

Magelis XBT OT User Manual

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Telemecanique

www.telemecanique.com

Thank you for purchasing one of Schneider's OPTI XBT OT Series Programmable Operator Interface modules (hereafter referred to as the "OT unit").

Before operating your OT unit, be sure to read this manual to familiarize yourself with the OT unit's operation procedures and features.

NOTICE

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Safety Instructions

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates an imminently hazardous situation, which, **will result** in death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation, which, if not avoided, **can result** in death, serious injury, or equipment damage.

CAUTION




CAUTION indicates a potentially hazardous situation, which, if not avoided, **can result** in injury or equipment damage.

Disclaimer

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material. This document is not intended as an instruction manual for untrained persons.

Information Symbols

This manual uses the following icons:

Screen Editor	Indicates the Vijeo Designer software.
PLC	Abbreviation for Programmable Logic Controller.
	Indicates useful or important supplemental information.
	Contains additional or useful information.
	Indicates pages containing related information.

Handling the LCD Panel

The following characteristics are specific to the LCD unit and are considered normal behavior:

- LCD screen may show unevenness in the brightness of certain images or may appear different when seen from outside the specified viewing angle. Extended shadows, or crosstalk may also appear on the sides of screen images.
- LCD screen pixels may contain black and white colored spots and color display may seem to have changed.
- When the same image is displayed on the unit's screen for a long period, an afterimage may appear when the image is changed. If this happens, turn OFF the unit, wait 10 sec. and then restart the unit.

NOTE

- Change the screen image periodically and try not to display the same image for a long period of time.



WARNING

SERIOUS EYE AND SKIN INJURY FROM DAMAGED OR LEAKING LCD PANEL

- Do not touch nor handle a unit whose LCD panel appears damaged or seems to be leaking.
- Do not use sharp objects or tools in the vicinity of the LCD touch panel or to operate its buttons.
- Handle the LCD panel carefully to prevent puncture, bursting, or cracking of the panel material.

The LCD panel's liquid contains an irritant. If the panel is damaged and any of this liquid is in contact with your skin, immediately rinse the area with running water for at least 15 min. If the liquid gets in your eyes, immediately rinse your eyes with running water for at least 15 min. and consult a doctor.

Failure to follow these instructions can result in death, serious injury, or equipment damage.



WARNING

RISK OF BURNS OR EQUIPMENT DAMAGE

Wait at least 10 sec. before restoring power to the HMI unit after turning it off. Switching the unit off and on too quickly can result in overheating that leads to personnel burn hazards or equipment damage.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

XBT OT Series Models and Features

The XBT OT series refers to the following model numbers:

Model	XBT OT2110	XBT OT2210	XBT OT4320	XBT OT5220	XBT OT5320
CPU	LH7A404	LH7A404	LH7A404	LH7A404	LH7A404
OS	VxWorks	VxWorks	VxWorks	VxWorks	VxWorks
DRAM	32MB	32MB	32MB	32MB	32MB
Main Flash	32MB	32MB	32MB	32MB	32MB
SRAM	512K	512K	512K	512K	512K
Panel Size	5.7"	5.7"	7.5"	10.4"	10.4"
Resolution	QVGA	QVGA	VGA	VGA	VGA
Display Device	Blue LCD	STN	TFT	TFT	TFT
Color	8 gray scale	256 colors	256 colors	16 colors	256 colors
Brightness	8 levels	8 levels	8 levels	8 levels	8 levels
Contrast	8 levels	8 levels	n/a	n/a	n/a
COM1	RS232C	RS232C	RS232C	RS232C	RS232C
COM2	RS422/485	RS422/485	RS422/485	RS422/485	RS422/485
USB	Yes (1)	Yes (1)	Yes (1)	Yes (1)	Yes (1)
Ethernet	No	No	No	No	No
CF Card Slot	No	No	Yes	Yes	Yes
Auxiliary	No	No	No	No	No
Sound Out	No	No	No	No	No
Sound In	No	No	No	No	No
Video	No	No	No	No	No



WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.¹
- Each implementation of the Magelis XBT OT must be individually and thoroughly tested for proper operation before being placed into service. The machine control system design should take into account the possibility of the backlight failing and the operator being unable to control the machine, or making errors in the control of the machine

Failure to follow these instructions can result in death, serious injury, or equipment damage.

¹ For additional information, refer to NEMA ICS 1.1 (latest edition), "Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control".

Do not use the unit as the only means of control for critical system functions such as motor start/stop or power disconnect.

Do not use the unit as the only notification device for critical alarms, such as device overheating or overcurrent.

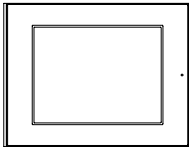
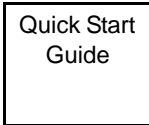
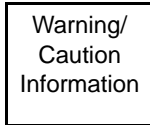

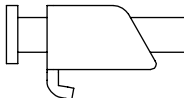
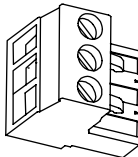
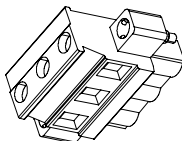
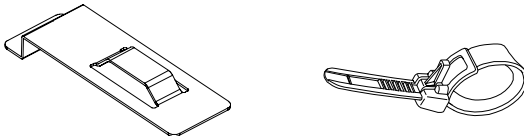
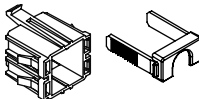

Do not use the unit with aircraft control devices, aerospace equipment, central trunk data transmission (communication) devices, nuclear power control devices, or medical life support equipment, due to the reliability requirements of these industries.

In the event of backlight or other unit failure, it may be difficult or impossible to identify a function.

Emergency stop, fuel shutoff, or any function that may present a danger if not immediately executed must be provided independently of the unit. In addition, the machine control system design should take into account the possibility of the backlight failing and the operator being unable to control the machine, or making errors in the control of the machine.

Package Contents

The following items are included in the OT unit’s package. Before using the OT, please check that items listed are present.

OT Unit: 1	Quick Start Guide	Warning/Caution Information
		
Installation Gasket: 1 (Attached to the OT unit)		Installation Fasteners: 4 per set
		
DC Power Connector: 1 OT2110/2210/4320 series (Attached to the OT unit for OT2110/2210 series)		OT5220/5320 series (Attached to the OT unit)
		
USB Cable Clamp: 1 set		
OT2110/2210 series Holder: 1, Clamp: 1		
		
OT4320 series Holder: 1, Cover: 1		
		
OT5220/5320 series Holder: 1, Clamp: 1		
		

This unit has been carefully packed, with special attention to quality. However, should you find anything damaged or missing, please contact Schneider Electric immediately.

UL/c-UL Approval

The following units are UL/c-UL listed products. (UL File No.E220851)

Product Model No.	UL/c-UL Registration Model No.
XBT OT2110	3580207-02
XBT OT2210	3580207-01
XBT OT4320	3580206-01
XBT OT5220	3520208-02
XBT OT5320	3520208-02

This product conforms to the following standards:

- UL508
Industrial Control Equipment
- CSA-C22.2 No.142-M1987 (c-UL Approval)
Standard for Process Control Equipment



CAUTION

EQUIPMENT DAMAGE

- The OT unit's rear face is not approved as an enclosure. When building the OT unit into an end-use product, be sure to use an enclosure that satisfies UL508 and CSA-C22.2 No.142-M1987 standards as the end-use product's overall enclosure.
- The OT unit must be used indoors only.
- Install and operate the OT with its front panel facing outwards.
- If the OT is mounted so as to cool itself naturally, be sure to install it in a vertical panel. Also, it is recommended that the OT should be mounted at least 100mm [3.94in] away from any other adjacent structures or machine parts. The temperature must be checked on the final product in which the OT is installed.
- Serial Interface (COM2) is not a Limited Power Source.
- For use on a flat surface of a Type 4X (Indoor Use Only) and/or Type 13 Enclosure.

Failure to follow these instructions can result in injury or equipment damage.

CE Marking

The following units are CE marked products complying with the EMC Directive. They comply with EN55011 Class A, EN61131-2.

XBT OT2110

XBT OT2210

XBT OT4320

XBT OT5220

XBT OT5320

1 | Overview

1. System Design
2. Accessories

This chapter describes the peripheral devices that can be connected to the OT Series units.

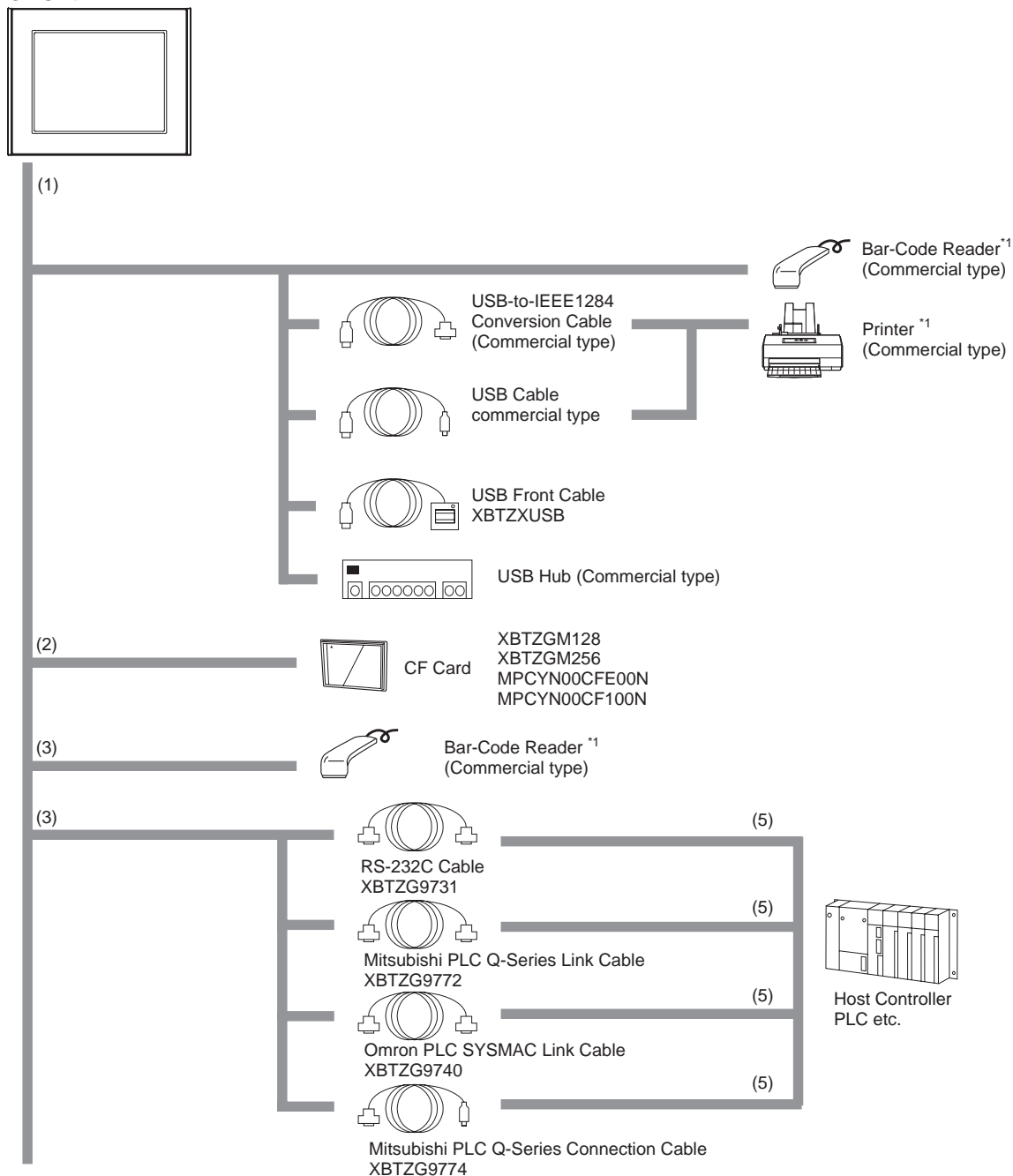
1.1 System Design

The following diagram illustrates the standard range of items that can be connected to XBT OT Series units. For host controller (PLC, etc.) connection information, refer to the Vijeo Designer Online Help's Device Driver manuals.

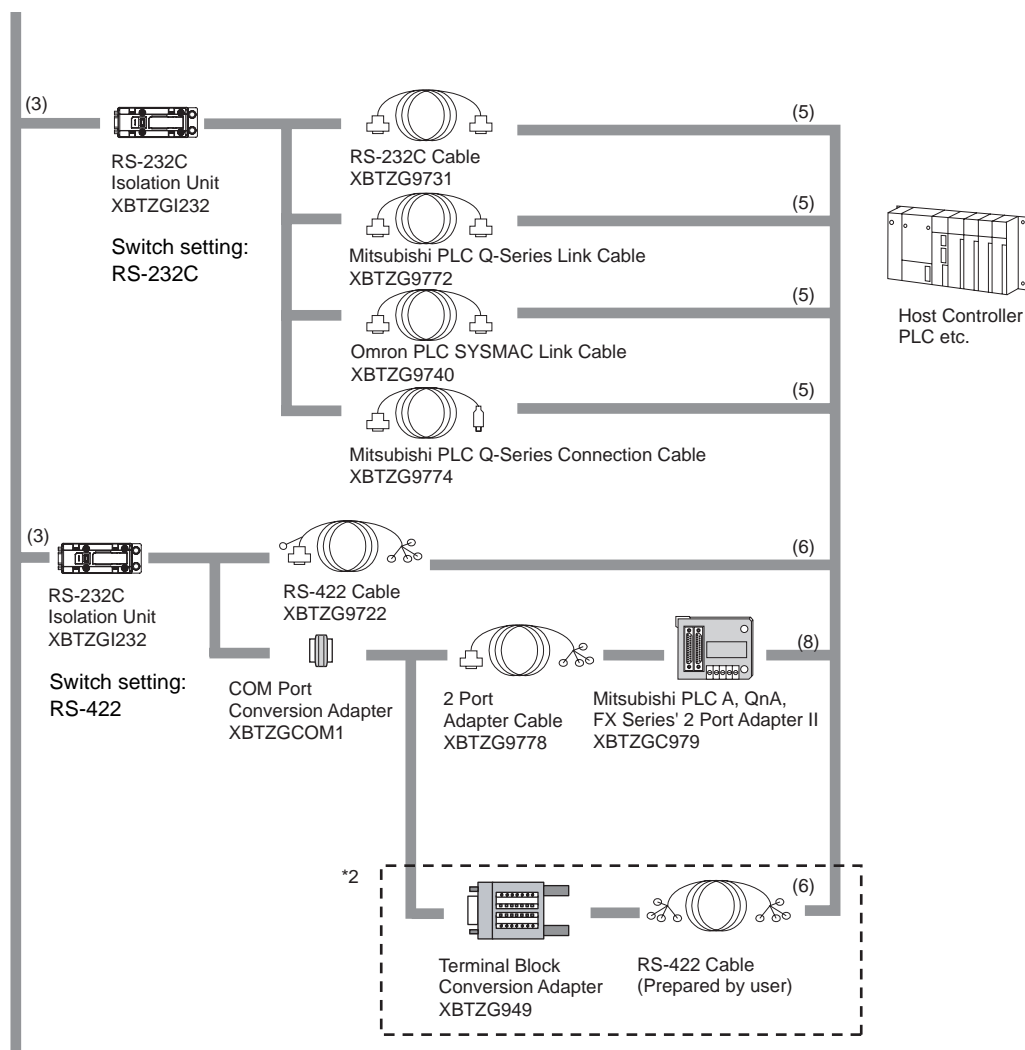
◆ OT RUN Mode Peripherals

For explanation of numbered items, see Component Legend on Page 1-4.

