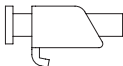## PS3451A-T41-24V
Installation Guide

Caution

Be sure to read the "Warning/Caution Information" on the attached sheet before using the product.
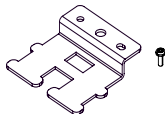
Package Contents

(1) PS-A Unit (1)

(2) English and Japanese Installation Guides (one of each) <This Guide>

(3) Warning/Caution Information (1)

(4) Installation Gasket (1) (attached to the PS-A unit)

(5) Installation Fasteners (Set of 4)

(6) USB Cable Clamp (2 ports) (2)
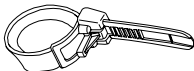
(7) USB Holder (1), Screw (1)

(8) Power Connector (1) (attached to the PS-A unit)

IMPORTANT

• Be careful when installing the PS-A not to damage the built-in HDD.

This unit has been carefully packed, with special attention to quality. However, should you find anything damaged or missing, please contact your local PS-A distributor immediately.

When you order a PS-A unit built to your specifications, that PS-A package should include each optional item's Installation Guide. Please use that guide to check the contents of each optional item's package.

About the Manual

For the detailed information on PS-A series, refer to the following manuals.

• PS-3450A Series
  Hardware Manual
• PS-3450A Series
  Reference Manual
• API Reference Manual
  Manual can be downloaded from Pro-face Home Page.

  URL
  http://www.pro-face.com/otasuke/

NOTE

• The drivers and utilities for PS-A can be downloaded from Pro-face Home Page.

Part Names and Functions
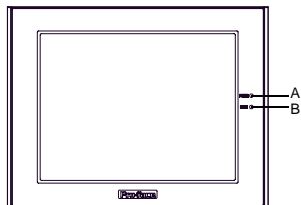
Front
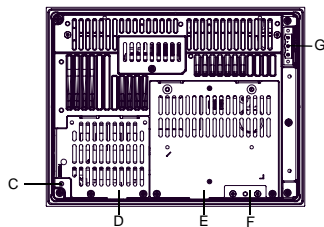
Rear
(PS-3451A with built-in HDD unit)
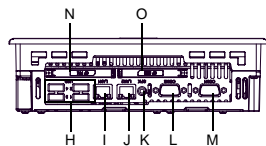
Bottom
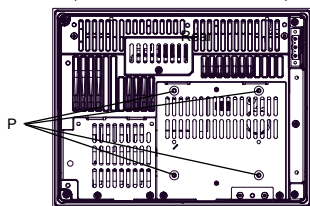
Rear
(PS-3451A without built-in HDD unit)

	Name	Description
A	Power LED / RAS Status Lamp (POWER)	<table><tr><td>LED</td><td>PS-A Status</td></tr><tr><td>Green (lit)</td><td>Normal Operation (power is on)</td></tr><tr><td>Green (blinking)</td><td>Soft OFF state</td></tr><tr><td>Orange (lit)</td><td>System Monitor Error Touch Panel Self Test Error</td></tr><tr><td>Orange/Red (blinking)</td><td>Backlight burnout is detected</td></tr><tr><td>Not lit</td><td>Power is OFF</td></tr></table>
B	HDD / IDE Access Lamp (DISK)	<table><tr><td>LED</td><td>PS-A Status</td></tr><tr><td>Green (lit)</td><td>Access to IDE.</td></tr><tr><td>Not lit</td><td>Not access to IDE.</td></tr></table>

C	Reset Switch (RESET)	Used to restart PS-A / turn on the power. Used in combination with System Set SW. Please refer to "Switches" for details.
D	Memory Slot Cover	—
E	IDE Cover	When removing this cover, you can set the switches on the PS-A's circuit board. (When the hard disk unit is installed, the HDD cover is attached instead.)
F	USB Holder Attachment Area	—
G	Power Connector	—
H	USB Interface (USB)	4 ports. Complies with USB 2.0. Uses a "TYPE-A" connector.

