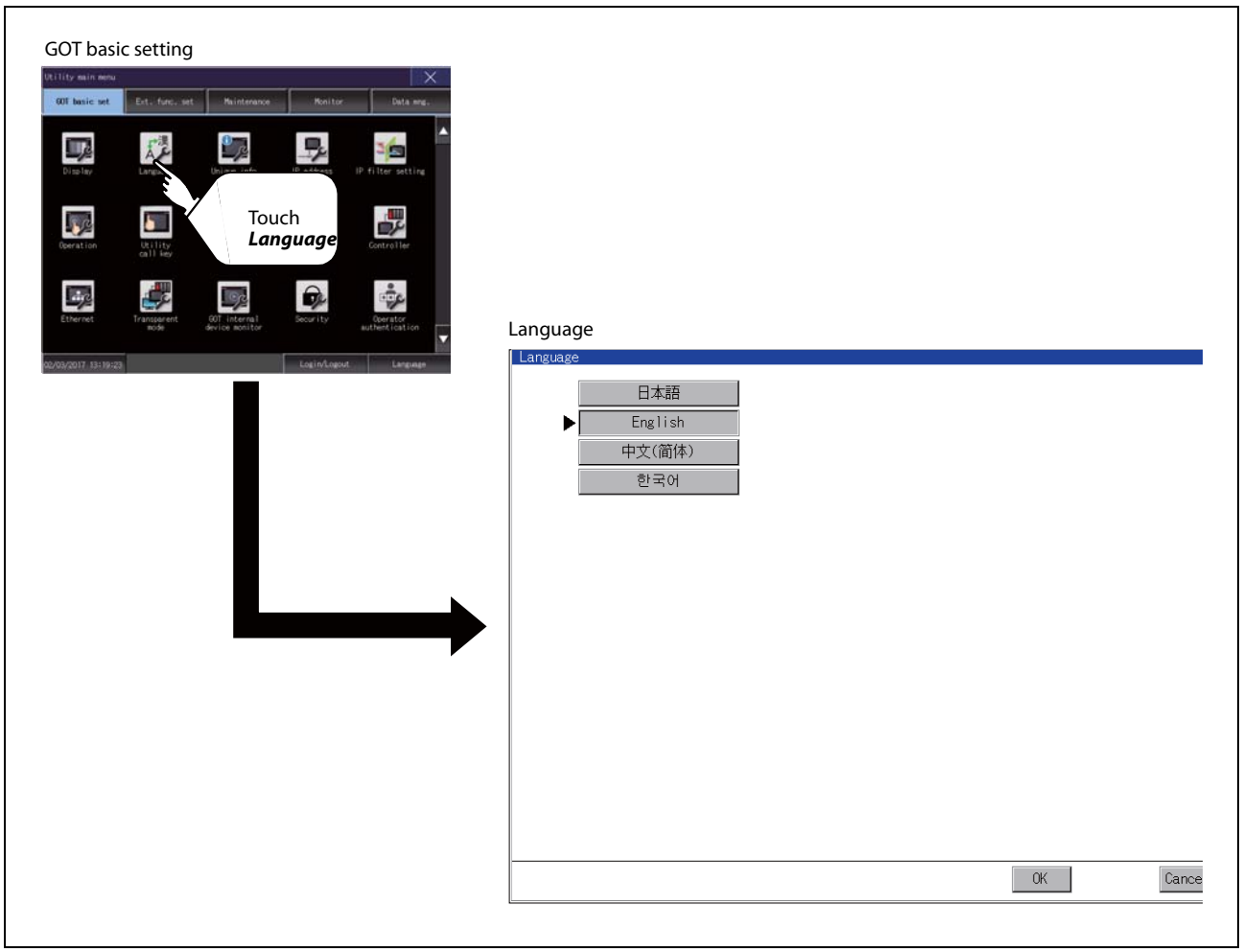
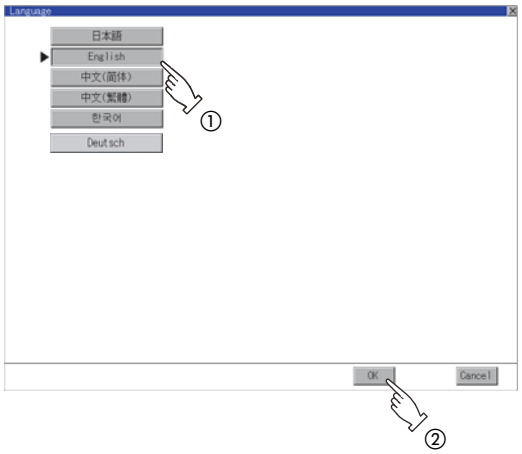


Fig. 9-2: Display operation of language display

9.2.3 Setting operation of language



① When the button of a desired language is touched, the language is selected.

② If the ***OK*** button is touched, the GOT restarts and operates with the changed settings.
If the ***Cancel*** button is touched, the changed settings are cancelled and the screen returns to the Main Menu.

NOTES

Selectable languages

The system message switch button is displayed only for the selectable languages. The selectable languages differ depending on the fonts installed in the GOT. For the relation between the selectable languages and the fonts, refer to the following manual:

– GT Designer3 (GOT2000) Screen Design Manual

System language switching using the device

The system language can be switched using the system language switching device set with GT Designer3. For the setting method of the system language switching device, refer to the following manual:

– GT Designer3 (GOT2000) Screen Design Manual

9.3 Time

NOTE

Clock data of the controller or the SNTP server can be acquired to change the clock data of the GOT and clock data of the GOT can be used to change the clock data of the controller.

For the details of the clock synchronization method, refer to the following manual:

– GT Designer3 (GOT2000) Screen Design Manual

9.3.1 Time setting

Function	Description
Current time	Carry out the display and setup of GOT clock data.
GOT internal battery voltage status	Displays GOT internal battery voltage status.

Tab. 9-3: *System menu "Time setting"*

9.3.2 Display operation of time setting

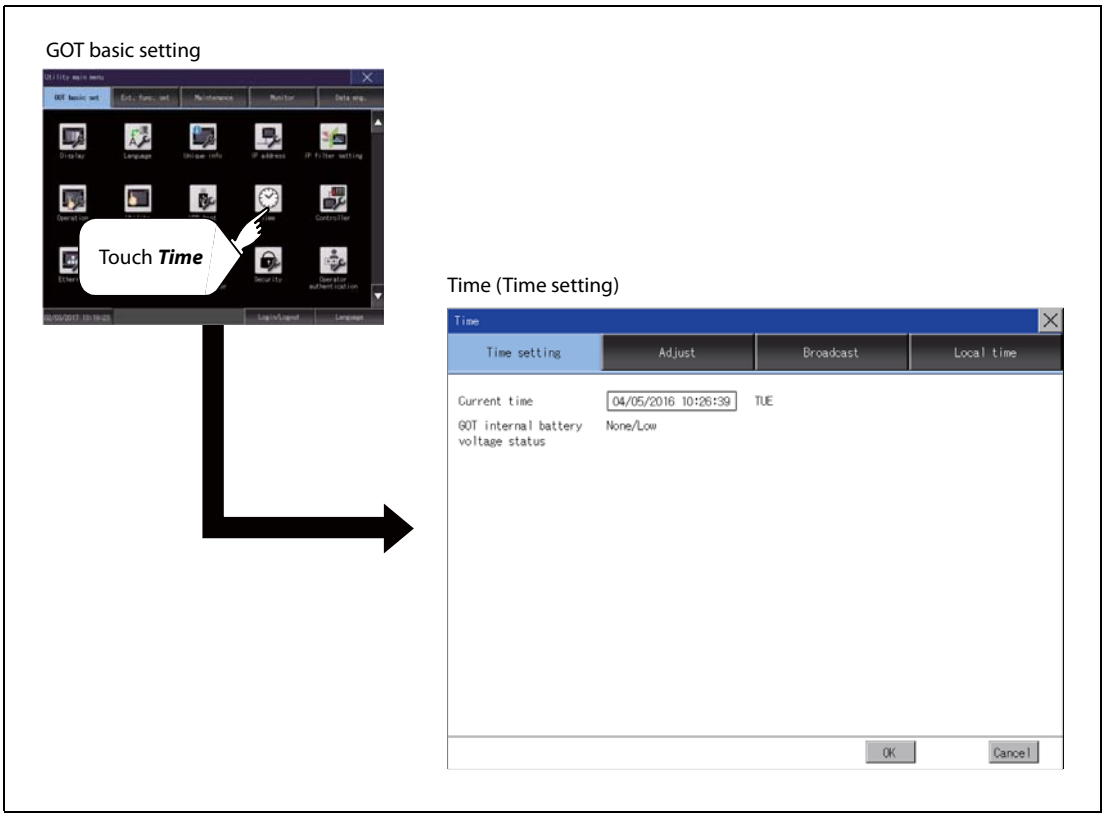
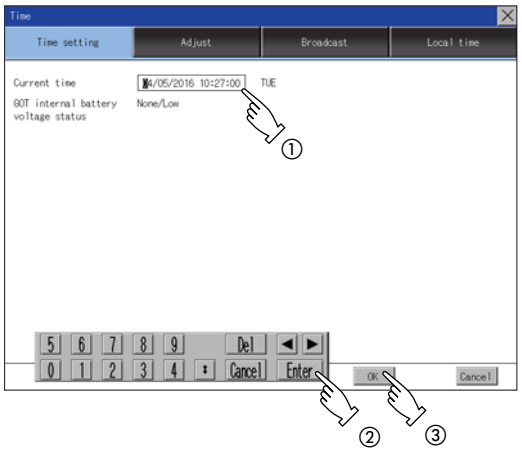


Fig. 9-3: *Display operation of time setting*

9.3.3 Setting procedure for the time setting

Current time



① Touch the current date and time to display the keyboard and stop the clock update.

② Input date and time with the keyboard by referring to the table below.

The input date and time are reflected after step ③ is performed.

The day of the week is displayed automatically according to the input date.

The effective range of clock setting is as follows:

Jan. 1, 2000 to Dec. 31, 2099

③ If the ***OK*** button is touched, the GOT restarts and operates with the changed settings.

If the ***Cancel*** button is touched, the changed settings are cancelled and the screen returns to the Main Menu.

Key	Description
0 to ***9***	Input numeric value in cursor position.
◀/▶	Move the cursor.
DEL	Move the cursor to the left by one character when ***DEL*** Key is touched while inputting year, month, day, time, minutes, seconds.
Enter	If you touch the ***Enter*** button, the keyboard closes and the input time is displayed in clock display. The update of the clock display does not restart even if the keyboard is closed. The update of the clock display restarts with the operation of step ③.
CANCEL	Cancel the input time and returns the time of clock display to the time at which the keyboard was displayed and close the keyboard. The update of the clock display does not restart even if the keyboard is closed. The update of the clock display restarts with the operation of step ③.

Tab. 9-4: *Input of time and date with the keyboard*

GOT internal battery voltage status

Displays battery voltage status:

– Normal

– Low/None: Low voltage or no battery

When the battery voltage is low, replace the battery immediately. Refer to the following for battery replacement procedure:

● GOT2000 Series User's Manual (Hardware)

10 Display and Operation Settings for GT21

The utility function can be used to set up the GOT (refer to section 8.2). Some of the settings can also be done in GT Designer3.

In the following you will find the description of a number of exemplary functions. For further details refer to the following manuals.

- GOT2000 Series User's Manual (Utility)
- GT Designer3 (GOT2000) Screen Design Manual
- GT Designer3 (GOT2000) Help

10.1 Language

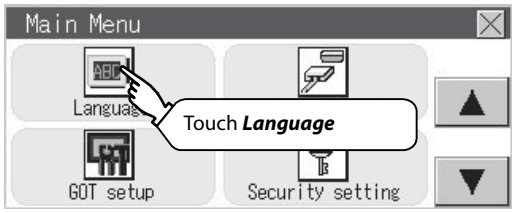
10.1.1 Display language setting

Item	Description	Setting range
Language	Display language in which the utility functions and dialog windows are displayed can be selected or confirmed in this menu.	Japanese/English/Chinese

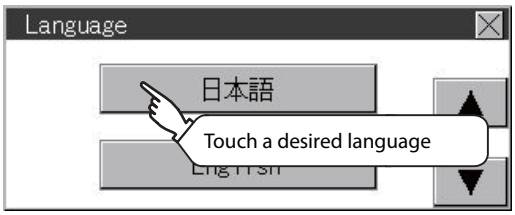
Tab. 10-1: *Language setting function*

10.1.2 Language setting operation

Main menu



① Touch ***Language*** to bring up the set up screen.



② Select a display language by touching the corresponding button.



③ After changing the setting, touch the ☒ button.
The setting is saved and the setting screen is closed.

NOTES

Selectable languages

The system message switch button is displayed only for the selectable languages. The selectable languages differ depending on the fonts installed in the GOT. For the relation between the selectable languages and the fonts, refer to the following manual:

– GT Designer3 (GOT2000) Help

Switching the display language of the utility by devices

Any device can be used for switching the display language of the utility. For details, refer to the following manual:

– GT Designer3 (GOT2000) Help

When using devices to switch the display language of the utility, it does not change even if the display language is switched from the GOT utility screen.

10.2 Display Settings

10.2.1 Display functions

The items which can be set are shown below. When each item part is touched, the respective setting becomes possible.