OT Unit



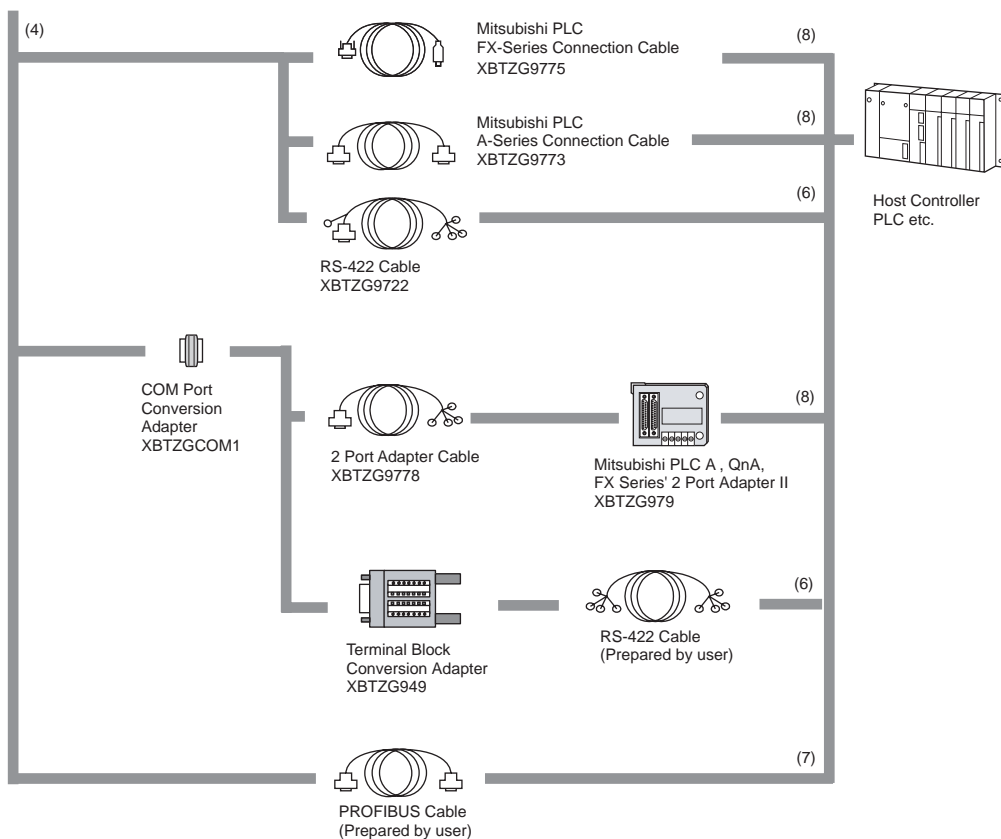
*1 For supported models, contact Schneider Electric.



*2 Only the four-wire one-to-one connection type can be used.

NOTE

- When connecting the XBTZGI232, the 9-pin setting of the COM port is required to be VCC. COM port settings can be set with Vijeo Designer or in the OT's Offline mode.



Component Legend

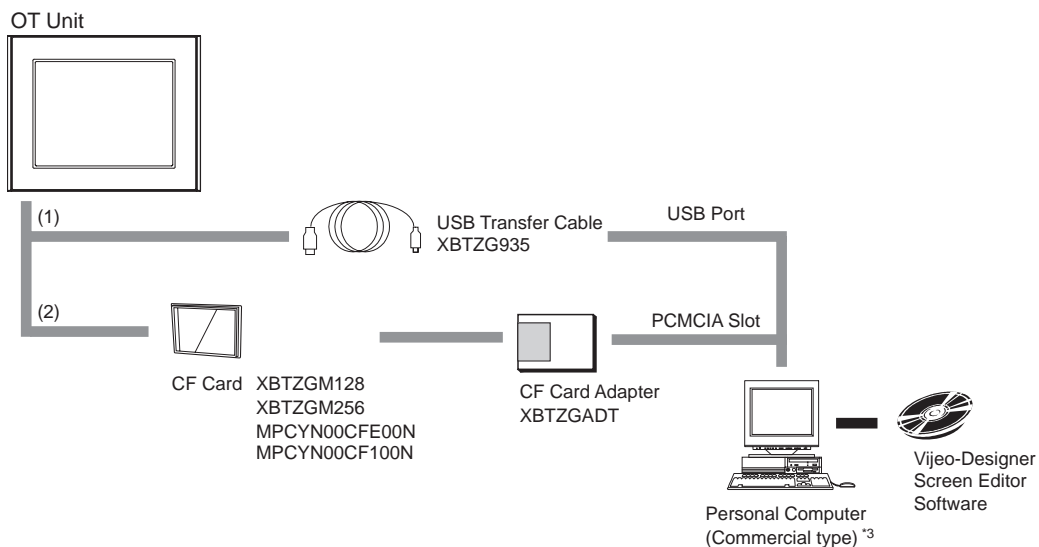
OT Interfaces

- (1) USB I/F
- (2) CF Card Interface
XBT OT4320/5220/5320 models only
- (3) RS-232C Serial Interface (COM1)
- (4) RS422/485 Serial Interface (COM2)

PLC Interfaces

- (5) RS-232C Port
- (6) RS-422 Port
- (7) RS-485 Port
- (8) Programming Console Port

◆ Editor Peripherals



*3 Certain types and models of PCs cannot be used.

Component Legend

OT Interfaces

- (1) USB Host Interface
- (2) CF Card Interface
(XBT OT4320/5220/5320 models only)

1.2 Accessories

All accessories listed here are produced by Schneider Electric.

■ Serial Interface Item

Product Name	Model No.	Description
RS-232C Cable	XBTZG9731 (5m[16.4ft])	Connects Mitsubishi PLC A-Series (or other host controller) to the OT. (RS-232C)
RS-422 Cable	XBTZG9722 (5m[16.4ft])	Connects a host controller to the OT. (RS-422)
Mitsubishi PLC Q-Series Link Cable	XBTZG9775 (5m[16.4ft])	Connects Mitsubishi PLC Q-Series (or other host controller) to the OT. (RS-232C)
Omron PLC SYSMAC Link Cable	XBTZG9740 (5m[16.4ft])	Connects Omron PLC SYSMAC Series unit (or other host controller) to the OT. (RS-232C)
Mitsubishi PLC A-Series Connection Cable	XBTZG9773 (5m[16.4ft])	Connects Mitsubishi PLC A, QnA Series programming console I/F to OT. (Simultaneous use of programming console is not possible.)
Mitsubishi PLC Q-Series Connection Cable	XBTZG9774 (5m[16.4ft])	Connects Mitsubishi PLC Q-Series programming console I/F to OT. (Simultaneous use of programming console is not possible.)
Mitsubishi PLC FX-Series Connection Cable	XBTZG9775 (5m[16.4ft])	Connects Mitsubishi PLC FX-Series programming console I/F and OT. (Simultaneous use of programming console is not possible.)
2 Port Adapter Cable	XBTZG9778 (5m[16.4ft])	Connects Mitsubishi PLC to the OT using 2 port adapter II (RS-422).
Mitsubishi PLC A, QnA, FX Series 2 Port Adapter II	XBTZG979	Allows simultaneous use of an OT Series unit and a Mitsubishi PLC A, QnA, FX Series peripheral device.
Terminal Block Conversion Adapter	XBTZG949	Connects output from a serial interface with an RS-422 terminal block.
COM Port Conversion Adapter	XBTZGCOM1	Connects optional RS-422/485 communication items to OT unit's COM2 port.
RS-232C Isolation Unit	XBTZGI232	Connects a host controller to the OT and provides isolation. RS-232C/RS-422 switching unit.

■ USB Host Interface

Product Name	Model No.	Description
USB Transfer Cable	XBTZG935 (2m[3.3ft])	Downloads project data created with the Screen Editor via the OT unit's Serial I/F.
USB Front Cable	XBTZGUSB (1m[3.3ft])	Extension cable attaching USB port to front panel.

■ CF Card Items

Only the XBT OT4320/5220/5320 Series includes an interface to the CF Cards.

Product Name	Model No.	Description
CF Card (128MB)	XBTZGM128	Inserted into the OT unit's CF Card slot.
CF Card (256MB)	XBTZGM256	
CF Card (512MB)	MPCYN00CFE00N	
CF Card (1GB)	MPCYN00CF100N	
CF Card Adapter	XBTZGADT	Used for read/write of CF Card data via a PC's PCMCIA slot.

■ Maintenance Items

Product Name	Model No.	Corresponding OT	Description
Installation Gasket	XBTZG52	OT2110/2210	Provides dust and moisture resistance when OT is installed into a solid panel.
	XBTZG54	OT4320	
	XBTZG55	OT5220/5320	
Connector Cover	XBTZGCNC	OT2110/2210/4320	Protects the OT unit's rear face connector.
Attachment	XBTZGCO2	OT2110/2210/4320	Panel cutout adapter for mounting OT2110/2210/4320 models.
	XBTZGCO4	OT5220/5320	Panel cutout adapter for mounting OT5220/5320.

■ Option Items

Product Name	Model No.	Corresponding OT	Description
Screen Protection Sheet	XBTZG62	OT2110/2210	Disposable, dirt-resistant sheet for the OT unit's screen. (5 sheets/set) (Hard type)
	XBTZG64	OT4320	
	XBTZG65	OT5220/5320	

2

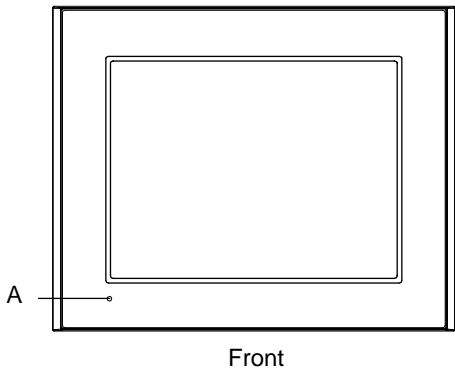


Part Names and Functions

1. XBT OT2110/2210 Series
2. XBT OT4320 Series
3. XBT OT5220/5320 Series

This chapter describes the names and functions of the components of the OT series.

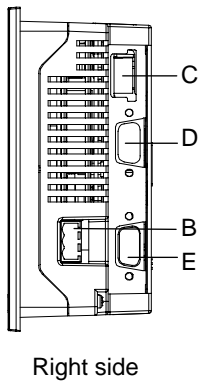
2.1 XBT OT2110/2210 Series



A: Status LED

This LED indicates the OT's status, e.g. power input, firmware RUN status.

LED	OT Operation
Green (lit)	Normal operation (power is ON) or OFFLINE operation.
Orange (blinking)	During software startup.
Red (lit)	Power is ON.
Not lit	Power is OFF.



B: Power Plug Connector

C: USB Host Interface (USB)

Complies with USB 1.1.
One port for TYPE-A connector.
Power supply voltage 5 VDC \pm 5%.
Maximum output current: 500mA
Maximum communication distance: 5m[16.4ft]
Interfaces to transfer cable, USB-compatible printer, and such.

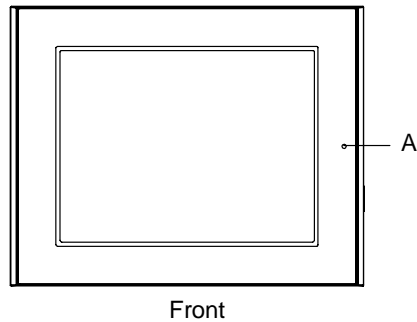
D: Serial Interface (COM1)

RS-232C serial interface.
9-pin SUB-D plug type connector.

E: Serial Interface (COM2)

RS-422/RS-485 serial interface.
9-pin SUB-D plug type connector.

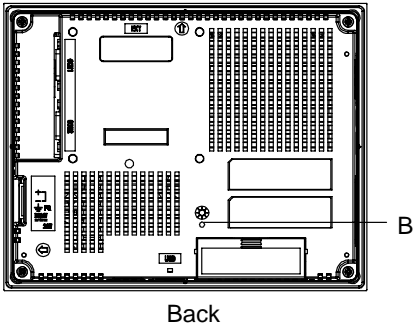
2.2 XBT OT4320 Series



A: Status LED

This LED indicates the OT's status, e.g. power input, firmware RUN status.

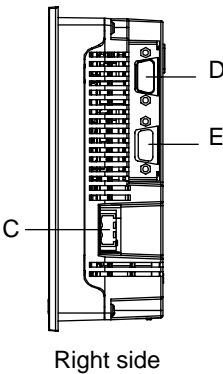
LED	OT Operation
Green (lit)	Normal operation (power is ON) or OFFLINE operation.
Orange (blinking)	During software startup.
Red (lit)	Power is ON.
Not lit	Power is OFF.



B: CF Card Access Lamp

This lamp lights up when a CF Card is inserted and the CF Card cover is closed. It will remain lit if you open the CF Card cover while the CF Card is inserted.

Access Lamp	Indicates
Green ON	The CF Card is inserted and the CF Card Cover is closed. Or, the CF Card is being accessed.
Green OFF	The CF Card is not inserted or is not being accessed.



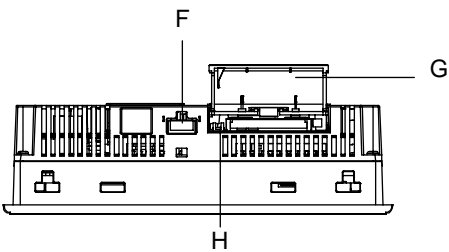
C: Power Plug Connector

D: Serial Interface (COM1)

RS-232C serial interface. 9-pin SUB-D plug type connector.

E: Serial Interface (COM2)

RS-422/RS-485 serial interface. 9-pin SUB-D plug type connector.



Bottom
(With CF Card Cover open)

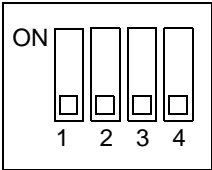
F: USB Host Interface (USB)

Complies with USB 1.1.
One port for TYPE-A connector.
Power supply voltage 5 VDC $\pm 5\%$.
Maximum output current: 500mA
Maximum communication distance: 5m[16.4ft]
Interfaces to transfer cable, USB-compatible printer, and such.

G: CF Card Cover

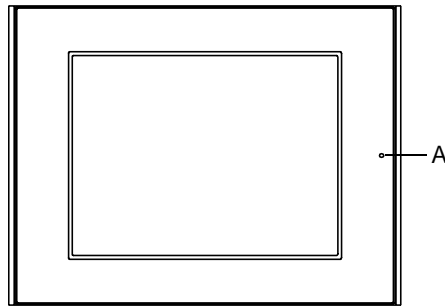
The CF Card interface and DIP Switches are located inside the CF Card access area when the cover is open. This cover must be closed when accessing the CF Card.

H: DIP Switches



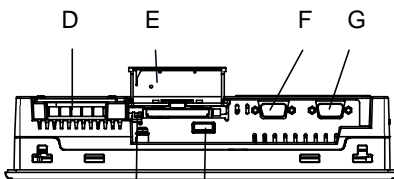
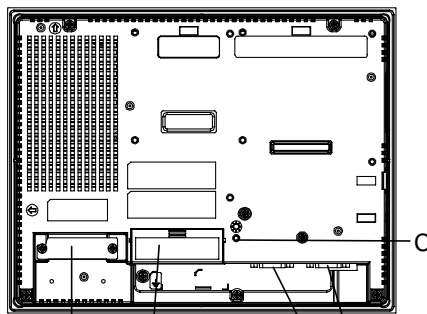
DIP Switches	Function	ON	OFF
1	Install project from CF Card. CF Card with project data required. Default setting: OFF.	Enabled	Disabled
2	Reserved	-	-
3	Enable Runtime Recovery. Default setting: OFF.	Enabled, contact customer support for serial recovery cable	Disabled
4	Simulate cover closed, allowing card to be read even if cover open. Default setting: OFF.	Enabled	Disabled

2.3 XBT OT5220/5320 Series



Front

Back

Bottom
(CF-Card Cover Open View)

A: Status LED

This LED indicates the OT's status, e.g. power input, firmware RUN status.

LED	OT Operation
Green (lit)	Normal operation (power is ON) or OFFLINE operation.
Orange (blinking)	During software startup.
Red (lit)	When power is turned ON.
Not lit	Power is OFF.

B: USB Host Interface (USB)

Complies with USB 1.1.

One port for the TYPE-A Connector.

Power supply voltage 5 VDC $\pm 5\%$.

Maximum output current: 500mA

Maximum communication distance: 5m[16.4ft]

Interfaces to transfer cable, USB-compatible printer, and such.

C: CF Card Access LED

This lamp lights up when a CF Card is inserted and the CF Card cover is closed. It will remain lit if you open the CF Card cover while the CF Card is inserted.

Access LED	Indicates
Green ON	The CF Card is inserted and the CF Card Cover is closed. Or, the CF Card is being accessed.
Green OFF	The CF Card is not inserted or is not being accessed.