Power supply voltage	5 VDC ±5%
Output current	Each port: 500mA (max.), 4 ports totally: 500mA (max.)
The maximum communication distance	5m

I	Ethernet Interface (LAN1)	10BASE-T/100BASE-TX Auto Changeover. This interface uses an RJ-45 type modular jack connector (8 pins).
J	Ethernet Interface (LAN2)	10BASE-T/100BASE-TX/1000BASE-T Auto Changeover. This interface uses an RJ-45 type modular jack connector (8 pins).
K	Speaker Output Interface (SPK)	1 port. (standard type AUDIO jack)
L	Serial Interface (COM2)	RS-232C/RS-422/RS-485 Changeover, RI/+5V Changeover. Dsub 9-pin plug type.
M	Serial Interface (COM1)	RS-232C. Dsub 9-pin plug type.
N	Primary CF Card Interface	Open the cover and insert the CF card.
O	Secondary CF Card Interface	CF card (Type I/II-compliant) is available. IDE-type connection.[*1]
P	Arm Insertion Hole Location	VESA 75mm. (Only for PS-3451A without built-in HDD unit.)

*1 Since an IDE-type connection is used, the unit is not hot-swappable. When inserting/removing the CF card, be sure that power is turned OFF.

IMPORTANT

• When attaching peripheral units to the PS-A, be sure the PS-A's power cord is disconnected from the main power supply.

3

General Specifications

■ Electrical Specifications

Power Supply	Input Voltage	DC24V
	Rated Voltage	DC19.2 to 28.8V
	Allowable Voltage Drop	5ms (max.)
	Power Consumption	40W or less
	In-Rush Current	30A (max.) (Ambient Temperature)
Voltage Endurance		AC500V 20mA for 1minute (between charging and FG terminals)
Insulation Resistance		DC500V 10MΩ (min.) (between charging and FG terminals)

■ Environmental Specifications

Physical	Surrounding Air Temperature	0 to 50°C :without HDD 5 to 45°C :with HDD
	Storage Temperature	-20 to +60°C
	Ambient Humidity	10 to 90% RH (Not condensing, wet bulb temperature: 39°C or less. Wet bulb temperature with HDD: 29°C or less.)
	Storage Humidity	10 to 90% RH (Not condensing, wet bulb temperature:39°C or less.)
	Dust	Free of dust
	Pollution Degree	For use in Pollution Degree 2 environment

IMPORTANT

• When using any of the PS-A's optional devices, be sure to check that device's specifications for any special conditions or cautions that may apply to its use.

• Be aware that not only does the Hard Disk have a fixed lifetime, but that accidents can always occur. Therefore, be sure to back up your Hard Disk's data regularly, or prepare another Hard Disk unit that can be used for backup.

• The Hard Disk lifetime given here may be reduced due to unforeseen environmental factors, however, generally speaking, the disk should last for 20,000 hours (of operation) or approximately 5 years, whichever comes first at an operating temperature of 20°C and 333 hours of operation per month. (HDD access frequency of 20% or less)

• Using the Hard Disk in an environment that is excessively hot and/or humid will shorten the disk's usage lifetime. A wet bulb temperature of 29°C or less is recommended. This is equivalent to the following data.

Temperature	at 35°C	at 40°C
Humidity	no higher than 64% RH	no higher than 44% RH

• In order to extend the lifetime of the hard disk, Pro-face recommends you set the Windows® 2000's [Control panel]-[Power Options]-[Turn off hard disks] selection or the Windows® XP's [Control panel]-[Performance and Maintenance]-[Power Management option]-[Turn off hard disks] selection to turn the hard disk off when the unit is not being operated. A setting of 5 minutes is recommended.
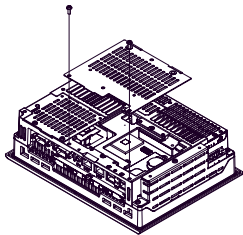
Switches

1. To change the switch settings

The switches are on the PS-A's circuit board. First of all, the cover is detached.

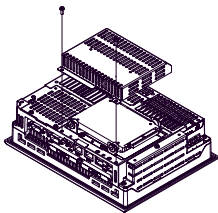■ For PS-3451A without built-in HDD unit

Unscrew the screws (2) of the IDE cover and remove the IDE cover.

When replacing the cover, the torque required for these screws is 0.5 to 0.6 N•m.

■ For PS-3451A with built-in HDD unit

(1) Unscrew the screws (2) of the HDD cover and remove the HDD cover. When replacing the cover, the torque required for these screws is 0.5 to 0.6 N•m.