Items	Description	Setting range
Opening time	The title display period at the main unit boot can be set.	0 to 60 seconds Factory setting: 0 seconds
Screen save time	The period from the user stops the touch panel operation till the screen save function starts can be set.	0 to 60 minutes Factory setting: 0 minutes
Brightness	The brightness can be adjusted.	—

Tab. 10-2: *Display setting functions*

10.2.2 Display operation of display setting

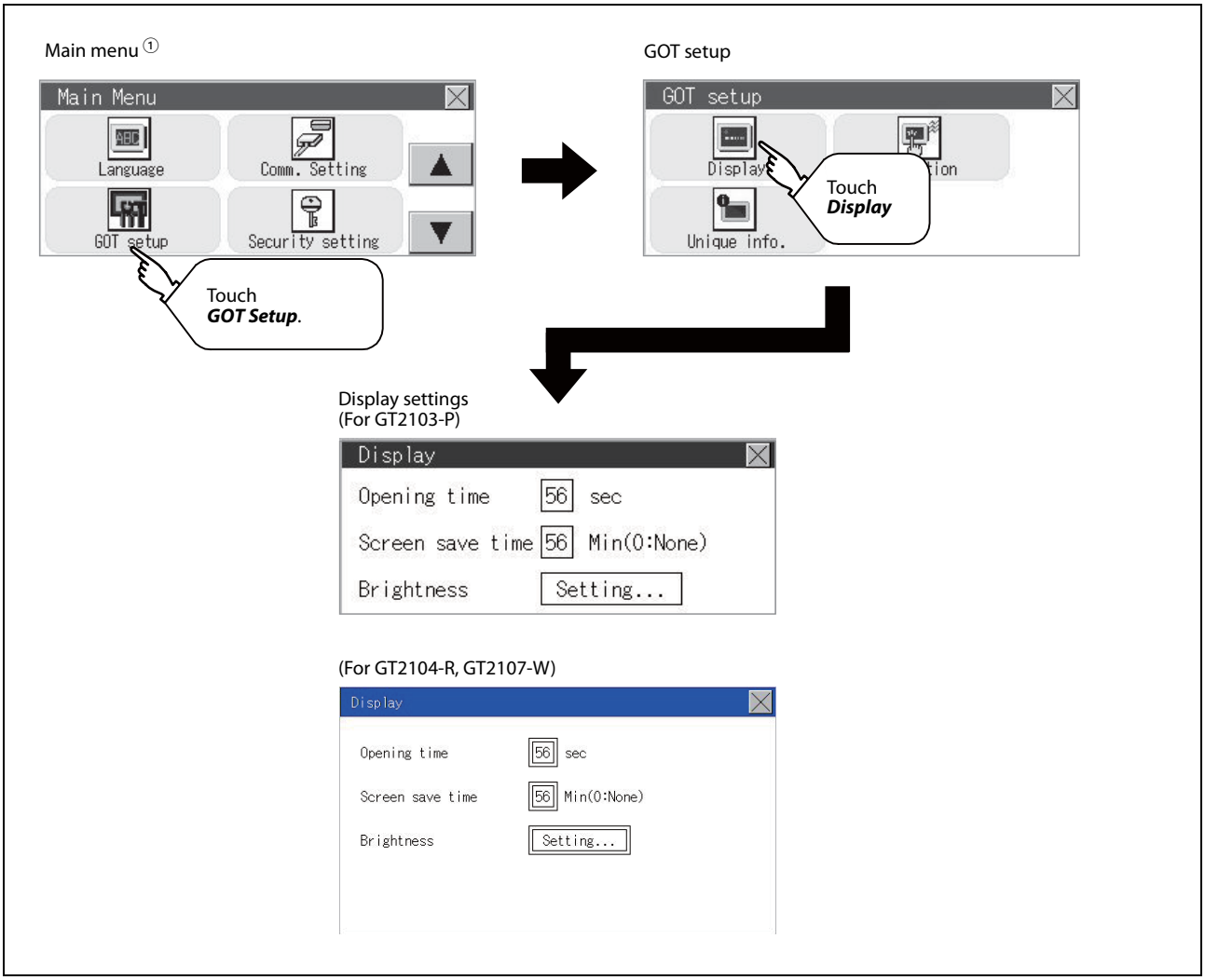
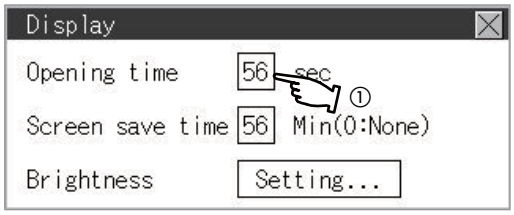


Fig. 10-1: Display operation of display setting

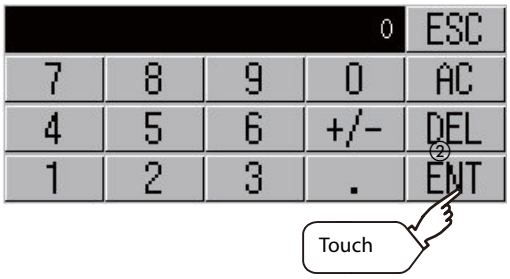
① Refer to the following for display operation of main menu: section 8.2.4

10.2.3 Display setting operations

Title display period, screen saving time

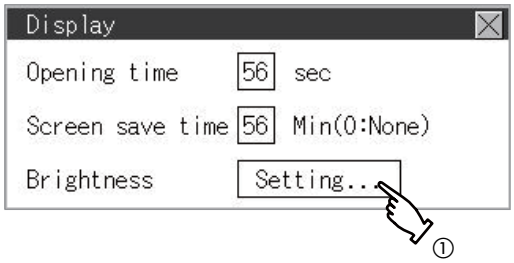


① Touch the setting item (numeral) to display a software keyboard. Input a value with the keyboard.



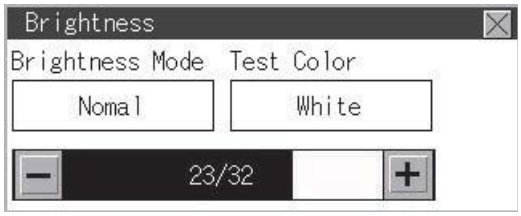
② Set the title display period with the ten-key pad window and touch ***ENT***.

Brightness



① Touch ***Brightness*** to bring up the Brightness setting window.

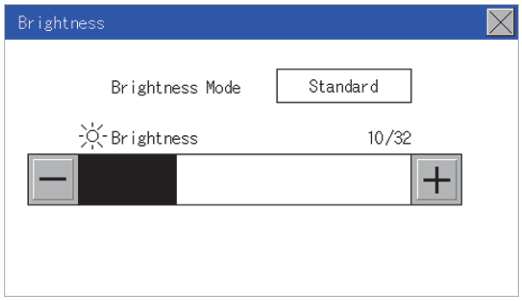
(For GT2103-P)



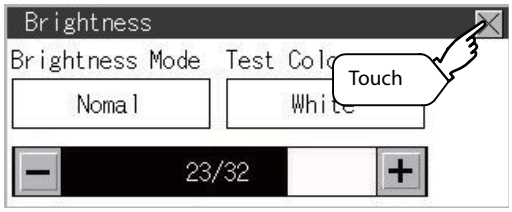
② The Brightness setting window is displayed. Touch an item to be set.

- Test Color (GT2104-P, GT2103-P only)
  Touch this item to change the backlight color, that is used for an color test. (***White***, ***Green***, ***Red***, ***Pink***, or ***Orange***).
- Brightness
  Touch the **+** or **–** key to adjust the brightness of the screen.

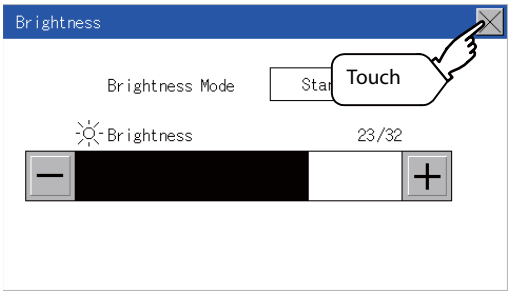
(For GT2104-R, GT2107-W)



(For GT2103-P)



(For GT2104-R, GT2107-W)



③ Touch the ☒ button to reflect the setting.

10.3 Clock Setting and Battery Status Display

NOTE

Clock data of the controller be acquired to change the clock data of the GOT and clock data of the GOT can be used to change the clock data of the controller.

For the details of the clock synchronization methods, refer to the following manual:

– GT Designer3 (GOT2000) Screen Design Manual

10.3.1 Time setting

Function	Description
Time Setting	Set the current time.
GOT internal battery voltage status ①	Displays GOT internal battery voltage status.
Adjust	Synchronize the clock data of the GOT with the clock data of the controller (refer to GT2000 User's Manual (Utility)).
Broadcast ①	Notify the clock data of the GOT to the controller for synchronization with the GOT (refer to GT2000 User's Manual (Utility)).
Local time	Set the time zone of the local time in the clock data of the GOT (refer to GT2000 User's Manual (Utility)).

Tab. 10-3: *System menu "Time setting"*

① GT2103-P cannot be specified.

10.3.2 Display operation of time setting

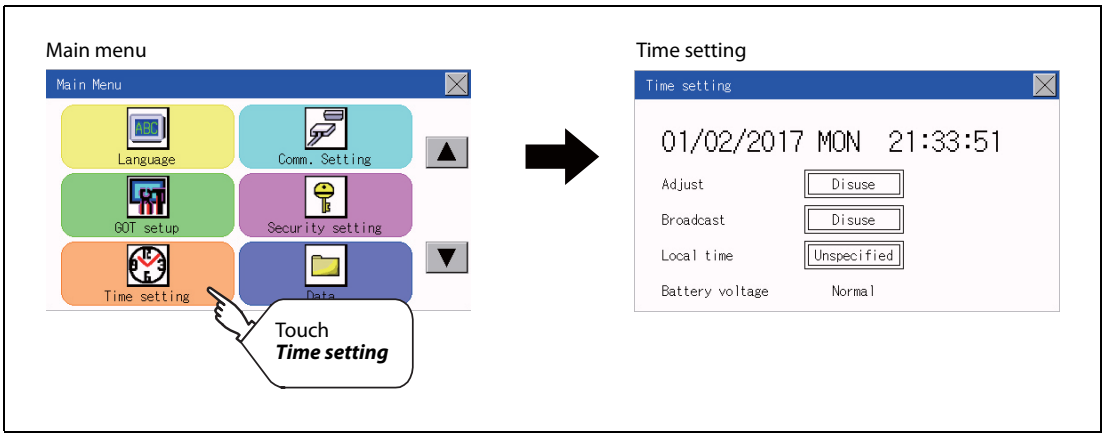
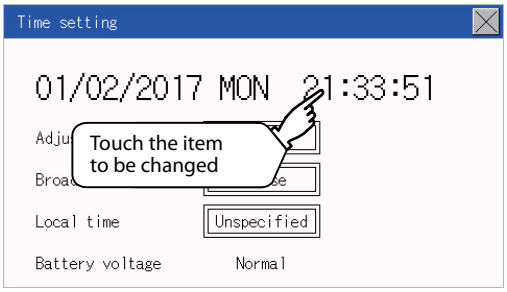


Fig. 10-2: *Display operation of time setting*

10.3.3 Setting procedure for the time setting

Current time



① Touch either the date or time to be changed.

② Input date and time with the keyboard by referring to the table below.
The input date and time are reflected after step ③ is performed.
The day of the week is displayed automatically according to the input date.



③ After setting either the date or time, touch the ⊠ button to save the changes and close the setting window.

Key	Description
0 to ***9***	Use these keys to enter numerical values.
⊠	Closes the ten-key window without saving any value entered for the date or time.
AC	Deletes the entire string of numerical characters that are being entered.
DEL	Deletes a digit from a string of numerical characters that are being entered.
ENT	Enters the value for the date or clock that has been entered and closes the ten-key pad window. The update of the clock display does not restart even if the keyboard is closed. The update of the clock display restarts with the operation of step ③.
+/-	Switches between positive and negative values. (Only positive values are valid for the date or clock setting.)
.	Invalid key (not used).

Tab. 10-4: *Input of time and date with the keyboard*

GOT internal battery voltage status (GT2103-P is excluded.)

Displays battery voltage status:

– Normal

– Low/None: Low voltage

When the battery voltage is low, replace the battery immediately. Refer to the following for battery replacement procedure:

● GOT2000 Series User's Manual (Hardware)

A Appendices

A.1 General Specifications

CAUTION:

Only use a GOT under the following mentioned operation conditions.

Otherwise components may be damaged and there is the risk of electric shock, fire or failure.

A.1.1 GT27, GT2510-WX, GT2507-W, GT25-S, GT25-V, GS21

<table>
<tr><th colspan="2">Item</th><th colspan="5">Specifications</th></tr>
<tr><td rowspan="2">Operating ambient temperature①</td><td>GT27, GT2510-WX, GT2507-W, GT25-S, GT25-V</td><td colspan="5">0 to +55 °C ②③</td></tr>
<tr><td>GS21</td><td colspan="5">0 to +50 °C</td></tr>
<tr><td colspan="2">Storage ambient temperature</td><td colspan="5">–20 to +60 °C</td></tr>
<tr><td colspan="2">Operating and storage ambient humidity</td><td colspan="5">10 to 90 % (non-condensing) ④</td></tr>
<tr><td colspan="2" rowspan="7">Vibration resistance</td><td rowspan="7">Compliant with JIS B3502 and IEC61131-2</td><td>Frequency</td><td>Acceleration</td><td>Half amplitude</td><td>Sweep count</td></tr>
<tr><td colspan="3">Intermittent vibration</td><td rowspan="3">10 times in each X, Y, or Z direction</td></tr>
<tr><td>5 to 8.4 Hz</td><td>—</td><td>3.5 mm</td></tr>
<tr><td>8.4 to 150 Hz</td><td>9.8 m/s^2 (1 g)</td><td>—</td></tr>
<tr><td colspan="3">Continuous vibration</td><td rowspan="3">—</td></tr>
<tr><td>5 to 8.4Hz</td><td>—</td><td>1.75 mm</td></tr>
<tr><td>8.4 to 150 Hz</td><td>4.9 m/s^2 (0.5 g)</td><td>—</td></tr>
<tr><td colspan="2">Shock resistant</td><td colspan="5">Compliant with JIS B3502 and IEC61131-2 (147 m/s^2 (15 g))
(Three times in each X, Y, or Z direction</td></tr>
<tr><td colspan="2">Operating atmosphere ⑤</td><td colspan="5">No greasy fumes, corrosive gas, flammable gas, excessive conductive dust, and direct sunlight (as well as at storage).</td></tr>
<tr><td colspan="2">Operating altitude ⑥</td><td colspan="5">2000 m or less</td></tr>
<tr><td colspan="2">Installation location</td><td colspan="5">Inside control panel</td></tr>
<tr><td colspan="2">Overvoltage category ⑦</td><td colspan="5">II or less</td></tr>
<tr><td colspan="2">Pollution degree ⑧</td><td colspan="5">2 or less</td></tr>
<tr><td colspan="2">Cooling method</td><td colspan="5">Self-cooling</td></tr>
<tr><td colspan="2">Grounding</td><td colspan="5">Grounding with a ground resistance of 100 Ω or less by using a ground cable that has a cross-sectional area of 2 mm^2 or more.
If impossible, connect the ground cable to the control panel.</td></tr>
</table>

Tab. A-1: *General specifications for GT27, GT2510-WX, GT2507-W, GT25-S, GT25-V and GS21*

① The operating ambient temperature indicates the temperature inside the enclosure of the control panel to which the GOT is installed.