D: Power Input Terminal Block (AC model), Power Plug Connector (DC model)

E: CF Card Cover

The CF Card interface and DIP Switches are located in the CF Card Cover open. This cover must be closed when accessing the CF Card.

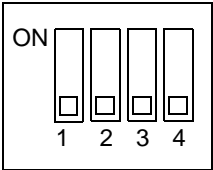
F: Serial Interface (COM1)

RS-232C serial interface. 9-pin SUB-D plug type connector.

G: Serial Interface (COM2)

RS-422/RS-485 serial interface. 9-pin SUB-D plug type connector.

H: DIP Switches



DIP Switches	Function	ON	OFF
1	Install project from CF Card. CF Card with project data required. Default setting: OFF.	Enabled	Disabled
2	Reserved	-	-
3	Enable Runtime Recovery. Default setting: OFF.	Enabled, contact customer support for serial recovery cable	Disabled
4	Simulate cover closed, allowing card to be read even if cover open. Default setting: OFF.	Enabled	Disabled

3

Specifications

1. XBT OT2110/2210 Series
2. XBT OT4320 Series
3. XBT OT5220/5320 Series

This chapter describes the general specifications, functions, interfaces and dimensions of the OT.

3.1 XBT OT2110/2210 Series

3.1.1 General Specifications

■ Electrical Specifications

Power Supply	Input Voltage	24 VDC
	Rated Voltage	19.2 to 28.8 VDC
	Allowable Voltage Drop	10ms (maximum)
	Power Consumption	18W (maximum)
	In-Rush Current	30A (max.)
Voltage Endurance		1000 VAC 20mA for 1 minute (between charging and FG terminals)
Insulation Resistance		500 VAC 10M Ω (min.) (between charging and FG terminals)

■ Environmental Specifications

Physical	Surrounding Air Temperature	0 to +50°C [32 to 122°F] ^{*1}
	Storage Temperature	-20 to +60°C [-4 to 140°F]
	Ambient Humidity	10 to 90% RH (Wet bulb temperature: 39°C[102°F] max. - no condensation.)
	Storage Humidity	10 to 90% RH (Wet bulb temperature: 39°C[102°F] max. - no condensation.)
	Dust	0.1mg/m ³ and below (non-conductive levels)
	Pollution Degree	For use in Pollution Degree 2 environment
	Atmosphere	Free of corrosive gases
	Air Pressure Vibration Resistance	800 to 1114hPa (2,000m[6557.4ft] above sea-level and below)
Mechanical	Vibration Resistance	IEC61131-2 compliant 5 to 9Hz single-amplitude 3.5mm[0.14in] 9 to 150Hz constant acceleration 9.8m/s ² X,Y,Z directions for 10 cycle (100 minute)
	Concussion Resistance	IEC61131-2 compliant (147m/s ² X,Y,Z directions for 3 times)
Electrical	Noise Immunity	Noise Voltage: 1000V _{P-P} Pulse Duration: 1 μ s Rise Time: 1ns (via noise simulator)
	Electrostatic Discharge Immunity	6kV (complies with EN 61000-4-2 Level 3)

*1. Extended use in environments where surrounding air temperature is 40°C[104°F] or higher may degrade the display quality and result in decreased contrast.

■ Structural Specifications

Installation	Grounding	Grounding resistance of 100Ω 2mm ² or thicker wire, or your country's applicable standard. (Same for FG and SG terminals)
	Structure*1	Rating: Equivalent to IP65f NEMA #250 TYPE 4X/13 (Front surface at panel embedding) Feature size: All-in-one Installation configuration: Panel embedding
	Cooling Method	Natural air circulation
	Weight Approx.	1.0kg[2.2lb]max. (unit only)
	External Dimensions	W167.5mm[6.59in] X H135mm[5.31in] X D59.5mm[2.34in]
	Panel Cut Dimensions	W156.0mm[6.14in] X H123.5mm[4.86in]*2 Panel thickness: 1.6mm[0.06in] to 5.0mm[0.20in]

*1. The front face of the OT unit, installed in a solid panel, has been tested using conditions equivalent to the standards shown in the specification. Even though the OT unit's level of resistance is equivalent to these standards, oils that should have no effect on the OT can possibly harm the unit. This can occur in areas where either vaporized oils are present, or where low viscosity cutting oils are allowed to adhere to the unit for long periods of time. If the OT's front face protection sheet is peeled off, these conditions can lead to the ingress of oil into the OT and separate protection measures are suggested.

Also, if non-approved oils are present, they may cause deformation or corrosion of the front panel's plastic cover. Therefore, prior to installing the OT be sure to confirm the type of conditions that will be present in the OT's operating environment.

If the installation gasket is used for a long period of time, or if the unit and gasket are removed from the panel, the original level of the protection can be compromised. To maintain the original protection level, be sure to replace the installation gasket regularly.

*2. As for dimensional tolerance, ensure everything is +1/-0mm[+0.04/-0in] and R in angles are below R3[0.12].

3.1.2 Performance Specifications

■ Performance Specifications

Application* ¹		FLASH EPROM 32MB
Data Backup		SRAM 512KB
		Used lithium battery for backup memory
Interface	Serial Interface	COM1: RS-232C Asynchronous Transmission Data Length: 7 bit/8 bit Parity: none, Odd or Even Stop Bit: 1bit/2bit Data transmission Speed: 2400bps to 115.2Kbps Connector: D-SUB-9pin plug
		COM2: RS-422/485 Asynchronous Transmission Data Length: 7 bit/8 bit Parity: none, Odd or Even Stop Bit: 1bit/2bit Data transmission Speed: 2400 bps to 115.2 Kbps 187.5 Kbps (MPI) Connector: DSUB-9pin plug
	USB Host Interface	Complies with USB 1.1. (TYPE-A connector) x 1 Power Supply Voltage: 5 VDC \pm 5% Output Current: 500mA (Max.) Communication Distance: 5m[16.4ft] (Max.)
Clock Accuracy* ²		\pm 65 seconds/ month (at room temperature)

*1. Active capacity.

*2. At normal operating temperatures and conditions, with the OT operating from its lithium battery, the degree of error is 65 seconds per month. Variations in operating conditions and battery life can cause this error to vary from -380 to +90 seconds per month. For systems where this degree of error will be a problem, the user should be sure to monitor this error and make adjustments when required.

NOTE

- When the message “RAAA051 Low battery” is displayed, supply power to the display unit and fully charge the battery. The battery charges within 24 hours to a level which allows backup operation. Completing a full charge requires about 96 hours (4 days).
- A Lithium battery's lifetime is: 10 years when the battery's ambient temperature is 40°C [104°F] or less. 4.1 years when the battery's ambient temperature is 50°C [122°F] or less. 1.5 years when the battery's ambient temperature is 60°C [140°F] or less.

When used for backup:

Approximately 100 days, with a fully charged battery.

Approximately 6 days, with a half-charged battery.

■ Display Specifications

		XBT OT2210	XBT OT2110
Display Type		STN Color LCD	Monochrome blue mode LCD
Resolution		W320 X H240 pixels	
Dot pitch		W0.36mm[0.01in] X H0.36mm[0.01in]	
Effective Display Area		W115.2mm[4.54in] X H86.4mm[3.40in]	
Color/Shade level		256 Colors (No blink) 64 Colors (Enables blink feature)	8 Shades
Backlight		CCFL (Not replaceable.)	
Brightness control		8 levels of adjustment available via touch panel	
Contrast Adjustment		8 levels of adjustment available via touch panel	
Display Service Life		MTBF value: 75,000hrs. (TYP) (Backlight display service life is not included.)	MTBF value: 58,000hrs. (TYP) (Backlight display service life is not included.)
Backlight Service Life		75,000hrs. or more (at 25°C[77°F] and continuous operation - period until backlight brightness decreases to 50% or backlight starts to flicker)	58,000hrs. or more (at 25°C[77°F] and continuous operation - period until backlight brightness decreases to 50% or backlight starts to flicker)
Language Fonts		ANK: 158 (Korean fonts, Simplified Chinese and Taiwanese traditional Chinese fonts are downloadable.)	
Text composition	Character Sizes	Standard font: 8X8, 8X16, 16X16 and 32X32 dot fonts Stroke font: 6 to 127 dot fonts	
	Font Sizes	Standard font: Width can be expanded up to 8 times. Height can be expanded up to 8 times ^{*1}	
Text	8 X 8 dots	40 Char. X 30 rows	
	8 X 16 dots	40 Char. X 15 rows	
	16 X 16 dots	20 Char. X 15 rows	
	32 X 32 dots	10 Char. X 7 rows	

*1. Font Sizes can be set up by software.

■ Touch Panel Specifications

Type	Resistive Film (analog)
Resolution	1024 X 1024
Service Life	1,000,000 times or more

3.1.3 Interface Specifications

This section describes the specifications of each interface of the OT Series unit.

DANGER

ELECTRIC SHOCK

- The OT unit's serial port is not isolated. When the host (PLC) unit is also not isolated, be sure to connect the #5 SG (Signal Ground) terminal to reduce the risk of damaging the RS-232C/RS-422 circuit.
- When connecting an external device to the OT using the SG terminal, be sure to check that no short-circuit loop is created when you setup the system.
- The same type of connector is used for the different signal types on COM1 and COM2 of the OT. Be careful not to mistake one for the other. Connecting them incorrectly disables communication.

Failure to follow these instructions will result in death or serious injury.

NOTE

- Connecting the RS-232C isolation unit (XBTZGI232) to COM1 enables isolation if needed.

■ Serial Interfaces

◆ Serial Interface (COM1)

This interface is used to connect an RS-232C serial cable. A 9-pin SUB-D plug connector is used.

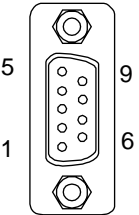
OT unit side

OT Connector	XM2C-0942-502LX (OMRON Co.)
Interfit Bracket	#4-40 inch screws are used.

Cable side

Recommended Cable Connector	XM2D-0901 (OMRON Co.)
Recommended Cable Cover	XM2S-0913 (OMRON Co.)
Recommended Jack Screw	XM2Z-0073 (OMRON Co.)

RS-232C

Pin Arrangement	Pin No.	RS-232C		
		Signal Name	Direction	Meaning
 (OT unit side)	1	CD	Input	Carrier Detect
	2	RD(RXD)	Input	Receive Data
	3	SD(TXD)	Output	Send Data
	4	ER(DTR)	Output	Data Terminal Ready
	5	SG	-	Signal Ground
	6	DR(DSR)	Input	Data Set Ready
	7	RS(RTS)	Output	Request to Send
	8	CS(CTS)	Input	Send Possible
	9	CI(RI)/VCC	Input	Called status display +5V±5% Output 0.25A *1
	Shell	FG	-	Frame Ground (Common with SG)

*1 The RI/VCC selection for Pin #9 is switched via software. The VCC output is not protected against overcurrent. To prevent damage or a unit malfunction, use only the rated current.

◆ Serial Interface (COM2)

This interface is used to connect an RS-422/485 serial cable. A 9-pin SUB-D plug connector is used.

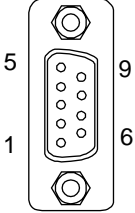
OT unit side

OT Connector	XM2C-0942-502LX (OMRON Co.)
Interfit Bracket	#4-40 inch screws are used.

Cable side

Recommended Cable Connector	XM2D-0901 (OMRON Co.)
Recommended Cable Cover	XM2S-0913 (OMRON Co.)
Recommended Jack Screw	XM2Z-0073 (OMRON Co.)

RS-422/485

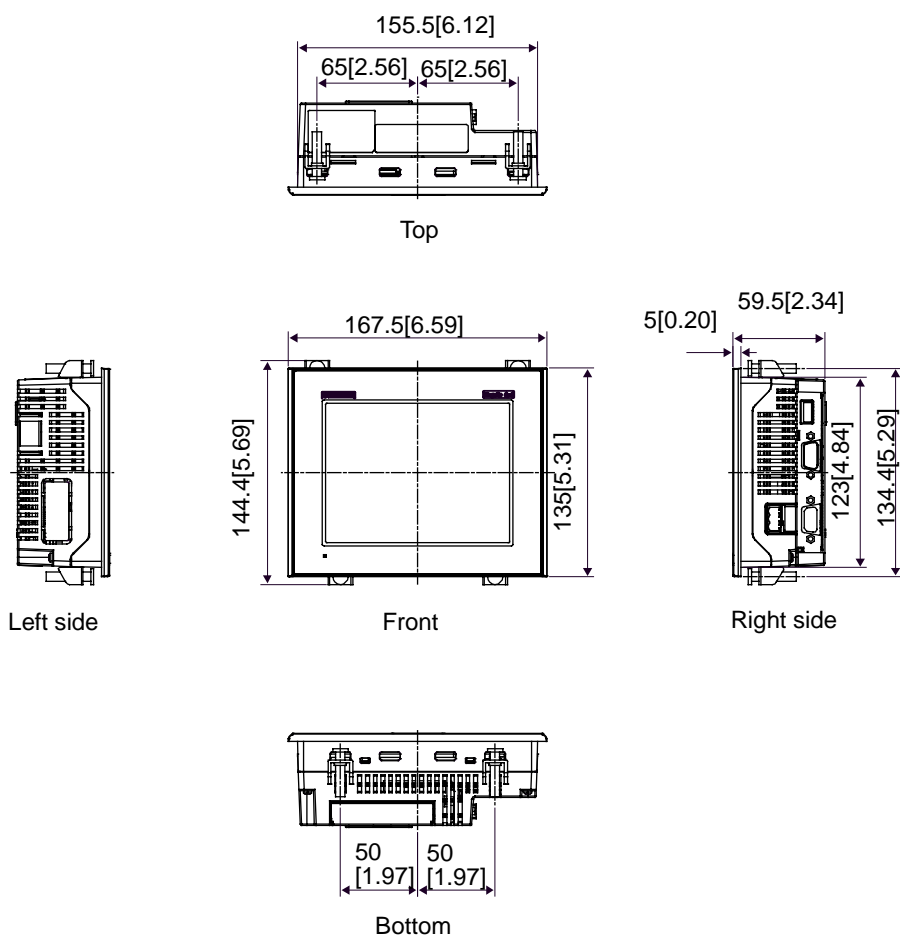
Pin Arrangement	Pin No.	RS-422/485		
		Signal Name	Direction	Meaning
 (OT unit side)	1	RDA	Input	Receive Data A(+)
	2	RDB	Input	Receive Data B(-)
	3	SDA	Output	Send Data A(+)
	4	ERA	Output	Data Terminal Ready A(+)
	5	SG	-	Signal Ground
	6	CSB	Input	Send Possible B(-)
	7	SDB	Output	Send Data B(-)
	8	CSA	Input	Send Possible A(+)
	9	ERB	Output	Data Terminal Ready B(-)
	Shell	FG	-	Frame Ground (Common with SG)

3.1.4 Dimensions

The following dimensions apply to the XBT OT2110/2210 models.

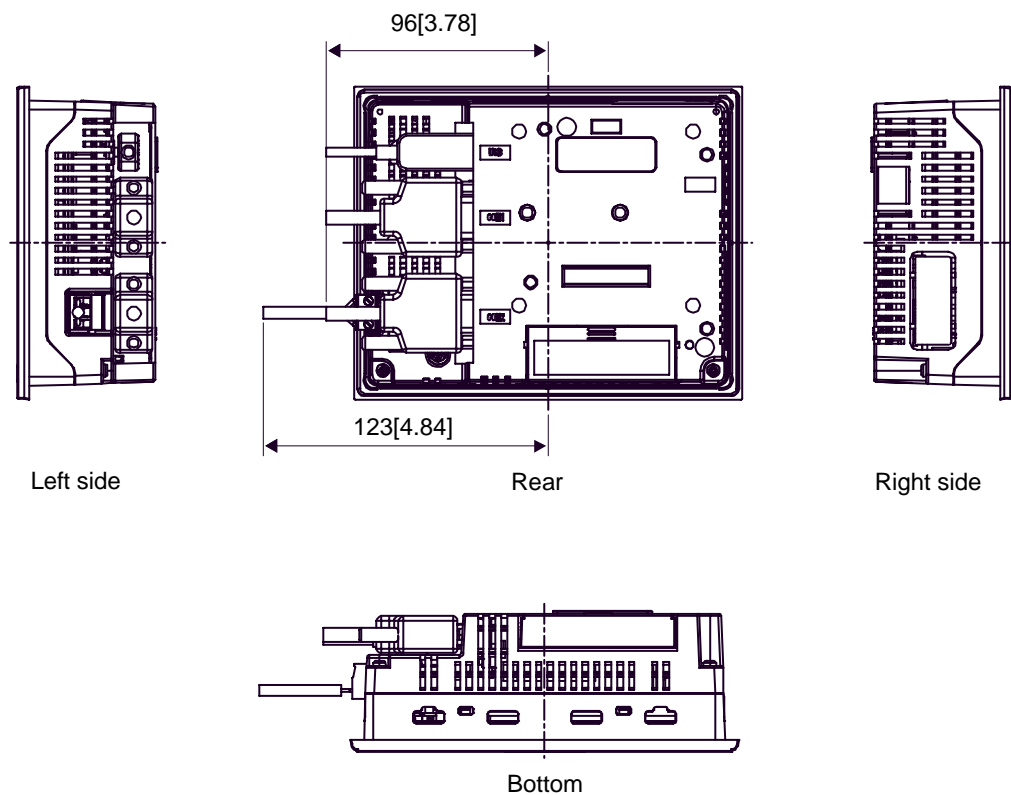
■ Installation Fasteners Attached Dimensions

Unit: mm[in.]



