

Surveillance Cabinet

NDA-U-PA0 | NDA-U-PA1 | NDA-U-PA2



BOSCH

en Installation manual

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1 Important Safety Instructions

Read, follow, and retain all of the following safety instructions. Heed all warnings on the unit and in the operating instructions before operation.

1.1 Safety precautions



Danger!

High risk: This symbol indicates an imminently hazardous situation such as “Dangerous Voltage” inside the product.

If not avoided, this will result in an electrical shock, serious bodily injury, or death.



Warning!

Medium risk: Indicates a potentially hazardous situation.

If not avoided, this could result in minor or moderate bodily injury.



Caution!

Low risk: Indicates a potentially hazardous situation.

If not avoided, this could result in property damage or risk of damage to the unit.



Notice!

This symbol indicates information or a company policy that relates directly or indirectly to the safety of personnel or protection of property.

1.2 Important safety instructions

Read, follow, and retain for future reference all of the following safety instructions. Heed all warnings on the unit and in the operating instructions before operating the unit.

1. **Cleaning** - Unplug the unit from the outlet before cleaning. Follow any instructions provided with the unit. Generally, using a dry cloth for cleaning is sufficient but a moist, fluff-free cloth or leather shammy may also be used. Do not use liquid cleaners or aerosol cleaners.
2. **Water** - Do not use this unit near water, for example near a bathtub, washbowl, sink, laundry basket, in a damp or wet basement, near a swimming pool, in an outdoor installation, or in any area classified as a wet location. To reduce the risk of fire or electrical shock, do not expose this unit to rain or moisture.
3. **Object and liquid entry** - Never push objects of any kind into this unit through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electrical shock. Never spill liquid of any kind on the unit. Do not place objects filled with liquids, such as vases or cups, on the unit.
4. **Power cord and plug protection** - Protect the plug and power cord from foot traffic, being pinched by items placed upon or against them at electrical outlets, and its exit from the unit. For units intended to operate with 230 VAC, 50 Hz, the input and output power cord must comply with the latest versions of *IEC Publication 227* or *IEC Publication 245*.
5. **Power disconnect** - Units have power supplied to the unit whenever the power cord is inserted into the power source. The power cord plug is the main power disconnect device for switching off the voltage for all units.

6. **Power sources** - Operate the unit only from the type of power source indicated on the label. Before proceeding, be sure to disconnect the power from the cable to be installed into the unit.
 - For battery powered units, refer to the operating instructions.
 - For external power supplied units, use only the recommended or approved power supplies.
 - For limited power source units, this power source must comply with *EN60950*. Substitutions may damage the unit or cause fire or shock.
 - For 24 VAC units, voltage applied to the unit's power input should not exceed $\pm 10\%$, or 28 VAC. User-supplied wiring must comply with local electrical codes (Class 2 power levels). Do not ground the supply at the terminals or at the unit's power supply terminals.
 - If unsure of the type of power supply to use, contact your dealer or local power company.
7. **Servicing** - Do not attempt to service this unit yourself. Opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
8. **Damage requiring service** - Unplug the unit from the main AC power source and refer servicing to qualified service personnel when any damage to the equipment has occurred, such as:
 - the power supply cord or plug is damaged;
 - exposure to moisture, water, and/or inclement weather (rain, snow, etc.);
 - liquid has been spilled in or on the equipment;
 - an object has fallen into the unit;
 - unit has been dropped or the unit cabinet is damaged;
 - unit exhibits a distinct change in performance;
 - unit does not operate normally when the user correctly follows the operating instructions.
9. **Replacement parts** - Be sure the service technician uses replacement parts specified by the manufacturer, or that have the same characteristics as the original parts. Unauthorized substitutions may cause fire, electrical shock, or other hazards.
10. **Safety check** - Safety checks should be performed upon completion of service or repairs to the unit to ensure proper operating condition.
11. **Installation** - Install in accordance with the manufacturer's instructions and in accordance with applicable local codes.
12. **Attachments, changes or modifications** - Only use attachments/accessories specified by the manufacturer. Any change or modification of the equipment, not expressly approved by Bosch, could void the warranty or, in the case of an authorization agreement, authority to operate the equipment.

1.3 Important Notices

U.S.A. models only - *Section 810* of the *National Electrical Code, ANSI/NFPA No.70*, provides information regarding proper grounding of the mount and supporting structure, grounding of the coax to a discharge unit, size of grounding conductors, location of discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.