② When any of the following units is mounted, the maximum operating ambient temperature must be 5°C lower than the one described in the general specifications.

- GT27
  - Multimedia unit (GT27-MMR-Z)
  - MELSECNET/H communication unit (GT15-J71LP23-25, GT15-J71BR13)
  - CC-Link communication unit (GT15-J61BT13)
- GT25 (Except for GT25-W, GT2505-V)
  - MELSECNET/H communication unit (GT15-J71LP23-25, GT15-J71BR13)
  - CC-Link communication unit (GT15-J61BT13)

③ When GT2505 is installed vertically, the operating ambient temperature must be between 0°C and 50°C.

④ If the ambient temperature of GT2505-V exceeds 40 °C, observe the maximum absolute humidity that is calculated based on 90 % RH at 40 °C.

⑤ Some models have ANSI/ISA12.12.01 approval for use in Class I, Division 2 (ANSI/ISA 12.12.01, C22.2 No.213-M1987) hazardous locations. For the details, please contact your local sales office.

⑥ Do not use or store the GOT under pressure higher than the atmospheric pressure of altitude 0 m. Doing so may cause a malfunction.
Air purging by applying pressure to the control panel may create clearance between the surface sheet and the touch panel. This may cause the touch panel to be not sensitive enough or the sheet to come off.

⑦ 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 withstand surge voltage for the equipment with the rated voltage up to 300 V is 2500 V.

⑧ This indicates the occurrence rate of conductive material in an environment where a device is used. Pollution degree 2 indicates an environment where only non-conductive pollution occurs normally and a temporary conductivity caused by condensation shall be expected depending on the conditions.

A.1.2 GT2507T-W

CAUTION:

The GOT rugged model uses the environmental protection sheet (not replaceable) with UV protection function on the front surface.

Therefore, it is possible to suppress deterioration of the touch panel or the liquid crystal display panel that may be caused by ultraviolet rays.

Note that if the rugged model is exposed to ultraviolet rays for an extended period of time, the front surface may turn yellow.

If the rugged model is likely to be exposed to ultraviolet rays for an extended period of time, it is recommended to use a UV protective sheet (option).

Item	Specifications ②				
Operating ambient temperature ①	0 to +65 °C				
Storage ambient temperature	–20 to +75 °C				
Operating and storage ambient humidity	10 to 90 % (non-condensing)				
Vibration resistance	Compliant with JIS B3502 and IEC61131-2	Frequency	Acceleration	Half amplitude	Sweep count
		Intermittent vibration			10 times in each X, Y, or Z direction
		5 to 8.4 Hz	—	7.0 mm	
		8.4 to 150 Hz	19.6 m/s^2 (2 g)	—	
		Continuous vibration			—
		5 to 8.4Hz	—	7.0 mm	
		8.4 to 150 Hz	19.6 m/s^2 (2 g)	—	
Shock resistant	Compliant with JIS B3502 and IEC61131-2 (392 m/s^2 (40 g)) (Three times in each X, Y, or Z direction				
Operating atmosphere	No greasy fumes, corrosive gas, flammable gas, excessive conductive dust, and direct sunlight (as well as at storage).				
Operating altitude ③	2000 m or less				
Installation location	Inside control panel				
Overvoltage category ④	II or less				
Pollution degree ⑤	2 or less				
Cooling method	Self-cooling				
Grounding	Grounding with a ground resistance of 100 Ω or less by using a ground cable that has a cross-sectional area of 2 mm^2 or more. If impossible, connect the ground cable to the control panel.				

Tab. A-2: *General specifications for GT2507T-W*

① The operating ambient temperature indicates the temperature inside the enclosure of the control panel to which the GOT is installed.

② Communication units and options usable with the rugged model can be used in the environment described in the general specifications of the rugged model.
For using peripheral devices to be connected to the GOT, refer to the manual of each device.

③ Do not use or store the GOT under pressure higher than the atmospheric pressure of altitude 0 m. Doing so may cause a malfunction.
Air purging by applying pressure to the control panel may create clearance between the surface sheet and the touch panel. This may cause the touch panel to be not sensitive enough or the sheet to come off.

④ 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 withstand surge voltage for the equipment with the rated voltage up to 300 V is 2500 V.

⑤ This indicates the occurrence rate of conductive material in an environment where a device is used. Pollution degree 2 indicates an environment where only non-conductive pollution occurs normally and a temporary conductivity caused by condensation shall be expected depending on the conditions.

A.1.3 GT23

<table>
<tr><th>Item</th><th colspan="5">Specifications</th></tr>
<tr><td>Operating ambient temperature ①</td><td colspan="5">0 to +55 °C</td></tr>
<tr><td>Storage ambient temperature</td><td colspan="5">–20 to +60 °C</td></tr>
<tr><td>Operating and storage ambient humidity</td><td colspan="5">10 to 90 % (non-condensing) ②</td></tr>
<tr><td rowspan="7">Vibration resistance</td><td rowspan="7">Compliant with JIS B3502 and IEC61131-2</td><td>Frequency</td><td>Acceleration</td><td>Half amplitude</td><td>Sweep count</td></tr>
<tr><td colspan="3">Intermittent vibration</td><td rowspan="3">10 times in each X, Y, or Z direction</td></tr>
<tr><td>5 to 8.4 Hz</td><td>—</td><td>3.5 mm</td></tr>
<tr><td>8.4 to 150 Hz</td><td>9.8 m/s^2 (1 g)</td><td>—</td></tr>
<tr><td colspan="3">Continuous vibration</td><td rowspan="3">—</td></tr>
<tr><td>5 to 8.4Hz</td><td>—</td><td>1.75 mm</td></tr>
<tr><td>8.4 to 150 Hz</td><td>4.9 m/s^2 (0.5 g)</td><td>—</td></tr>
<tr><td>Shock resistant</td><td colspan="5">Compliant with JIS B3502 and IEC61131-2 (147 m/s^2 (15 g))
(Three times in each X, Y, or Z direction</td></tr>
<tr><td>Operating atmosphere</td><td colspan="5">No greasy fumes, corrosive gas, flammable gas, excessive conductive dust, and direct sunlight (as well as at storage).</td></tr>
<tr><td>Operating altitude ③</td><td colspan="5">2000 m or less</td></tr>
<tr><td>Installation location</td><td colspan="5">Inside control panel</td></tr>
<tr><td>Overvoltage category ④</td><td colspan="5">II or less</td></tr>
<tr><td>Pollution degree ⑤</td><td colspan="5">2 or less</td></tr>
<tr><td>Cooling method</td><td colspan="5">Self-cooling</td></tr>
<tr><td>Grounding</td><td colspan="5">Grounding with a ground resistance of 100 Ω or less by using a ground cable that has a cross-sectional area of 2 mm^2 or more.
If impossible, connect the ground cable to the control panel.</td></tr>
</table>

Tab. A-3: *General specifications for GT23*

① The operating ambient temperature indicates the temperature inside the enclosure of the control panel to which the GOT is installed.

② If the ambient temperature exceeds 40 °C, the absolute humidity must not exceed 90% RH at 40 °C.

③ Do not use or store the GOT under pressure higher than the atmospheric pressure of altitude 0 m. Doing so may cause a malfunction.
Air purging by applying pressure to the control panel may create clearance between the surface sheet and the touch panel. This may cause the touch panel to be not sensitive enough or the sheet to come off.

④ 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 withstand surge voltage for the equipment with the rated voltage up to 300 V is 2500 V.

⑤ This indicates the occurrence rate of conductive material in an environment where a device is used. Pollution degree 2 indicates an environment where only non-conductive pollution occurs normally and a temporary conductivity caused by condensation shall be expected depending on the conditions.

A.1.4 GT21

<table>
<tr><th>Item</th><th colspan="5">Specifications</th></tr>
<tr><td>Operating ambient temperature ①</td><td colspan="5">0 to +55 °C (Horizontal installation)
0 to +50 °C (Vertical installation)</td></tr>
<tr><td>Storage ambient temperature</td><td colspan="5">–20 to +60 °C</td></tr>
<tr><td>Operating and storage ambient humidity</td><td colspan="5">10 to 90 % (non-condensing) ②</td></tr>
<tr><td rowspan="7">Vibration resistance</td><td rowspan="7">Compliant with JIS B3502 and IEC61131-2</td><td>Frequency</td><td>Acceleration</td><td>Half amplitude</td><td>Sweep count</td></tr>
<tr><td colspan="3">Intermittent vibration</td><td rowspan="3">10 times in each X, Y, or Z direction</td></tr>
<tr><td>5 to 8.4 Hz</td><td>—</td><td>3.5 mm</td></tr>
<tr><td>8.4 to 150 Hz</td><td>9.8 m/s^2 (1 g)</td><td>—</td></tr>
<tr><td colspan="3">Continuous vibration</td><td rowspan="3">—</td></tr>
<tr><td>5 to 8.4Hz</td><td>—</td><td>1.75 mm</td></tr>
<tr><td>8.4 to 150 Hz</td><td>4.9 m/s^2 (0.5 g)</td><td>—</td></tr>
<tr><td>Shock resistant</td><td colspan="5">Compliant with JIS B3502 and IEC61131-2 (147 m/s^2 (15 g))
(Three times in each X, Y, or Z direction</td></tr>
<tr><td>Operating atmosphere</td><td colspan="5">No greasy fumes, corrosive gas, flammable gas, excessive conductive dust, and direct sunlight (as well as at storage).</td></tr>
<tr><td>Operating altitude ③</td><td colspan="5">2000 m or less</td></tr>
<tr><td>Installation location</td><td colspan="5">Inside control panel</td></tr>
<tr><td>Overvoltage category ④</td><td colspan="5">II or less</td></tr>
<tr><td>Pollution degree ⑤</td><td colspan="5">2 or less</td></tr>
<tr><td>Cooling method</td><td colspan="5">Self-cooling</td></tr>
<tr><td>Grounding</td><td colspan="5">For GT2107: Grounding with a ground resistance of 100 Ω or less by using a ground cable that has a cross-sectional area of 2 mm^2 or more.
For GT2103 and GT2104: Grounding with a ground resistance of 100 Ω or less by using a ground cable that has a cross-sectional area of 0.14 to 1.5 mm^2 (solid wire), 0.14 to 1.0 mm^2 (stranded wire), or 0.25 to 0.5 mm^2 (rod terminal with an insulation sleeve).
If impossible, connect the ground cable to the control panel. ⑥</td></tr>
</table>

Tab. A-4: *General specifications for GT21*

① The operating ambient temperature indicates the temperature inside the enclosure of the control panel to which the GOT is installed.

② If the ambient temperature exceeds 40 °C, the absolute humidity must not exceed 90% RH at 40 °C.

③ Do not use or store the GOT under pressure higher than the atmospheric pressure of altitude 0 m. Doing so may cause a malfunction.
Air purging by applying pressure to the control panel may create clearance between the surface sheet and the touch panel. This may cause the touch panel to be not sensitive enough or the sheet to come off.

④ 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 withstand surge voltage for the equipment with the rated voltage up to 300 V is 2500 V.

⑤ This indicates the occurrence rate of conductive material in an environment where a device is used. Pollution degree 2 indicates an environment where only non-conductive pollution occurs normally and a temporary conductivity caused by condensation shall be expected depending on the conditions.

⑥ The 5V DC type does not require to be grounded.

A.2 Performance Specifications

A.2.1 GT27

GT2715-X

Item		GT2715-XTBA	GT2715-XTBD
Display section ①②	Type	TFT colour LCD	
	Screen size	15"	
	Resolution	XGA: 1024 x 768 Pixel	
	Display size	304.1 x 228.1 mm	
	Number of displayed characters	16-dot standard font: 64 characters × 48 lines (two-byte characters)	
		12-dot standard font: 85 characters × 64 lines (two-byte characters)	
	Display colour	65536 colours	
	Brightness Adjustment	32 levels	
Backlight	Type	LED (Not replaceable)	
	Backlight life ③	Approx. 60000 h (operating ambient temperature: 25 °C, display intensity: 50 %)	
Touch panel ④	Type	Analog resistive film	
	Key size	Minimum 2 × 2 dots ⑤ (per key)	
	Simultaneous press	Up to two points	
	Life	1 million touches or more (Operating force: 0.98 N or less)	
Human sensor	Detection length	1 m	
	Detection temperature	Temperature difference between human body and ambient air: 4 °C or higher	
User memory	Memory capacity	Memory for storage (ROM): 57 MB, Memory for operation (RAM): 128 MB	
	Life (number of write times)	100 000 times	
Built-in clock precision		±90 seconds/month (Ambient temperature: 25 °C)	
Battery	Type	GT11-50-BAT lithium battery	
	Life	Approx. 5 years (Ambient temperature: 25 °C)	
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: D-sub 9-pin (male)	
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin (female)	
	Ethernet	1 channel, data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45	
	USB (Host)	2 channels (front side, back side)	
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB-A	
	USB (Device)	1 channel (front side)	
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB Mini-B	
	SD card	1 channel, SDHC compliant (maximum 32 GB)	
	Extension interface	For installing a communication unit or an option unit	
	Auxiliary extension interface	For installing an option unit	
	Side interface	For installation of a communication unit	

Tab. A-5: *Specifications for Graphic Operation Terminal GT2715-X (1)*

Item	GT2715-XTBA	GT2715-XTBD
Buzzer output	Single tone (tone and tone length adjustable)	
POWER LED	2 colours (blue and orange)	
Productive structure	Front: IP67F ⑥⑦, Inside the enclosure: IP2X	
Dimensions (WxHxD) in mm	397 x 300 x 60	
Panel cut dimensions (WxH) in mm	383.5 x 282.5	
Weight (Excluding installation fittings)	4.5 kg	
Compatible software package	GT Works3, Version 1.112S or later	