■ Cable Attached Dimensions

Unit:mm[in.]

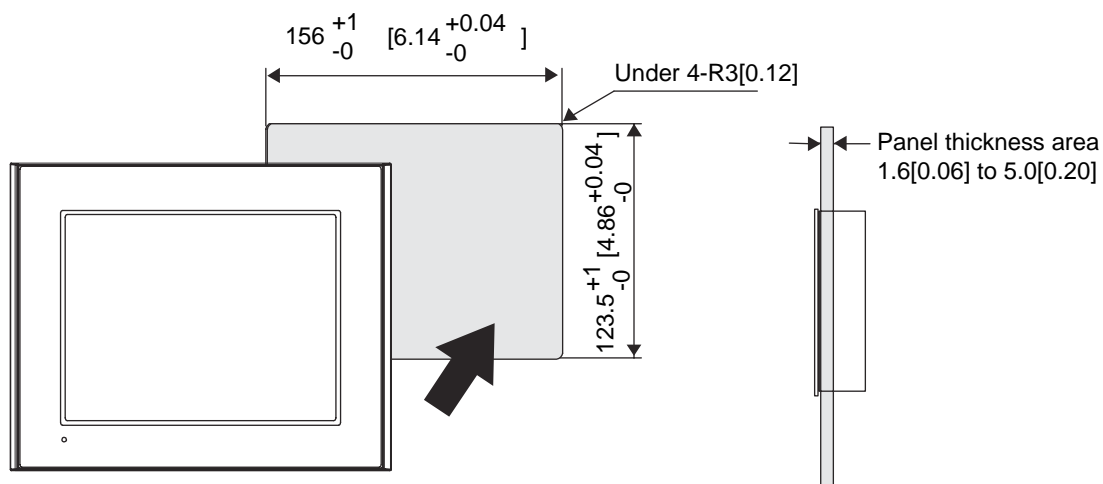


NOTE

- Depending on the type of connection cable used the dimensions shown above will change. The dimensions given here are representative values and are intended for reference only.

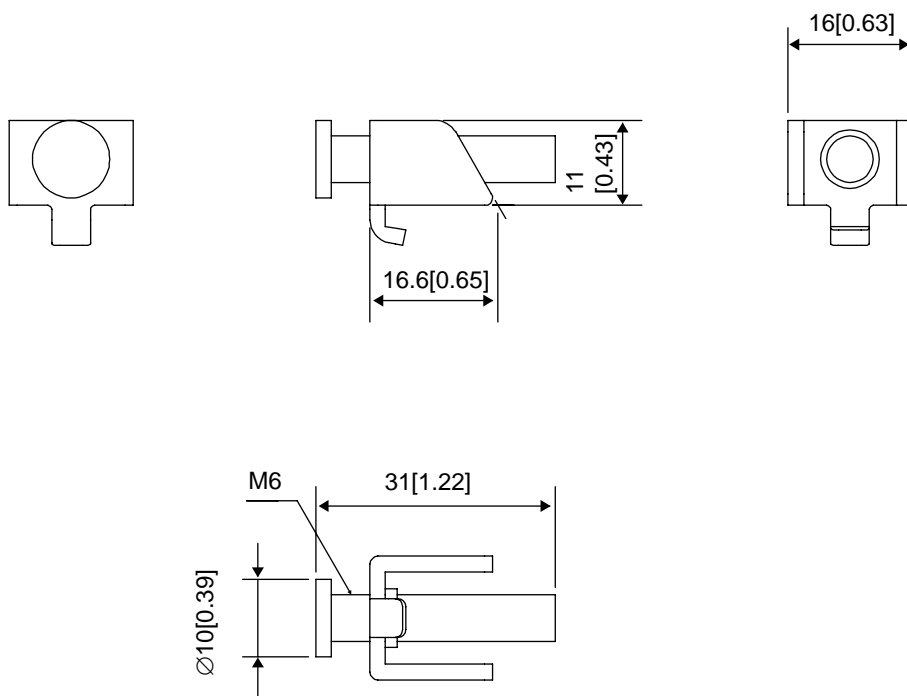
■ Panel Cut Dimensions

Unit: mm[in.]



■ Installation Fasteners

Unit: mm[in.]



3.2 XBT OT4320 Series

3.2.1 General Specifications

■ Electrical Specifications

Power Supply	Input Voltage	24 VDC
	Rated Voltage	19.2 to 28.8 VDC
	Allowable Voltage Drop	10ms (max.)
	Power Consumption	22W (max.)
	In-Rush Current	30A (max.)
Voltage Endurance		1000 VAC 20mA for 1 minute (between charging and FG terminals)
Insulation Resistance		500 VDC 10M Ω (min.) (between charging and FG terminals)

■ Environmental Specifications

Physical	Surrounding Air Temperature	0 to +50°C [32 to 122°F]
	Storage Temperature	-20 to +60°C [-4 to 140°F]
	Ambient Humidity	10 to 90% RH (Wet bulb temperature: 39°C[102°F] max. - no condensation.)
	Storage Humidity	10 to 90% RH (Wet bulb temperature: 39°C[102°F] max. - no condensation.)
	Dust	0.1mg/m ³ and below (non-conductive levels)
	Pollution Degree	For use in Pollution Degree 2 environment
	Atmosphere	Free of corrosive gases
	Air Pressure Vibration Resistance	800 to 1114hPa (2,000m[6557.4ft] above sea-level and below)
Mechanical	Vibration Resistance	IEC61131-2 compliant 5 to 9Hz single-amplitude 3.5mm[0.14in] 9 to 150Hz constant acceleration 9.8m/s ² X,Y,Z directions for 10 cycle (100 minute)
	Concussion Resistance	IEC61131-2 compliant (147m/s ² X,Y,Z directions for 3 times)
Electrical	Noise Immunity	Noise Voltage: 1000V _{P-P} Pulse Duration: 1 μ s Rise Time: 1ns (via noise simulator)
	Electrostatic Discharge Immunity	6kV (complies with EN 61000-4-2 Level 3)

■ Structural Specifications

Installation	Grounding	Grounding resistance of 100Ω 2mm ² or thicker wire, or your country's applicable standard. (Same for FG and SG terminals)
	Structure*1	Rating: Equivalent to IP65f NEMA #250 TYPE 4X/13 (Front surface at panel embedding) Feature size: All-in-one Installation configuration: Panel embedding
	Cooling Method	Natural air circulation
	Weight Approx.	1.8kg[4lb]max. (unit only)
	External Dimensions	W215mm[8.47in] X H170mm[6.69in] X D60mm[2.36in]
	Panel Cut Dimensions	W204.5mm[8.05in] X H159.5mm[6.28in]*2 Panel thickness: 1.6mm[0.06in] to 10.0mm[0.39in]

*1. The front face of the OT unit, installed in a solid panel, has been tested using conditions equivalent to the OT standards shown in the specification. Even though the OT unit's level of resistance is equivalent to these standards, oils that should have no effect on the OT can possibly harm the unit. This can occur in areas where either vaporized oils are present, or where low viscosity cutting oils are allowed to adhere to the unit for long periods of time. If the OT's front face protection sheet is peeled off, these conditions can lead to the ingress of oil into the OT and separate protection measures are suggested.

Also, if non-approved oils are present, they may cause deformation or corrosion of the front panel's plastic cover. Therefore, prior to installing the OT be sure to confirm the type of conditions that will be present in the OT's operating environment.

If the installation gasket is used for a long period of time, or if the unit and its gasket are removed from the panel, the original level of the protection can be compromised. To maintain the original protection level, be sure to replace the installation gasket regularly.

*2. As for dimensional tolerance, ensure everything is +1/-0mm[+0.04/-0in] and R in angles are below R3[0.12].

3.2.2 Performance Specifications

■ Performance Specifications

Application* ¹		FLASH EPROM 32MB
Data Backup		SRAM 512KB
		Used lithium battery for backup memory
Interface	Serial Interface	COM1: RS-232C Asynchronous Transmission Data Length: 7 bit/8 bit Parity: none, Odd or Even Stop Bit: 1bit/2bit Data transmission Speed: 2400bps to 115.2Kbps Connector: D-SUB-9pin plug
		COM2: RS-422/485 Asynchronous Transmission Data Length: 7 bit/8 bit Parity: none, Odd or Even Stop Bit: 1bit/2bit Data transmission Speed: 2400bps to 115.2Kbps 187.5Kbps (MPI) Connector: DSUB-9pin plug
	USB Host Interface	Conforms to USB1.1. (TYPE-A connector) x 1 Power Supply Voltage: 5 VDC \pm 5% Output Current: 500mA (Max.) Communication Distance: 5m[16.4ft] (Max.)
Clock Accuracy* ²		\pm 65 seconds/ month (at room temperature)

*1. Active capacity.

*2. At normal operating temperatures and conditions, with the OT operating from its lithium battery, the degree of error is 65 seconds per month. Variations in operating conditions and battery life can cause this error to vary from -380 to +90 seconds per month. For systems where this degree of error will be a problem, the user should be sure to monitor this error and make adjustments when required.

NOTE

- When the message “RAAA051 Low battery” is displayed, supply power to the display unit and fully charge the battery. The battery charges within 24 hours to a level which allows backup operation. Completing a full charge requires about 96 hours (4 days).
- A Lithium battery's lifetime is: 10 years when the battery's ambient temperature is 40°C [104°F] or less. 4.1 years when the battery's ambient temperature is 50°C [122°F] or less. 1.5 years when the battery's ambient temperature is 60°C [140°F] or less.

When used for backup:

Approximately 100 days, with a fully charged battery.

Approximately 6 days, with a half-charged battery.

■ Display Specifications

Display Type		TFT Color LCD
Resolution		W640 X H480 pixels
Dot pitch		W0.237mm[0.01in] X H0.237mm[0.01in]
Effective Display Area		W151.68mm[5.97in] X H113.76mm[4.48in]
Color/Shade level		256 Colors (No blink) 64 Colors (Enables blink feature)
Backlight		CCFL (Not replaceable.)
Brightness control		8 levels of adjustment available via touch panel
Contrast Adjustment		Not applicable
Display Service Life		MTBF value: 50,000hrs. or more (Backlight display service life is not included.)
Backlight Service Life		50,000hrs. or more (at 25°C[77°F] and continuous operation - period until backlight brightness decreases to 50% or backlight starts to flicker)
Language Fonts		Japanese: 6962 (JIS Standards 1 & 2) (including 607 non-kanji characters) ANK: 158 (Korean fonts, Simplified Chinese and Taiwanese traditional Chinese fonts are downloadable.
Text composition	Character Sizes	Standard font: 8X8, 8X16, 16X16 and 32X32 dot fonts Stroke font: 6 to 127dot fonts
	Font Sizes	Standard font: Width can be expanded up to 8 times. Height can be expanded up to 8 times ^{*1}
Text	8 X 8 dots	80 Char. X 60 rows
	8 X 16 dots	80 Char. X 30 rows
	16 X 16 dots	40 Char. X 30 rows
	32 X 32 dots	20 Char. X 15 rows

*1. Font Sizes can be set up by software.

■ Touch Panel Specifications

Type	Resistive Film (analog)
Resolution	1024 X 1024
Service Life	1,000,000 times or more

3.2.3 Interface Specifications

This section describes the specifications of each interface of the OT Series unit.

DANGER

ELECTRIC SHOCK

- The OT unit's serial port is not isolated. When the host (PLC) unit is also not isolated, be sure to connect the #5 SG (Signal Ground) terminal to reduce the risk of damaging the RS-232C/RS-422 circuit.
- When connecting an external device to the OT using the SG terminal, be sure to check that no short-circuit loop is created when you setup the system.
- The same type of connector is used for the different signal types on COM1 and COM2 of the OT. Be careful not to mistake one for the other. Connecting them incorrectly disables communication.

Failure to follow these instructions will result in death or serious injury.

NOTE

- Connecting the RS-232C isolation unit (XBTZGI232) to COM1 enables isolation if needed.

■ Serial Interfaces

◆ Serial Interface (COM1)

This interface is used to connect an RS-232C serial cable. A 9-pin SUB-D plug connector is used.

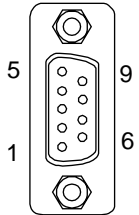
OT unit side

OT Connector	XM2C-0942-502LX (OMRON Co.)
Interfit Bracket	#4-40 inch screws are used.

Cable side

Recommended Cable Connector	XM2D-0901 (OMRON Co.)
Recommended Cable Cover	XM2S-0913 (OMRON Co.)
Recommended Jack Screw	XM2Z-0073 (OMRON Co.)

RS-232C

Pin Arrangement	Pin No.	RS-232C		
		Signal Name	Direction	Meaning
 (OT unit side)	1	CD	Input	Carrier Detect
	2	RD(RXD)	Input	Receive Data
	3	SD(TXD)	Output	Send Data
	4	ER(DTR)	Output	Data Terminal Ready
	5	SG	-	Signal Ground
	6	DR(DSR)	Input	Data Set Ready
	7	RS(RTS)	Output	Request to Send
	8	CS(CTS)	Input	Send Possible
	9	CI(RI)/VCC	Input	Called status display +5V±5% Output 0.25A *1
	Shell	FG	-	Frame Ground (Common with SG)

*1 The RI/VCC selection for Pin #9 is switched via software. The VCC output is not protected against overcurrent. To prevent damage or a unit malfunction, use only the rated current.

◆ Serial Interface (COM2)

This interface is used to connect an RS-422/485 serial cable. A 9-pin SUB-D plug connector is used.

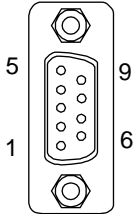
OT unit side

OT Connector	XM2C-0942-502LX (OMRON Co.)
Interfit Bracket	#4-40 inch screws are used.

Cable side

Recommended Cable Connector	XM2D-0901 (OMRON Co.)
Recommended Cable Cover	XM2S-0913 (OMRON Co.)
Recommended Jack Screw	XM2Z-0073 (OMRON Co.)

RS-422/485

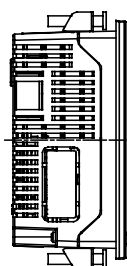
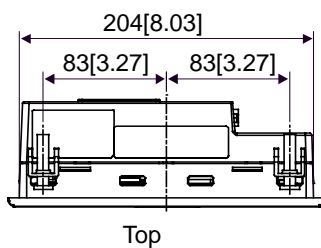
Pin Arrangement	Pin No.	RS-422/485		
		Signal Name	Direction	Meaning
 (OT unit side)	1	RDA	Input	Receive Data A(+)
	2	RDB	Input	Receive Data B(-)
	3	SDA	Output	Send Data A(+)
	4	ERA	Output	Data Terminal Ready A(+)
	5	SG	-	Signal Ground
	6	CSB	Input	Send Possible B(-)
	7	SDB	Output	Send Data B(-)
	8	CSA	Input	Send Possible A(+)
	9	ERB	Output	Data Terminal Ready B(-)
	Shell	FG	-	Frame Ground (Common with SG)

3.2.4 Dimensions

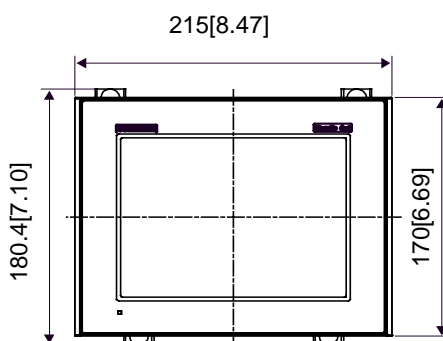
The following dimensions apply to the XBT OT4320 models.