Disposal - Your Bosch product was developed and manufactured with high-quality material and components that can be recycled and reused. This symbol means that electronic and electrical appliances, which have reached the end of their working life, must be collected and disposed of separately from household waste material. Separate collecting systems are usually in place for disused electronic and electrical products. Please dispose of these units at an environmentally compatible recycling facility, per *European Directive 2002/96/EC*


Environmental statement - Bosch has a strong commitment towards the environment. This unit has been designed to respect the environment as much as possible.

Power lines: An outdoor system should not be located in the vicinity of overhead power lines, electrical lights, or power circuits, or where it may contact such power lines or circuits. When installing an outdoor system, extreme care should be taken to keep from touching power lines or circuits, as this contact may be fatal. U.S.A. models only - refer to the National Electrical Code *Article 820* regarding installation of CATV systems.

SELV - All the input/output ports are Safety Extra Low Voltage (SELV) circuits. SELV circuits should only be connected to other SELV circuits.

Because the ISDN circuits are treated like telephone-network voltage, avoid connecting the SELV circuit to the Telephone Network Voltage (TNV) circuits.

System ground/Safety ground

System (video) ground is indicated by the symbol .

Safety (power) ground is indicated by the symbol .

The system ground is only used to comply with safety standards or installation practices in certain countries. Bosch does **not** recommend connecting system ground to safety ground unless it is explicitly required. However, if the system ground and safety ground are connected and grounding loops are causing interference in the video signal, use an isolation transformer (available separately from Bosch).



Caution!

Connecting System ground to Safety ground may result in ground loops that can disrupt the CCTV system.

1.4

UL certification

Disclaimer

Underwriter Laboratories Inc. ("UL") has not tested the performance or reliability of the security or signaling aspects of this product. UL has only tested fire, shock and/or casualty hazards as outlined in UL's *Standard(s) for Safety for Closed Circuit Television Equipment, UL 2044*. UL Certification does not cover the performance or reliability of the security or signaling aspects of this product.

UL MAKES NO REPRESENTATIONS, WARRANTIES, OR CERTIFICATIONS WHATSOEVER REGARDING THE PERFORMANCE OR RELIABILITY OF ANY SECURITY OR SIGNALING RELATED FUNCTIONS OF THIS PRODUCT.

Disclaimer

Underwriter Laboratories Inc. (“UL”) has not tested the performance or reliability of the security or signaling aspects of this product. UL has only tested fire, shock and/or casualty hazards as outlined in UL's *Standard(s) for Safety for Information Technology Equipment, UL 60950-1*. UL Certification does not cover the performance or reliability of the security or signaling aspects of this product.

UL MAKES NO REPRESENTATIONS, WARRANTIES, OR CERTIFICATIONS WHATSOEVER REGARDING THE PERFORMANCE OR RELIABILITY OF ANY SECURITY OR SIGNALING-RELATED FUNCTIONS OF THIS PRODUCT.

1.5**Bosch notices****Video loss**

Video loss is inherent to digital video recording; therefore, Bosch Security Systems cannot be held liable for any damage that results from missing video information. To minimize the risk of lost digital information, Bosch Security Systems recommends multiple, redundant recording systems, and a procedure to back up all analog and digital information.

Copyright

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Trademarks

All hardware and software product names used in this document are likely to be registered trademarks and must be treated accordingly.

Note:

This manual has been compiled with great care and the information it contains has been thoroughly verified. The text was complete and correct at the time of printing. The ongoing development of the products may mean that the content of the user guide can change without notice. Bosch Security Systems accepts no liability for damage resulting directly or indirectly from faults, incompleteness or discrepancies between the user guide and the product described.

More information

For more information please contact the nearest Bosch Security Systems location or visit www.boschsecurity.com

2 Unpacking

- This equipment should be unpacked and handled with care. Check the exterior of the packaging for visible damage. If an item appears to have been damaged in shipment, notify the shipper immediately.
- Verify that all the parts listed in the Parts List below are included. If any items are missing, notify your Bosch Security Systems Sales or Customer Service Representative.
- Do not use this product if any component appears to be damaged. Please contact Bosch Security Systems in the event of damaged goods.
- The original packing carton is the safest container in which to transport the unit and must be used if returning the unit for service. Save it for possible future use.

2.1 Parts list

The following table lists the parts included with this mounting package.