Tab. A-5: *Specifications for Graphic Operation Terminal GT2715-X (2)*

① Bright dots (always lit) and dark dots (never lit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.
- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.
- Key size: 16 × 16 dots or larger
- Distance between keys: 16 dots or more

⑥ To conform to IP67F, close the USB environmental protection cover by pushing the [PUSH] mark firmly. (The GOT conforms to IP2X when the USB environmental protection cover is open.)
Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑦ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

GT2712-S

Item		GT2712-STBA, GT2712-STBD	GT2712-STWA, GT2712-STWD
Display section ①②	Type	TFT colour LCD	
	Screen size	12.1"	
	Resolution	SVGA: 800 x 600 dots	
	Display size	246 x 184.5 mm	
	Number of displayed characters	16-dot standard font: 50 characters × 37 lines (two-byte characters)	
		12-dot standard font: 66 characters × 50 lines (two-byte characters)	
	Display colour	65536 colours	
	Brightness Adjustment	32 levels	
Backlight	Type	LED (Not replaceable)	
	Backlight life ③	Approx. 60000 h (operating ambient temperature: 25 °C, display intensity: 50 %)	
Touch panel ④	Type	Analog resistive film	
	Key size	Minimum 2 × 2 dots ⑤ (per key)	
	Simultaneous press	Up to two points	
	Life	1 million touches or more (Operating force: 0.98 N or less)	
Human sensor	Detection length	1 m	
	Detection temperature	Temperature difference between human body and ambient air: 4 °C or higher	
User memory	Memory capacity	Memory for storage (ROM): 57 MB, Memory for operation (RAM): 128 MB	
	Life (number of write times)	100 000 times	
Built-in clock precision		±90 seconds/month (Ambient temperature: 25 °C)	
Battery	Type	GT11-50-BAT lithium battery	
	Life	Approx. 5 years (Ambient temperature: 25 °C)	
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: D-sub 9-pin (male)	
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin (female)	
	Ethernet	1 channel, data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45	
	USB (Host)	2 channels (front side, back side)	1 channel (back side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB-A	
	USB (Device)	1 channel (front side)	1 channel (back side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB Mini-B	
	SD card	1 channel, SDHC compliant (maximum 32 GB)	
	Extension interface	For installing a communication unit or an option unit	
	Auxiliary extension interface	For installing an option unit	
	Side interface	For installation of a communication unit	
Buzzer output		Single tone (tone and tone length adjustable)	
POWER LED		2 colours (blue and orange)	
Productive structure		Front: IP67F ⑥⑦, Inside the enclosure: IP2X	
Dimensions (WxHxD) in mm		316 x 246 x 52	
Panel cut dimensions (WxH) in mm		302 x 228	
Weight (Excluding installation fittings)		2.4 kg	
Compatible software package		GT Works3, Version 1.100E or later	

Tab. A-6: *Specifications for Graphic Operation Terminals GT2712-S*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.

- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.

- Key size: 16 × 16 dots or larger
- Distance between keys: 16 dots or more

⑥ To conform to IP67F, close the USB environmental protection cover by pushing the [PUSH] mark firmly. (The GOT conforms to IP2X when the USB environmental protection cover is open.)
Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑦ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

GT2710-S, GT2710-V

Item		GT2710-STBA, GT2710-STBD	GT2710-VTBA, GT2710-VTBD	GT2710-VTWA, GT2710-VTWD
Display section①②	Type	TFT colour LCD		
	Screen size	10.4"		
	Resolution	SVGA: 800 x 600 dots	VGA: 640 x 480 dots	
	Display size	211.2 x 158.4 mm		
	Number of displayed characters	16-dot standard font: 50 characters × 37 lines (two-byte characters)	16-dot standard font: 40 characters × 30 lines (two-byte characters)	
		12-dot standard font: 66 characters × 50 lines (two-byte characters)	12-dot standard font: 53 characters × 40 lines (two-byte characters)	
	Display colour	65536 colours		
	Brightness Adjustment	32 levels		
Backlight	Type	LED (Not replaceable)		
	Backlight life③	Approx. 60000 h (operating ambient temperature: 25 °C, display intensity: 50 %)		
Touch panel ④	Type	Analog resistive film		
	Key size	Minimum 2 × 2 dots ⑤ (per key)		
	Simultaneous press	Up to two points		
	Life	1 million touches or more (Operating force: 0.98 N or less)		
Human sensor	Detection length	—		
	Detection temperature	—		
User memory	Memory capacity	Memory for storage (ROM):57 MB, Memory for operation (RAM): 128 MB		
	Life (number of write times)	100 000 times		
Built-in clock precision		±90 seconds/month (Ambient temperature: 25 °C)		
Battery	Type	GT11-50-BAT lithium battery		
	Life	Approx. 5 years (Ambient temperature: 25 °C)		
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps, Connector shape: D-sub 9-pin (male)		
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps, Connector shape: 9-pin (female)		
	Ethernet	1 channel, data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45		
	USB (Host)	2 channels (front side, back side)		1 channel (back side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB-A		
	USB (Device)	1 channel (front side)		1 channel (back side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB Mini-B		
	SD card	1 channel, SDHC compliant (maximum 32 GB)		
	Extension interface	For installing a communication unit or an option unit		
	Auxiliary extension interface	For installing an option unit		
	Side interface	For installation of a communication unit		
Buzzer output		Single tone (tone and tone length adjustable)		
POWER LED		2 colours (blue and orange)		
Productive structure		Front: IP67F ⑥⑦, Inside the enclosure: IP2X		
Dimensions (WxHxD) in mm		303 x 218 x 52		
Panel cut dimensions (WxH) in mm		289 x 200		
Weight (Excluding installation fittings)		2.1 kg		
Compatible software package		GT Works3, Version 1.100E or later		

Tab. A-7: *Specifications for Graphic Operation Terminals GT2710-S and GT2710-V*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.

- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.

- Key size: 16 × 16 dots or larger
- Distance between keys: 16 dots or more

⑥ To conform to IP67F, close the USB environmental protection cover by pushing the [PUSH] mark firmly. (The GOT conforms to IP2X when the USB environmental protection cover is open.)
Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑦ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

GT2708-S, GT2708-V

Item		GT2708-STBA, GT2708-STBD	GT2708-VTBA, GT2708-VTBD
Display section ①②	Type	TFT colour LCD	
	Screen size	8.4"	
	Resolution	SVGA: 800 x 600 dots	VGA: 640 x 480 dots
	Display size	170.9 × 128.2 mm	
	Number of displayed characters	16-dot standard font: 50 characters × 37 lines (two-byte characters)	16-dot standard font: 40 characters × 30 lines (two-byte characters)
		12-dot standard font: 66 characters × 50lines (two-byte characters)	12-dot standard font: 53 characters × 40lines (two-byte characters)
	Display colour	65536 colours	
	Brightness Adjustment	32 levels	
Backlight	Type	LED (Not replaceable)	
	Backlight life ③	Approx. 60000 h (operating ambient temperature: 25 °C, display intensity: 50 %)	
Touch panel ④	Type	Analog resistive film	
	Key size	Minimum 2 × 2 dots ⑤ (per key)	
	Simultaneous press	Up to two points	
	Life	1 million touches or more (Operating force: 0.98 N or less)	
Human sensor	Detection length	—	
	Detection temperature	—	
User memory	Memory capacity	Memory for storage (ROM): 57 MB, Memory for operation (RAM): 128 MB	
	Life (number of write times)	100 000 times	
Built-in clock precision		±90 seconds/month (Ambient temperature: 25 °C)	
Battery	Type	GT11-50-BAT lithium battery	
	Life	Approx. 5 years (Ambient temperature: 25 °C)	
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: D-sub 9-pin (male)	
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin (female)	
	Ethernet	1 channel, data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45	
	USB (Host)	2 channels (front side, back side)	
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB-A	
	USB (Device)	1 channel (front side)	
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB Mini-B	
	SD card	1 channel, SDHC compliant (maximum 32 GB)	
	Extension interface	For installing a communication unit or an option unit	
	Auxiliary extension interface	For installing an option unit	
	Side interface	For installation of a communication unit	
Buzzer output		Single tone (tone and tone length adjustable)	
POWER LED		2 colours (blue and orange)	
Productive structure		Front: IP67F ⑥⑦, Inside the enclosure: IP2X	
Dimensions (WxHxD) in mm		241 x 194 x 52	
Panel cut dimensions (WxH) in mm		227 x 176	
Weight (Excluding installation fittings)		1.5 kg	
Compatible software package		GT Works3, Version 1.100E or later	

Tab. A-8: *Specifications for Graphic Operation Terminals GT2708-S and GT2708-V*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.

- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.

- Key size: 16 × 16 dots or larger
- Distance between keys: 16 dots or more

⑥ To conform to IP67F, close the USB environmental protection cover by pushing the [PUSH] mark firmly. (The GOT conforms to IP2X when the USB environmental protection cover is open.)
Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑦ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

GT2705

Item		GT2705-VTBD
Display section ①②	Type	TFT colour LCD
	Screen size	5.7"
	Resolution	VGA: 640 x 480 dots
	Display size	115.2 × 86.4 mm
	Number of displayed characters	16-dot standard font: 40 characters × 30 lines (two-byte characters)
		12-dot standard font: 53 characters × 40 lines (two-byte characters)
	Display colour	65536 colours
	Brightness Adjustment	32 levels
Backlight	Type	LED (Not replaceable)
	Backlight life ③	Approx. 60000 h (operating ambient temperature: 25 °C, display intensity: 50 %)
Touch panel ④	Type	Analog resistive film
	Key size	Minimum 2 × 2 dots ⑤ (per key)
	Simultaneous press	Up to two points
	Life	1 million touches or more (Operating force: 0.98 N or less)
Human sensor	Detection length	—
	Detection temperature	—
User memory	Memory capacity	Memory for storage (ROM): 32 MB, Memory for operation (RAM): 80 MB
	Life (number of write times)	100 000 times
Built-in clock precision		±90 seconds/month (Ambient temperature: 25 °C)
Battery	Type	GT11-50-BAT lithium battery
	Life	Approx. 5 years (Ambient temperature: 25 °C)
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: D-sub 9-pin (male)
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin (female)
	Ethernet	1 channel, data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45
	USB (Host)	2 channels (front side, back side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB-A
	USB (Device)	1 channel (front side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB Mini-B
	SD card	1 channel, SDHC compliant (maximum 32 GB)
	Extension interface	For installing a communication unit or an option unit
	Auxiliary extension interface	—
	Side interface	For installation of a communication unit
Buzzer output		Single tone (tone and tone length adjustable)
POWER LED		2 colours (blue and orange)
Productive structure		Front: IP67F ⑥⑦, Inside the enclosure: IP2X
Dimensions (WxHxD) in mm		167 x 139 x 60
Panel cut dimensions (WxH) in mm		153 x 121
Weight (Excluding installation fittings)		1.0 kg
Compatible software package		GT Works3, Version 1.130L or later

Tab. A-9: *Specifications for Graphic Operation Terminal GT2705-V*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.

- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.

- Key size: 16 × 16 dots or larger
- Distance between keys: 16 dots or more

⑥ To conform to IP67F, close the USB environmental protection cover by pushing the [PUSH] mark firmly. (The GOT conforms to IP2X when the USB environmental protection cover is open.)
Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑦ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

A.2.2 GT2510-WX, GT2507-W

GT2510-WXTSD

Item		GT2510-WXTSD
Display section ①②	Type	TFT colour LCD
	Screen size	10.1" wide screen
	Resolution	WXGA: 1280 x 800 dots
	Display size	216.96 × 135.6 mm
	Number of displayed characters	16-dot standard font: 80 characters × 50 lines (two-byte characters)
		12-dot standard font: 106 characters × 66 lines (two-byte characters)
	Display colour	65536 colours
	Brightness Adjustment	32 levels
Backlight	Type	LED (Not replaceable)
	Backlight life ③	Approx. 50000 h (operating ambient temperature: 25 °C, display intensity: 50 %)
Touch panel ④	Type	Analog resistive film
	Key size	Minimum 2 × 2 dots ⑤ (per key)
	Simultaneous press	Not available ⑥ (Only 1 point can be touched.)
	Life	1 million touches or more (Operating force: 0.98 N or less)
Human sensor	Detection length	—
	Detection temperature	—
User memory	Memory capacity	Memory for storage (ROM): 32 MB, Memory for operation (RAM): 128 MB
	Life (number of write times)	100 000 times
Built-in clock precision		±90 seconds/month (Ambient temperature: 25 °C)
Battery	Type	GT11-50-BAT lithium battery
	Life	Approx. 5 years (Ambient temperature: 25 °C)
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: D-sub 9-pin (male)
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin (female)
	Ethernet	2 channels, Data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45
	USB (Host)	1 channel (back side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB-A
	USB (Device)	1 channel (front side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB Mini-B
	SD card	1 channel, SDHC compliant (maximum 32 GB)
	Extension interface	—
	Auxiliary extension interface	—
	Wireless LAN communication unit interface	For installing a wireless LAN communication unit
	Sound output interface	1 channel, WAV format (16 bits, 8.000 kHz/16.000 kHz, monaural), applicable plug: Ø3.5 stereo mini-plug (3-prong)
Buzzer output		Single tone (tone and tone length adjustable)
POWER LED		2 colours (blue and orange)
Productive structure		Front: IP67F ⑦⑧, Inside the enclosure: IP2X
Dimensions (WxHxD) in mm		252 x 194 x 48
Panel cut dimensions (WxH) in mm		243.5 x 185.5
Weight (Excluding installation fittings)		1.2 kg
Compatible software package		GT Works3, Version 1.175H or later

Tab. A-10: *Specifications for Graphic Operation Terminal GT2510-WXTSD*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.
- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.
- Key size: 16 × 16 dots or larger
- Distance between keys: 16 dots or more

⑥ If you touch two points or more simultaneously on the touch panel, a touch switch near the touched points may operate unexpectedly.
Do not touch two points or more simultaneously on the touch panel.