(2) Unscrew the screws (4) of the HDD unit, remove the cable connector from IDE I/F while lifting up the HDD unit, and remove it.
To replace the HDD unit, connect the cable connector to IDE I/F securely and fix the HDD unit with the screws (4). (For the location of the IDE/IF, refer to the following figure "Inside of the rear".)The torque required for these screws is 0.5 to 0.6 N•m.
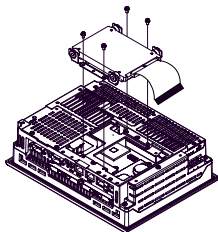
Inside of the rear
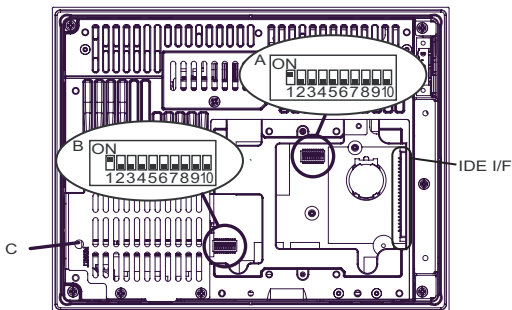
Switch Location	Switch Name	Description
A	System Set SW	10-point dip switch. For System Set SW details and the factory settings details, see Table (1).
B	Serial Mode Select SW	10-point dip switch. Designates COM2 communication settings. For Serial Mode Select SW details, see Table (2). Factory Settings: For RS-232C
C	Reset SW	■ Power Button Mode In advance, turn ON the System Set SW No.6. For Windows® 2000, the mode of [When I press the power button on my computer] that is selected from PS-A's start menu-[Settings]-[Control panel]-[Power Options]-[Advanced]-[Power buttons] is operated when pressing the Reset SW. For Windows® XP, the mode of [When I press the power button on my computer] that is selected from [Control panel]-[Performance and Maintenance]-[Power Management option]-[Advanced] is operated. NOTE • PS-A restarts when pressing the switch at the Soft OFF[*1] state (the Power LED / RAS Status Lamp is blinking in green). ■ Reset Switch Mode In advance, turn OFF the System Set SW No.6. PS-A restarts when pressing the Reset SW.

*1 The Soft OFF refers to the state that Windows® has been shut down and the power is provided only for the electric circuit to boot system. This Soft OFF State is different from what is System Standby set by Windows®.

Switch No.	Description	ON	OFF	Notes
1	Used for the system.	Reserved	Reserved	Factory Settings: ON
2	Used for the system.	Reserved	Reserved	Factory Settings: OFF
3	Used for the system.	Reserved	Reserved	Factory Settings: OFF
4	Cancellation function of pushing two points on the touch panel*1.	Enabled	Disabled	Factory Settings: OFF The middle point is not considered to be touched when the SW is Enabled. It is considered to be touched when the SW is Disabled.
5	Used for the system.	Reserved	Reserved	Factory Settings: OFF
6	Changes Reset SW mode.	Power button	Reset SW	Factory Settings: OFF
7	Used for the system.	Reserved	Reserved	Factory Settings: OFF
8	Changes COM2 (RI <---> +5V). (enabled only when RS-232C mode)	+5V Output	RI	Factory Settings: OFF
9	Changes a Master/ Slave setting for Primary CF card Interface.	Slave	Master	The factory settings depend on your selected built-in accessory.
10	Used for the system.	Reserved	Reserved	Factory Settings: OFF

Table 1) System Set Switches

*1 When two points are pushed, it is considered that middle point between the two points is touched according to the nature of the analog resistive touch panel.
When the switch, etc. is set on the middle point, it will be enabled and may operate.
To prevent such a switch from malfunction in case of pushing two points, turn ON the SW No.4 in advance, then the middle point will be disabled to be touched.

