

# **GOT series**

Human-Machine-Interface

Hardware Manual

## **Handy Graphic Operation Terminal F940GOT**

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## Foreword

- This manual contains text, diagrams and explanations which will guide the reader in the correct installation and operation of the F940GOT Handy Series. It should be read and understood before attempting to install or use the unit.
- Further information can be found in the GOT-F900 Series Operation Manual, GOT-900 Series Hardware Manual and manual of the associated PLC.
- If in doubt at any stage of the installation of F940GOT Handy Series always consult a professional electrical engineer who is qualified and trained to the local and national standards which apply to the installation site.
- If in doubt about the operation or use of F940GOT Handy Series please consult the nearest Mitsubishi Electric distributor.
- This manual is subject to change without notice.

# **F940GOT Handy Series (F94\*GOT-\*BD-H-E)**

## **Hardware Manual**

Manual number : JY992D86901

Manual revision : B

Date : March 2001







## Guidelines for the Safety of the User and Protection of the F940GOT Handy Series (F94\*GOT-\*BD-H-E)

This manual provides information for the use of the F940GOT Handy Series. The manual has been written to be used by trained and competent personnel. The definition of such a person or persons is as follows;

- a) Any engineer who is responsible for the planning, design and construction of automatic equipment using the product associated with this manual should be of a competent nature, trained and qualified to the local and national standards required to fulfill that role. These engineers should be fully aware of all aspects of safety with regards to automated equipment.
- b) Any commissioning or service engineer must be of a competent nature, trained and qualified to the local and national standards required to fulfill that job. These engineers should also be trained in the use and maintenance of the completed product. This includes being completely familiar with all associated documentation for the said product. All maintenance should be carried out in accordance with established safety practices.
- c) All operators of the completed equipment should be trained to use that product in a safe and co-ordinated manner in compliance to established safety practices. The operators should also be familiar with documentation which is related to the actual operation of the completed equipment.

**Note :** Note: the term 'completed equipment' refers to a third party constructed device which contains or uses the product associated with this manual.

### Notes on the Symbols Used in this Manual

At various times through out this manual certain symbols will be used to highlight points of information which are intended to ensure the users personal safety and protect the integrity of equipment. Whenever any of the following symbols are encountered its associated note must be read and understood. Each of the symbols used will now be listed with a brief description of its meaning.

#### Hardware Warnings



- 1) Indicates that the identified danger **WILL** cause physical and property damage.



- 2) Indicates that the identified danger could **POSSIBLY** cause physical and property damage.



- 3) Indicates a point of further interest or further explanation.

#### Software Warnings



- 4) Indicates special care must be taken when using this element of software.



- 5) Indicates a special point which the user of the associate software element should be aware of.



- 6) Indicates a point of interest or further explanation.

- Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment.
- All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation. Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples.
- Owing to the very great variety in possible applications of this equipment, you must satisfy yourself as to its suitability for your specific application.



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## Associated Manual Lists

Further information can be found in the following manuals.

	Manual Title	Manual Number	Description
⊙	GOT-F900 Series Operation Manual	JY992D94701	This manual contains explanations for the operation and use of the GOT-F900 series graphic operation terminals.
⊙	GOT-F900 Series Hardware Manual	JY992D94801	This manual contains explanations for the wiring and installation, etc. of the GOT-F900 series graphic operation terminals.
○	FX-PCS-DU/WIN-E Operation Manual	JY992D68301	This manual contains explanations for the operation of FX-PCS-DU/WIN-E screen design software.
○	SW*D5C-GOTR-PACKE Operating Manual	-	This manual contains explanations for the operation of GT-Designer (SW*D5C-GOTR-PACKE) screen design software.
□	F9GT-HCNB Hardware Manual	JY992D88901	This manual contains explanations for installation and wiring of F9GT-HCNB Hardware Manual.

⊙: Indispensable manual

○: Either manual is necessary.

□: Refer if necessary, please.

# MEMO

1	Introduction
2	Specifications
3	Installation and Wiring
4	Creation of Operation Switch Name Sheet
5	Maintenance
6	Diagnostics



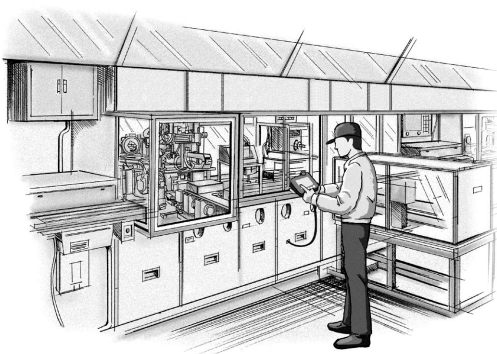
## 1. Introduction

### 1.1 Introduction

The F940GOT Handy Series (hereafter called “Handy GOT”) is an all-in-one type handy graphic operation terminal equipped with a touch key display unit (F94\*GOT-\*WD-E) and mechanical keys (operation switches) available for command input to the machine. The Handy GOT can connect to MELSEC FX, A, QnA and Q PLCs as well as a host of third party manufactured units. Further information of system configuration can be found in the GOT-F900 Series Hardware Manual.

Further information regarding optional cables connecting a PLC can be found in the GOT-F900 Series Hardware Manual.

### Using Example



#### Note;

Screens displayed on the display unit can be created using the screen design software which runs on a personal computer.

### 1.1.1 Product Components

#### 1) Operation switches

These switches give direct commands to inputs on the PLC, when immediate response from the machine such as operation and stop is required.

##### Application examples:

- Start/stop
- Preparation for operation
- Setup change
- Error reset
- Mode selection between automatic and manual

##### Note;

The name of these operation switches can be personalized using a transparent sheet and a name base sheet offered as accessories. (Refer to Chapter 4)

#### 2) Display unit

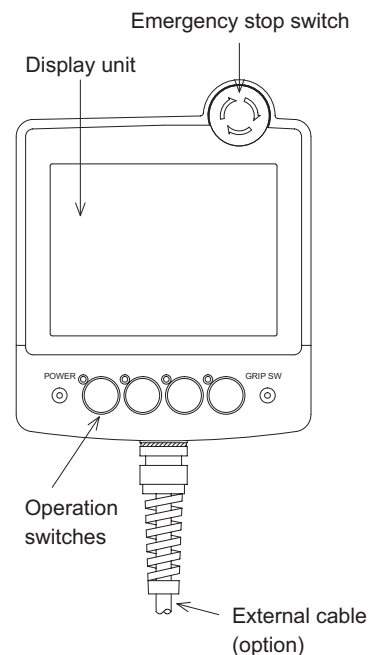
The display unit is touch-key type LCD equivalent to that of a standard type F940GOT.

All functions offered in the standard type F940GOT are available. The operator can easily monitor ON/OFF status of bit devices in the PLC, set such bit devices to ON/OFF, monitor the set value and the current value of word devices of the PLC, and change such values of word devices.

This display unit can be used to change the setup, or set values, and perform troubleshooting, as well as give guidance to the operator.

##### Application examples:

- Selection of manual operation
- manual operation
- One-cycle operation
- Monitoring
- Force turning ON/OFF
- Change of set values
- Troubleshooting





## 1.2 Product Lists

**Table 1.1: Product Lists**

Production Name	Description
F940GOT-SBD-H-E	Handy GOT main unit This type uses RS-422 communication for connecting to PLC. - SBD type is 8 Colors - LBD type is White and black
F940GOT-LBD-H-E	
F943GOT-SBD-H-E	Handy GOT main unit This type uses RS-232C communication for connecting to PLC. - SBD type is 8 Colors - LBD type is White and black
F943GOT-LBD-H-E	

### 1.2.1 Model Name

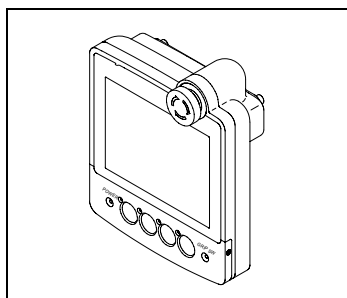
The model name of the handy graphic operation terminal is expressed as follows.

F94\*\_GOT-\*BD-H-E  
A      B

**Table 1.2: Notes on Model Name**

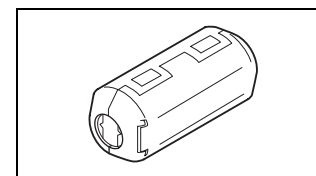
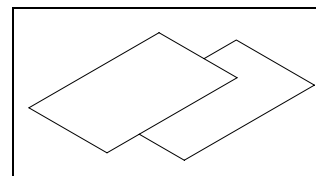
		Description
A	0	RS-422 communication for connecting to PLC
	3	RS-232C communication for connecting to PLC
B	S	STN type 8 colors liquid crystal
	L	STN type black and white liquid crystal

### 1.2.2 Handy GOT Main Unit



Accessories:

- Sheets to change switch names (All model)  
A transparent sheet and a mount sheet are offered as accessories so that operation switch names can be changed.  
For the name changing procedure, refer to chapter 4.
- Ferrite filter for CE EMC (F943GOT-\*BD-H-E model only)  
For compliance to CE EMC regulations it is necessary to add a ferrite filter on the external cable for F943GOT-SBD-H-E or F943GOT-LBD-H-E.  
Further information can be found in the Notification of CE marking sheet in the product box and section 3.2.2 of this manual.  
This ferrite filter is TDK ZCAT2035-0930A-BK.