■ Installation Fasteners Attached Dimensions

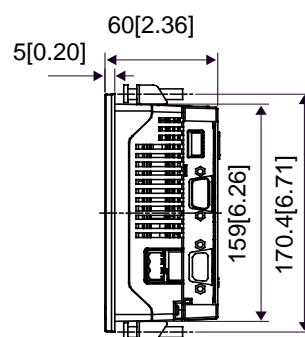
Unit: mm[in.]



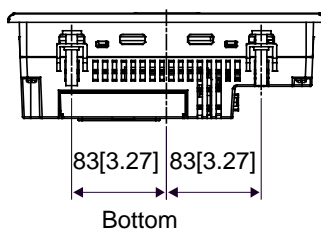
Left side



Front



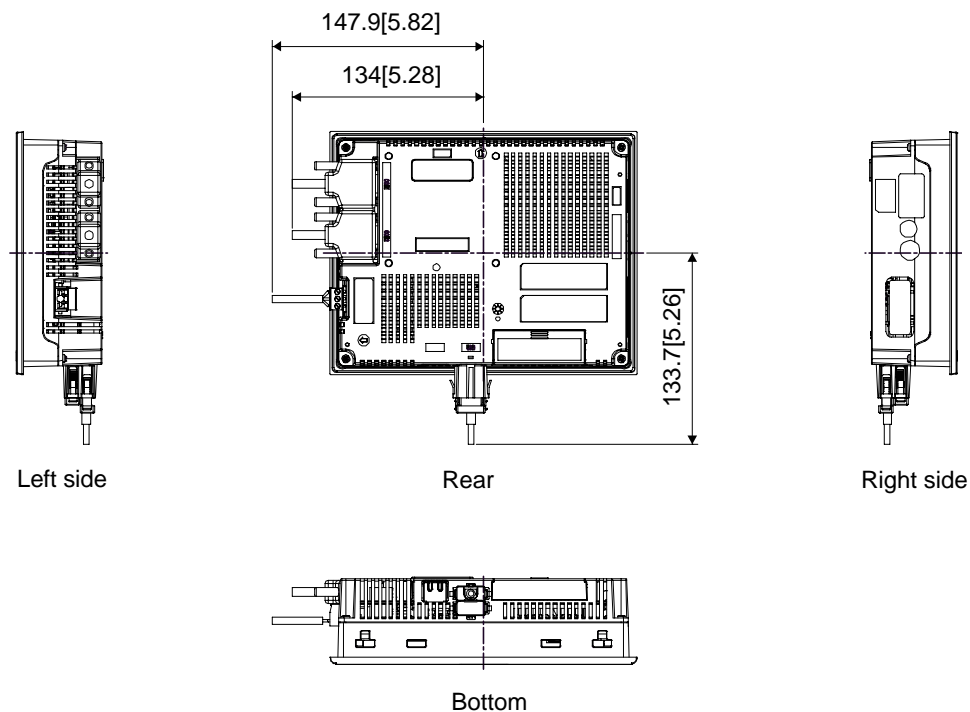
Right side



Bottom

■ Cable Attached Dimensions

Unit:mm[in.]

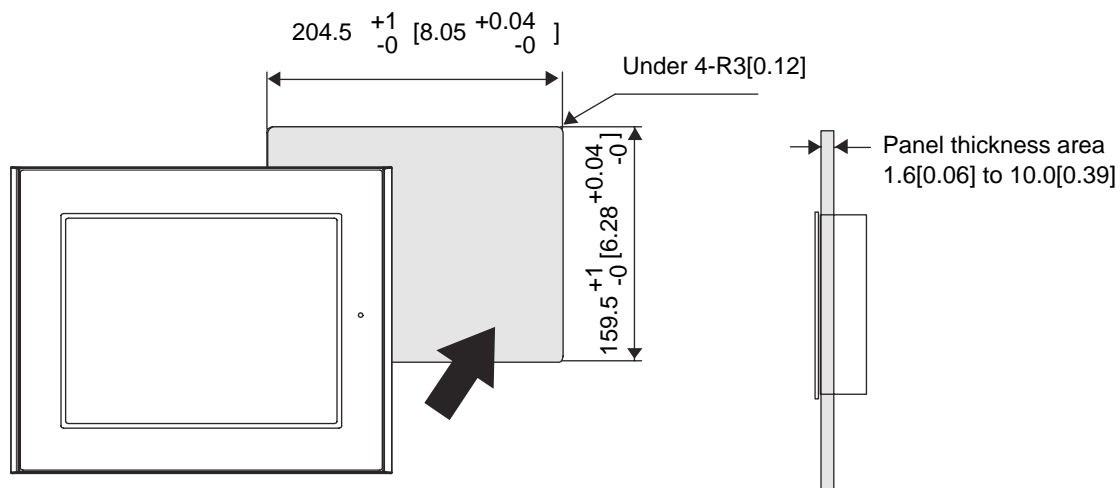


NOTE

- Depending on the type of connection cable used the dimensions shown above will change. The dimensions given here are representative values and are intended for reference only.

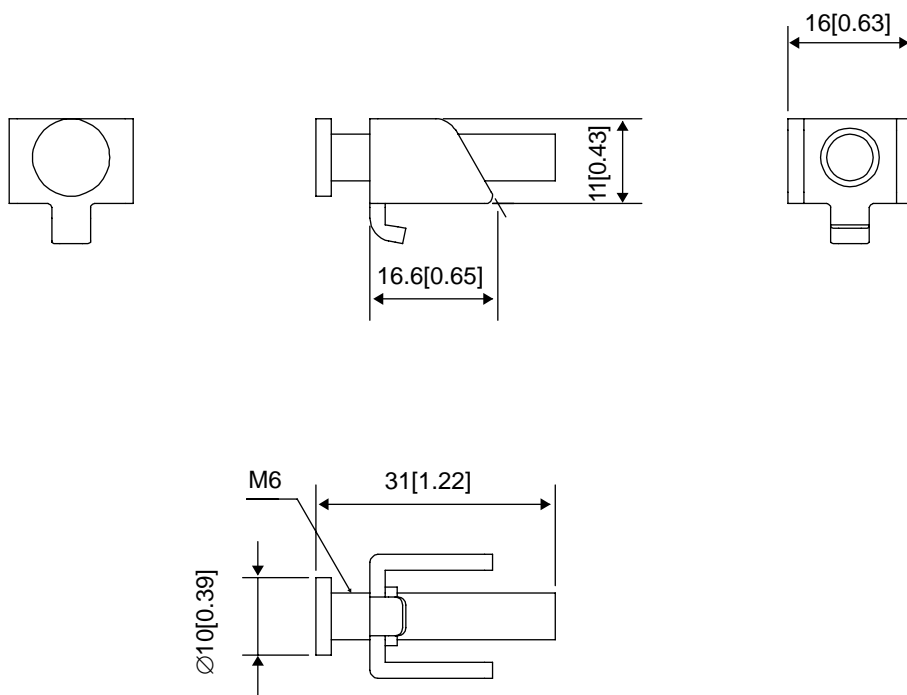
■ Panel Cut Dimensions

Unit: mm[in.]



■ Installation Fasteners

Unit: mm[in.]



3.3 XBT OT5220/5320 Series

3.3.1 General Specifications

■ Electrical Specifications

Power Supply	Input Voltage	24 VDC
	Rated Voltage	19.2 to 28.8 VDC
	Rated frequency	-
	Rated frequency range	-
	Allowable Voltage Drop	10ms or less
	Power Consumption	45W or less
	In-Rush Current	30A or less
Voltage Endurance		1000 VAC 20mA 1minute
Insulation Resistance		500 VDC 10M Ω (min.) (between charging and FG terminals)

■ Environmental Specifications

Physical	Surrounding Air Temperature	0 to +50°C [32 to 122°F]
	Storage Temperature	-20 to +60°C [-4 to 140°F]
	Ambient Humidity	10 to 90% RH (Wet bulb temperature: 39°C[102°F] max. - no condensation.)
	Storage Humidity	10 to 90% RH (Wet bulb temperature: 39°C[102°F] max. - no condensation.)
	Dust	0.1mg/m ³ and below (non-conductive levels)
	Pollution Degree	For use in Pollution Degree 2 environment
	Atmosphere	Free of corrosive gases
Mechanical	Air Pressure Vibration Resistance	800 to 1114hPa (2,000m[6557.4ft] above sea-level and below)
	Vibration Resistance	IEC61131-2 compliant 5 to 9Hz single-amplitude 3.5mm[0.14in] 9 to 150Hz constant acceleration 9.8m/s ² X,Y,Z directions for 10 cycle (100 minute)
Electrical	Concussion Resistance	IEC61131-2 compliant (147m/s ² X,Y,Z directions for 3 times)
	Noise Immunity	Noise Voltage: 1000V _{P-P} (DC model) 1500V _{P-P} (AC model) Pulse Duration: 1 μ s Rise Time: 1ns (via noise simulator)
Electrostatic Discharge Immunity		6kV (complies with EN 61000-4-2 Level 3)

■ Structural Specifications

Installation	Grounding	Grounding resistance of 100Ω 2mm ² or thicker wire, or your country's applicable standard. (Same for FG and SG terminals)
	Structure *1	Rating: Equivalent to IP65f NEMA #250 TYPE 4X/13 (Front surface at panel embedding) Feature size: All-in-one Installation configuration: Panel embedding
	Cooling Method	Natural air circulation
	Weight Approx.	2.5kg[5.5lb] max. (unit only)
	External Dimensions	W270.5mm[10.65in] X H212.5mm[8.37in] X D57mm[2.24in]
	Panel Cut Dimensions	W259mm[10.20in] X H201mm[7.91in]*2 Panel thickness: 1.6mm[0.06in] to 10.0mm[0.39in]

- *1. The front face of the OT unit, installed in a solid panel, has been tested using conditions equivalent to the standards shown in the specification. Even though the OT unit's level of resistance is equivalent to these standards, oils that should have no effect on the OT can possibly harm the unit. This can occur in areas where either vaporized oils are present, or where low viscosity cutting oils are allowed to adhere to the unit for long periods of time. If the OT's front face protection sheet is peeled off, these conditions can lead to the ingress of oil into the OT and separate protection measures are suggested.
- Also, if non-approved oils are present, they may cause deformation or corrosion of the front panel's plastic cover. Therefore, prior to installing the OT be sure to confirm the type of conditions that will be present in the OT's operating environment.
- If the installation gasket is used for a long period of time, or if the unit and its gasket are removed from the panel, the original level of the protection can be compromised. To maintain the original protection level, be sure to replace the installation gasket regularly.
- *2. As for dimensional tolerance everything $+1/-0\text{mm}[+0.04/-0\text{in}]$ and R in angle are below R3[0.12].

3.3.2 Performance Specifications

■ Performance Specifications

Application *1		FLASH EPROM 32MB
Data Backup		SRAM 512KB
		Used lithium battery for backup memory
Interface	Serial Interface	COM1: RS-232C Asynchronous Transmission Data Length: 7 bit/8 bit Parity: none, Odd or Even Stop Bit: 1bit/2bit Data transmission Speed: 2400bps to 115.2Kbps Connector: D-SUB-9pin plug
		COM2: RS-422/485 Asynchronous Transmission Data Length: 7 bit/8 bit Parity: none, Odd or Even Stop Bit: 1bit/2bit Data transmission Speed: 2400bps to 115.2Kbps (RS422) 187.5Kbps (MPI) Connector: DSUB-9pin plug
	USB Host Interface	Complies with USB1.1. (TYPE-A connector) x 1 Power Supply Voltage: 5 VDC \pm 5% Output Current: 500mA (Max.) Communication Distance: 5m[16.4ft] (Max.)
	CF Card Interface	Compact Flash CF Card Slot (TYPE-II)
Clock Accuracy *2		\pm 65 seconds/ month (at room temperature)

*1. It is user active capacity.

*2. The OT's internal clock has a slight error. At normal operating temperatures and conditions, with the OT operating from its lithium battery, the degree of error is 65 seconds per month. Variations in operating conditions and battery life can cause this error to vary from -380 to +90 seconds per month. For systems where this degree of error will be a problem, the user should be sure to monitor this error and make adjustments when required.

NOTE

- When the message "RAAA051 Low battery" is displayed, supply power to the display unit and fully charge the battery. The battery charges within 24 hours to a level which allows backup operation. Completing a full charge requires about 96 hours (4 days).
- A Lithium battery's lifetime is: 10 years when the battery's ambient temperature is 40°C [104°F] or less. 4.1 years when the battery's ambient temperature is 50°C [122°F] or less. 1.5 years when the battery's ambient temperature is 60°C [140°F] or less.

When used for backup:

Approximately 100 days, with a fully charged battery.

Approximately 6 days, with a half-charged battery.

■ Display Specifications

		XBT OT5220	XBT OT5320
Display Type		Color LCD	TFT Color LCD
Resolution		W640 X H480 pixels	
Dot pitch		W0.33mm[0.01in] X H0.33mm[0.01in]	
Effective Display Area		W211.2mm[8.31in] X H158.4mm[6.24in]	
Color/Shade level		16 Colors	256 Colors (No blink) 64 Colors (Enables blink feature)
Backlight		CCFL (Not replaceable)	
Brightness control		8 levels of adjustment available via touch panel	
Contrast Adjustment		Not applicable	
Display Service Life		MTBF value: 50,000hrs. or more (Backlight display service life is not included.)	
Backlight Service Life		50,000hrs. or more (at 25°C[77°F] and continuous operation - period until backlight brightness decreases to 50% or backlight starts to flicker)	
Language Fonts		Japanese: 6962 (JIS Standards 1 & 2) (including 607 non-kanji characters) ANK: 158 (Korean fonts, Simplified Chinese and Taiwanese traditional Chinese fonts are downloadable.)	
Text composition	Character Sizes	Standard font: 8X8, 8X16, 16X16 and 32X32 dot fonts Stroke font: 6 to 127dot fonts	
	Font Sizes	Standard font: Width can be expanded up to 8 times. Height can be expanded up to 8 times ^{*1}	
Text	8 X 8 dots	80 Char. X 60 rows	
	8 X 16 dots	80 Char. X 30 rows	
	16 X 16 dots	40 Char. X 30 rows	
	32 X 32 dots	20 Char. X 15 rows	

*1. Font Sizes can be set up by software.

■ Touch Panel Specifications

Type	Resistive Film (analog)
Resolution	1024 X 1024
Service Life	1,000,000 times or more

3.3.3 Interface Specifications

This section describes the specifications of each interface of the OT Series unit.

DANGER

ELECTRIC SHOCK

- The OT unit's serial port is not isolated. When the host (PLC) unit is also not isolated, be sure to connect the #5 SG (Signal Ground) terminal to reduce the risk of damaging the RS-232C/RS-422 circuit.
- When connecting an external device to the OT using the SG terminal, be sure to check that no short-circuit loop is created when you setup the system.
- The same type of connector is used for the different signal types on COM1 and COM2 of the OT. Be careful not to mistake one for the other. Connecting them incorrectly disables communication.

Failure to follow these instructions will result in death or serious injury.

NOTE

- Connecting the RS-232C isolation unit (XBTZGI232) to COM1 enables isolation if needed.

■ Serial Interfaces

◆ Serial Interface (COM1)

This interface is used to connect an RS-232C serial cable. A 9-pin SUB-D plug connector is used.

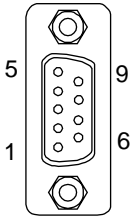
OT unit side

OT Connector	XM2C-0942-502L (OMRON Co.)
Interfit Bracket	#4-40 inch screws are used.

Cable side

Recommended Cable Connector	XM2D-0901 (OMRON Co.)
Recommended Cable Cover	XM2S-0913 (OMRON Co.)
Recommended Jack Screw	XM2Z-0073 (OMRON Co.)