Switch No.	Description	ON	OFF	RS-232C	RS-422	RS-485
1	Changes COM2's communication method	RS-232C	RS-422/RS-485	ON	OFF*1	OFF*1
2	Changes COM2's communication method	RS-422/RS-485	RS-232C	OFF	ON	ON

| Switch No.	Description	ON	OFF	RS-232C	RS-422	RS-485
3	Changes COM2's communication method	RS-422/RS-485	RS-232C	OFF	ON	ON
4	Changes TX data's output mode	TX data output is controlled via the RTS signal.	TX data output is NOT controlled via the RTS signal. (normally output)	OFF	ON/OFF	ON/OFF[*3]
5	Switches the TX termination resistance ON/OFF	Inserts termination resistance of 220Ω between TXA and TXB.	No termination	OFF	ON	ON/OFF[*2]
6	Switches the RX termination resistance ON/OFF	Inserts termination resistance of 220Ω between RXA and RXB.	No termination	OFF	ON	ON/OFF[*2]
7	Switches the shorting of TXA and RXA ON/OFF	Shorts TXA and RXA (RS-485 mode)	No shorting (RS-422 mode)	OFF	OFF	ON
8	Switches the shorting of TXB and RXB ON/OFF	Shorts TXB and RXB (RS-485 mode)	No shorting (RS-422 mode)	OFF	OFF	ON
9	RTS Automatic control mode (enabled only when RS-485 mode)	The data is automatically controlled via the RTS signal.	The data is not automatically controlled via the RTS signal.	OFF	OFF	ON/OFF[*3]
10				OFF	OFF	ON/OFF[*3]

Table 2) Serial Mode Select Switches

*1 Be sure to keep the settings, "OFF" for RS-422 or RS-485.

*2 If you use the termination resistance, base your settings on the connection specifications.

*3 To control TX output driver via RTS automatically, set ON. Be sure to set SW No.4 OFF.
Not to control TX output driver via RTS automatically, set OFF. Be sure to set SW No.4 ON.

Serial Mode Select Switches (SW4 to SW10) operate as shown in the circuit diagram below.
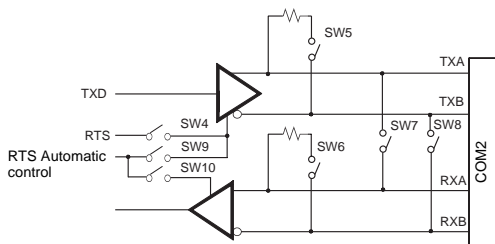
External Interfaces

IMPORTANT

- This PS-A unit's serial port is not isolated. When the host (PLC) unit is also not isolated, and to reduce the risk of damaging the RS-232C/RS-422/RS-485 circuit, be sure to connect the #5 SG (Signal Ground) terminal.

■ Serial Interface (COM1, COM2)

Interfit Bracket	#4-40 (Inch screw thread)

◆COM1

Pin #	RS-232C	
	Signal Name	Meaning
1	CD	Carrier Detect
2	RD (RXD)	Receive Data
3	SD (TXD)	Send Data
4	ER (DTR)	Data Terminal Ready
5	GND	Signal Ground
6	DR (DSR)	Data Set Ready
7	RS (RTS)	Request to Send
8	CS (CTS)	Clear to Send
9	CI (RI)	Called status display
FG	FG	Frame Ground (Common with SG)

◆COM2

COM2 can be changed to either RS-232C, RS-422 or RS-485. (The factory setting is RS-232C.) To change this setting, set Serial Mode Select switch on the circuit board to the desired position.

Please refer to "Switches" for details.

Pin #	RS-232C	
	Signal Name	Meaning
1	CD	Carrier Detect
2	RD (RXD)	Receive Data
3	SD (TXD)	Send Data
4	ER (DTR)	Data Terminal Ready
5	GND	Signal Ground
6	DR (DSR)	Data Set Ready
7	RS (RTS)	Request to Send
8	CS (CTS)	Clear to Send
9	CI (RI)/ +5V[*1]	Called status display/ +5V Output (Switching available)
FG	FG	Frame Ground (Common with SG)

*1 To change the RI/+5V setting of #9 pin set System Set switch to the desired position.