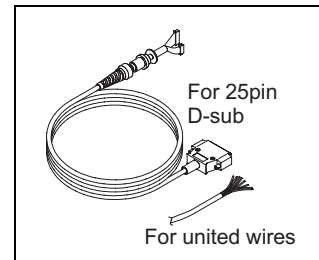
### 1.3 Options

#### 1.3.1 External Cable

These external cable containing independent wires for communications, DC power supply, operation switches and the emergency switch. One of those wired below is always necessary.

**Table 1.3: External Cable**

Model Name	Description
F9GT-HCAB-3M	25-pin D-sub connector on one side,
F9GT-HCAB-10M	- 3M: Cable length is 3m (9' 10") - 10M: Cable length is 10m (32' 9")
F9GT-HCAB1-3M	United wires on one side,
F9GT-HCAB1-10M	- 3M: Cable length is 3m (9' 10") - 10M: Cable length is 10m (32' 9")



**Note;**

When using F9GT-HCAB-\*M external cable, one of the following relay cables or an F9GT-HCNB conversion box is necessary.

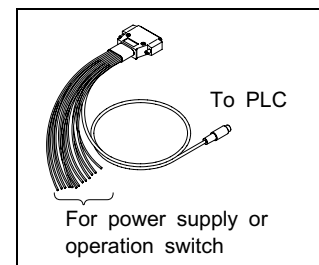
#### 1.3.2 Other Options

Order the following options upon necessity.

1) Relay cable for PLC

- F9GT-HCAB2-150

This cable connects an FX<sub>0</sub>/FX<sub>0s</sub>/FX<sub>0N</sub>/FX<sub>1s</sub>/FX<sub>1N</sub>/FX<sub>2N</sub>/FX<sub>2NC</sub> (with 8-pin MINI-DIN connector), and is equipped with an external cable (with 25-pin D-sub connector) for power supply, operation switch and emergency switch. Cable length is 1.5 m (4' 11").

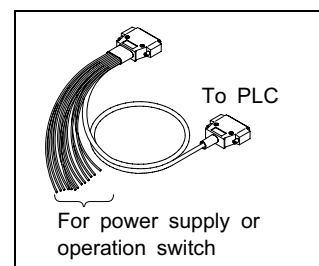


**Note;**

This cable cannot be used for the F943GOT-\*BD-H-E (RS-232C communication type Handy GOT).

- F9GT-HCAB3-150

This cable connects an FX/FX<sub>2c</sub>/A/QnA Series PLC or motion controller (with 25-pin D-sub connector), and is equipped with an external cable (with 25-pin D-sub connector) for power supply, operation switch and emergency switch. Cable length is 1.5 m (4' 11").

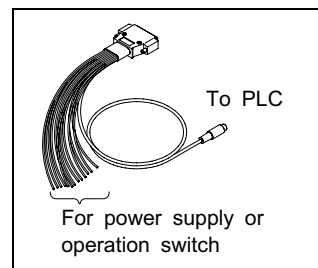


**Note;**

This cable cannot be used for the F943GOT-\*BD-H-E (RS-232C communication type Handy GOT).

- F9GT-HCAB5-150

This cable connects a Q Series PLC or motion controller (with 6-pin MINI-DIN connector), and is equipped with an external cable (with 25-pin D-sub connector) for power supply, operation switch and emergency switch  
Cable length is 1.5 m (4' 11").



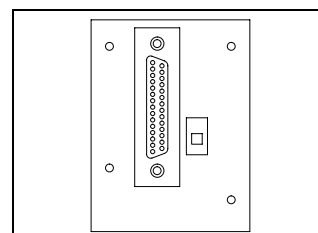
**Note;**

This cable cannot be used for the F940GOT-\*BD-H-E (RS-422 communication type Handy GOT).



2) F9GT-HCNB conversion box

This box converts a 25-pin D-sub connector of an external cable into a port for PLC connection and separate terminals for power supply, operation switch and emergency switch.



**Note;**

This conversion box cannot be used for the F943GOT-\*BD-H-E (RS-232C communication type Handy GOT).

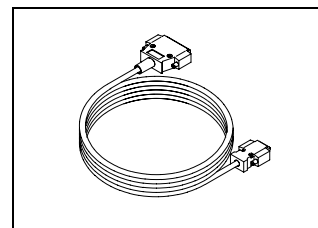


3) Communication cables

- FX-40DU-CAB

This cable connects the F9GT-HCNB and CPU port (programming port) on an FX/FX2c/A Series PLC by CPU port connection setting.  
Cable length is 3.0 m (9' 10")

This cable is not available when a Handy GOT is connected by way of a communication port (communication unit).  
Further information can be found in the GOT-F900 Series Hardware Manual.

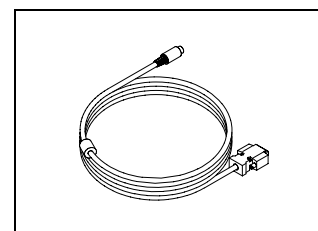


- FX-50DU-CAB0 /-1M

Either of these cables connects the F9GT-HCNB and an FX0/FX0S/FX0N/FX1S/FX1N/FX2N/FX2NC Series PLC by CPU port connection setting.

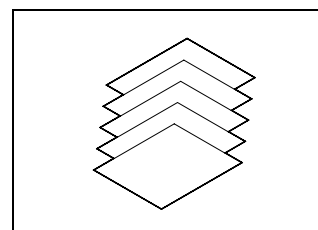
Cable length;

- Normal type: 3m (9' 10")
- -1M type: 1m (3' 3")



4) Protective sheets F9GT-40PSC (5 sheets in 1 set)

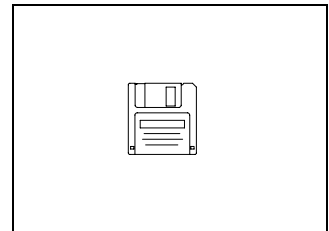
Adhere one disposable sheet to the display screen for protection against dirt and abrasion.



5) Screen design software

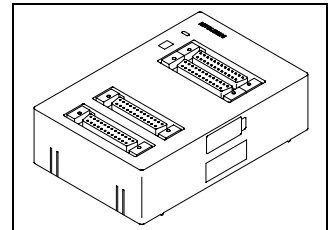
**Table 1.4: Screen Design Software**

Model Name	Description
FX-PCS-DU/WIN-E	SW0PC-FXDU/WIN-E Version V2.10 or more (3.5 FD)
GT-Designer	SW1D5C-GOTR-PACKE Version 40E or more (CD-ROM)



6) FX-2PIF two-port interface

This interface offered as an option allows use of a Handy GOT and a peripheral unit for creating programs at the same time. This interface is not available when the Handy GOT is connected to a general-purpose personal computer or when the Handy GOT is connected by way of a computer link unit.



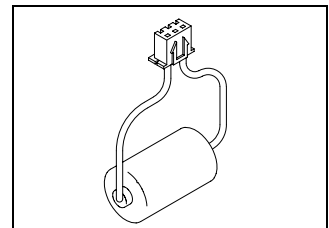
**Note;**

This unit cannot be used for the F943GOT-\*BD-H-E (RS-232C communication type Handy GOT).

**1.3.3 Spare Parts**

1) FX<sub>2</sub>NC-32BL Battery

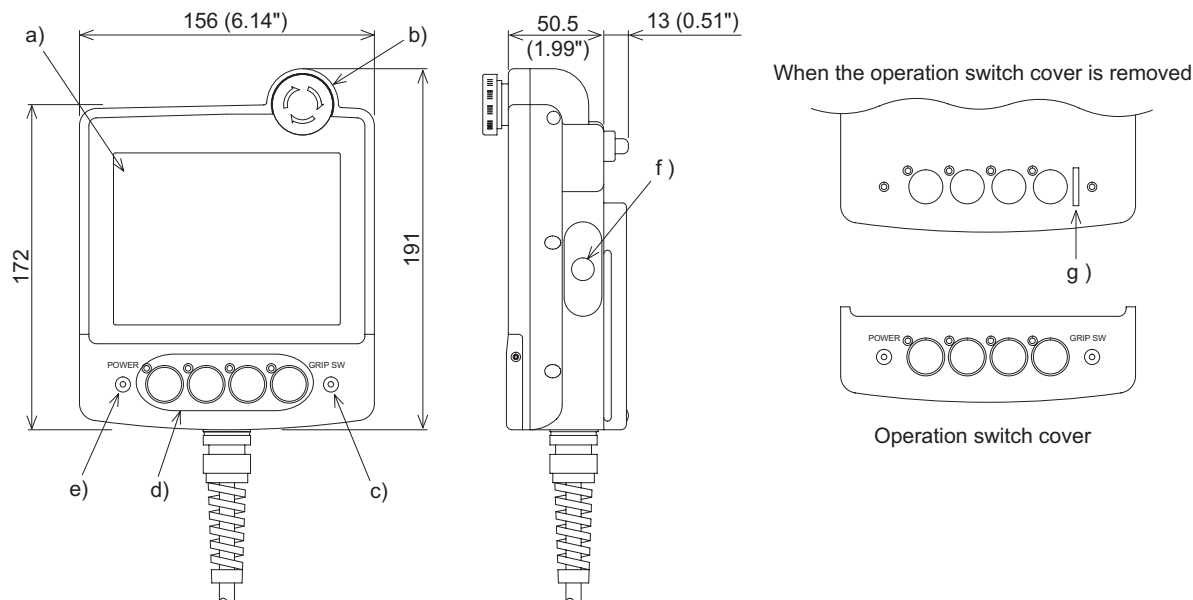
This battery is used to back up the alarm history, sampling and the current time data. For replacement, refer to chapter 5.