⑦ To conform to IP67F, close the USB environmental protection cover by pushing the [PUSH] mark firmly. (The GOT conforms to IP2X when the USB environmental protection cover is open.)
Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑧ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

GT2507-WTSD

Item		GT2507-WTSD
Display section ①②	Type	TFT colour LCD
	Screen size	7" wide screen
	Resolution	WVGA: 800 x 480 dots
	Display size	152.40 × 91.44 mm
	Number of displayed characters	16-dot standard font: 50 characters × 30 lines (two-byte characters)
		12-dot standard font: 66 characters × 40 lines (two-byte characters)
	Display colour	65536 colours
	Brightness Adjustment	32 levels
Backlight	Type	LED (Not replaceable)
	Backlight life ③	Approx. 50000 h (operating ambient temperature: 25 °C, display intensity: 50 %)
Touch panel ④	Type	Analog resistive film
	Key size	Minimum 2 × 2 dots ⑤ (per key)
	Simultaneous press	Not available ⑥ (Only 1 point can be touched.)
	Life	1 million touches or more (Operating force: 0.98 N or less)
Human sensor	Detection length	—
	Detection temperature	—
User memory	Memory capacity	Memory for storage (ROM): 32 MB, Memory for operation (RAM): 128 MB
	Life (number of write times)	100 000 times
Built-in clock precision		±90 seconds/month (Ambient temperature: 25 °C)
Battery	Type	GT11-50-BAT lithium battery
	Life	Approx. 5 years (Ambient temperature: 25 °C)
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: D-sub 9-pin (male)
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin (female)
	Ethernet	2 channels, Data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45
	USB (Host)	1 channel (back side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB-A
	USB (Device)	1 channel (front side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB Mini-B
	SD card	1 channel, SDHC compliant (maximum 32 GB)
	Extension interface	—
	Auxiliary extension interface	—
	Wireless LAN communication unit interface	For installing a wireless LAN communication unit
	Sound output interface	1 channel, WAV format (16 bits, 8.000 kHz/16.000 kHz, monaural), applicable plug: Ø3.5 stereo mini-plug (3-prong)
Buzzer output		Single tone (tone and tone length adjustable)
POWER LED		2 colours (blue and orange)
Productive structure		Front: IP67F ⑦⑧, Inside the enclosure: IP2X
Dimensions (WxHxD) in mm		189 x 142 x 48
Panel cut dimensions (WxH) in mm		180.5 x 133.5
Weight (Excluding installation fittings)		0.75 kg
Compatible software package		GT Works3, Version 1.175H or later

Tab. A-11: *Specifications for Graphic Operation Terminal GT2507-WTSD*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.

- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.

- Key size: 16 × 16 dots or larger
- Distance between keys: 16 dots or more

⑥ If you touch two points or more simultaneously on the touch panel, a touch switch near the touched points may operate unexpectedly.
Do not touch two points or more simultaneously on the touch panel.

⑦ To conform to IP67F, close the USB environmental protection cover by pushing the [PUSH] mark firmly. (The GOT conforms to IP2X when the USB environmental protection cover is open.)
Note that the structure does not guarantee protection in all users' environments.

The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑧ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

A.2.3 GT2507T-W

Item		GT2507T-WTSD
Display section ①②	Type	TFT colour LCD
	Screen size	7" wide screen
	Resolution	WVGA: 800 x 480 dots
	Display size	152.40 × 91.44 mm
	Number of displayed characters	16-dot standard font: 50 characters × 30 lines (two-byte characters)
		12-dot standard font: 66 characters × 40 lines (two-byte characters)
	Display colour	65536 colours
	Brightness Adjustment	32 levels
Backlight	Type	LED (Not replaceable)
	Backlight life ③	Approx. 50000 h (operating ambient temperature: 25 °C, display intensity: 50 %)
Touch panel ④	Type	Analog resistive film
	Key size	Minimum 2 × 2 dots ⑤ (per key)
	Simultaneous press	Not available ⑥ (Only 1 point can be touched.)
	Life	1 million touches or more (Operating force: 0.98 N or less)
Human sensor	Detection length	—
	Detection temperature	—
User memory	Memory capacity	Memory for storage (ROM): 32 MB, Memory for operation (RAM): 128 MB
	Life (number of write times)	100 000 times
Built-in clock precision		±90 seconds/month (Ambient temperature: 25 °C)
Battery	Type	GT11-50-BAT lithium battery
	Life	Approx. 5 years (Ambient temperature: 25 °C)
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: D-sub 9-pin (male)
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin (female)
	Ethernet	2 channels, Data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45
	USB (Host)	1 channel (back side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB-A
	USB (Device)	1 channel (back side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB Mini-B
	SD card	1 channel, SDHC compliant (maximum 32 GB)
	Extension interface	—
	Auxiliary extension interface	—
	Wireless LAN communication unit interface	For installing a wireless LAN communication unit
	Sound output interface	1 channel, WAV format (16 bits, 8.000 kHz/16.000 kHz, monaural), applicable plug: Ø3.5 stereo mini-plug (3-prong)
Buzzer output		Single tone (tone and tone length adjustable)
POWER LED		2 colours (blue and orange)
UV cutoff		Front: Approximately 95% (370 nm)
Productive structure		Front: IP66F ⑦/IP67F ⑦, Inside the enclosure: IP2X
Dimensions (WxHxD) in mm		214 x 158 x 55
Panel cut dimensions (WxH) in mm		197 x 141
Weight (Excluding installation fittings)		1.2 kg
Compatible software package		GT Works3, Version 1.175H or later

Tab. A-12: *Specifications for Graphic Operation Terminal GT2507T-WTSD*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.

- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.

- Key size: 16 × 16 dots or larger
- Distance between keys: 16 dots or more

⑥ If you touch two points or more simultaneously on the touch panel, a touch switch near the touched points may operate unexpectedly.
Do not touch two points or more simultaneously on the touch panel.

⑦ The suffix "F" of IP66F and IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

A.2.4 GT25-S, GT25-V

GT2512-S, GT2512F-S

Item		GT2512-STBA, GT2512-STBD	GT2512F-STNA, GT2512F-STND
Display section ①②	Type	TFT colour LCD	
	Screen size	12.1"	
	Resolution	SVGA: 800 x 600 dots	
	Display size	246 x 184.5 mm	
	Number of displayed characters	16-dot standard font: 50 characters × 37 lines (two-byte characters)	
		12-dot standard font: 66 characters × 50 lines (two-byte characters)	
	Display colour	65536 colours	
	Brightness Adjustment	32 levels	
Backlight	Type	LED (Not replaceable)	
	Backlight life ③	Approx. 60000 h (operating ambient temperature: 25 °C, display intensity: 50 %)	
Touch panel ④	Type	Analog resistive film	
	Key size	Minimum 2 × 2 dots ⑤ (per key)	
	Simultaneous press	Not available ⑥ (Only 1 point can be touched.)	
	Life	1 million touches or more (Operating force: 0.98 N or less)	
Human sensor	Detection length	—	
	Detection temperature	—	
User memory	Memory capacity	Memory for storage (ROM): 32 MB, Memory for operation (RAM): 80 MB	
	Life (number of write times)	100 000 times	
Built-in clock precision		±90 seconds/month (Ambient temperature: 25 °C)	
Battery	Type	GT11-50-BAT lithium battery	
	Life	Approx. 5 years (Ambient temperature: 25 °C)	
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: D-sub 9-pin (male)	
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin (female)	
	Ethernet	1 channel, data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45	
	USB (Host)	2 channels (front side, back side)	1 channel (back side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB-A	
	USB (Device)	1 channel (front side)	1 channel (back side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB Mini-B	
	SD card	1 channel, SDHC compliant (maximum 32 GB)	
	Extension interface	For installing a communication unit or an option unit	
	Auxiliary extension interface	—	
	Side interface	For installation of a communication unit	
Buzzer output		Single tone (tone and tone length adjustable)	
POWER LED		2 colours (blue and orange)	
Productive structure		Front: IP67F ⑦⑨, Inside the enclosure: IP2X	Front: IP67F ⑧⑨, Inside the enclosure: IP2X
Dimensions (WxHxD) in mm		316 x 246 x 52	311 x 237 x 54
Panel cut dimensions (WxH) in mm		302 x 228	269 x 214
Weight (Excluding installation fittings)		2.4 kg	
Compatible software package		GT Works3, Version 1.122C or later	GT Works3, Version 1.150G or later

Tab. A-13: *Specifications for Graphic Operation Terminals GT2512-S and GT2512F-S*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.

- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.

- Key size: 16 × 16 dots or larger
- Distance between keys: 16 dots or more

⑥ If you touch two points or more simultaneously on the touch panel, a touch switch near the touched points may operate unexpectedly.
Do not touch two points or more simultaneously on the touch panel.

⑦ To conform to IP67F, close the USB environmental protection cover by pushing the [PUSH] mark firmly. (The GOT conforms to IP2X when the USB environmental protection cover is open.)
Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑧ To conform to IP67F attach the environmental protection sheet.
Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑨ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

GT2510-V, GT2510F-V

Item		GT2510-VTBA / -VTBD	GT2510-VTWA / -VTWD	GT2510F-VTNA / -VTND
Display section ①②	Type	TFT colour LCD		
	Screen size	10.4"		
	Resolution	VGA: 640 x 480 dots		
	Display size	211.2 x 158.4 mm		
	Number of displayed characters	16-dot standard font: 40 characters × 30 lines (two-byte characters)		
		12-dot standard font: 53 characters × 40 lines (two-byte characters)		
	Display colour	65536 colours		
	Brightness Adjustment	32 levels		
Backlight	Type	LED (Not replaceable)		
	Backlight life③	Approx. 60000 h (operating ambient temperature: 25 °C, display intensity: 50 %)		
Touch panel ④	Type	Analog resistive film		
	Key size	Minimum 2 × 2 dots ⑤ (per key)		
	Simultaneous press	Not available ⑥ (Only 1 point can be touched.)		
	Life	1 million touches or more (Operating force: 0.98 N or less)		
Human sensor	Detection length	—		
	Detection temperature	—		
User memory	Memory capacity	Memory for storage (ROM):32 MB, Memory for operation (RAM): 80 MB		
	Life (number of write times)	100 000 times		
Built-in clock precision		±90 seconds/month (Ambient temperature: 25 °C)		
Battery	Type	GT11-50-BAT lithium battery		
	Life	Approx. 5 years (Ambient temperature: 25 °C)		
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: D-sub 9-pin (male)		
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin (female)		
	Ethernet	1 channel, data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45		
	USB (Host)	2 channels (front side, back side)	1 channel (back side)	
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB-A		
	USB (Device)	1 channel (front side)	1 channel (back side)	
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB Mini-B		
	SD card	1 channel, SDHC compliant (maximum 32 GB)		
	Extension interface	For installing a communication unit or an option unit		
	Auxiliary extension interface	—		
	Side interface	For installation of a communication unit		
Buzzer output		Single tone (tone and tone length adjustable)		
POWER LED		2 colours (blue and orange)		
Productive structure		Front: IP67F ⑦⑨, Inside the enclosure: IP2X		Front: IP67F ⑧⑨, Inside the enclosure: IP2X
Dimensions (WxHxD) in mm		303 x 218 x 52		298 x 209 x 54
Panel cut dimensions (WxH) in mm		289 x 200		234 x 187
Weight (Excluding installation fittings)		2.1 kg		
Compatible software package		GT Works3, Version 1.112S or later		GT Works3, Version 1.150G or later

Tab. A-14: *Specifications for Graphic Operation Terminals GT2510-V and GT2510F-V*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.

- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.

- Key size: 16 × 16 dots or larger
- Distance between keys: 16 dots or more

⑥ If you touch two points or more simultaneously on the touch panel, a touch switch near the touched points may operate unexpectedly.
Do not touch two points or more simultaneously on the touch panel.

⑦ To conform to IP67F, close the USB environmental protection cover by pushing the [PUSH] mark firmly. (The GOT conforms to IP2X when the USB environmental protection cover is open.)
Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑧ To conform to IP67F attach the environmental protection sheet.
Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑨ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

GT2508-V, GT2508F-V

Item		GT2508-VTBA / -VTBD	GT2508-VTWA / -VTWD	GT2508F-VTNA / -VTND
Display section ①②	Type	TFT colour LCD		
	Screen size	8.4"		
	Resolution	VGA: 640 x 480 dots		
	Display size	170.9 x 128.2 mm		
	Number of displayed characters	16-dot standard font: 40 characters × 30 lines (two-byte characters)		
		12-dot standard font: 53 characters × 40 lines (two-byte characters)		
	Display colour	65536 colours		
	Brightness Adjustment	32 levels		
Backlight	Type	LED (Not replaceable)		
	Backlight life ③	Approx. 60000 h (operating ambient temperature: 25 °C, display intensity: 50 %)		
Touch panel④	Type	Analog resistive film		
	Key size	Minimum 2 × 2 dots ⑤ (per key)		
	Simultaneous press	Not available ⑥ (Only 1 point can be touched.)		
	Life	1 million touches or more (Operating force: 0.98 N or less)		
Human sensor	Detection length	—		
	Detection temperature	—		
User memory	Memory capacity	Memory for storage (ROM): 32 MB, Memory for operation (RAM): 80 MB		
	Life (number of write times)	100 000 times		
Built-in clock precision		±90 seconds/month (Ambient temperature: 25 °C)		
Battery	Type	GT11-50-BAT lithium battery		
	Life	Approx. 5 years (Ambient temperature: 25 °C)		
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: D-sub 9-pin (male)		
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin (female)		
	Ethernet	1 channel, data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45		
	USB (Host)	2 channels (front side, back side)	1 channel (back side)	
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB-A		
	USB (Device)	1 channel (front side)	1 channel (back side)	
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB Mini-B		
	SD card	1 channel, SDHC compliant (maximum 32 GB)		
	Extension interface	For installing a communication unit or an option unit		
	Auxiliary extension interface	—		
	Side interface	For installation of a communication unit		
Buzzer output		Single tone (tone and tone length adjustable)		
POWER LED		2 colours (blue and orange)		
Productive structure		Front: IP67F ⑦⑨, Inside the enclosure: IP2X		Front: IP67F ⑧⑨, Inside the enclosure: IP2X
Dimensions (WxHxD) in mm		241 x 194 x 52		236 x 185 x 54
Panel cut dimensions (WxH) in mm		227 x 176		194 x 185
Weight (Excluding installation fittings)		1.5 kg		
Compatible software package		GT Works3, Version 1.112S or later		GT Works3 Version1.150G or later

Tab. A-15: *Specifications for Graphic Operation Terminals GT2508-V and GT2508F-V*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.

- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.

- Key size: 16 × 16 dots or larger
- Distance between keys: 16 dots or more

⑥ If you touch two points or more simultaneously on the touch panel, a touch switch near the touched points may operate unexpectedly.
Do not touch two points or more simultaneously on the touch panel.

⑦ To conform to IP67F, close the USB environmental protection cover by pushing the [PUSH] mark firmly. (The GOT conforms to IP2X when the USB environmental protection cover is open.)
Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑧ To conform to IP67F attach the environmental protection sheet.
Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑨ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

GT2505-V

Item		GT2505-VTBD
Display section ①②	Type	TFT colour LCD
	Screen size	5.7"
	Resolution	VGA: 640 x 480 dots
	Display size	115.2 x 86.4 mm
	Number of displayed characters	16-dot standard font: 40 characters × 30 lines (two-byte characters)
		12-dot standard font: 53 characters × 40 lines (two-byte characters)
	Display colour	65536 colours
	Brightness Adjustment	32 levels
Backlight	Type	LED (Not replaceable)
	Backlight life ③	Approx. 60000 h (operating ambient temperature: 25 °C, display intensity: 50 %)
Touch panel ④	Type	Analog resistive film
	Key size	Minimum 2 × 2 dots ⑤ (per key)
	Simultaneous press	Not available ⑥ (Only 1 point can be touched.)
	Life	1 million touches or more (Operating force: 0.98 N or less)
Human sensor	Detection length	—
	Detection temperature	—
User memory	Memory capacity	Memory for storage (ROM): 32 MB, Memory for operation (RAM): 80 MB
	Life (number of write times)	100 000 times
Built-in clock precision		±90 seconds/month (Ambient temperature: 25 °C)
Battery	Type	GT11-50-BAT lithium battery
	Life	Approx. 5 years (Ambient temperature: 25 °C)
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: D-sub 9-pin (male)
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Terminating resistor: OPEN, 100 Ω, 330 Ω (Selectable by the terminating resistor setting switch. Factory default: 330 Ω) ⑦ Connector shape: 9-pin (female)
	Ethernet	Data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45
	USB (Host)	1 channel (back side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB-A
	USB (Device)	1 channel (front side)
		USB version: USB 2.0 (High-Speed 480 Mbps), Connector shape: USB Mini-B
	SD card	1 channel, SDHC compliant (maximum 32 GB)
	Extension interface	—
	Auxiliary extension interface	—
	Side interface	—
Buzzer output		Single tone (tone and tone length adjustable)
POWER LED		2 colours (blue and orange)
Productive structure		Front: IP67F ⑧⑨, Inside the enclosure: IP2X
Dimensions (WxHxD) in mm		164 x 139 x 53.5
Panel cut dimensions (WxH) in mm		153 x 121
Weight (Excluding installation fittings)		0.6 kg
Compatible software package		GT Works3, Version 1.180N or later

Tab. A-16: *Specifications for Graphic Operation Terminal GT2505-VTBD*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.

- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.

- Key size: 16 × 16 dots or larger
- Distance between keys: 16 dots or more

⑥ If you touch two points or more simultaneously on the touch panel, a touch switch near the touched points may operate unexpectedly.
Do not touch two points or more simultaneously on the touch panel.

⑦ For the GOT multi-drop connection, set the terminating resistor setting switch of the GOT according to the connection type. For the details of the GOT multi-drop connection, refer to the following.

– GOT2000 Series Connection Manual (Mitsubishi Electric Products) For GT Works3 Version1

⑧ To conform to IP67F, close the USB environmental protection cover by pushing the [PUSH] mark firmly. (The GOT conforms to IP2X when the USB environmental protection cover is open.)
Note that the structure does not guarantee protection in all users' environments.

The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑨ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

A.2.5 GT23

GT2310-V

Item		GT2310-VTBA, GT2310-VTBD
Display section ①②	Type	TFT colour LCD
	Screen size	10.4"
	Resolution	VGA: 640 x 480 dots
	Display size	211.2 x 158.4 mm
	Number of displayed characters	16-dot standard font: 40 characters × 30 lines (two-byte characters)
		12-dot standard font: 53 characters × 40 lines (two-byte characters)
	Display colour	65536 colours
	Brightness Adjustment	16 levels
Backlight	Type	LED (Not replaceable)
	Backlight life ③	Approx. 50000 h (operating ambient temperature: 25 °C, display intensity: 50 %)
Touch panel ④	Type	Analog resistive film
	Key size	Minimum 2 × 2 dots ⑤ (per key)
	Simultaneous press	Not available ⑥ (Only 1 point can be touched.)
	Life	1 million touches or more (Operating force: 0.98 N or less)
User memory	Memory capacity	Memory for storage (ROM): 9 MB, Memory for operation (RAM): 9 MB
	Life (number of write times)	Max. 100 000 times
Built-in clock precision		±90 seconds/month (Ambient temperature: 25 °C)
Battery	Type	GT11-50-BAT lithium battery
	Life	Approx. 5 years (Ambient temperature: 25 °C)
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: D-sub 9-pin (male)
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin (female)
	Ethernet	1 channel, data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45
	USB (Host)	1 channel
		USB version: USB1.1 (Full-Speed 12 Mbps), Connector shape: USB-A
	USB (Device)	1 channel
		USB version: USB1.1 (Full-Speed 12 Mbps), Connector shape: USB Mini-B
	SD card	1 channel, SDHC compliant (maximum 32 GB)
Buzzer output		Single tone (tone length adjustable)
POWER LED		2 colours (blue and orange)
Productive structure		Front: IP67F ⑦⑧, Inside the enclosure: IP2X
Dimensions (WxHxD) in mm		303 x 218 x 56
Panel cut dimensions (WxH) in mm		289 x 200
Weight (Excluding installation fittings)		1.9 kg
Compatible software package		GT Works3, Version 1.100E or later

Tab. A-17: *Specifications for Graphic Operation Terminal GT2310-V*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.
- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.
- Key size: 16 × 16 dots or larger
- Distance between keys: 16 dots or more

⑥ If you touch two points or more simultaneously on the touch panel, a touch switch near the touched points may operate unexpectedly.
Do not touch two points or more simultaneously on the touch panel.

⑦ Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑧ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

GT2308-V

Item		GT2308-VTBA, GT2308-VTBD
Display section ①②	Type	TFT colour LCD
	Screen size	8.4"
	Resolution	VGA: 640 x 480 dots
	Display size	170.9 x 128.2 mm
	Number of displayed characters	16-dot standard font: 40 characters × 30 lines (two-byte characters)
		12-dot standard font: 53 characters × 40 lines (two-byte characters)
	Display colour	65536 colours
	Brightness Adjustment	16 levels
Backlight	Type	LED (Not replaceable)
	Backlight life ③	Approx. 50000 h (operating ambient temperature: 25 °C, display intensity: 50 %)
Touch panel ④	Type	Analog resistive film
	Key size	Minimum 2 × 2 dots ⑤ (per key)
	Simultaneous press	Not available ⑥ (Only 1 point can be touched.)
	Life	1 million touches or more (Operating force: 0.98 N or less)
User memory	Memory capacity	Memory for storage (ROM): 9 MB, Memory for operation (RAM): 9 MB
	Life (number of write times)	Max. 100 000 times
Built-in clock precision		±90 seconds/month (Ambient temperature: 25 °C)
Battery	Type	GT11-50-BAT lithium battery
	Life	Approx. 5 years (Ambient temperature: 25 °C)
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: D-sub 9-pin (male)
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin (female)
	Ethernet	1 channel, data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45
	USB (Host)	1 channel
		USB version: USB1.1 (Full-Speed 12 Mbps), Connector shape: USB-A
	USB (Device)	1 channel
		USB version: USB1.1 (Full-Speed 12 Mbps), Connector shape: USB Mini-B
	SD card	1 channel, SDHC compliant (maximum 32 GB)
Buzzer output		Single tone (tone length adjustable)
POWER LED		2 colours (blue and orange)
Productive structure		Front: IP67F ⑦⑧, Inside the enclosure: IP2X
Dimensions (WxHxD) in mm		241 x 194 x 56
Panel cut dimensions (WxH) in mm		227 x 176
Weight (Excluding installation fittings)		1.5 kg
Compatible software package		GT Works3, Version 1.100E or later

Tab. A-18: *Specifications for Graphic Operation Terminal GT2308-V*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.
- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.
- Key size: 16 × 16 dots or larger
- Distance between keys: 16 dots or more

⑥ If you touch two points or more simultaneously on the touch panel, a touch switch near the touched points may operate unexpectedly.
Do not touch two points or more simultaneously on the touch panel.

⑦ Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑧ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

A.2.6 GT21

GT2107-WTSD

Item		GT2107-WTSD
Display section ①②	Type	TFT colour LCD
	Screen size	7" wide screen
	Resolution	WVGA: 800 x 480 dots
	Display size	152.40 × 91.44 mm
	Number of displayed characters	16-dot standard font: 50 characters × 30 lines (two-byte characters)
		12-dot standard font: 66 characters × 40 lines (two-byte characters)
	Display colour	65536 colours
	Brightness Adjustment	32 levels
Backlight	Type	LED (Not replaceable)
	Backlight life ③	Approx. 50000 h (operating ambient temperature: 25 °C, display intensity: 50 %)
Touch panel ④	Type	Analog resistive film
	Key size	Minimum 2 × 2 dots ⑤ (per key)
	Simultaneous press	Not available ⑥ (Only 1 point can be touched.)
	Life	1 million touches or more (Operating force: 0.98 N or less)
Human sensor	Detection length	—
	Detection temperature	—
User memory	Memory capacity	Memory for storage (ROM): 15 MB
	Life (number of write times)	100 000 times
Built-in clock precision		±45 seconds/month (Ambient temperature: 25 °C)
Battery	Type	GT11-50-BAT lithium battery
	Life	Approx. 5 years (Ambient temperature: 25 °C)
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: D-sub 9-pin (male)
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin (female)
	Ethernet	1 channel, data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45
	USB (Host)	1 channel (back side)
		USB version: USB1.1 (Full-Speed 12 Mbps), Connector shape: USB-A
	USB (Device)	1 channel (front side)
		USB version: USB1.1 (Full-Speed 12 Mbps), Connector shape: USB Mini-B
	SD card	1 channel, SDHC compliant (maximum 32 GB)
	Extension interface	—
	Auxiliary extension interface	—
	Side interface	—
Buzzer output		Single tone (tone length adjustable)
POWER LED		—
Productive structure		Front: IP67F ⑦⑧, Inside the enclosure: IP2X
Dimensions (WxHxD) in mm		189 x 142 x 48
Panel cut dimensions (WxH) in mm		180.5 x 133.5
Weight (Excluding installation fittings)		0.7 kg
Compatible software package		GT Works3, Version 1.170C or later

Tab. A-19: *Specifications for Graphic Operation Terminal GT2107-WTSD*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.

- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.

- Key size: 16 × 16 dots or larger

⑥ If you touch two points or more simultaneously on the touch panel, a touch switch near the touched points may operate unexpectedly.
Do not touch two points or more simultaneously on the touch panel.

⑦ To conform to IP67F, close the USB environmental protection cover by pushing the [PUSH] mark firmly. (The GOT conforms to IP2X when the USB environmental protection cover is open.)
Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑧ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

GT2104-R

Item		GT2104-RTBD
Display section ①②	Type	TFT colour LCD
	Screen size	4.3"
	Resolution	480 x 272 dots
	Display size	95.0 × 53.8 mm
	Number of displayed characters	16-dot standard font: 30 characters × 17 lines (two-byte characters)
		12-dot standard font: 40 characters × 22 lines (two-byte characters)
	Display colour	65536 colours
	Brightness Adjustment	32 levels
Backlight	Type	LED (Not replaceable)
	Backlight life ③	Approx. 50000 h (operating ambient temperature: 25 °C, display intensity: 50 %)
Touch panel ④	Type	Analog resistive film
	Key size	Minimum 2 × 2 dots ⑤ (per key)
	Simultaneous press	Not available ⑥ (Only 1 point can be touched.)
	Life	1 million touches or more (Operating force: 0.98 N or less)
Human sensor	Detection length	—
	Detection temperature	—
User memory	Memory capacity	Memory for storage (ROM): 9 MB
	Life (number of write times)	100 000 times
Built-in clock precision		±45 seconds/month (Ambient temperature: 25 °C)
Battery	Type	GT11-50-BAT lithium battery
	Life	Approx. 5 years (Ambient temperature: 25 °C)
Built-in interface	RS-232	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin connector terminal block
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin connector terminal block
	Ethernet	1 channel, data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45
	USB (Host)	—
		—
	USB (Device)	1 channel (back side)
		USB version: USB1.1 (Full-Speed 12 Mbps), Connector shape: USB Mini-B
	SD card	1 channel, SDHC compliant (maximum 32 GB)
	Extension interface	—
	Auxiliary extension interface	—
	Side interface	—
Buzzer output		Single tone (tone length adjustable)
POWER LED		—
Productive structure		Front: IP67F ⑧⑨, Inside the enclosure: IP2X
Dimensions (WxHxD) in mm		128 x 102 x 40
Panel cut dimensions (WxH) in mm		118 x 92
Weight (Excluding installation fittings)		0.4 kg
Compatible software package		GT Works3, Version 1.122C or later

Tab. A-20: *Specifications for Graphic Operation Terminal GT2104-RTBD*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.

- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.

- Key size: 16 × 16 dots or larger

⑥ If you touch two points or more simultaneously on the touch panel, a touch switch near the touched points may operate unexpectedly.
Do not touch two points or more simultaneously on the touch panel.