Pin	RS-422	
#	Signal Name	Meaning
1	RDA	Receive Data A (+)
2	RDB	Receive Data B (-)
3	SDA	Send Data A (+)
4	NC	No Connection
5	GND	Signal Ground
6	NC	No Connection
7	SDB	Send Data B (-)
8	NC	No Connection
9	NC	No Connection
FG	FG	Frame Ground (Common with SG)

Pin	RS-485	
#	Signal Name	Meaning
1	DATA +	Send/Receive Data(+)
2	DATA -	Send/Receive Data(-)
3	NC	No Connection
4	NC	No Connection
5	GND	Signal Ground
6	NC	No Connection
7	NC	No Connection
8	NC	No Connection
9	NC	No Connection
FG	FG	Frame Ground (Common with SG)

IMPORTANT

- Be sure to connect pin number 5 (GND) of COM1 and COM2 (RS-232C) to the host unit's Signal Ground terminal.
- Be sure to confirm what settings will be used by the other device and set the slide switches accordingly. Failure to do so can result in a unit malfunction or damage.

- Whenever changing the PS-A switches, be sure to first turn the PS-A's power supply OFF. Failure to do so can cause a PS-A malfunction.
- Connect the FG terminal line to the shell.
- FG and SG terminals are internally connected in the PS-A. When connecting to another device, be sure not to create an SG shorting loop in your system.

Installations

1. Installation Requirements

- For easier maintenance, operation, and improved ventilation, be sure to install the PS-A at least 50 mm [1.97 in.] away from adjacent structures and other equipment.

Unit: mm[in.]
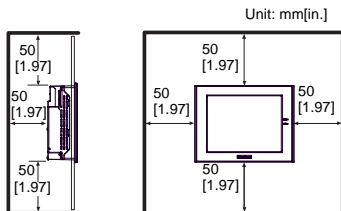
- Be sure that the surrounding air temperature and the ambient humidity are within their designated ranges. (Surrounding air temperature: with HDD 5 to 45°C without HDD 0 to 50°C, Ambient humidity: 10 to 90%RH, Wet bulb temperature: 39°C or less, with HDD: 29°C or less)
When installing the PS-A on the panel of a cabinet or enclosure, "Surrounding air tem-

perature" indicates both the panel face and cabinet or enclosure's internal temperature.

Panel Face / Inside Cabinet
50mm
30mm 30mm
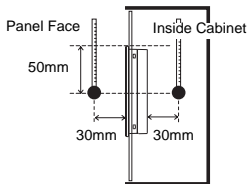
• Be sure that heat from surrounding equipment does not cause the PS-A to exceed its standard operating temperature.

2. PS-A Installation

(1) Create a Panel Cut following the dimensions in the table below. Also, determine the panel thickness according to the panel thickness range with due consideration of panel strength.
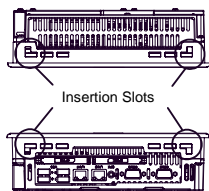
Unit: mm[in.]
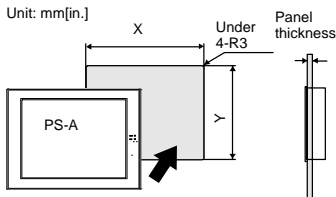
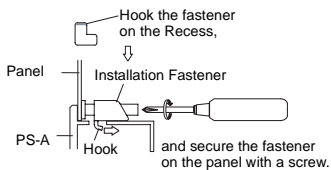| X	Y	Panel thickness
218.5 $^{+1}_{-0}$ [8.60 $^{+0.04}_{-0}$]	165.5 $^{+1}_{-0}$ [6.52 $^{+0.04}_{-0}$]	1.6[0.06] to 10.0[0.39]

(2) Confirm that the installation gasket is attached to the PS-A unit and then place the PS-A unit into the Panel from the front.

IMPORTANT

• It is strongly recommended that you use the installation gasket, since it absorbs vibration in addition to repelling water.
  For the procedure for replacing the installation gasket, refer to "PS-3450A Series Hardware Manual".

(3) Insert each fastener's hook into the slot and tighten it with a screwdriver. Insert the installation fasteners securely into the insertion slot recess. There are four insertion slots.

Insertion Slots

Insertion Slot Recess

Hook the fastener on the Recess,
⇩
Panel | Installation Fastener
PS-A | Hook and secure the fastener on the panel with a screw.

IMPORTANT

• Tightening the screws with too much force can damage the PS-A unit.
• The necessary torque is 0.5N•m.
• Be sure to insert installation fasteners in the recessed portion of an installation fasteners hole. If the fasteners are not correctly attached, the PS-A unit may shift or fall out of the panel.