## 1.4 Dimensions and Each Part Name

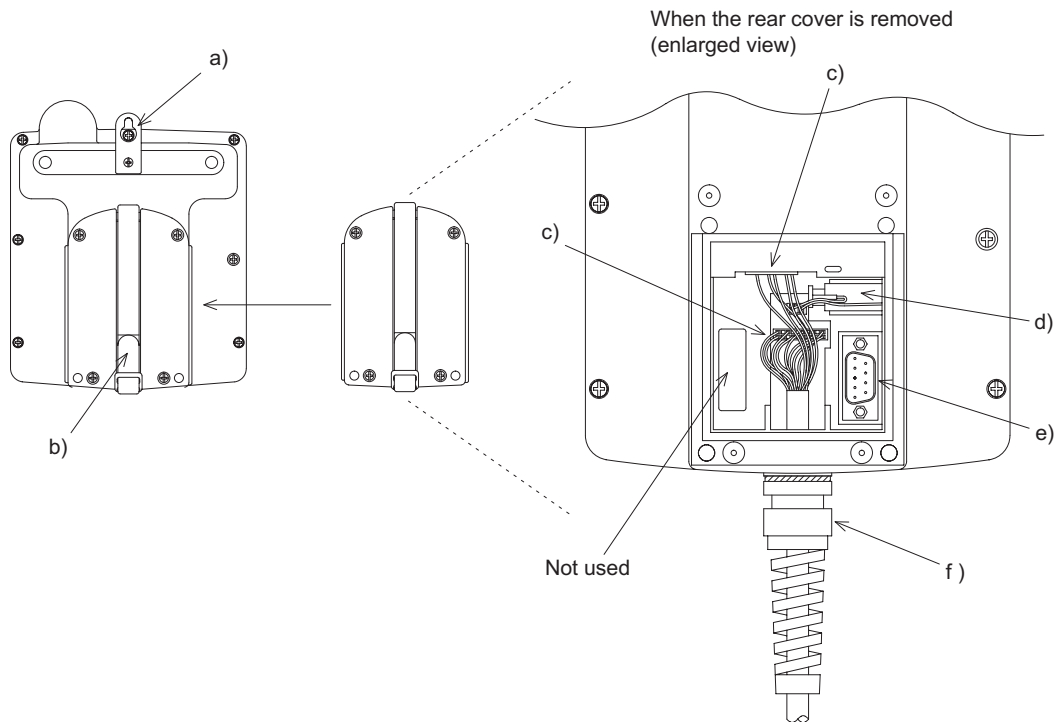
### 1.4.1 Each Part Name of Front Panel and Dimensions

Dimensions: mm (inches) MASS: 0.79 kg (1.74 lbs)



- a) Touch key LCD unit  
This display unit offers the functions equivalent to those offered by the display unit of the standard type F940GOT series. Further information of standard type F940GOT series can be found in the GOT-F900 Series Operation Manual.
- b) Emergency stop switch  
Independent contact, 24V DC specification.
- c) Grip switch LED  
Lit while the grip switch provided on the side is being pressed.
- d) Operation switches  
Direct connection to inputs in the PLC.  
The name of these operation switches can be personalized using a transparent sheet and a name base sheet offered as accessories. (Refer to Chapter 4)  
Each of these switches is equipped with a green LED which indicates its status. The green LED lighting command is transferred between the PLC through serial communication.  
These LEDs can be controlled by user program in PLC. Further information can be found in the GOT-F900 Series Hardware Manual.
- e) POWER LED  
Lit while 24V DC power is supplied to the Handy GOT.
- f) Grip switch  
A grip switch is provided on the side of the Handy GOT. While the grip switch is being pressed, manipulation of the touch keys on the screen is effective. Further information can be found in the GOT-F900 Series Hardware Manual.
- g) Operation switch name sheet insertion slot  
Can be seen when the operation switch cover is removed from the lower portion of the Handy GOT.

### 1.4.2 Rear face



- a) Metal hook for wall mounting  
Offered to mount the Handy GOT on a wall.
- b) Hand strap  
Adjustable length strap allowing comfortable holding of the Handy GOT.
- c) Port for communications signal, the DC power supply, the operation switches and the emergency switch
- d) FX<sub>2</sub>NC-32BL Battery  
Built in to back up data.  
For replacement, refer to chapter 5.
- e) Port for personal computer (9-pin D-sub, male) (for RS-232C communication)  
Offered to transfer screen data created using the screen design software or use the two-port interface function.
- f) External cable  
Offered to connect a PLC, power supply or operation switch to ports outlined in "c)".

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4	Creation of Operation Switch Name Sheet
5	Maintenance
6	Diagnostics





## 2. Specifications



### Caution

During abnormal communication (including cable break) when monitor is executed within the Handy GOT, communication between the Handy GOT and programmable controller CPU is interrupted and it is impossible to operate switches or devices in the PLC through the Handy GOT.

Communication and operation resumes when the Handy GOT system is correctly configured.

DO NOT configure emergency stop or safety features to operate through the Handy GOT, and be sure that there is no adverse consequences in the event of a Handy GOT - PLC communications malfunction.



### Note;

- Do not lay signal cables near high voltage power cables or allow them to share the same trunking duct.  
Otherwise effects of noise or surge induction are likely to take place. Keep a safe distance of more than 100 mm from these wires.
- Operate touch switches on the display screen by hand.  
DO NOT use excessive force, or attempt operate them with hard or pointed objects.  
The tip of a screw driver, pen or similar object for example may break the screen.

## 2.1 General Specifications

Table 2.1: General Specifications

Item	Specifications
Operating Temperature	0 ~ 40 °C (32 ~ 104 °F)
Storage Temperature	-20 ~ 60 °C (-4 ~ 140 °F)
Humidity	35 ~ 85% Relative Humidity, No condensation
Vibration Resistance - intermittent vibration	Conforms to IEC 1131-2; 10 ~ 57 Hz: 0.075 mm Half Amplitude 57 ~ 150 Hz: 9.8 m/s <sup>2</sup> Acceleration Sweep Count for X, Y, Z: 10 times (80 min. in each direction)
Vibration Resistance - Continuous vibration	Conforms to IEC 1131-2; 10 ~ 57 Hz: 0.035 mm Half Amplitude 57 ~ 150 Hz: 4.9 m/s <sup>2</sup> Acceleration Sweep Count for X, Y, Z: 10 times (80 min. in each direction)
Shock Resistance	Conforms to IEC 1131-2: 147m/s <sup>2</sup> Acceleration, 3 times in each direction X, Y, and Z
Noise Immunity	1000 Vp-p, 1micro second, 30 ~ 100 Hz, tested by noise simulator
Dielectric Withstand Voltage	500 V AC > 1 min., tested between power terminals and ground
Insulation Resistance	5 MΩ > at 500 V DC, tested between power terminals and ground
Ground	Grounding register 100 Ω or less (Class D)
Protection	IP 54

## 2.2 Power Supply Specifications

Table 2.2: Power Supply Specifications

Items	Specifications
Power Supply Voltage	24V DC, +10% -15%
Power Supply Ripple	200 mV or less
Current Consumption	Ratings: 300 mA at 24V DC (200 mA at 24V DC when backlight is turned OFF)
Fuse	Fuse 1.0 A built-in Handy GOT (impossible to change)
Max. Allowable Momentary Power Supply Failure period	5 ms; If less than 5 ms, the Handy GOT will continue operation. If 5 ms or more, the Handy GOT will shut down.
Battery	Built-in, FX2NC-32BL type lithium battery. (Approximately 3 years life) Guaranteed term is 1 year.

## 2.3 Screen Hardware Specifications

Table 2.3: Screen Hardware Specifications

Items		F94*GOT-SWD-E	F94*GOT-LWD-E
Display Device		STN color liquid crystal	
Resolution		320 × 240 (dot), 40 characters × 15 lines	
Dot Pitch		0.36 mm (0.014") Horizontal × 0.36 mm (0.014") Vertical.	
Effective Display Size		115 mm (4.53") × 86 mm (3.39"); 6 (5.7 inch) type	
Number of Colors		8 colors	White and Black
Life of liquid crystal		Approximately 50,000 hours (Operating temperature: 25 x°C / 77x°F) Guaranteed term is 1 year.	
Backlight		Cold cathode tube	
Life of Backlight		40,000 hours or more (Operating temperature: 25 x°C / 77x°F) Guaranteed term is 1 year.	
Touch Keys		Maximum 50 touch keys / screen, 20 × 12 matrix	
Interface	With PLC	F940GOT-*DB-H-E: RS-422 F943GOT-*DB-H-E: RS-232C	
	With personal computer	Conforming to RS-232C	
Number of Screens		User screen: 500 screens or less System screen: Allocated screens No. 1001-1030.	
User Memory		Flash memory 512 KB (built-in)	

## 2.4 Emergency and Operation Switch Specifications

Table 2.4: Emergency and Operation Switch Specifications

Item	Description
Operation switch	a-contact × 4 points, 10 mA/24V DC (Operation life time: approximately 1,000,000 times)
Emergency stop switch	b-contact × 1 point, 1 A/24V DC, independent wiring (AH165-VR01 manufactured by Fuji Electric)

# MEMO

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### 3. Installation and Wiring

This section describes installation of the Handy GOT and wiring of the power supply and the operation switches.