⑦ Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑧ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

GT2103-P

Item		GT2103-PMBD	GT2103-PMBDS	GT2103-PMBLS
Display section ①②	Type	TFT monochrome LCD		
	Screen size	3.8"		
	Resolution	320 x 128 dots		
	Display size	89.0 × 35.6 mm		
	Number of displayed characters	16-dot standard font: 20 characters × 8 lines (two-byte characters)		
		12-dot standard font: 26 characters × 10 lines (two-byte characters)		
	Display colour	Monochrome (black/white) 32 shade grayscale		
	Brightness Adjustment	32 levels		
Backlight	Type	5-colour LED (White, green, pink, orange, red) (Not replaceable)		
	Backlight life ③	Approx. 50000 h (operating ambient temperature: 25 °C, display intensity: 50 %)		
Touch panel ④	Type	Analog resistive film		
	Key size	Minimum 2 × 2 dots ⑤ (per key)		
	Simultaneous press	Not available ⑥ (Only 1 point can be touched.)		
	Life	1 million touches or more (Operating force: 0.98 N or less)		
Human sensor	Detection length	—		
	Detection temperature	—		
User memory	Memory capacity	Memory for storage (ROM): 3 MB		
	Life (number of write times)	100 000 times		
Built-in clock precision		—		
Battery	Type	—		
	Life	—		
Built-in interface	RS-232	—	1 channel, transmission speed: 115200/57600/38400/19200/ 9600/4800 bps Connector shape: MINI-DIN 6-pin (female)	—
	RS-422/485	1 channel, transmission speed: 115200/57600/38400/19200/ 9600/4800 bps Connector shape: 5-pin connector terminal block	1 channel, transmission speed: 115200/57600/38400/19200/ 9600/4800 bps Connector shape: 9-pin connector terminal block	—
	RS-422	—	—	1 channel, transmission speed: 115200/57600/38400/19200/ 9600/4800 bps Connector shape: 9-pin connector terminal block ⑦
	Ethernet	1 channel, data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45	—	—
	USB (Host)	—		
		—		
	USB (Device)	1 channel (back side)		
		USB version: USB1.1 (Full-Speed 12 Mbps), Connector shape: USB Mini-B		
	SD card ⑧	1 channel, SDHC compliant (maximum 32 GB)		
	Extension interface	—		
	Auxiliary extension interface	—		
	Side interface	—		
Buzzer output		Single tone (tone length adjustable)		

Tab. A-21: *Specifications for Graphic Operation Terminals GT2103-P*

Item	GT2103-PMBD	GT2103-PMBDS	GT2103-PMBLS
POWER LED	—		
Productive structure	Front: IP67F ⑨⑩, Inside the enclosure: IP2X		
Dimensions (WxHxD) in mm	113 x 74 x 32	113 x 74 x 27 ⑪	113 x 74 x 27
Panel cut dimensions (WxH) in mm	105 x 66		
Weight (Excluding installation fittings)	0.2 kg		
Compatible software package	GT Works3, Version 1.112S or later		GT Works3, Version 1.119Z or later

Tab. A-21: *Specifications for Graphic Operation Terminals GT2103-P*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.

- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ The minimum size of a key that can be arranged.
To ensure safe use of the product, the following settings are recommended.

- Key size: 16 × 16 dots or larger

⑥ If you touch two points or more simultaneously on the touch panel, a touch switch near the touched points may operate unexpectedly.
Do not touch two points or more simultaneously on the touch panel.

⑦ Use a 3 m or shorter cable.

⑧ The SD card unit (GT21-03SDCD), sold separately, needs to be mounted.

⑨ Note that the structure does not guarantee protection in all users' environments.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

⑩ The suffix "F" of IP67F is a symbol that indicates protection rate against oil. It is described in the Appendix of Japanese Industrial Standard JIS C 0920.

⑪ The dimension when the SD card unit (GT21-03SDCD) is mounted is 113 (W) × 74 (H) × 32 (D) mm.

A.2.7 GS21

Item		GS2110-WTBD	GS2107-WTBD
Display section ①②	Type	TFT colour LCD	
	Screen size	10"	7"
	Resolution	VGA: 640 x 480 dots	
	Display size	222 x 132.5 mm	154 x 85.9 mm
	Displayed number of characters	16-dot standard font: 50 characters × 30 lines (two-byte characters)	
	Display colour	65536 colours	
	Brightness Adjustment	32 levels	
Backlight	Type	LED (Not replaceable)	
	Backlight life ③	Approx. 60000 h (operating ambient temperature: 25 °C, display intensity: 50 %)	
Touch panel ④	Type	Analog resistive film	
	Key size	Minimum 2 × 2 dots (per key)	
	Simultaneous press	Simultaneous press is prohibited. (Only one point can be touched.) ⑤	
	Life	1 million touches or more (Operating force: 0.98 N or less)	
Human sensor	Detection length	—	
	Detection temperature	—	
User memory	Memory capacity	Built-in flash memory: 9 MB	
	Life (number of write times)	Max. 100 000 times	
Built-in clock precision		—	
Battery	Type	—	
	Life	—	
Built-in interface	RS-232	Transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: D-sub 9-pin (male)	
	RS-422/485	Transmission speed: 115200/57600/38400/19200/9600/4800 bps Connector shape: 9-pin (female)	
	Ethernet	Data transfer method: 100BASE-TX/10BASE-T, Connector shape: RJ-45	
	USB (Host)	—	
		—	
	USB (Device)	1 channel (back side)	
		Transmission speed: 12 Mbps, Connector shape: Mini-B	
	SD card	1 channel, SDHC compliant (maximum 32 GB)	
	Extension interface	—	
	Extension auxiliary interface	—	
	Side interface	—	
Buzzer output		Single tone (tone length adjustable)	
POWER LED		—	
Productive structure		Outside the enclosure: IP65F⑥	
Dimensions (WxHxD) in mm		272 x 214 x 56	206 x 155 x 50
Panel cut dimensions (WxH) in mm		258 x 200	191 x 137
Weight (Excluding installation fittings)		1.3 kg	0.9 kg
Compatible software package		GT Works3, Version 1.104J or later	

Tab. A-22: *Specifications for Graphic Operation Terminals GS2110 and GS2107*

① Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel due to its characteristics. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. In addition, colour tone difference, unevenness of brightness, or flickers may occur due to individual differences of liquid crystal display panels.

② Flickering may occur due to vibration, shock, or the display colours.

③ To prevent the display section from burning in and lengthen the backlight life, enable the screen save function and turn off the backlight.

④ When a stylus pen is used, the touch panel endures touches of up to 100000 times.
The stylus pen must satisfy the following specifications.

- Material: Polyacetal resin
- Tip radius: 0.8 mm or more

⑤ If you touch two points or more simultaneously on the touch panel, a touch switch near the touched points may operate unexpectedly.
Do not touch two points or more simultaneously on the touch panel.

⑥ Protection class complies with IP65. Note that this does not guarantee all users' operation environment.
The GOT may not be used in an environment where the GOT is exposed to oil or chemicals for a long time, or where oil mist fills the air.

A.3 Specifications of Power Supply Section

NOTES

If an instantaneous power failure occurs in the power supply and continues for more than the permissible period, the GOT may be reset.

Make sure to power on the unit more than 5 seconds after power-off.

A.3.1 GT27, input power supply 100 to 240 V AC

Item		GT2715-XTBA	GT2712-STBA GT2712-STWA	GT2710-STBA GT2710-VTBA GT2710-VTWA	GT2708-STBA GT2708-VTBA
Power supply voltage		100–240 V AC (+10 %, -15 %)			
Power supply frequency		50/60 Hz ±5 %			
Maximum apparent power		140 VA	100 VA		
Power consumption	Under the maximum load	max. 51 W	max. 44 W	max. 41 W	max. 41 W
	Main unit	max. 25 W	max. 19 W	max. 17 W	max. 15 W
	Main unit (Backlight OFF)	max. 10 W	max. 10 W	max. 10 W	max. 10 W
Inrush current ①		max. 40 A (3 ms)	max. 60 A (2 ms)		
Permissible instantaneous power failure time		max. 20 ms (100 V AC or more)			
Noise immunity		Noise voltage: 1500 Vpp, noise width: 1 µs (measured by a noise simulator with noise frequency ranging from 25 Hz to 60 Hz)			
Withstand voltage		1500 V AC for 1 minute across power terminals and earth			
Insulation resistance		500 V DC across power terminals and earth, 10 MΩ or more by an insulation resistance tester			
Applicable wire size		0.75–2 mm^2			
Applicable solderless terminal		Solderless terminal for M3 screw RAV1.25-3, V2-S3.3, V2-N3A, FV2-N3A			
Applicable tightening torque (Terminal block terminal screw)		0.5–0.8 Nm			

Tab. A-23: *Specifications of power supply for GT27 (100 to 240 V AC)*

① At an ambient temperature of 25 °C and maximum load.

A.3.2 GT27, input power supply 24 V DC

Item		GT2715-XTBD	GT2712-STBD GT2712-STWD	GT2710-STBD GT2710-VTBD GT2710-VTWD	GT2708-STBD GT2708-VTBD	GT2705-VTBD
Power supply voltage		24 V DC (+25 %, -20 %)				
Power consumption	Under the maximum load	max. 48 W	max. 45 W	max. 42 W	max. 39 W	max. 30 W
	Main unit	23 W	18 W	15 W	13 W	7 W
	Main unit (Backlight OFF)	8 W	8 W	8 W	8 W	5 W
Inrush current ①		max. 5 A (20 ms)				max. 69A (1 ms)
Permissible instantaneous power failure time		max. 10 ms				
Noise immunity		500 Vpp, noise width: 1 µs (measured by a noise simulator with noise frequency ranging from 25 Hz to 60 Hz)				
Withstand voltage		350 V AC for 1 minute across power terminals and earth				
Insulation resistance		500 V DC across power terminals and earth, 10 MΩ or more by an insulation resistance tester				
Applicable wire size		0.75–2 mm^2				
Applicable solderless terminal		Solderless terminal for M3 screw RAV1.25-3, V2-S3.3, V2-N3A, FV2-N3A				
Applicable tightening torque (Terminal block terminal screw)		0.5–0.8 Nm				

Tab. A-24: *Specifications of power supply for GT27 (24 V DC)*

① At an ambient temperature of 25 °C and maximum load.

A.3.3 GT2510-WX, GT2507-W, input power supply 24 V DC

Item		GT2510-WXTSD	GT2507-WTSD
Power supply voltage		24 V DC (+25 %, -20 %)	
Power consumption	Under the maximum load	max. 16 W	
	Main unit	9 W	
	Main unit (Backlight OFF)	5 W	
Inrush current ①		max. 59 A (2 ms)	
Permissible instantaneous power failure time		max. 5 ms	
Noise immunity		500 Vpp, noise width: 1 µs (measured by a noise simulator with noise frequency ranging from 25 Hz to 60 Hz)	
Withstand voltage		350 V AC for 1 minute across power terminals and earth	
Insulation resistance		500 V DC across power terminals and earth, 10 MΩ or more by an insulation resistance tester	
Applicable wire size		0.75–2 mm^2	
Applicable solderless terminal		Solderless terminal for M3 screw RAV1.25-3, V2-S3.3, V2-N3A, FV2-N3A	
Applicable tightening torque (Terminal block terminal screw)		0.5–0.8 Nm	

Tab. A-25: *Specifications of power supply for GT2510-WX and GT2507-W (24 V DC)*

① At an ambient temperature of 25 °C and maximum load.

A.3.4 GT2507T-W, input power supply 24 V DC

Item		GT2507T-WTSD
Power supply voltage		24 V DC (+25 %, -20 %)
Power consumption	Under the maximum load	max. 17 W
	Main unit	11 W
	Main unit (Backlight OFF)	7 W
Inrush current ①		max. 59 A (2 ms)
Permissible instantaneous power failure time		max. 5 ms
Noise immunity		500 Vpp, noise width: 1 µs (measured by a noise simulator with noise frequency ranging from 25 Hz to 60 Hz)
Withstand voltage		350 V AC for 1 minute across power terminals and earth
Insulation resistance		500 V DC across power terminals and earth, 10 MΩ or more by an insulation resistance tester
Applicable wire size		0.75–2 mm^2
Applicable solderless terminal		Solderless terminal for M3 screw RAV1.25-3, V2-S3.3, V2-N3A, FV2-N3A
Applicable tightening torque (Terminal block terminal screw)		0.5–0.8 Nm

Tab. A-26: *Specifications of power supply for GT2507T-WTSD (24 V DC)*

① At an ambient temperature of 25 °C and maximum load.

A.3.5 GT25-S, GT25-V, input power supply 100 to 240 V AC

Item		GT2512-STBA GT2512F-STNA	GT2510-VTBA GT2510-VTWA GT2510F-VTNA	GT2508-VTBA GT2508-VTWA GT2508F-VTNA
Power supply voltage		100–240 V AC (+10 %, -15 %)		
Power supply frequency		50/60 Hz ±5 %		
Maximum apparent power		80 VA	80 VA	70 VA
Power consumption	Under the maximum load	max. 35 W	max. 34 W	max. 31 W
	Main unit	max. 14 W	max. 12 W	max. 11 W
	Main unit (Backlight OFF)	max. 7 W	max. 7 W	max. 7 W
Inrush current ①		max. 60 A (3 ms)		
Permissible instantaneous power failure time		max. 20 ms (100 V AC or more)		
Noise immunity		Noise voltage: 1500 Vpp, noise width: 1 µs (measured by a noise simulator with noise frequency ranging from 25 Hz to 60 Hz)		
Withstand voltage		1500 V AC for 1 minute across power terminals and earth		
Insulation resistance		500 V DC across power terminals and earth, 10 MΩ or more by an insulation resistance tester		
Applicable wire size		0.75–2 mm^2		
Applicable solderless terminal		Solderless terminal for M3 screw RAV1.25-3, V2-S3.3, V2-N3A, FV2-N3A		
Applicable tightening torque (Terminal block terminal screw)		0.5–0.8 Nm		

Tab. A-27: *Specifications of power supply for GT25-S and GT25-V (100 to 240 V AC)*

① At an ambient temperature of 25 °C and maximum load.