RS-232C

Pin Arrangement	Pin No.	RS232C		
		Signal Name	Direction	Meaning
 (OT unit side)	1	CD	Input	Carrier Detect
	2	RD(RXD)	Input	Receive Data
	3	SD(TXD)	Output	Send Data
	4	ER(DTR)	Output	Data Terminal Ready
	5	SG	-	Signal Ground
	6	DR(DSR)	Input	Data Set Ready
	7	RS(RTS)	Output	Request to Send
	8	CS(CTS)	Input	Send Possible
	9	CI(RI)/VCC	Input	Called status display +5V±5% Output 0.25A *1
	Shell	FG	-	Frame Ground (Common with SG)

*1 The RI/VCC selection for Pin #9 is switched via software. The VCC output is not protected against overcurrent. To prevent damage or a unit malfunction, use only the rated current.

◆ Serial Interface (COM2)

This interface is used to connect an RS-422/485 serial cable. A 9-pin SUB-D plug connector is used.

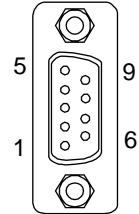
OT unit side

OT Connector	XM2C-0942-502LX (OMRON Co.)
Interfit Bracket	#4-40 inch screws are used.

Cable side

Recommended Cable Connector	XM2D-0901 (OMRON Co.)
Recommended Cable Cover	XM2S-0913 (OMRON Co.)
Recommended Jack Screw	XM2Z-0073 (OMRON Co.)

RS-422/485

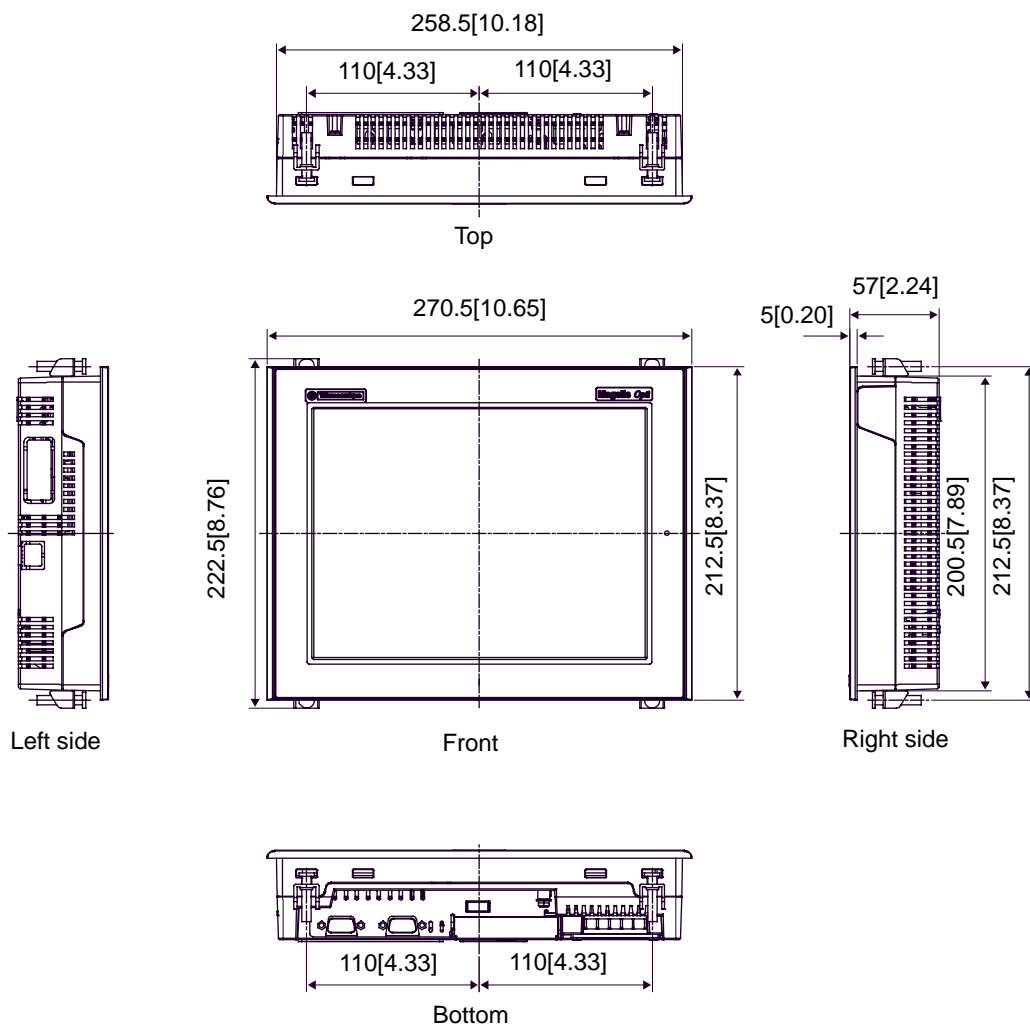
Pin Arrangement	Pin No.	RS-422/485		
		Signal Name	Direction	Meaning
 <p>(OT unit side)</p>	1	RDA	Input	Receive Data A(+)
	2	RDB	Input	Receive Data B(-)
	3	SDA	Output	Send Data A(+)
	4	ERA	Output	Data Terminal Ready A(+)
	5	SG	-	Signal Ground
	6	CSB	Input	Send Possible B(-)
	7	SDB	Output	Send Data B(-)
	8	CSA	Input	Send Possible A(+)
	9	ERB	Output	Data Terminal Ready B(-)
	Shell	FG	-	Frame Ground (Common with SG)

3.3.4 Dimensions

The following dimensions apply to the XBT OT5220/5320 models.

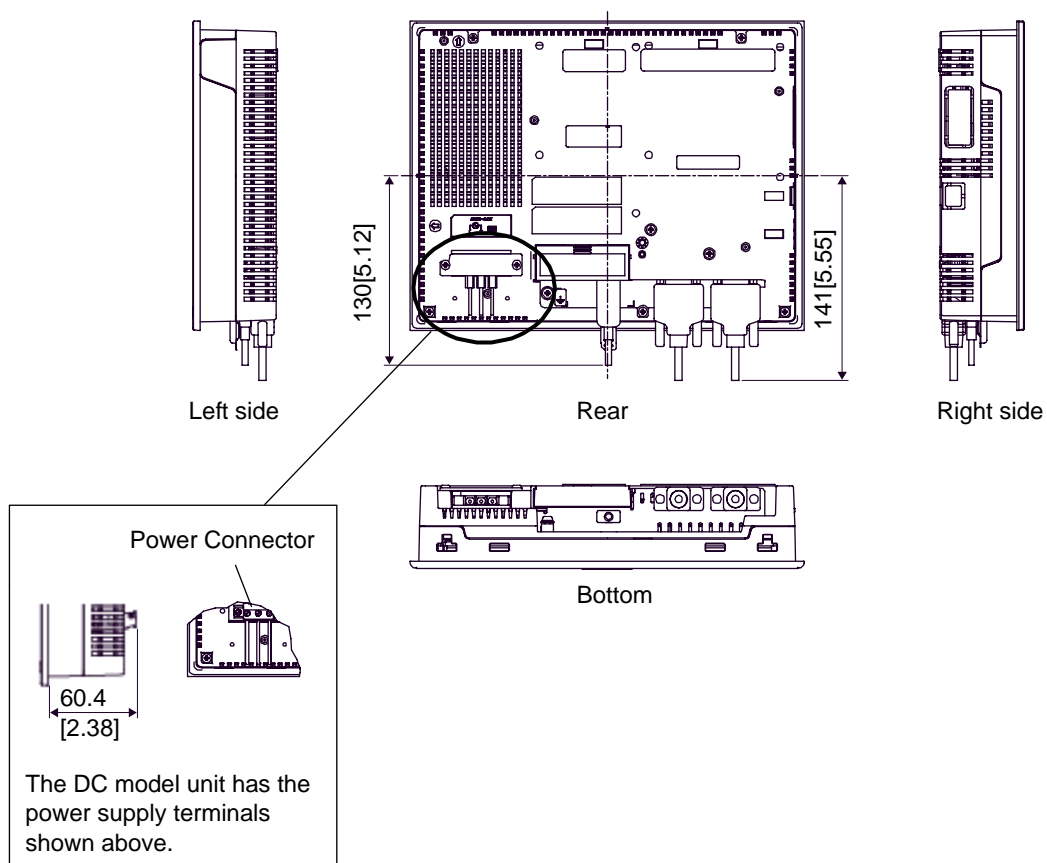
■ Installation Fasteners Attached Dimensions

Unit: mm[in.]



■ Cable Attached Dimensions

Unit:mm[in.]

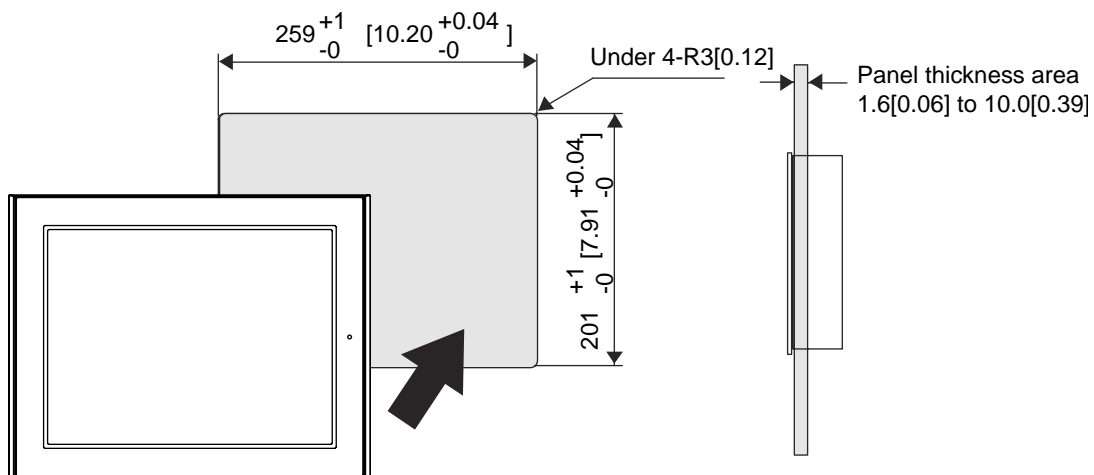


NOTE

- Depending on the type of connection cable used the dimensions shown above will change. The dimensions given here are representative values and are intended for reference only.

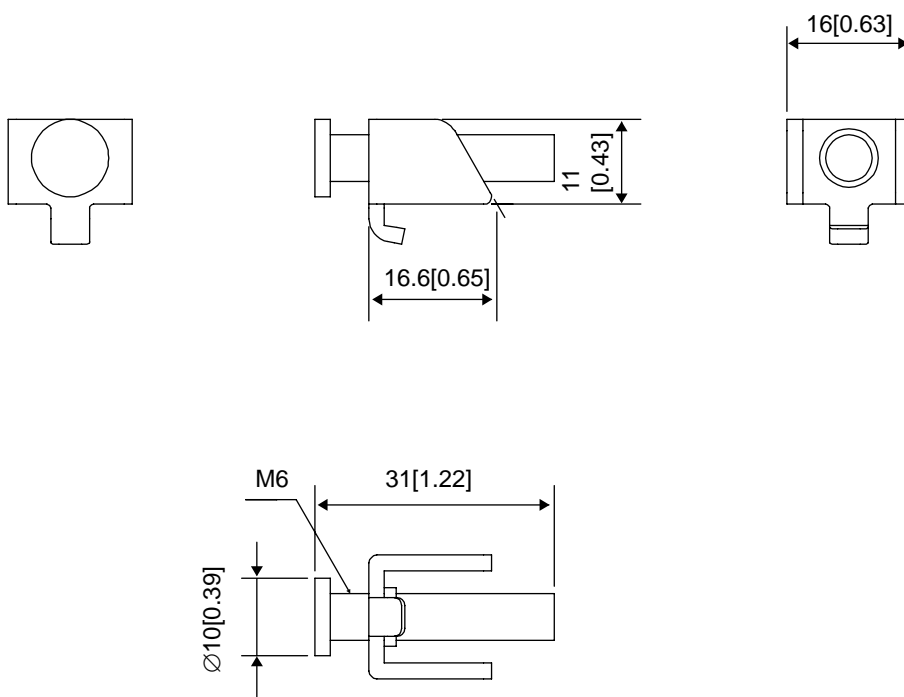
■ Panel Cut Dimensions

Unit: mm[in.]



■ Installation Fasteners

Unit: mm[in.]



4

Installation and Wiring

1. Installation
2. Wiring Precautions
3. CF Card Insertion/Removal
4. USB Cable Clamp Attachment/Removal

This chapter describes the installation and cable arrangement of the OT Series and its peripheral equipment.

4.1 Installation

This section describes the procedures and precautions for installing the OT Series units.

■ Check the Installation Gasket's Seating

It is strongly recommended that you use the installation gasket, since it absorbs vibration in addition to repelling water.

SEE →

5.3 *Replacing the Installation Gasket (page 5-3)* for the procedure for attaching the installation gasket.

IMPORTANT

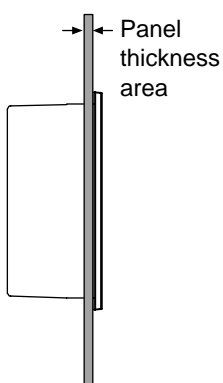
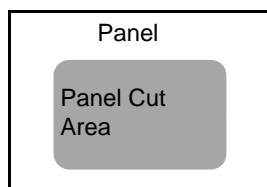
- Before installing the OT into a cabinet or panel, check that the installation gasket is securely attached to the unit.
- A gasket which has been used for a long period of time may have scratches or dirt on it, and could have lost much of its dust and drip resistance. Be sure to change the gasket periodically (or when scratches or dirt become visible).

■ Creating a Panel Cut

Create the correct sized opening required to install the OT, using the installation dimensions given.

Determine the panel thickness according to the panel thickness range with due consideration of panel strength.

SEE →



OT2110/2210 Series

■ *Panel Cut Dimensions (page 3-11)*

OT4320 Series

■ *Panel Cut Dimensions (page 3-21)*

OT5220/5320 Series

■ *Panel Cut Dimensions (page 3-31)*

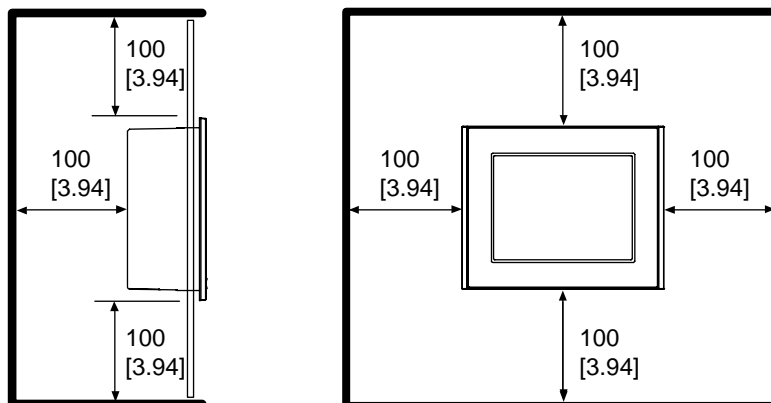
NOTE

- Check that the installation panel or cabinet's surface is flat, in good condition and has no jagged edges. Also, if desired, metal reinforcing strips can be attached to the inside of the panel, near the Panel Cut, to increase the panel's strength.

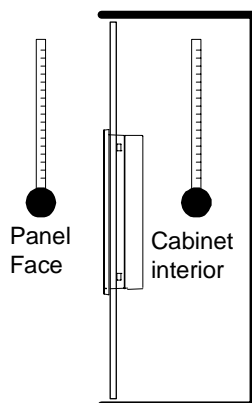
■ Installation Requirement

- For easier maintenance, operation, and improved ventilation, be sure to install the OT at least 100mm [3.94in] away from adjacent structures and other equipment.

Unit: mm[in.]