Thoroughly understand the specifications before performing installation and wiring.

#### 3.1 Installation Method

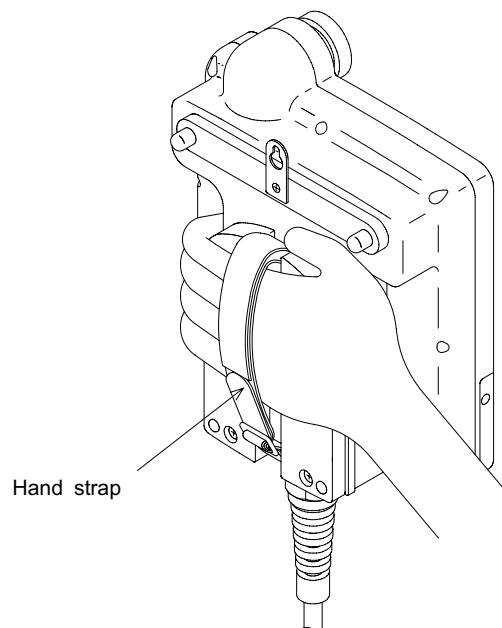


##### Note;

- Do not mount the GOT in an environment that contains dust, soot corrosive or conductive dust, corrosive or flammable gas, or expose the unit to high temperatures, dew condensation, rain and wind or impact and vibration.  
If the GOT is used in such a place, electrical shock, fire, malfunction, damage or deterioration may be caused.
- Make sure that the power is turned off, before securely connecting any cables. Poor connection may cause malfunction.

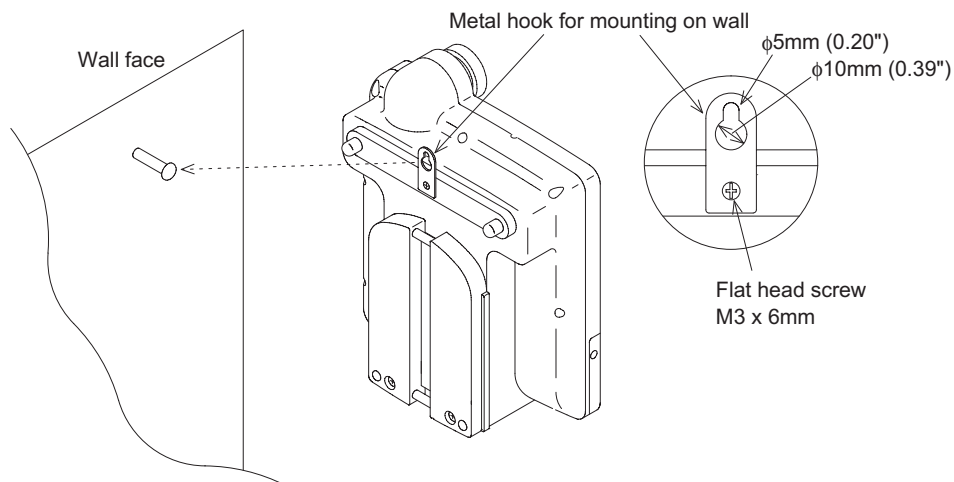
##### 3.1.1 Holding

When holding the Handy GOT for operation, place your hand through the hand strap provided on its rear face. You can adjust the length of the hand strap.



### 3.1.2 Wall Mounting

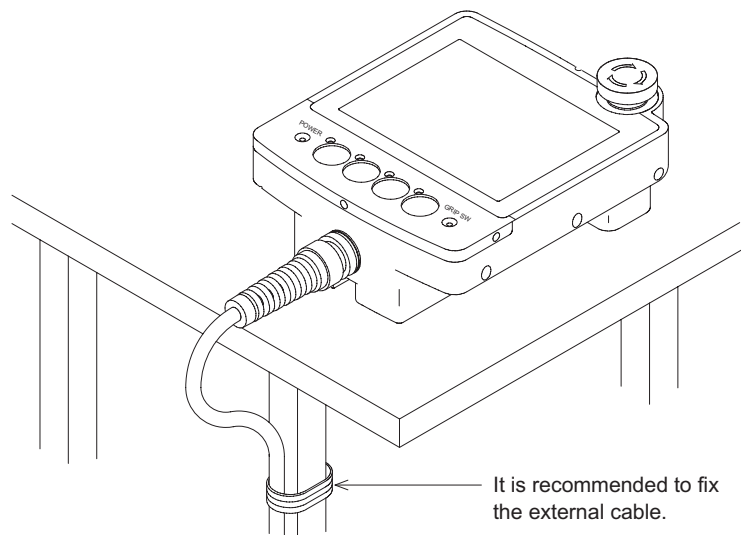
When mounting the Handy GOT on a wall, use the metal hook provided on its rear face.



On the wall face, the weight of the main unit (approximately 0.79 kg/1.74 lbs) and a load of approximately 1 ~ 3 kg (2.20 ~ 6.61 lbs) which varies depending on the communication cable length are applied. While taking this into consideration, attach a suitable metal fixture on the wall.

### 3.1.3 Flat Surface Mounting

When using the Handy GOT on a flat surface, such as a desk or shelf, keep the Handy GOT parallel to the surface so that it does not drop and, fix the communication cable to the desk.