3. Attach the PS-A unit to an Arm

IMPORTANT

• Only for PS-3451A without built-in HDD unit is enabled to use VESA arm or wall mount adaptor using the VESA arm attachment holes on the rear face.

To attach the PS-A unit to an Arm or to the wall, insert the attachment screws for a commercial-type arm or wall mount adaptor into the holes in the PS-A's rear face.

(Holes specifications: VESA 75mm)
For detailed attachment instructions, please refer to that product's installation guide. The VESA Arm Attachment Hole dimensions are signifies as follows;

(unit:mm[in.])
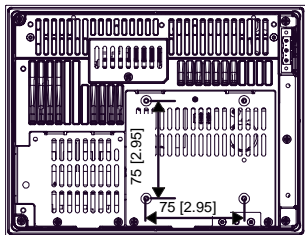
PS-3451A without built-in HDD

Arm Attachment Screw Holes (VESA 75mm).

Attach the four (4) M4 attachment screws. (Screw length: 6mm or less.) The torque required for these screws is 0.7 to 0.8 N•m.

Wiring

⚠ WARNING

• To avoid an electric shock, prior to connecting the PS-A unit's power cord terminals to the power terminal block, confirm that the PS-A unit's power supply is completely turned OFF, via a breaker, or similar unit.

• Any other power level can damage both the PS-A and the power supply.

• Since the PS-A unit has no power ON/OFF switch, be sure to attach a breaker-type switch to its power cord.

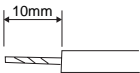• When the FG terminal is connected, be sure the wire is grounded.

1. Wiring the DC type power supply cable

IMPORTANT

• When the FG terminal is connected, be sure the wire is grounded. Not grounding the PS-A unit will result in excessive noise. Use your country's applicable standard for grounding.

■ Power Cord Specifications

Use copper conductors only.

Power Cord Diameter	0.75 to 2.5mm^2 (18 to 12 AWG)
Conductor Type	Simple or Stranded Wire[1]
Conductor Length	10mm

[1] If the Conductor's end (individual) wires are not twisted correctly, the end wires may either short against each other, or against an electrode.

■ Wiring

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

| Recommended Driver	SZS 0.6x3.5 (1205053)
Recommended Pin Terminals	AI 0.75-10GY (3201288) AI 1-10RD (3200182) AI 1.5-10BK (3200195) AI 2.5-12BU (3200962)
Recommended Pin Terminal Crimp Tool	CRIMPFOX ZA3 (1201882)

NOTE
- Accompanying power supply connector is CA7-DCCNL-01 of Pro-face (Digital Electronics Corporation) or GFKC2.5/3-STF-7.62 is manufactured by Phoenix Contact.

■ Connecting the Power Cord

(1) Confirm that the power is not supplied to the PS-A unit.

(2) Unplug the power connector from the rear of the PS-A unit.

(3) Push the Opening button by a small and flat screw driver to open the desired pin hole.

(4) Insert each pin terminal into its each hole. Release the Opening button to clamp the pin place.

Power supply cord

Opening Button

24V
0V
FG
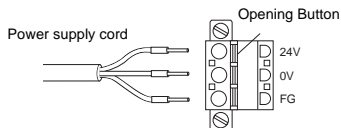
(5) After inserting all three pins, insert the Power Plug into the Power Connector at PS-A. Fix the plug with two (2) minus screws.

IMPORTANT
- The torque required to tighten these screws is 0.5 to 0.6N•m.
- To prevent the possibility of a terminal short, use a pin terminal that has an insulating sleeve.

2. Power Supply Cautions

- Input and Output signal lines must be separated from the power control cables for operational circuits.

- To improve the noise resistance, be sure to twist the ends of the power cord wires before connecting them to the Power connector (Plug).

- The PS-A unit's power supply cord should not be bundled with or kept close to main circuit lines (high voltage, high current), or input/output signal lines.

- To reduce noise, make the power cord as short as possible.

- If the supplied voltage exceeds the PS-A unit's range, connect a voltage transformer.

- Between the line and the ground, be sure to use a low noise power supply. If there is an excess amount of noise, connect a noise reducing transformer.

- The temperature rating of field installed conductors: 75°C only.

IMPORTANT
- Use voltage and noise reducing transformers with capacities exceeding Power Consumption value.
- Must be used with a Class 2 Power Supply. (24VDC)
- Connect a surge absorber to handle power surges.