Description	Part Number
Surveillance cabinet without transformer (24 VAC)	NDA-U-PA0
Surveillance cabinet with 120 VAC transformer	NDA-U-PA1
Surveillance cabinet with 230 VAC transformer	NDA-U-PA2

2.2 Optional mounting accessories

This table shows the optional parts you may need for attaching a Surveillance cabinet to a wall, a corner, or a pole.

Mounting Options	Part Number
Pendant wall mount	NDA-U-WMT
Corner mount adapter	NDA-U-CMT
Pole mount adapter large	NDA-U-PMAL
Fiber optic Ethernet media converter kit	VG4-SFPSCKT

2.3 Description

This chapter describes the installation of a Surveillance cabinet to a wall, a corner, or a pole. Use one of the accessories from Optional Mounting Accessories for correct mounting. Any variations to the installation procedures are noted.

Only the connections in the unit for power supply are used. You can connect all other wires directly with the connectors on the wires. The unit is a safe, robust and watertight box in which you can make your connections.

Note: You may need to purchase additional mounting accessories for corner and pole mount applications. Refer to Optional Mounting Accessories.

2.4 Tools required

- 5 mm Allen wrench (supplied)
- Small, straight-blade screwdriver - 2.5 mm (0.1 in.)
- No. 2 Phillips screwdriver
- Socket wrench and 9/16-in. socket
- Banding tool (Bosch P/N TC9311PM3T) - if installing a mast (pole) mount

- 3/4 in. (20-mm) NPS right angle conduit connector - if installing a mast (pole) mount with a VG4-ARM-WPLATE

3 Installing the Surveillance cabinet

3.1 Pre-installation checklist

1. Make sure that you have the correct camera and accessories for the installation in your environment.
2. Determine the location and distance for the unit based on its voltage and current consumption. Prepare the wires and connections that are necessary to connect your camera.
3. You can route the main power supply through an intermediate unit (type PA1 or PA2) before connecting the power to a PA0 type unit. Refer to Cable and wire standards for wiring information and distances. See also *Routing power through intermediate unit*, page 14.
4. Use only UL listed liquid tight strain reliefs for conduits to the unit to ensure that water cannot enter the unit. Use water tight conduits and fittings to meet NEMA 4 standards.

**Caution!**

Select a rigid mounting location to prevent too much vibration to the camera.

**Warning!**

Power and I/O cabling must be routed separately inside different permanently earthed metal conduits.

**Warning!**

Install external interconnecting cables in accordance to NEC, ANSI/NFPA70 (for US application) and Canadian Electrical Code, Part I, CSA C22.1 (for CAN application) and in accordance to local country codes for all other countries.

Branch circuit protection incorporating a 20 A, 2-pole Listed Circuit Breaker or Branch Rated Fuses are required as part of the building installation. A readily accessible 2-pole disconnect device with a contact separation of at least 3 mm must be incorporated.

3.2 Mounting the Surveillance cabinet

Before you mount the unit, decide if you route the wires through the holes in the bottom or in the back of the unit. If you choose the holes in the back, move the 2 seal plugs to the holes in the bottom before you mount the unit.

Use 20 mm (3/4 inch) NPS fittings for the holes on the bottom and back of the unit. Use 15 mm (1/2-inch) NPS fittings for the side holes.

1. Use the wall mount template supplied with the unit to locate the 4 mounting holes for the unit.
2. Drill holes for the 4 mounting anchors. For outdoor installation, use a weatherproof sealant around each hole at the mounting surface.



Warning!

A stud diameter of 6.4 mm (1/4 inch) to 8 mm (5/16 inch) able to withstand a 120 kg (265 lb) pull-out force is recommended. The mounting material must be able to withstand this pull out force. For example, 19 mm (3/4 inch) minimum for plywood.