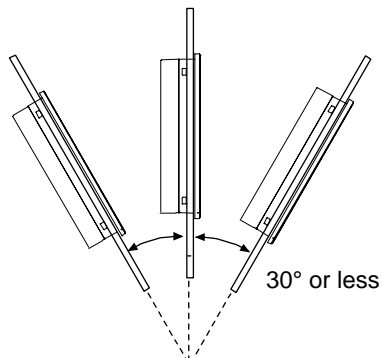


- Be sure that the ambient operation temperature and the ambient humidity are within their designated ranges. (Ambient operation temperature: 0 to 50°C [-32 to 122°F], Ambient humidity: 10 to 90%RH, Wet bulb temperature: 39°C[102°F] max.) When installing the OT on the panel of a cabinet or enclosure, “Ambient operation temperature” indicates both the panel face and cabinet or enclosure’s internal temperature.



- Be sure that heat from surrounding equipment does not cause the OT to exceed its standard operating temperature.

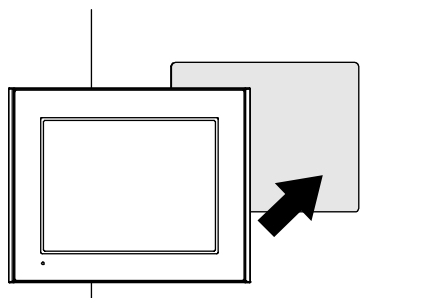
- When installing the OT in a slanted panel, the panel face should not incline more than 30°.



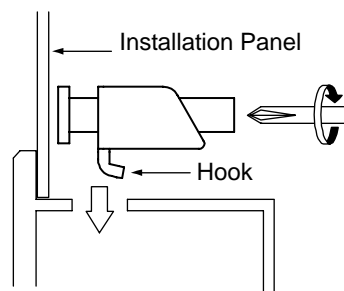
- When installing the OT in a slanted panel, and the panel face inclines more than 30°, the ambient temperature must not exceed 40°C[104°F]. You may need to use forced air cooling (fan, A/C) to ensure the ambient operating temperature is 40°C[104°F] or below.
- When installing the OT vertically, position the unit so that the Power Input Terminal Block is also vertical.

■ Installing the OT

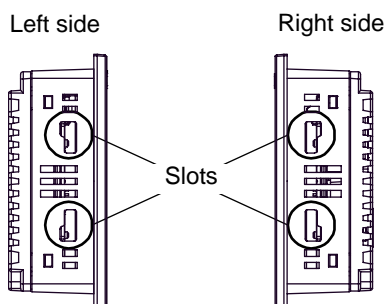
- (1) Insert the OT into the panel cut, as shown.



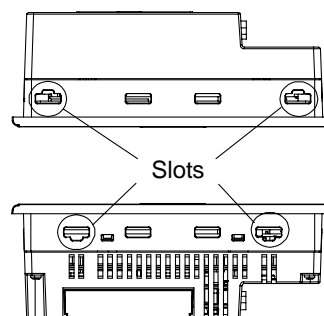
- (2) Mount four pieces of the panel-mounting brackets on the right and left sides, or the top and bottom sides of the panel to secure the panel.



Models that have the mounting bracket holes on the sides

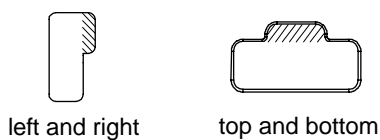


Models that have the mounting bracket holes on the top and bottom

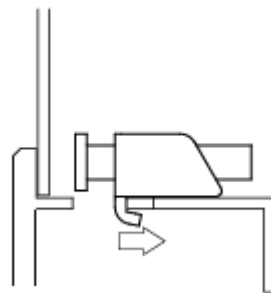


IMPORTANT

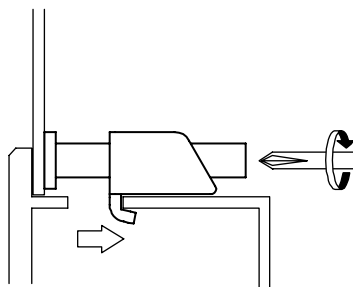
- Be sure to insert installation fasteners in the recessed portion of a installation fasteners hole. (Refer to the following figure) If the fasteners are not correctly attached, the OT unit may shift or fall out of the panel.



- (3) Insert each of the fasteners shown below.
Be sure to pull the fastener back until it is
flush with the rear of the attachment hole.



- (4) Use a Phillips screwdriver to tighten each
fastener screw and secure the OT in place.




IMPORTANT

- Tightening the screws with too much force can damage the OT unit's plastic case.
- The torque required to tighten these screws is 0.5 N.m(4.4 lb-in).

4.2 Wiring Precautions

This section describes the procedures and precautions for wiring power cords.

4.2.1 Connecting the Power Cord

 **WARNING**

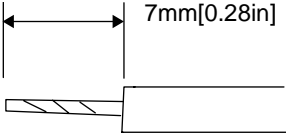
POWER, WIRING, AND GROUNDING HAZARDS

- Be sure the 24 VDC power is OFF when wiring to the power terminals of the unit.
- The unit uses only 24 VDC power. Using any other level of power can damage both the power supply and the unit.
- Since the unit is not equipped with a power switch, be sure to connect a power switch to the unit's power supply.
- Be sure to ground the unit's FG terminal.
- When the FG terminal is connected, be sure the wire is grounded. Not grounding the OT unit will result in excess noise and vibration. OT Series have the SG (signal ground) connection and the FG (frame ground) connection inside. When connecting the SG wire to another device, be sure that the design of the system/connection does not produce a shorting loop.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

■ DC Connection

◆ Power Cord Specifications

Power Cord Diameter	0.75 to 2.5mm ² [0.0009 to 0.0097in ²] (18-12AWG)
Conductor Type	Simple or Twisted Wire
Conductor Length	

IMPORTANT

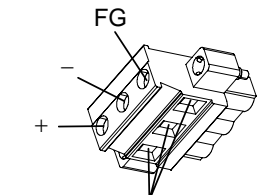
- Use copper conductors only.
- If the Conductor's end (individual) wires are not twisted correctly, the end wires may either short against each other, or against an electrode.

◆ Power Connector (Plug) Specifications

XBT OT2110/2210/4320 Series

	+	24V
	-	0V
	FG	FG Grounding Terminal connected to the OT

XBT OT5220/5320 Series

	+	24V
	-	0V
	FG	FG Grounding Terminal connected to the OT

◆ Wiring

When connecting the Power Cord, use the following items when performing wiring. (Items are made by Phoenix Contact.)

Recommended Driver	SZF 1-0.6x3.5 (1204517)
Recommended Pin Terminals	AI 0.75-8GY (3200519) AI 1-8RD (3200030) AI 1.5-8BK (3200043) AI 2.5-8BU (3200522)
Recommended Pin Terminal Crimp Tool	CRIMPFOX ZA3 (1201882)

◆Connecting the Power Cord

⚠ WARNING**POWER LOSS**

- Remove the connector from the OT unit prior to starting wiring.
- Avoid excessive stress on the power cable to prevent accidental disconnection.
- Securely attach power cables to the panel or cabinet.
- Use the designated torque to tighten the unit's terminal block screws.
- Install and fasten unit on installation panel or cabinet prior to connecting Power Supply and Communication lines.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

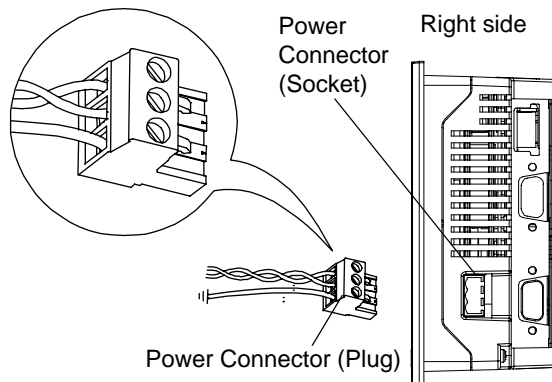
XBT OT2110/2210/4320 Series

- (1) Confirm that the power cord is unplugged from the power supply.
- (2) Remove the power connector (plug) from the main unit when using the OT2110/2210 Series.
(When using OT4320 Series, the power connector (plug) is packaged with other accessories.)
- (3) Strip the membrane of the power cord, twist the wire ends, and connect them to the Power Connector.

IMPORTANT

- Use a flat-blade screwdriver (Size 0.6 X 3.5) to tighten the terminal screws.
The torque required to tighten these screws is 0.5 to 0.6N.m[4.4-5.3 lb-in].
- Do not solder the cable connection.

- (4) Reattach the Power Connector.

**NOTE**

- Be sure to twist the power cords together, up to the power connector.

XBT OT5220/5320 Series

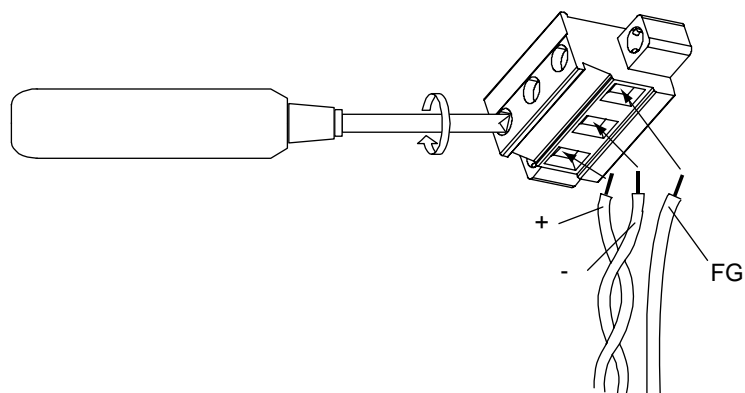
- (1) Confirm that the power cord is unplugged from the power supply.
- (2) Remove the power connector (plug) from the main unit.
- (3) Loosen the three screws in the center of the Power Connector (plug).
- (4) Strip the sheath of the power cord, twist the wire ends, insert them into the bar terminals.
- (5) Fix them with screws.

IMPORTANT

- Use a flat-blade screwdriver (size 0.6 x 3.5) to tighten the terminal screws. The torque required to tighten these screws is 0.5 to 0.6N.m[4.4-5.3 lb-in].
- Do not solder the cable connection.

NOTE

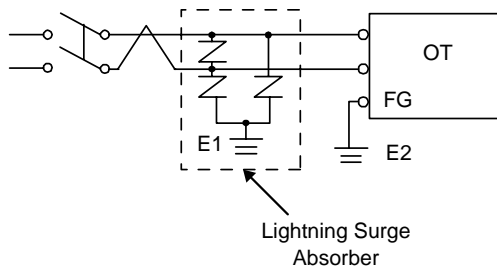
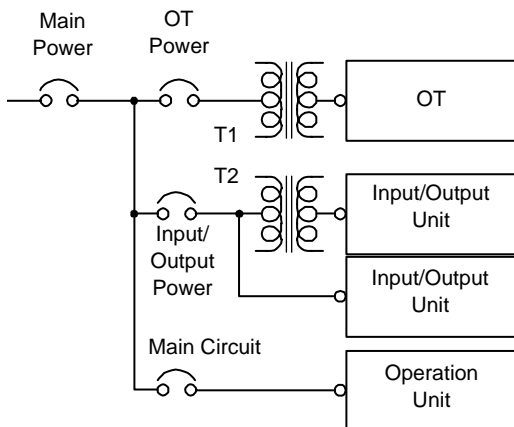
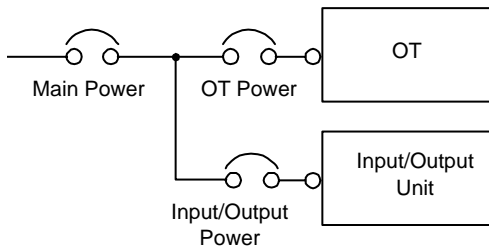
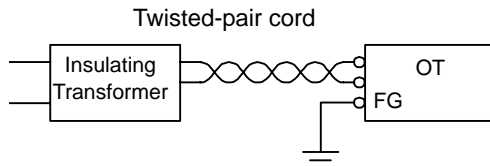
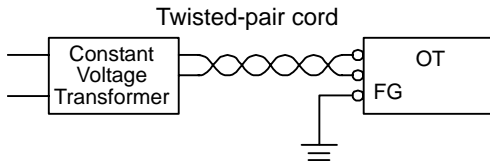
- Be sure to twist the power cords together, up to the power connector.



- (6) Attach the Power Connector (Plug) to the OT and fix it to the OT main unit with right/left tightening screws.

4.2.2 Connecting the Power Supply

This section describes the precautions for supplying a power voltage.



- If the supplied voltage exceeds the OT unit's range, connect a constant voltage transformer.

SEE → Chapter 3 Specifications (page 3-1)

- For between the line and ground, select a power supply that is low in noise. If there is an excess amount of noise, connect a insulating transformer.

IMPORTANT

- Use constant voltage and insulating transformers with capacities exceeding Power Consumption value.
- When supplying power to the OT unit, be sure to separate the input/output and power lines, as shown.
- To increase the noise resistance quality of the power cord, simply twist each power wire before attaching the Ring Terminal.
- The power supply cable must not be bundled or positioned close to main circuit lines (high voltage, high current), or input/output signal lines.
- Connect a lightening surge absorber, as shown in the diagram, to deal with power surges.
- To avoid excess noise, make the power cord as short as possible.
- 24 VDC input unit is must be used with a Class 2 power supply.

IMPORTANT

- Be sure to ground the surge absorber (E1) separately from the OT unit (E2).
- Select a surge absorber that has a maximum circuit voltage greater than that of the peak voltage of the power supply.

4.2.3 Grounding

This section describes the precautions for grounding the OT unit.

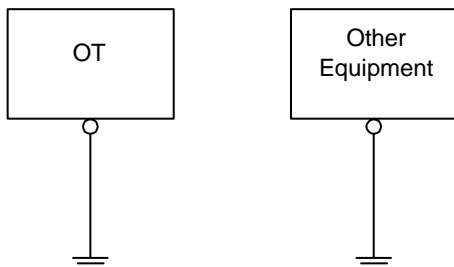
⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Do not use common grounding, since it can lead to an accident or machine breakdown.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

(a) Exclusive Grounding (BEST)

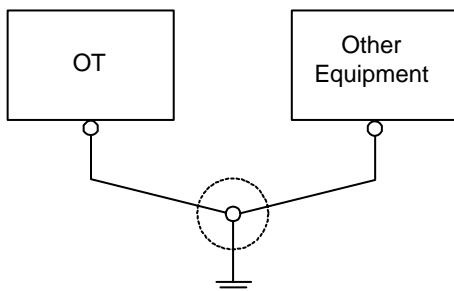


- When supplying power to the OT unit, be sure to separate the input/output and power lines, as shown. [diagram (a)]

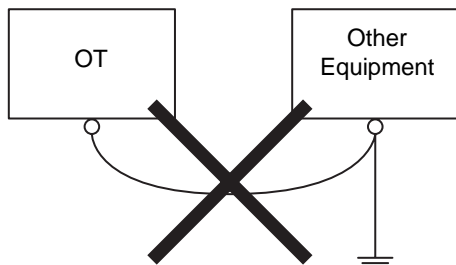
IMPORTANT

- Check that the grounding resistance is 100Ω or less.
- FG and SG terminals are internally connected in the OT. When connecting an external device to the OT using the SG terminal, be sure to check that no short-circuit loop is created when you setup the system.
- The grounding wire should have a cross sectional area greater than 2mm^2 [0.078²]. Create the grounding point as close to the OT unit as possible, and make the wire as short, as possible. When using a long grounding wire, replace the thin wire with a thicker wire, and place it in a duct.

(b) Exclusive Grounding (OK)



(C) Common Grounding (Not OK)



- If exclusive grounding is not possible, use a common grounding point, [diagram (b)]. A D-type grounding or equivalent should be used for the grounding point.

NOTE

- If the equipment does not function properly when grounded, disconnect the ground wire from the FG terminal.

4.2.4 I/O Signal Line Placement

- Input and output signal lines must be separated from the power control cables for operating circuits.
- If this is not possible, use a shielded cable and connect the shield to the OT unit's frame.

4.3 CF Card Insertion/Removal

This section describes how to insert and remove a CF Card.