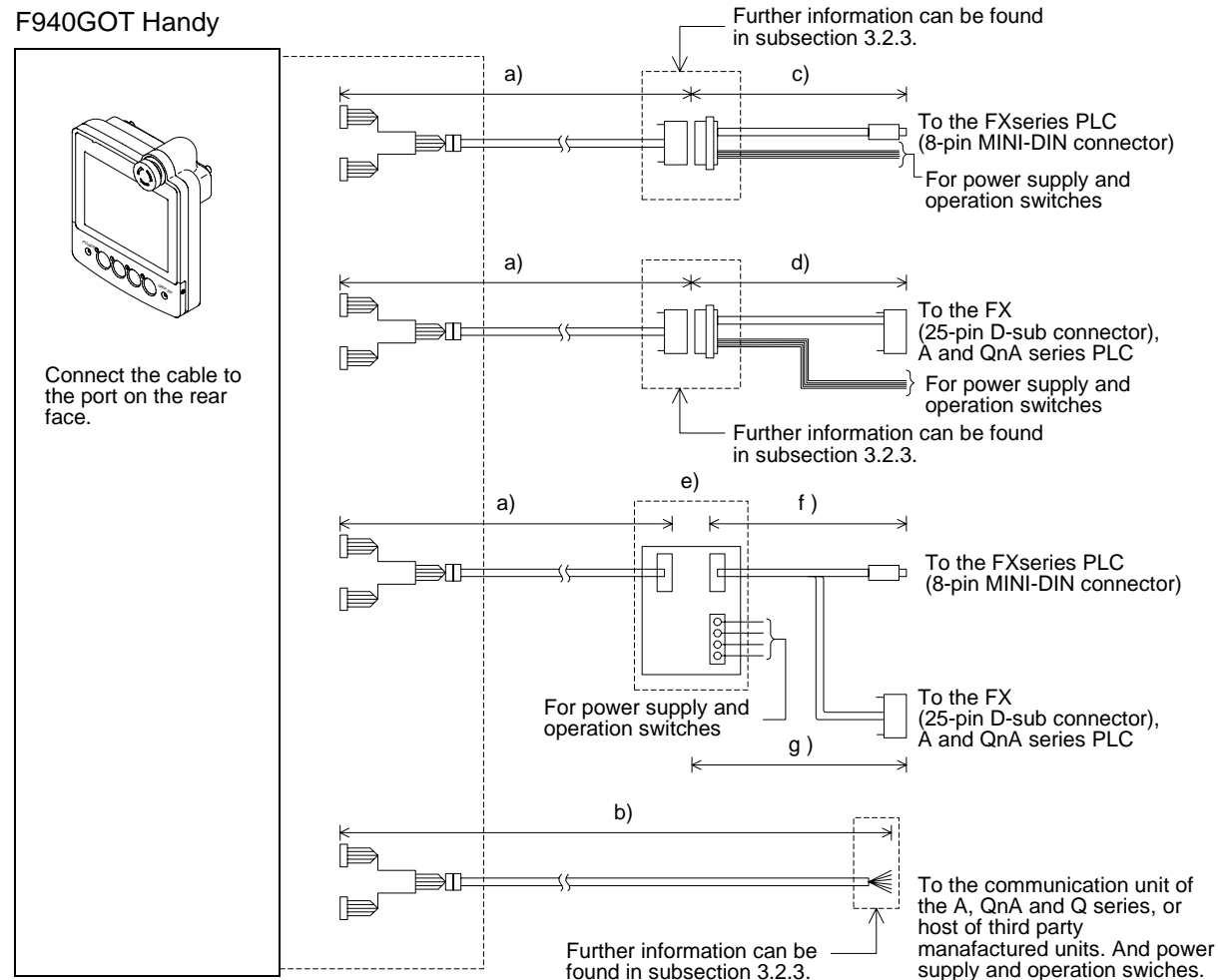




## 3.2 Connection Configuration

### 3.2.1 Connection to PLC by F940GOT-\*BD-H-E (RS-422)

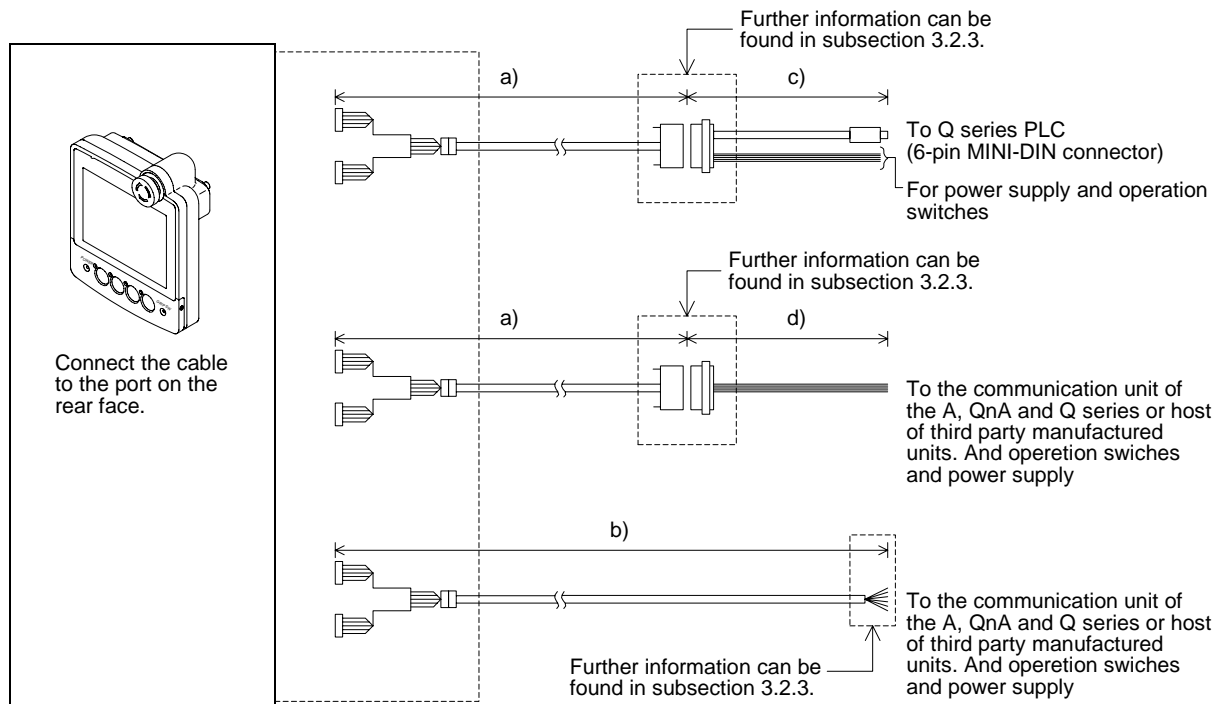
Connection of Handy GOT (F940GOT-\*BD-H-E) to PLC is shown below. Further information regarding applicable PLCs can be found in GOT-F900 Series Hardware Manual.



- a) External cable (with 25-pin D-sub connector on one side)  
F9GT-HCAB-3M (3m/9' 10"), F9GT-HCAB-10M (10m/32' 9")
- b) External cable (with untied 20-core wires on one side)  
F9GT-HCAB1-3M (3m/9' 10"), F9GT-HCAB1-10M (10m/32' 9")
- c) Relay cable for PLC connection (with 8-pin MINI-DIN connector on PLC side)  
F9GT-HCAB2-150 (1.5m/4' 11")
- d) Relay cable for PLC connection (with 25-pin D-sub connector on PLC side)  
F9GT-HCAB3-150 (1.5m/4' 11")
- e) Conversion box F9GT-HCNB  
Further information can be found in F9GT-HCNB Hardware Manual
- f) PLC connection cable (with 8-pin MINI-DIN connector on PLC side)  
FX-50DU-CAB0 (3m/9' 10"), FX-50DU-CAB0-1M (1m/3' 3")
- g) PLC connection cable (with 25-pin D-sub connector on PLC side)  
FX-40DU-CAB (3m/9' 10")

### 3.2.2 Connection to PLC by F943GOT-\*BD-H-E (RS-232C)

Connection of the Handy GOT (F943GOT-\*BD-H-E) to a PLC is shown below. Further information regarding applicable PLCs can be found in GOT-F900 Series Hardware Manual.



- a) External cable (with 25-pin D-sub on one side)  
F9GT-HCAB-3M (3m/9' 10")
- b) External cable (with untied 20-core wires on one side)  
F9GT-HCAB1-3M (3m/9' 10")
- c) Relay cable (with 6-pin MINI-DIN on one side)  
F9GT-HCAB5-150 (1.5m/4' 11")
- d) Cable prepared by user



**Note:**

The connection distance between the handy graphic operation terminal and the PLC (“a) + c)” or “a) + b)”) should be within 6 m (19' 8”).

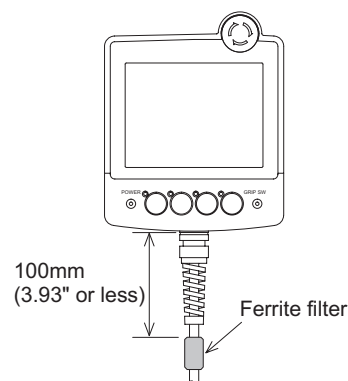


**Caution for CE EMC:**

For compliance to CE EMC regulations it is necessary to add a ferrite filter on the external cable for F943GOT-SBD-H-E or F943GOT-LBD-H-E.

The filter should be attached as shown right with the filter surrounding the external cable.

The recommended ferrite filter is the TDK ZCAT2035-0930A-BK or equivalent.



### 3.2.3 Signal Allocation of Connector and Untied Wires

The signal allocation within connector and untied wires of an external cable are shown below.



**Table 3.1: Name of communication, power supply and operation switches**

External Cable		Signal Name		Description
Pin No. (F9GT-HCAB-*M)	Color of Untied wires (F9GT-HCAB1-*M)	F940GOT Handy (RS-422)	F943GOT Handy (RS-232C)	
1	Drain wire	FG (shield)		Frame ground
2	Black	TXD+ (SDA)	SD (TXD)	Note 1
3	White	TXD- (SDB)	ER (DTR)	
4	Red	RTS+ (RSA)	RD (RXD)	
5	Green	RTS- (RSB)	DR (DSR)	
6	Yellow	RXD+ (RDA)	RS (RTS)	
7	Brown	RXD- (RDB)	CS (CTS)	
8	Blue	CTS+ (CSA)	NC	
9	Gray	CTS- (SCB)	NC	
10	Orange	SG		Signal ground
11	-	NC		Not used
12	Purple	DC 24V G		24V DC power supply “-”
13	Pink			
14	Light green	SW-COM		COM for Operation switches
15	Sky blue	SW1		Operation switches
16	Black/white	SW2		
17	Red/white	SW3		
18	Green/white	SW4		
19	-	NC		Not used
20	-			
21	Brown/white	ES1		Emergency stop switch
22	Yellow/white	ES1		
23	-	NC		Not used
24	Blue/white	DC 24V +		24V DC power supply “+”
25	Gray/white			

**Note 1;**

These are signals for communication with the PLC. When connecting to a port other than the programming port of the FX, A, QnA or Q series PLC, refer to the manual of the connected module. Also use a relay cable. For relay cable details, refer to subsection 1.3.2.

### 3.3 Installation of External Cable

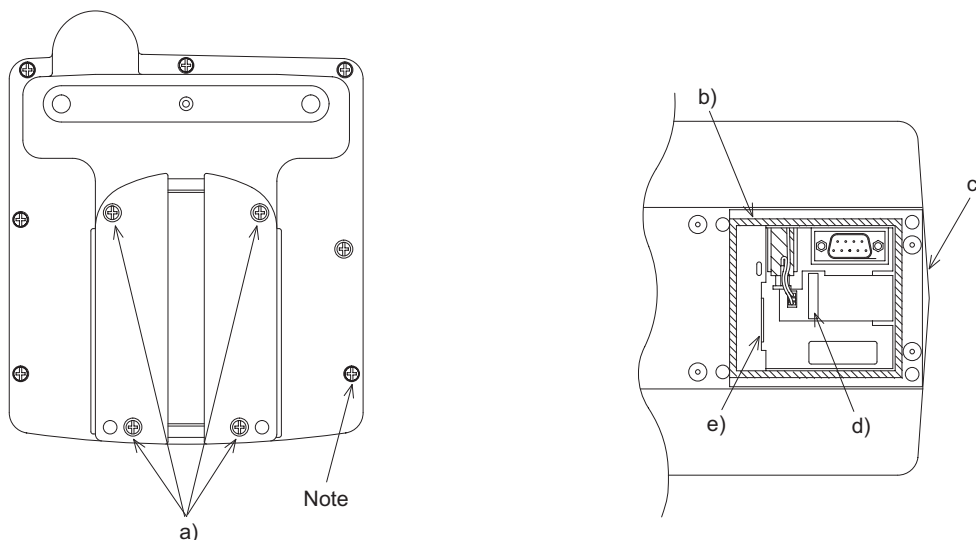
Connect an optional external cable to the Handy GOT main unit.