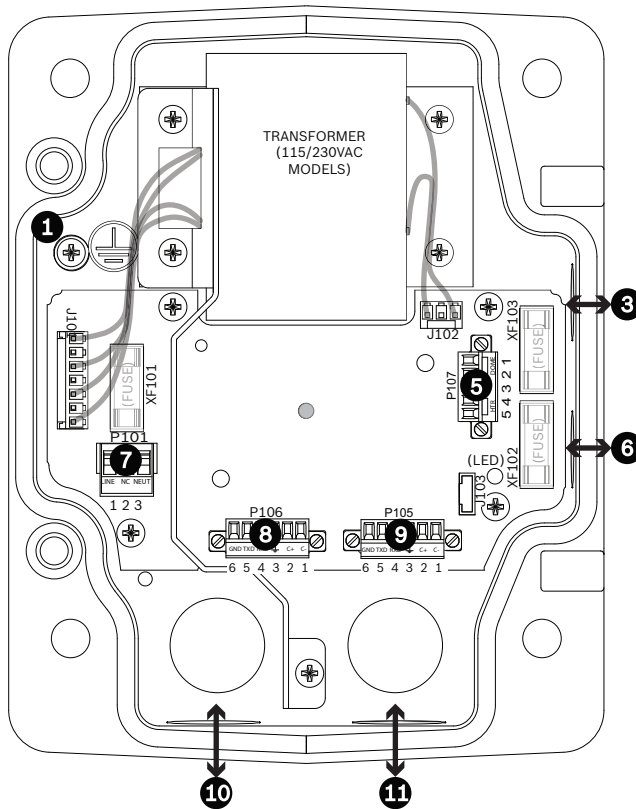
3. Place the unit into the optional Trim Skirt.
4. Mount the unit to the mounting surface.
5.
 - For a Wall installation: Use 4 corrosion-resistant, stainless steel studs (not supplied). Then proceed to Step 7 below.
 - For a Corner installation: Mount the Corner mount adapter to the wall corner with 4 studs (not supplied). Then proceed to Step 6 below.
 - For a Pole installation: The metal straps included with the Pole mount adapter are suitable for a pole with a diameter of 100 - 380 mm (4 - 15 inch). Use a banding tool (not supplied) for a mast or pole installation. Follow the instructions provided with the banding tool to securely mount the Pole mount adapter to the pole. Contact your Bosch Sales Representative to order Banding Tool P/N TC9311PM3T.
6. Mount the unit to the Corner mount adapter or Pole mount adapter with the 4 bolts (3/8 x 1-3/4 inch) and split lock washers (supplied).
7. Attach 20 mm (3/4 inch) NPS watertight pipe fittings (not supplied) to the bottom or back holes of the unit for the routing of the power, video, and control data wires.

3.3 Routing the wires and attaching the connectors

Making the connections

Refer to illustration for numbers.

1. Route all video, control, and alarm wires through the conduit fitting on the right side of the unit (11).
2. Route the power wires through the conduit fitting on the left side of the unit (10).
3. Cut and trim the power and ground wires with sufficient slack to reach their connectors in the unit, but not so long as to be pinched by or to obstruct closing the door. Refer to the image above for the connector locations.
4. Attach the supplied 3-pin Power Plug to the incoming power wires. Refer to connector P101 for wire connections.
5. Attach an RJ45 plug to the incoming Ethernet cable.



Overview of connections in the unit

1	Ground Screw	7	P101 Connector; Power in (120 VAC / 220 VAC)
2	Not used	8	P106 Connector; not used
3	In/Out; 15 mm (1/2 inch) NPS Fitting	9	P105 Connector; not used
4	Ethernet connector	10	Left conduit fitting. Use for power wires 20 mm (3/4 inch) NPS Fitting
5	P107 Connector; 24 VAC to camera	11	Right conduit fitting. Use for video, control and alarm wires; 20 mm (3/4 inch) NPS Fitting
6	In/Out; 15 mm (1/2 inch) NPS Fitting		

Fuse Specifications			
Volts	XF101 Mains	XF102 Camera	XF103 Heater
24 V	T 5.0 A	T 2.0 A	T 3.15 A
115 V	T 1.6 A	T 2.0 A	T 3.15 A
230 V	T 0.8A	T 2.0 A	T 3.15 A

**Warning!**

Fuse replacement by qualified service personnel only. Replace with same type fuse.