A.3.6 GT25-S, GT25-V, input power supply 24 V DC

Item		GT2512-STBD GT2512F-STND	GT2510-VTBD GT2510-VTWD GT2510F-VTND	GT2508-VTBD GT2508-VTWD GT2508F-VTND	GT2505-VTBD
Power supply voltage		24 V DC (+25 %, -20 %)			24 V DC (+10 %, -15 %)
Power consumption	Under the maximum load	max. 37 W	max. 33 W	max. 31 W	max. 8.4 W
	Main unit	13 W	10 W	8 W	4.3 W
	Main unit (Backlight OFF)	6 W	6 W	6 W	2.6 W
Inrush current ①		max. 5 A (20 ms)			max. 42 A (2 ms)
Permissible instantaneous power failure time		max. 10 ms			
Noise immunity		500 Vpp, noise width: 1 µs (measured by a noise simulator with noise frequency ranging from 25 Hz to 60 Hz)			1000 Vpp, noise width: 1 µs (measured by a noise simulator with noise frequency ranging from 30 Hz to 100 Hz)
Withstand voltage		350 V AC for 1 minute across power terminals and earth			500 V AC for 1 minute across power terminals and earth
Insulation resistance		500 V DC across power terminals and earth, 10 MΩ or more by an insulation resistance tester			
Applicable wire size		0.75–2 mm^2			
Applicable solderless terminal		Solderless terminal for M3 screw RAV1.25-3, V2-S3.3, V2-N3A, FV2-N3A			
Applicable tightening torque (Terminal block terminal screw)		0.5–0.8 Nm			

Tab. A-28: *Specifications of power supply for GT25-S and GT25-V (24 V DC)*

① At an ambient temperature of 25 °C and maximum load.

A.3.7 GT23, input power supply 100 to 240 V AC

Item		GT2310-VTBA	GT2308-VTBA
Power supply voltage		100–240 V AC (+10 %, -15 %)	
Power supply frequency		50/60 Hz ±5 %	
Maximum apparent power		44 VA (max. load)	30 VA (max. load)
Power consumption	Under the maximum load	max. 18 W	max. 11 W
	Main unit	5 W	9 W
	Main unit (Backlight OFF)	8 W	6 W
Inrush current ①		max. 40 A (2 ms)	
Permissible instantaneous power failure time		max. 20 ms (100 V AC or more)	
Noise immunity		Noise voltage: 1500 Vpp, noise width: 1 µs (measured by a noise simulator with noise frequency ranging from 25 Hz to 60 Hz)	
Withstand voltage		1500 V AC for 1 minute across power terminals and earth	
Insulation resistance		500 V DC across power terminals and earth, 10 MΩ or more by an insulation resistance tester	
Applicable wire size		0.75–2 mm^2	
Applicable solderless terminal		Solderless terminal for M3 screw RAV1.25-3, V2-S3.3, V2-N3A, FV2-N3A	
Applicable tightening torque (Terminal block terminal screw)		0.5–0.8 Nm	

Tab. A-29: *Specifications of power supply for GT23 (100 to 240 V AC)*

① At an ambient temperature of 25 °C and maximum load.

A.3.8 GT23, input power supply 24 V DC

Item		GT2310-VTBD	GT2308-VTBD
Power supply voltage		24 V DC (+25 %, -20 %)	
Power consumption	Under the maximum load	max. 17 W	max. 11 W
	Main unit	13 W	8 W
	Main unit (Backlight OFF)	7 W	6 W
Inrush current ①		max. 40 A (2 ms)	
Permissible instantaneous power failure time		max. 10 ms	
Noise immunity		500 Vpp, noise width: 1 µs (measured by a noise simulator with noise frequency ranging from 25 Hz to 60 Hz)	
Withstand voltage		350 V AC for 1 minute across power terminals and earth	
Insulation resistance		500 V DC across power terminals and earth, 10 MΩ or more by an insulation resistance tester	
Applicable wire size		0.75–2 mm^2	
Applicable solderless terminal		Solderless terminal for M3 screw RAV1.25-3, V2-S3.3, V2-N3A, FV2-N3A	
Applicable tightening torque (Terminal block terminal screw)		0.5–0.8 Nm	

Tab. A-30: *Specifications of power supply for GT23 (24 V DC)*

① At an ambient temperature of 25 °C and maximum load.

A.3.9 GT2107-WTSD, input power supply 24 V DC

Item		GT2107-WTSD
Power supply voltage		24 V DC (+10 %, -15 %)
Power consumption	Under the maximum load	max. 11.3 W
	Backlight OFF	7 W
Inrush current ①		max. 35 A (3 ms)
Permissible instantaneous power failure time		max. 5 ms
Noise immunity		1000 Vpp, noise width: 1 µs (measured by a noise simulator with noise frequency ranging from 30 Hz to 100 Hz)
Withstand voltage		500 V AC for 1 minute across power terminals and earth
Insulation resistance		500 V DC across power terminals and earth, 10 MΩ or more by an insulation resistance tester
Applicable wire size		For power supply: 0.75 mm^2 or more, for ground: 2 mm^2
Applicable solderless terminal		Solderless terminal for M3 screw RAV1.25-3, V2-N3A, FV2-N3A
Applicable tightening torque (Terminal block terminal screw)		0.5–0.8 Nm

Tab. A-31: *Specifications of power supply for GT2107-WTSD (24 V DC)*

① At an ambient temperature of 25 °C and maximum load.

A.3.10 GT2104, GT2103, input power supply 24 V DC/5 V DC

Item		GT2104-RTBD	GT2103-PMBD	GT2103-PMBDS	GT2103-PMBLS
Power supply voltage		24 V DC (+10 %, -15 %)			5 V DC (+5 %, -5 %) ①
Power consumption	Under the maximum load	max. 4.4 W	max. 33 W	max. 1.9 W	max. 1.1 W
	Backlight OFF	2.9 W	2.0 W	1.3 W	0.7 W
Inrush current ②		max. 18 A (2 ms)	max. 30 A (1 ms)		—
Permissible instantaneous power failure time		max. 5 ms			—
Noise immunity		1000 Vpp, noise width: 1 µs (measured by a noise simulator with noise frequency ranging from 30 Hz to 100 Hz)			
Withstand voltage		500 V AC for 1 minute across power terminals and earth			—
Insulation resistance		500 V DC across power terminals and earth, 10 MΩ or more by an insulation resistance tester			—
Applicable wire size		Single wiring: solid wire 0.14 to 1.5 mm^2, stranded wire 0.14 to 1.0 mm^2, or rod terminal with an insulation sleeve 0.25 to 0.5 mm^2 Double wiring: solid wire 0.14 to 0.5 mm^2 or stranded wire 0.14 to 0.2 mm^2			
Applicable solderless terminal		AI 0.25-6BU (AWG24), AI 0.34-6TQ (AWG22), AI 0.5-6WH (AWG20) (manufactured by PHOENIX CONTACT) Swage: CRIMPFOXZA3 (manufactured by PHOENIX CONTACT)			
Applicable tightening torque (Terminal block terminal screw)		0.22–0.25 Nm			

Tab. A-32: *Specifications of power supply for GT2104 and GT2103 (24 V DC/5 V DC)*

① Power is supplied by the controller.

② At an ambient temperature of 25 °C and maximum load.

A.3.11 GS21, input power supply 24 V DC

Item		GS2110-WTBD	GS2107-WTBD
Power supply voltage		24 V DC (+10 %, -15 %), ripple voltage max. 200 mV	
Power consumption		max. 7.6 W	max. 6.5 W
	Backlight OFF	max. 3.8 W	max. 3.8 W
Inrush current ①		max. 18 A (2 ms)	
Permissible instantaneous power failure time		max. 5 ms	
Noise immunity		Corresponds to IEC61000-4-4. 2 kV (power supply line)	
Withstand voltage		350 V AC for 1 minute across power terminals and earth	
Insulation resistance		500 V DC across power terminals and earth, 10 MΩ or more by an insulation resistance tester	
Applicable wire size		0.5–2.5 mm^2	
Applicable solderless terminal		Wire end ferrules with plastic collars Al 0.75-8BU, Al 1.0-8RD, Al 1.5-8BK, Al 2.5-8BU	
Applicable tightening torque (Terminal block terminal screw)		0.3–0.5 Nm	

Tab. A-33: *Specifications of power supply for GS21 (24 V DC)*

① At an ambient temperature of 25 °C and maximum load.

A.4 Battery specifications

Item		GT11-50BAT
Type		Lithium battery
Initial voltage		3.0 V
Nominal capacity		550 mAh
Lithium content		0.15 g
Storage life		Approx. 5 years (Operating ambient temperature: 25 °C)
Battery life for data backup after power supply is turned off	Operating ambient temperature of 0 to 25 °C For GT2507T-W: Operating ambient temperature of -20 to 25 °C	3 years
	Operating ambient temperature of 25 to 45 °C	4 years
	Operating ambient temperature of 45 to 55 °C	3 years
	Data backup time after detection of battery voltage low ①	14 days
Application		For backup of clock data, maintenance timing setting data and system log data

Tab. A-34: *Battery specifications*

① In the following conditions, the data backup time is 5 minutes after the power supply is turned off. (As for GT23, the data backup time is 30 seconds.)
- The battery connector is disconnected.
- A battery lead is broken.

A.5 Confirming of Versions and Standards

A.5.1 GT27, GT25, GT23, GS21

Rating plate

The GOT hardware version, BootOS version at factory default, function version, and conforming standards can be checked with the rating plate on the GOT rear face.

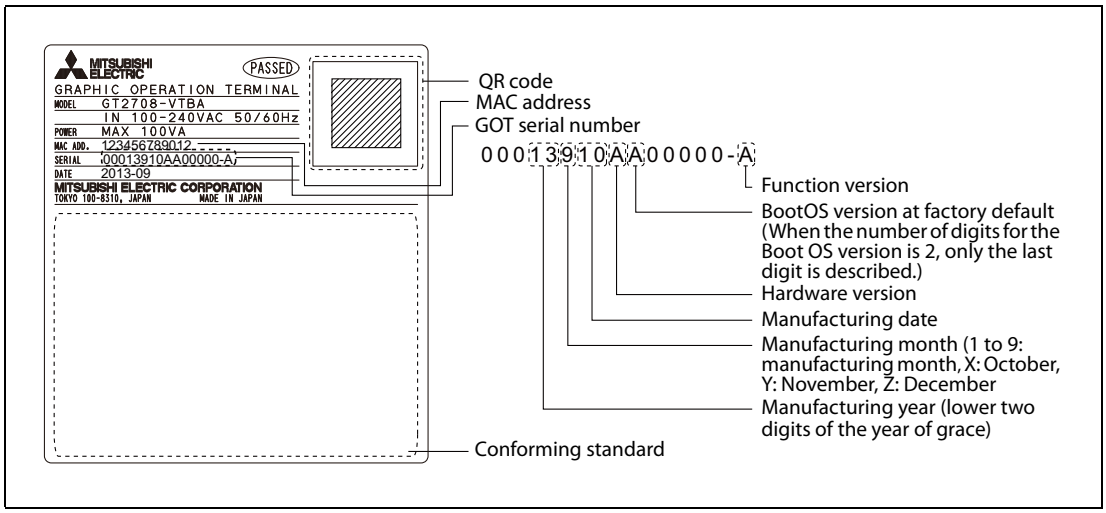


Fig. A-1: *Rating plate*

Packing box

The conforming standards can be confirmed by the label on the packing box. Note that the position of the label differs depending on the model or the shipment date.

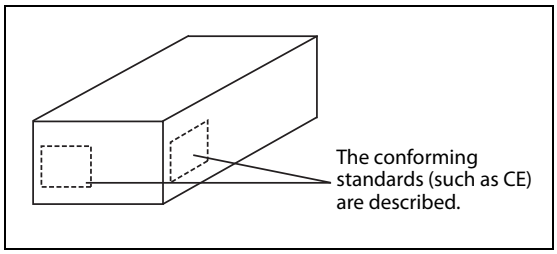


Fig. A-2:
Label position on packing box

A.5.2 GT21

Rating plate

The GOT hardware version, BootOS version at factory default, function version, and conforming standards can be checked with the rating plate on the GOT rear face.

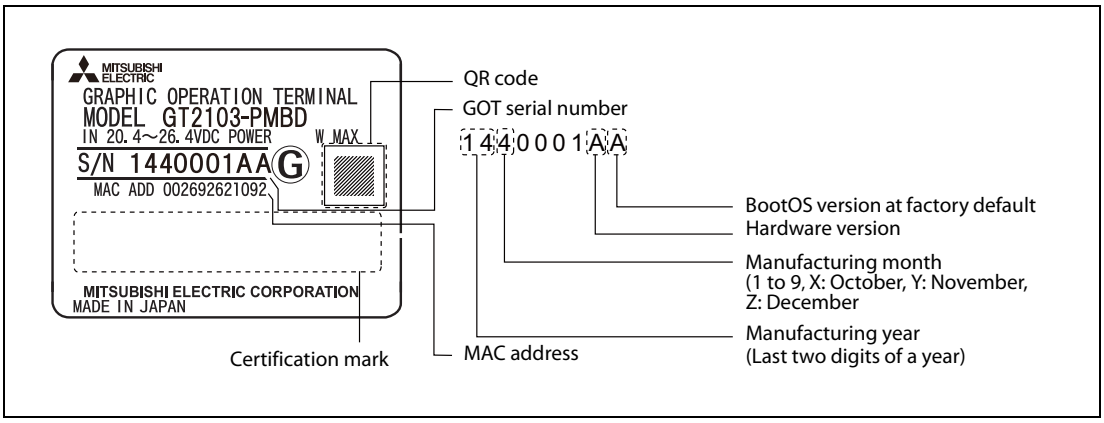


Fig. A-3: *Rating plate for GT21*

Packing box

The conforming standards can be confirmed by the label on the packing box. Note that the position of the label differs depending on the shipment date.

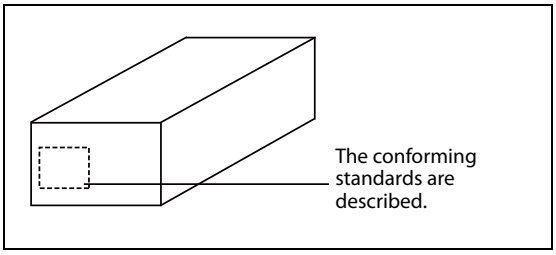


Fig. A-4:
Label position on packing box for GT21

A.6 Transportation Precautions

A.6.1 Batteries

When transporting lithium batteries, make sure to treat them based on the transport regulations.

The lithium battery GT11-50BAT for the GOT2000 series is classified as non-dangerous good.

A.6.2 Transportation guidelines

Products are packed properly in compliance with the transportation regulations prior to shipment. When repacking any of the unpacked products to transport it to another location, make sure to observe the IATA Dangerous Goods Regulations, IMDG Code, and other local transportation regulations.

For details, please consult your transportation company.

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