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


Lightening Surge Absorber
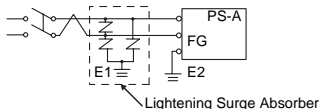
3. Grounding Cautions

- Be sure to create an exclusive ground for the Power Cord's FG terminal. Use a grounding resistance of 100Ω, a wire of 2mm^2 or thicker, or your country's applicable standard.

- The SG (signal ground) and FG (frame ground) terminals are connected internally in the PS-A unit.
  When connecting the SG line to another device, be sure that the design of the system/connection does not produce a shorting loop.

- The grounding wire should have a cross sectional area greater than 2mm^2. Create the connection point as close to the PS-A 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.
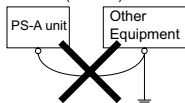

Exclusive Grounding (BEST)
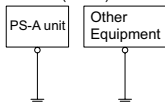
Common Grounding (OK)
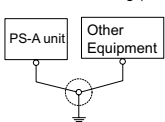
Common Grounding (Not OK)

4. Input/Output Signal Line Cautions

- All PS-A Input and Output signal lines must be separated from all operating circuit (power) cables.
- If this is not possible, use a shielded cable and ground the shield.
- To improve noise immunity, it is recommended to attach a ferrite core to the power cord.

To prevent the USB cable from coming off

■ Attaching the USB Cable Clamp

(1) Place the PS-A unit face-down on a flat surface as shown below. Your PS-A unit has four USB connectors.

Upper USB Interface

Lower USB Interface
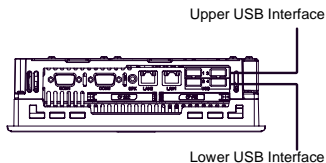
NOTE
- When using two or more USB ports, be sure to first connect one USB cable to the upper USB connector, and then connect the second USB cable to the lower USB connector.
- When using only one of the USB ports, be sure to use the upper USB connector. This allows you to securely clamp the USB cable in the cable clamp.

(2) Fix the USB holder with a screw. The torque required for this screw is 0.5 to 0.6 N•m. Next, as shown, insert the USB Cable Clamp's band through the hollow of the holder. Pass the USB cables through the Cable Clamp's band and securely tighten the clamp band around the cables.

NOTE
- Be sure the clamp is securely holding the USB cable's plug and collar.
- Be sure the clamp is positioned as shown below, with the clamp pointing upwards - not to the side. This is to keep the clamp from interfering with nearby connectors and their cables.

Band

Clamp

Cable collar
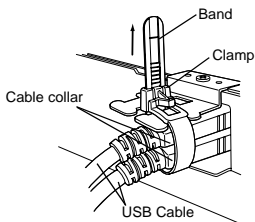
USB Cable

■ Removing the USB Cable Clamp

(1) 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.

Clip

Clamp
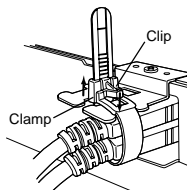
Installation prerequisites for standards

The following units are UL/c-UL listed products:

(UL File No.E220851)

Product Model No.	UL/c-UL Registration Model No.
PS3451A-T41-24V	3581702-12

For the detailed certification's information, refer to the Pro-face Home page.

<Cautions>

Be aware of the following items when building the PS-A into an end-use product:

• The PS-A unit's rear face is not approved as an enclosure. When building the PS-A unit into an end-use product, be sure to use an enclosure that satisfies standards as the end-use product's overall enclosure.

• The PS-A unit must be used indoors only.

• Install and operate the PS-A with its front panel facing outwards.

• If the PS-A is mounted so as to cool itself naturally, be sure to install it in a vertical panel. Also, it's recommended that the PS-A should be mounted at least 50mm away from any other adjacent structures or machine parts. The temperature must be checked on the final product in which the PS-A is installed.

• For use on a flat surface of a Type 1 Enclosure.

CE Marking

• PS3451A-T41-24V units are CE marked, EMC directives compliant products.

For the detailed information, be downloaded and refer the Declaration of Conformity from Pro-face Home Page.

Inquiry
Do you have any questions about difficulties with this product? Please access our site anytime that you need help with a solution. **http://www.pro-face.com/otasuke/**