Fuse Specifications			
Volts	XF101 Mains	XF102 Camera	XF103 Heater
24 V	T 5.0 A	T 2.0 A	T 3.15 A
115 V	T 1.6 A	T 2.0 A	T 3.15 A
230 V	T 0.8A	T 2.0 A	T 3.15 A

No.	Connector	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6
	Ground	Grounding Screw					
P101	115/230 VAC or 24 VAC Power In	Line	NC	Neutral			
P106	Not used						
P107	24 VAC Power (Arm Harness)	Camera 24 VAC	Camera 24 VAC	Earth Ground	Heater (24 VAC)	Heater (24 VAC)	

Table 3.1: Surveillance cabinet connections

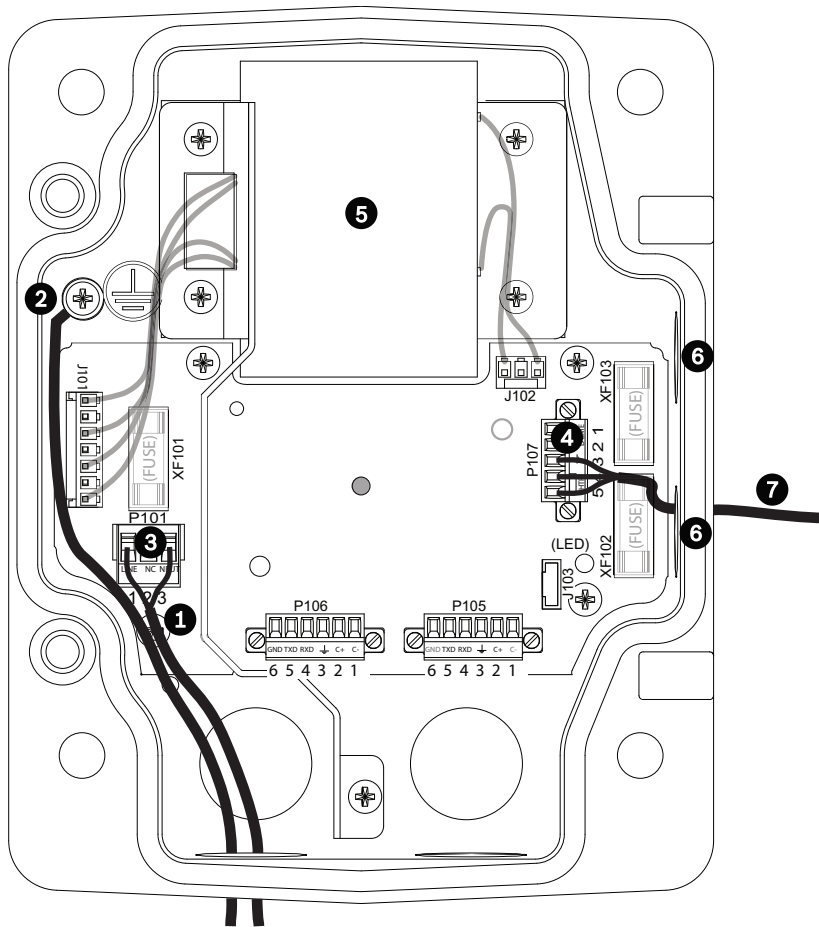
See also

- *Routing the wires and attaching the connectors, page 12*

3.4 Routing power through intermediate unit

You can route the main power supply through an intermediate unit (type PA1 or PA2) before connecting the power to a PA0 type unit. This chapter describes how to make the connections for this configuration. You must change the connectors, because the 5-pin power out connector from the PA1 or PA2 unit does not match to the 3-pin power input of the PA0 power supply. The illustration below shows:

- A type PA1 or PA2 unit.
- The main power supply connected to the P101 connector and to the grounding screw.
- The 24 VAC power out wire connected to the P107 heater power connectors.



Connections of the power wires in the NDA-U-PA1 / NDA-U PA2 unit

1	120/230 VAC Power in	5	Transformer
2	Ground wire	6	In/out conduit 15 mm (1/2 inch) NPS fitting
3	P101 connector	7	24 VAC power out
4	P107 connector		

For the correct connection of the incoming high voltage and the outgoing low voltage wires, refer to this table:

No.	Connector	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6
	Ground	Grounding screw					
P101	120/230 VAC power in	Line	NC	Neutral			
P107	24 VAC power out			Ground	Heater (24 VAC)	Heater (24 VAC)	

Table 3.2: NDA-U-PA1 / NDA-U PA2 Surveillance cabinet connections

1. Route the high voltage 120/230 VAC wires through the grounded conduit fitting on the left side of the unit. The unit with a transformer comes with a barrier that separates the high voltage side on the left, from the low voltage side on the right.
2. Cut and trim the high voltage 120/230 VAC power and ground wires with sufficient slack to reach their connector terminal in the box, but not so long as to be pinched by or to obstruct closing the door.
3. Attach the supplied 3-pin power plug to the incoming high voltage power wires in the unit. Refer to connector P101 in the table above and to the image below:

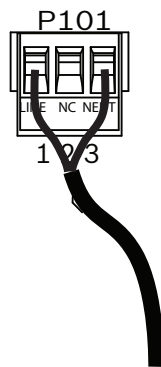


Figure 3.1: Incoming 115/230 VAC power wires

4. Connect the ground wire to the grounding screw.
5. Connect three wires to the P107 Power Out connector to route the 24 VAC power supply to the PA0 unit.
 Connect the first wire to pin 5 (HN: Heater Neutral) connector.
 Connect the second wire to pin 4 (HL: Heater Line) connector.
 Connect the third wire to pin 3 (Ground) connector.
 Refer to connector P107 in the table above and to the image below for these connections:

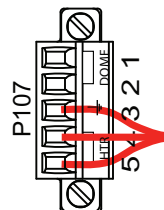


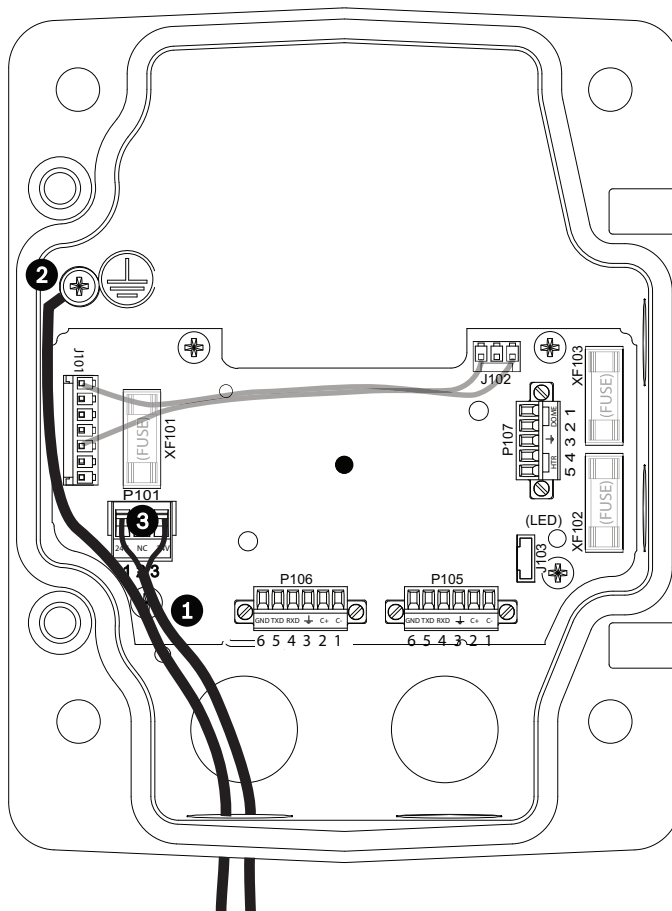
Figure 3.2: Outgoing 24 VAC power wires



Warning!

Make sure that you connect the outgoing power supply wires to the P107 heater connectors (HN and HL). The heater power fuse (XF103) can handle a higher amperage (3.15 A) than the camera power (XF102) fuse (2.0 A).

6. Route the 24 VAC outgoing power supply wires into the PA0 unit through the conduit fitting on the left side of the unit.
7. Cut and trim the 24 VAC power supply and ground wires with sufficient slack to reach their connector terminal in the unit, but not so long as to be pinched by or to obstruct closing the door.
8. Attach the supplied 3-pin power plug to the incoming 24 VAC power supply wires in the unit, as illustrated below.