**Table 3.2: External Cable**

Model Name	Length	Description
F9GT-HCAB-3M	3m (9' 10")	25-pin D-sub connector on one side
F9GT-HCAB-10M*1	10m (32' 9")	
F9GT-HCAB1-3M	3m (32' 9")	Untied 20-core wires on one side
F9GT-HCAB1-10M*1	10m (9' 10")	

\*1 The cable cannot be used for the F943GOT Handy type (RS-232C communication type Handy GOT).

- 1) Remove rear cover  
Remove the mounting screws “a)”, and open the rear cover.



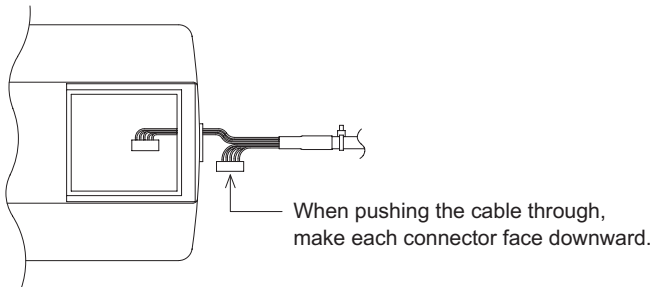
- a) Rear cover mounting screws, (M3 × 8mm, 4 screws)
- b) Packing seal
- c) Mounting slot
- d) Connector for communication or power switch (20-pin type)
- e) Power connector (8-pin type)



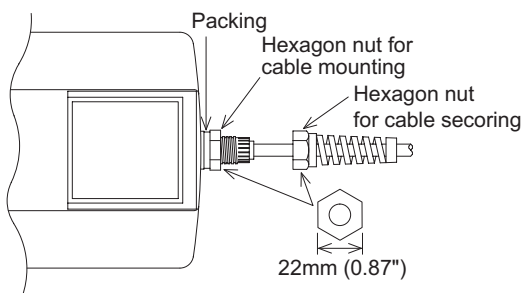
**Note;**

- Never remove any screw (among seven screws located around the rear face of the Handy GOT) other than the mounting screws “a)”.  
If such a screw is removed, the waterproof ability may deteriorate or failure may occur.
- When installing rear cover, securely tighten mounting screws with a torque of 0.49 ~ 0.68 N·m if tightened more than this, the cover may crack, and the water and dustproof properties may be lost.
- Before closing the rear cover, make sure that the packing “b)” has not come off.

- Put the external cable through the hole "c)" in the Handy GOT main unit, and connect it to "e)" and "d)".



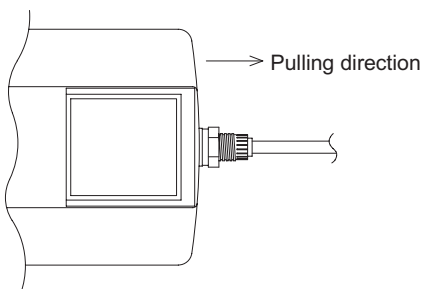
- Tighten the hexagon nut.



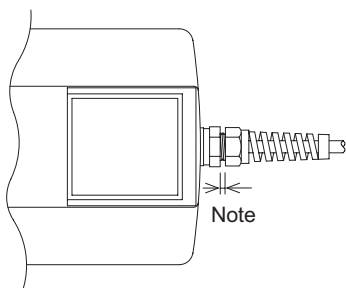
Make sure to tighten the hexagon nut for cable mounting with a sufficient force to avoid looseness.

As guideline, tighten it until the packing is crushed by 0.5 mm (0.02") or more.

- Pull lightly on the cable until it naturally stops.



- Securely tighten the hexagon nut for cable sewing so that the cable will not come out or the waterproof ability will not be deteriorated.



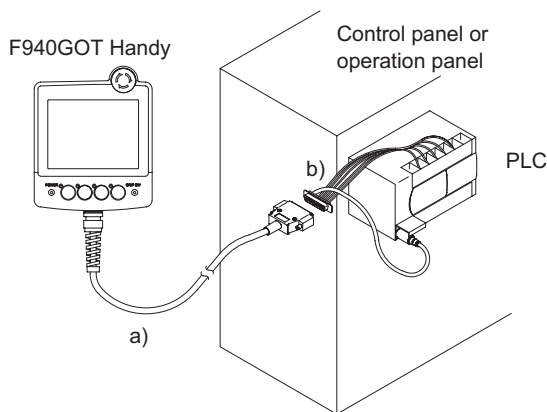
**Note;**

As guideline, make sure that clearance is 3.5 mm (0.14") or less.

### 3.4 Processing Panel of Control Box or Cabinet

#### 3.4.1 Using F940GOT Handy

- 1) Installing a connector on the panel of control box or cabinet.  
 Connect an FX/A/QnA Series PLC using a relay cable for connection to PLC as shown below. Further information re applicable PLCs can be found in GOT-F900 Series Hardware Manual.



- a) External cable (with 25-pin D-sub male connector)

**Table 3.3: External Cable**

Model Name	Length
F9GT-HCAB-3M	3m (9' 10")
F9GT-HCAB-10M	10m (32' 9")

- b) Relay cable for connection to PLC

**Table 3.4: Relay Cable**

Model Name	Length	Applicable
F9GT-HCAB2-150	1.5m (4' 11")	FX Series (FX0, FX0S, FX0N, FX1S, FX1N, FX2N, FX2NC)
F9GT-HCAB3-150		FX (FX, FX2c), A, QnA Series

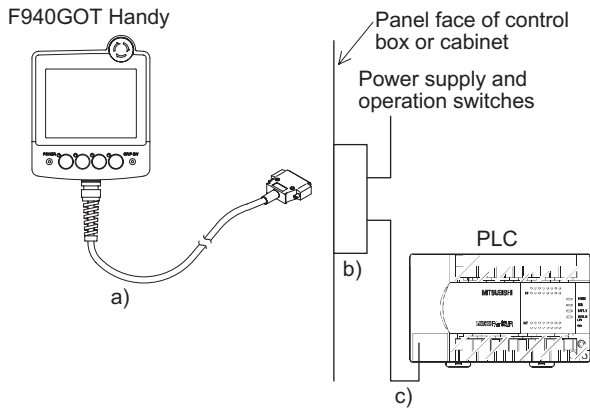


**Note;**

When connecting to a port or unit other than the programming port of an FX, A or QnA series PLC, make a cable corresponding to the configuration of the communications port in question. Or use F9GT-HCAB1-\*\*M external cable. For allocation of Handy GOT communication signals, refer to subsection 3.2.3.

2) Using F9GT-HCNB

Connect an FX/A/QnA Series PLC using a F9GT-HCNB as shown below. Further information about the installing F9GT-HCNB can be found in F9GT-HCNB Hardware Manual.



a) External cable (with 25-pin D-sub male connector)

**Table 3.5: External Cable**

Model Name	Length
F9GT-HCAB-3M	3m (9' 10")
F9GT-HCAB-10M	10m (32' 9")

b) F9GT-HCNB conversion box

c) Communication cable for connection to PLC

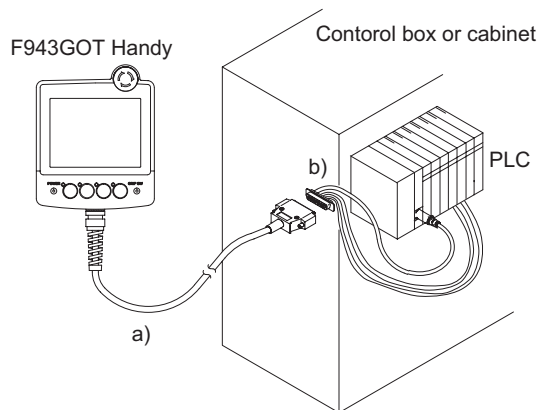
**Table 3.6: Communication Cable**

Model Name	Length	Applicable
FX-50DU-CAB0	3m (9' 10")	FX Series (FX0, FX0s, FX0N, FX1S, FX1N, FX2N, FX2NC)
FX-50DU-CAB0-1M	1m (3' 3")	
FX-40DU-CAB	3m (9' 10")	FX (FX, FX2c), A, QnA Series

### 3.4.2 Using F943GOT Handy

Installing a connector on the panel of control box or cabinet

Connect a Q Series PLC using a relay cable for connection to PLC as shown below. Connect an FX/A/QnA Series PLC using a F9GT-HCAB1-\*\*M external cable for connection to these PLC. Further information about applicable PLC can be found in GOT-F900 Series Hardware Manual.