Precautions

When using the unit and a CF Card, follow the precautions below:

- Prior to inserting or removing a CF Card, be sure to turn the unit's CF Card ACCESS switch OFF and to confirm that the ACCESS lamp is not lit. If you do not, CF Card internal data may be damaged or lost.
- Check that the CF Card DIP switches setting are appropriate.
- While a CF Card is being accessed, NEVER turn OFF or reset the unit, or insert or remove the CF Card. Prior to performing these operations, create and use a special unit application screen that will prevent access to the CF Card.
- Prior to inserting a CF Card, familiarize yourself with the CF Card's front and rear face orientation, as well as the CF Card connector's position. If the CF Card is not correctly positioned when it is inserted into the unit, the CF Card's internal data and the unit may be damaged or broken.
- Be sure to use only CF Cards manufactured by Schneider Electric. Performance can be compromised when using another manufacturer's CF Card.

Once unit data is lost, it cannot be recovered. Since accidental data loss can occur at any time, be sure to back up all unit screen and CF Card data regularly.



CAUTION

CORRUPTED CF CARD DATA

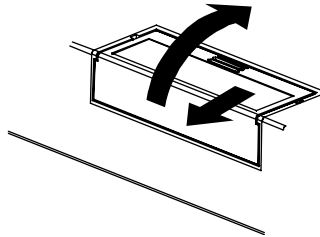
- Be sure to follow the instructions given below to prevent the CF Card's internal data from being destroyed or a CF Card malfunction from occurring:
- DO NOT bend the CF Card.
- DO NOT drop or strike the CF Card against another object.
- Keep the CF Card dry.
- DO NOT touch the CF Card connectors.
- DO NOT disassemble or modify the CF Card.

Failure to follow these instructions can result in injury or equipment damage.

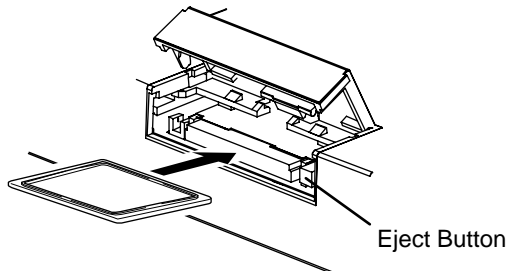
4.3.1 Inserting the CF Card

Use the following steps to insert the CF Card in the OT.

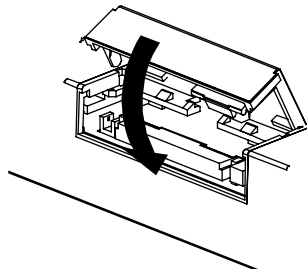
- (1) Pull the CF Card Cover frontward and then open it upward.



- (2) Insert the CF Card in the CF Card Slot, until the eject button is pushed forward.



- (3) Close the cover. (As shown.)



NOTE

- Make sure that the CF Card cover is closed when accessing the CF Card.

4.3.2 Removing the CF Card

Simply reverse the steps shown in the previous “Inserting CF Card” explanation. Prior to pressing the eject button to remove the CF Card, confirm that the CF Card Access LED is turned OFF.

4.3.3 CF Card Handling

The CF Card has a data overwrite limit of approximately 100,000 times. Therefore, be sure to back up all CF Card data regularly to another storage media. (100,000 times assumes the overwriting of 500KB of data in DOS format.) Two methods are available for backing up data. After using either method (1) or method (2), use your personal computer to save your data to the CF Card.

- (1) If your PC is equipped with a PC Card Slot

To view CF Card data on a personal computer, first, insert the CF Card into a CF Card Adapter.

- (2) If your PC is NOT equipped with a PC Card slot

Use a commercially available PC Card Reader, or a CF Card Reader.

4.4 USB Cable Clamp Attachment/Removal

This clamp is used to prevent the USB cable connected to the USB Host Interface on the bottom of the OT unit from being unplugged due to vibration or other causes.

DANGER

ELECTRIC SHOCK

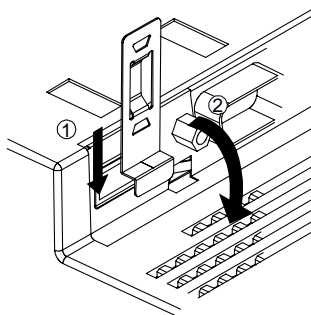
Unplug the unit's Power Cord from the 24 VDC power supply prior to attaching or detaching any connector(s) to or from the unit.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

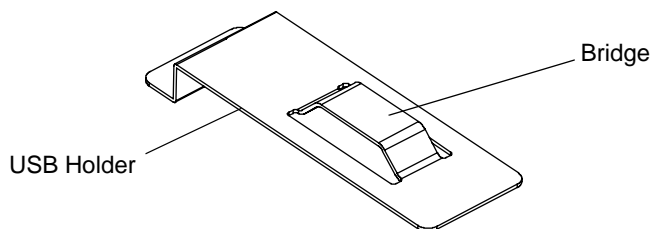
4.4.1 XBT OT2110/2210 Series

■ Attachment

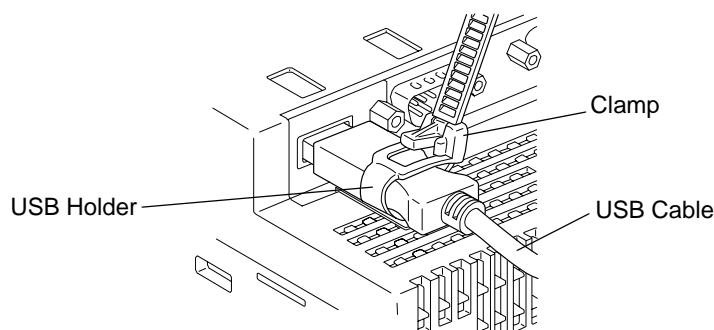
- (1) Insert the USB holder into the slot in front of the OT unit's USB port and pull it down and forward.



- (2) Pass the band of the USB cable clamp through the bridge of the USB holder.

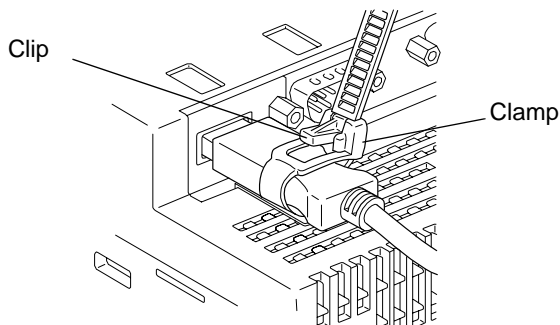


- (3) Insert the USB cable into the port. Fasten the band around the plug and secure it with the clamp.



■ Removal

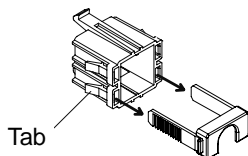
To remove the clamp from the USB cables, push down on the clamp strap's clip to release it while pulling up on the clamp.



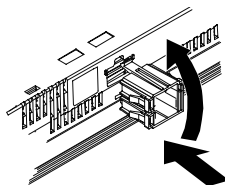
4.4.2 XBT OT4320 Series

■ Attachment

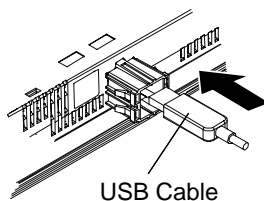
- (1) Before starting the procedure, lift up the tab on both sides of the USB Holder and remove the USB Cover.



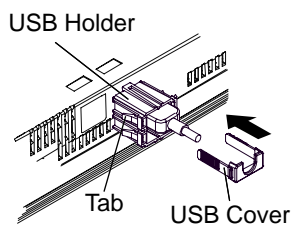
- (2) Attach the USB holder to the USB Host Interface part of the main unit. Hook a pick of the USB holder to the attachment hole of the main unit and then insert the other (lower) pick to fix the USB holder.



- (3) Insert the USB cable into the USB Host Interface.



- (4) Attach the USB cover to fix the USB cable. Insert the USB cover into the tab of the USB holder.

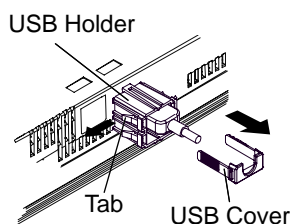


NOTE

- Check the up/down orientation of the USB cover to ensure that the USB cable is secured properly.

■ Removal

- (1) Lift up the tab of the USB holder and then remove the USB cover as shown below.

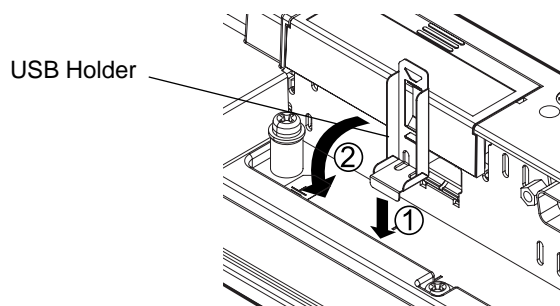


- (2) After removing the USB cable, remove the picks pushing the USB holder from both top and bottom.

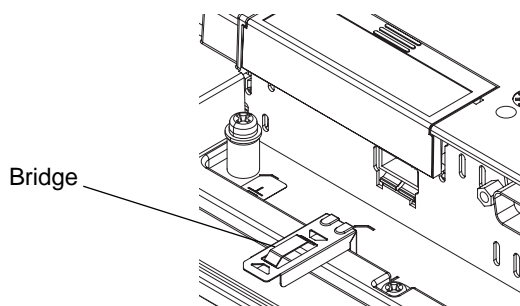
4.4.3 XBT OT5220/5320 Series

■ Attachment

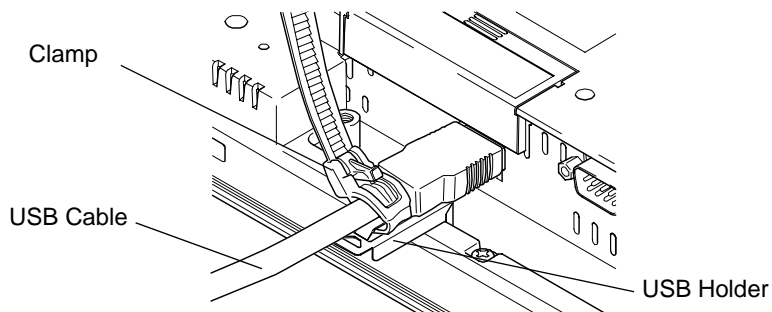
- (1) Insert the USB holder into the slot in front of the OT unit's USB port and pull it down and forward.



- (2) Pass the band of the USB cable clamp through the bridge of the USB holder.

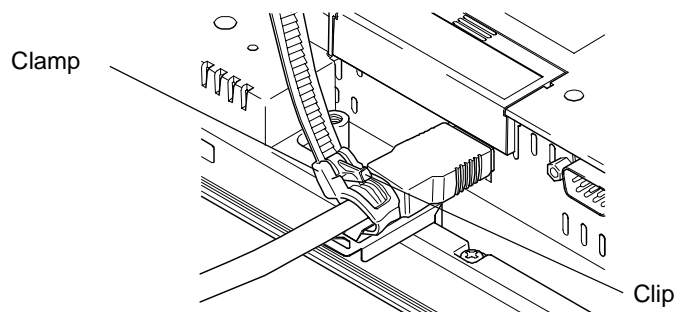


- (3) Insert the USB cable into the port. Fasten the band around the plug and secure it with the clamp.



■ Removal

To remove the clamp from the USB cables, push down on the clamp strap's clip to release it while pulling up on the clamp.



5

Maintenance

1. Cleaning the Display
2. Periodic Check Points
3. Replacing the Installation Gasket
4. Replacing the Backlight

This chapter explains steps and inspection criteria for proper maintenance of the operating terminal.

5.1 Cleaning the Display

When the surface or frame of the display become dirty, soak a soft cloth in water with a neutral detergent, wring the cloth tightly, and wipe the display.



CAUTION

EQUIPMENT DAMAGE

- Do not use hard or pointed objects to operate the touch-screen panel, since it can damage the panel surface.
- Do not use paint thinner, organic solvents, or a strong acid compound to clean the unit.

Failure to follow these instructions can result in injury or equipment damage.

5.2 Periodic Check Points

To keep your OT unit in its best condition, please inspect the following points periodically.

■ OT Operation Environment

- ☐ Is the operating temperature within the allowable range (0°C to 50°C [-32 to 122°F])?
- ☐ Is the operating humidity within the specified range (10%RH to 90%RH, dry bulb temperature of 39°C[102°F] or less)?
- ☐ Is the operating atmosphere free of corrosive gasses?

When using the OT unit inside a panel, the ambient environment refers to the interior of the panel.

■ Electrical Specifications

- ☐ Is the input voltage appropriate?
19.2 to 28.8 VDC

■ Related Items

- ☐ Are all power cords and cables connected properly? Have any become loose?
- ☐ Are all mounting brackets holding the unit securely?
- ☐ Are there many scratches or traces of dirt on the installation gasket?

5.3 Replacing the Installation Gasket

The installation gasket provides protection against dust and moisture.

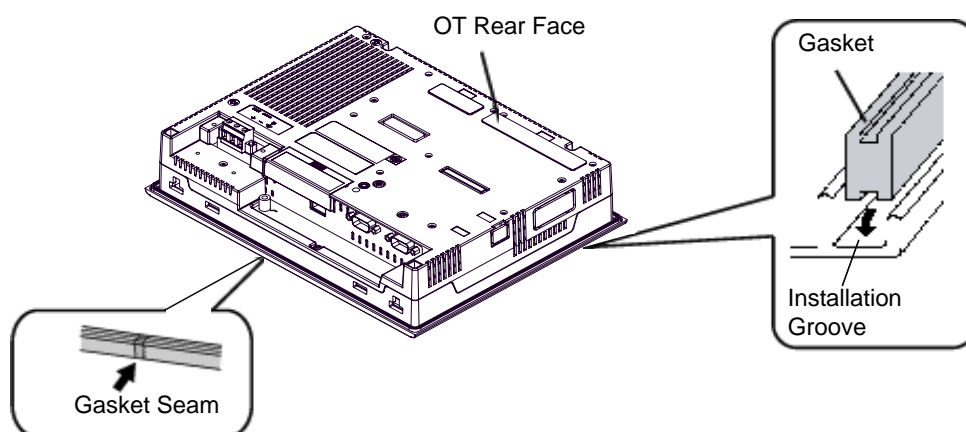
IMPORTANT

- A gasket which has been used for a long period of time may have scratches or dirt on it, and could have lost much of its water resistance. Be sure to change the gasket at least once a year, or when scratches or dirt become visible.
- The OT unit installation gasket's model number is as follows.

OT2110/2210 Series	XBTZG52
OT4320 Series	XBTZG54
OT5220/5320 Series	XBTZG55

■ Installation Gasket Attachment Procedure

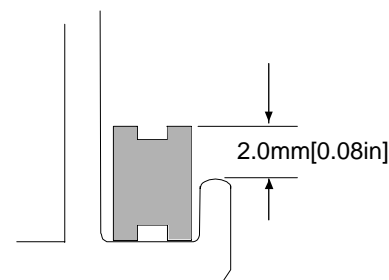
- (1) Place the OT on a flat, level surface facing the display face downwards.
- (2) Remove the gasket from the OT.
- (3) Attach the new gasket to the OT. Be sure to insert the gasket into the OT's groove so that the gasket's groove sides are vertical.



- (4) Check that the gasket is attached correctly to the OT.

IMPORTANT

- The gasket must be inserted correctly into the groove for the OT's moisture resistance to be equivalent to IP65f.
- Since the gasket is flexible but not elastic, be careful not to stretch it unnecessarily, as doing so could tear the gasket.
- Be sure the gasket's seam is not inserted into any of the unit's corners, only in the straight sections of the groove. Inserting it into a corner may lead to its eventually tearing.
- To provide stable resistance against dust and moisture, insert the gasket so that the seam is at the bottom of the OT unit.
- The upper surface of the gasket should protrude approximately 2.0mm[0.08in] out from the groove. Be sure to check that the gasket is correctly inserted before installing the OT into a panel.



5.4 Replacing the Backlight

The backlights of the XBT OT Series are not replaceable. Although the backlights used are a long-life type, their lifetime may be shorter than the specified period depending on the XBT OT Series operating environment. We would like to replace the displays instead of replacing the backlights. Please contact Schneider Electric.



WARNING

UNINTENDED EQUIPMENT OPERATION

- Do not create switches for system functions that may cause injury and/or equipment damage.

If the unit's backlight burns out and the unit is not set to standby mode, the panel remains active. If the operator fails to notice that the backlight is burned out and touches the panel, unintended equipment operation can occur.

Failure to follow these instructions can result in death, serious injury, or equipment damage.