Connect the 24 VAC power supply wires in the NDA-U-PA0 unit

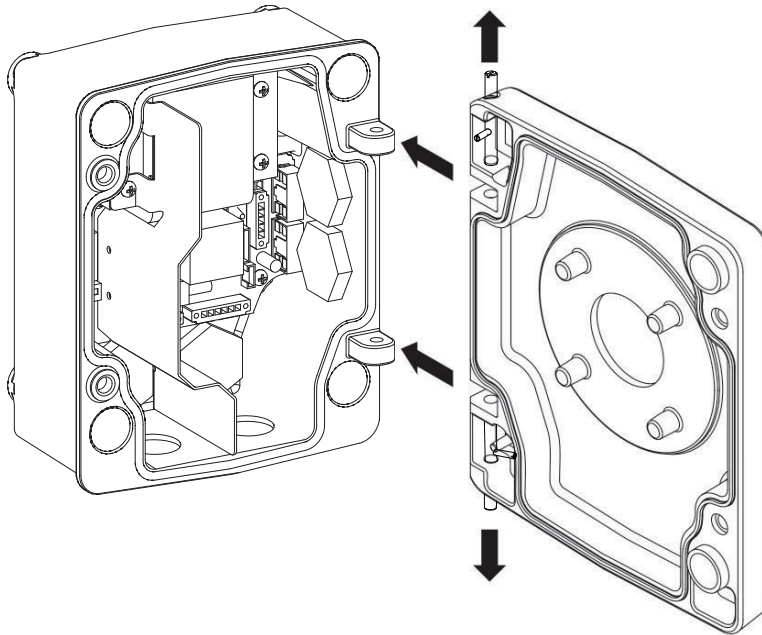
1	Incoming 24 VAC power supply wires (from PA1 or PA2 unit)
2	Ground wire
3	P101 connector

9. Use the instructions in *Attaching the door*, page 18 to continue the installation.

See also

- *Attaching the door, page 18*

3.5 Attaching the door



The bottom hinge pin of the door has a Hinge Pin Stop to hold the hinge open when you attach the arm to the unit.

1. Push the bottom hinge pin down and rotate it behind the Hinge Pin Stop.
2. Push the top hinge pin up and hold it.



Notice!

Both Hinge Pins must be fully pushed to unlock the hinges of the door and before you proceed to the next step.

3. Hold the top hinge pin open and align the top and bottom hinges of the door to their mating points on the unit. See the illustration above.
4. When you have aligned the hinges, release the top hinge pin to connect with its mating hinge on the unit. Then release the bottom hinge pin from the Hinge Pin Stop to lock the door to the unit.



Warning!

Serious injury or death can occur if the hinge pins of the door are not fully connected to the unit. Exercise caution before releasing the door.

3.6 Attaching the Pendant pipe mount or Pendant wall mount

To attach accessories such as a Pendant pipe mount or Pendant wall mount, refer to the documentation that comes with your accessory.

**Notice!**

The accessory comes with a watertight plug. When you attach the accessory to the door, always use the plug to make a watertight cable feed through.

3.7 Making connections in unit

Make the connections in the unit, depending on your camera model.

1. Connect the ground wire to the grounding screw on the left side of the unit.
2. Connect all wires from the camera to their mating wires in the unit. (For Fiber Optic models: connect the 6-pin Control to Dome Plug to the P106 connector.)
3. Connect the 5-pin, 24 VAC to Dome Plug to connector P107 with corresponding color on the right side of the unit.
4. Connect the 3-pin Power In Plug to its mating connector P101 on the left side of the unit.
5. Attach the grounding strap of the Pendant arm to the unit.
6. After making the connections to the unit, rotate the Pendant arm to close and seal the unit and tighten the 2 captive screws to 10-12 N-m (90-105 in.-lbs).
7. Refer to Attach Pendant to Arm and Tighten to continue the installation procedure.

**Notice!**

Make sure that you tighten the screws to 10-12 N-m (90-105 in.-lbs) to ensure the unit is watertight.

4 Connections for video, control, alarm and relay

4.1 Using fiber optic ethernet media converter to transmit video and control

The Small Form-factor Pluggable (SFP) modules are available as multi-mode fiber (MMF) or single-mode fiber (SMF) models with a single SC connector or dual-fiber with an LC connector. Refer to the *VG4-SFP SCKT Fiber Optic Media Converter Installation Guide*.

Ethernet Media Converter	
Data Interface	Ethernet
Data Rate	10/100 Mbps IEEE 802.3 Compliant Full Duplex or Half Duplex Electrical Port Full Duplex Optical Port
Fiber Type, MMF	50/125 μ m MMF. For 50/125 μ m fiber, subtract 4 dB from the specified optical budget value. Must meet or exceed fiber standard ITU-T G.651.
Fiber Type, SMF	8–10/125 μ m SMF. Must meet or exceed fiber standard ITU-T G.652.
Maximum Distance	60 km (37.3 miles)
Requirement	Media converter receiver (CNFE2MC/IN) at controller end of system
Terminal Connection	Duplex LC or Single SC

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