- a) External cable (with 25-pin D-sub male connector)  
F9GT-HCAB-3M (3m /9' 10")
- b) Relay cable for connection to Q series PLC  
F9GT-HCAB5-150 (1.5m /4' 11") for Q series PLC



#### Note;

When connecting to a port or unit other than the programming port of an FX, A or QnA series PLC, make a cable corresponding to the configuration of the communications port in question. Or use F9GT-HCAB1-\*\*M external cable. For allocation of Handy GOT communication signals, refer to subsection 3.2.3.

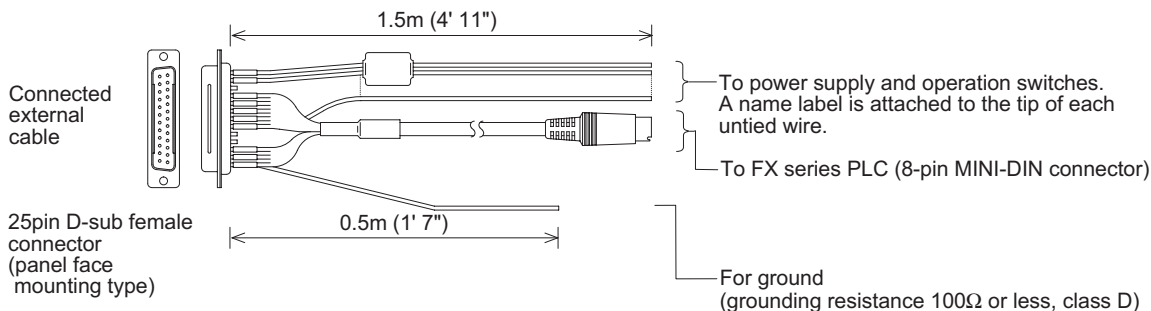


### 3.4.3 Appearance of Relay Cable

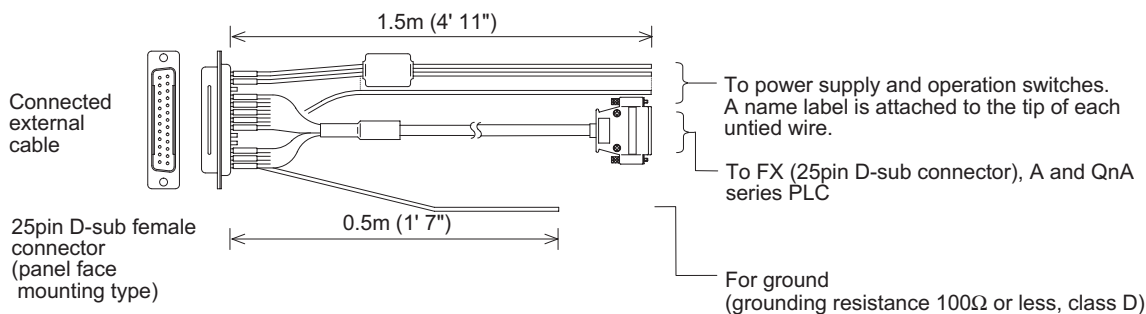
**Table 3.7:**

Model Name	Length	Applicable
F9GT-HCAB2-150	1.5m (4' 11")	FX Series (FX0, FX0S, FX0N, FX1S, FX1N, FX2N, FX2NC)
F9GT-HCAB3-150		FX (FX, FX2C), A, QnA Series

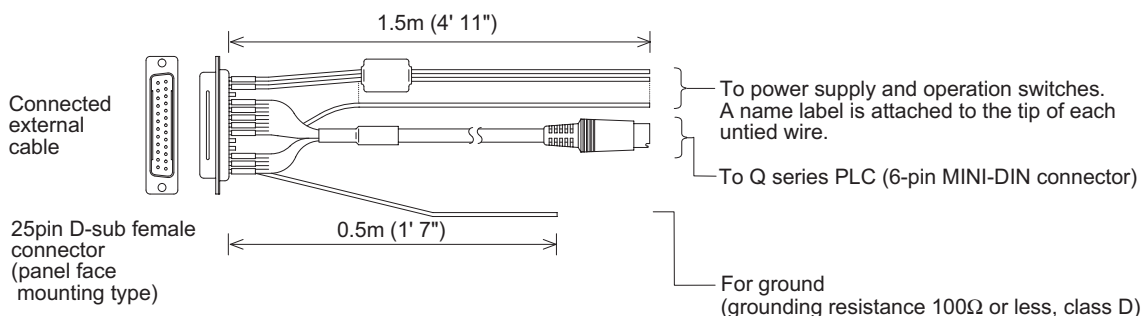
1) F9GT-HCAB2-150 relay cable for FX Series (FX0, FX0S, FX0N, FX1S, FX1N, FX2N, FX2NC) PLC



2) F9GT-HCAB3-150 relay cable for FX (FX, FX2C), A, QnA series PLC



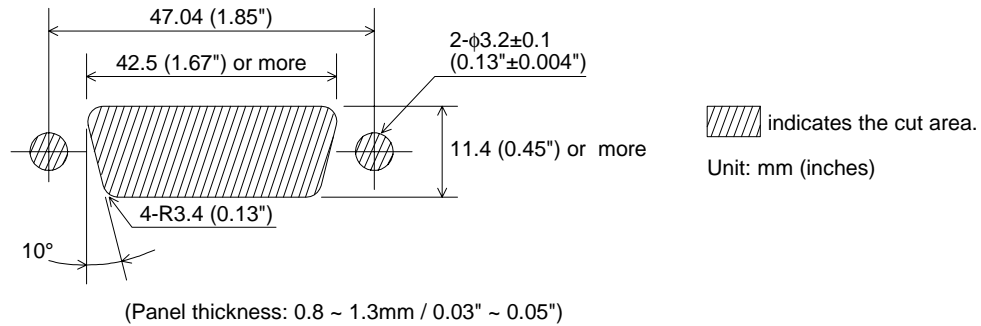
3) F9GT-HCAB5-150 relay cable for Q series PLC



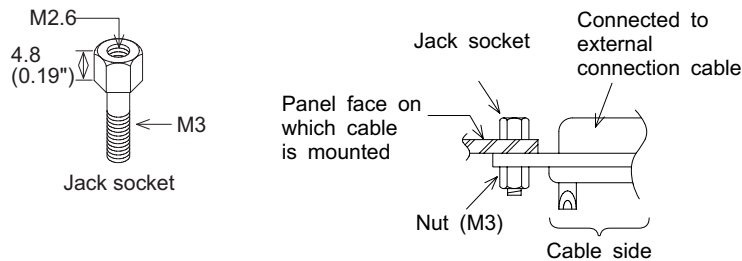
### 3.4.4 Mounting Connector of Relay Cable

When mounting the relay cable connector on the panel of a control box or cabinet, prepare panel of control box or cabinet as follows.

Panel cut size



Insert a jack socket into a hole shown above, and tighten it with a nut (M3).



### 3.5 Wiring of Power Supply

Further information about operation switches and emergency switch can be found in GOT-F900 Series Hardware Manual.

**Caution:**

Cut OFF all phases of power source externally, before installation or wiring work in order to avoid electric shock or damage to the product.

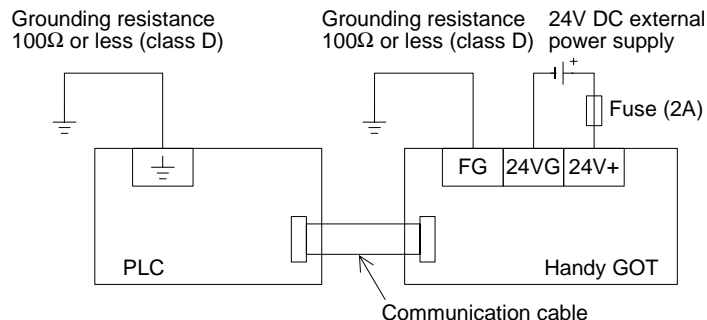
**Note:**

- Insure correct termination of DC power source, incorrect connection may result in unit failure or the GOT being burnt.
- Attach a fuse of 2 A to the 24V DC power supply.
- Perform Class D grounding to the Handy GOT (grounding register 100Ω or less). Never perform common grounding of the GOT and a strong power system.

**Note**

- Feed power to the GOT by an external power supply. (The service power supply of the programmable controller cannot be used.)
- Even if instantaneous power interruption of less than 5 ms occurs, the GOT continues its operation. When power interruption for considerable period of time or voltage drop occurs, the GOT stops its operation. However, when the power supply is recovered, the GOT automatically restarts its operation. (The screen displayed just after recovery is determined by the working environment originally set.)

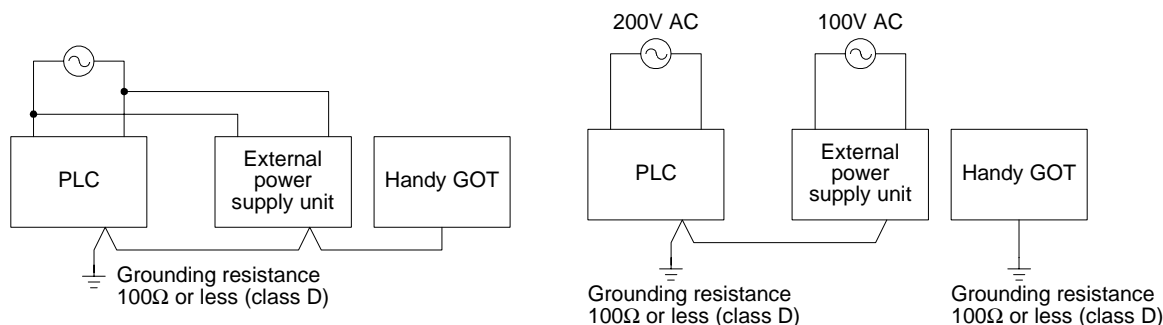
Handy GOT power is supplied from the PLC or an external power supply unit.  
 The current consumption of the Handy GOT is 300 mA at 24V DC. (Refer to section 2.2.)



**Note;**

When the input power for the PLC main unit is equivalent to the input power for the external power supply, grounding may be performed by connecting the frame ground of the Handy GOT to the ground terminal of the PLC.

When the input power is different (PLC: 100V AC, external power supply: 200V AC), perform dedicated grounding to each of the PLC and Handy GOT.



**Table 3.8: Allocation of Signal 24V+ / 24VG /FG**

Signal Name in Diagram	External Cable		F9GT-HCNB Conversion Box (Terminal Name)
	F9GT-HCAB-*M (Pin No.)	F9GT-HCAB1-*M (Pin No.)	
24V+	24, 25	Blue/white, Gray/white	DC24V +
24VG	12, 13	Purple, Pink	DC24V -
FG	1	Drain wire	FG

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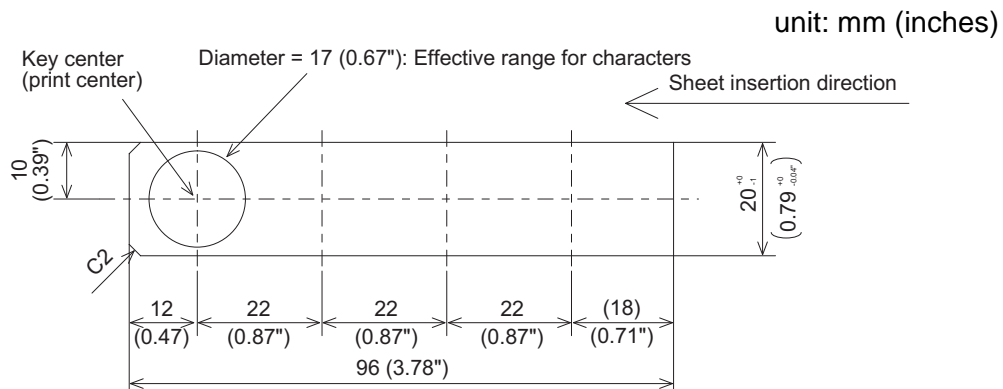


## 4. Creation of Operation Switch Name Sheet

This paragraph describes how to create the operation switch name sheet.

### 4.1 Creation of name sheet

- 1) Prepare a mount sheet and OHP sheet (transparent sheet) offered as accessories.
- 2) Write switch names on the mount sheet.  
The mount sheet is of actual dimensions. As two sets are offered as accessories, select one.  
If you would like to make additional mount sheets, refer to the following dimensions.



- 1) When the work in the step 2) is finished, copy the contents of the mount sheet on the OHP sheet in the actual dimensions (100%) using a copy machine.  
If you would like to prepare another OHP sheet, use the following type.



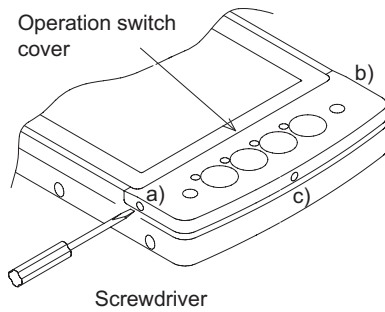
### OHP sheet specification

**Table 4.1: OHP Sheet Specification**

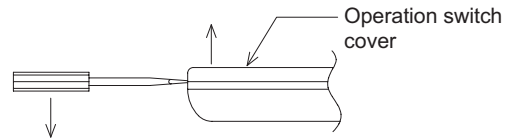
Item	Specifications
Material	Polyester film
Thickness	0.1 mm (0.004")

## 4.2 Attachment of sheet

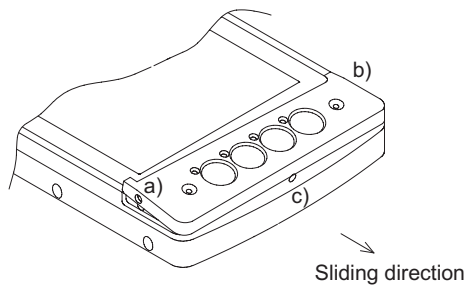
### 1) Removing the operation switch cover



Insert a screwdriver into the clearance “a)” or “b)” between the operation switch cover and the main body, and slowly push the operation switch cover up.

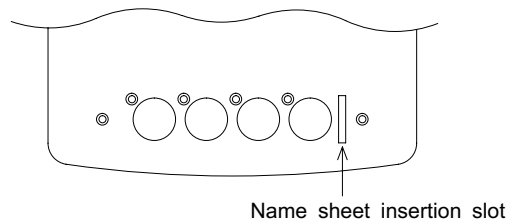


When the either side “a)” or “b)” comes off, pull the operation switch cover in the sliding direction to remove it.

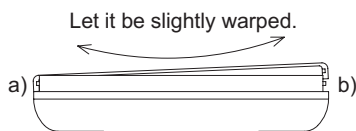


### 2) Inserting the sheet

Insert the name sheet into the following position of the F940GOT.



### 3) Attaching the operation switch cover



Align the operation switch cover with the protrusion “a)” or “b)” shown in the figure in the step 1), then attach the operation switch cover while flexing it slightly.



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## 5. Maintenance



### Cautions:

- Correctly install the battery for memory backup. Never charge, disassemble, heat, burn or short-circuit the battery. If the battery is handled in such a way, bursting or fire may be caused.
- Always power OFF and remove the Handy GOT from any mounting location before starting replacement of the backlight and battery. If this is not the case, the backlight may be dropped and cause injury, or electrical shock may be sustained.
- Never disassemble or modify the Handy GOT. Disassembly or modification may cause failure, malfunction or fire. For repair, please, contact a service representative.



### Note:

Make sure to turn OFF the power, before connecting/disconnecting cables. If you connect/disconnect cables while the power is turned on, failure or malfunction may be caused.

### 5.1 Replacement of battery

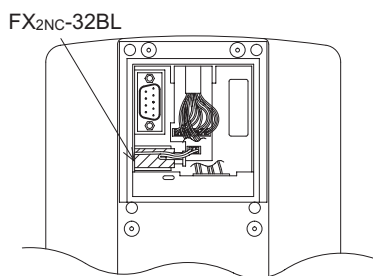
When the battery voltage drops, a control device (system information) set by the screen design software turns ON. The control device interlocks with an auxiliary relay in the PLC. It is recommended to provide a lamp while utilizing the output of the PLC so that voltage drop can be monitored outside the handy GOT.

For details of control devices, refer to the GOT-F900 Series Operation Manual.



### Note:

For approximately one month after the control device for battery voltage drop turns ON, the battery backs up the alarm history, sampling and the current time. When the control device (system information) turns ON, replace the battery (FX2NC-32BL) soon. The screen data is stored in the flash memory. Even if the battery is totally worn out, the screen data remains stored



- 1) Turn off the power of the Handy GOT.
- 2) Open the small window of the rear panel.
- 3) Remove the existing battery from the holder, and disconnect it.
- 4) Within 30 seconds, connect a new battery.
- 5) Insert the new battery into the holder, and close the small window.

# MEMO

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## 6. Diagnostics

### 6.1 Primly Check

- 1) Check "POWER LED"  
If the POWER LED is OFF, check cable(s), and check 24V DC power souce capacity is sufficient.
- 2) Check display  
If the display screen is dark, adjust "LCD CONTRAST" in "SET-UP MODE".  
If the display screen remains dark even after adjustment, it is recommended to replace the backlight. In this case, please contact a service representative.
- 3) Check setting "PLC TYPE" in "SET-UP MODE"  
If this setting is incorrect, Handy GOT cannot communicate with the PLC correctly.

### 6.2 Check Error Messages

The table below shows the list of error messages displayed during manipulation or operation. Check the contents, and take proper action.

**Table 6.1: Check Error Messages**

Error message	Description	Action
CAN NOT WRITE PLC MEMORY.	The PLC is running in EPROM mode. Or the write-protect switch of the EEPROM is set to ON.	Run the PLC in RAM mode. Or set OFF the write-protect switch of the EEPROM.
PLC IS RUNNING.	A program is trying to be written from a personal computer using "DATA TRANSFER" in "OTHER MODE" while the PLC is running. Or an entry code has been registered.	Stop the PLC. Or enter the correct entry code.
DATA IS NOT FOUND.	There are no screen data or data files.	Create the data using the screen creation software.
DISPLAY SCREEN IS NOT AVAIL-ABLE.	Screen No. 0 (in the case of FX-PCSDU/WIN-E) or screen No. 1 (in the case of DT-Designer) is not created yet. When a screen is to be changed over, there is no destination screen.	Create screen No. 0 or 1. Or change the changeover destination screen, or create the corresponding screen.

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