



**BOSCH**

# **AUTODOME IP starlight 5000i**

NDP-5512-Z30



en

Installation Manual



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# 1 Safety

## 1.1 About this manual

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. Because of the ongoing development of products, the content of the manual may change without notice. Bosch Security Systems accepts no liability for damage resulting directly or indirectly from faults, incompleteness, or discrepancies between the manual and the product described.

## 1.2 Legal information

### Copyright

This manual is the intellectual property of Bosch Security Systems, Inc. and is protected by copyright. All rights reserved.

### Trademarks

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

## 1.3 Safety precautions

In this manual, the following symbols and notations are used to draw attention to special situations:



### 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 may result in minor or moderate injury.

---



### Caution!

Low risk: Indicates a potentially hazardous situation. If not avoided, this may 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.

---

## 1.4 Important safety instructions

Read, follow, and retain for future reference all of the following safety instructions. Follow all warnings before operating the device.

1. Clean only with a dry cloth. Do not use liquid cleaners or aerosol cleaners.
2. Do not install device near any heat sources such as radiators, heaters, stoves, or other equipment (including amplifiers) that produce heat.
3. Never spill liquid of any kind on the device.
4. Take precautions to protect the device from power and lightning surges.
5. Adjust only those controls specified in the operating instructions.
6. Operate the device only from the type of power source indicated on the label.
7. Unless qualified, do not attempt to service a damaged device yourself. Refer all servicing to qualified service personnel.
8. Install in accordance with the manufacturer's instructions in accordance with applicable local codes.
9. Use only attachments/accessories specified by the manufacturer.
10. Protect all connection cables from possible damage, particularly at connection points.



### Caution!

Installation must be made by qualified personnel and conform to ANSI/NFPA 70 (the National Electrical Code® (NEC)), Canadian Electrical Code, Part I (also called CE Code or CSA C22.1), and all applicable local codes. Bosch Security Systems accepts no liability for any damages or losses caused by incorrect or improper installation.

**All-pole power switch** - Incorporate an all-pole power switch, with a contact separation of at least 3 mm, into the electrical installation of the building. If it is needed to open the housing, use this all-pole switch as the main disconnect device for switching off the voltage to the unit.

**Camera signal** - Protect the cable with a primary protector if the camera signal is beyond 140 feet, in accordance with *NEC800 (CEC Section 60)*.

**Fuse rating** - For security protection of the device, the branch circuit protection must be secured with a maximum fuse rating of 16A. This must be in accordance with *NEC800 (CEC Section 60)*.

**Outdoor signals** - The installation for outdoor signals, especially regarding clearance from power and lightning conductors and transient protection, must be in accordance with *NEC725* and *NEC800 (CEC Rule 16-224 and CEC Section 60)*.

**Power disconnect** - Units have power supplied whenever the power cord is inserted into the power source, or when High Power-over-Ethernet (High PoE) power is provided over the Ethernet CAT 5E/6 cable. The power cord is the main power disconnect device for switching off the voltage for all units. When High PoE or PoE+ (820.3at) is used to power the unit, the power is provided over the Ethernet cable, which is then the main power disconnect device for switching off the voltage for all units.

**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 losing information, we recommend multiple, redundant recording systems, and a procedure to back up all analog and digital information.



### Caution!

Always securely tighten all fittings to ensure a liquid-tight seal. Failure to do so could allow water to enter the housing and damage the units. If a sealant is used, ensure that it is a neutral cure type. Sealants that release acetic acid may harm electronics. Use drip loops on the wiring outside the housing.

Always use Teflon tape and sealant on connector threads of any mount (sold separately by Bosch or user-supplied).

## 1.5 Connection in applications

**24 VAC power source:** This unit is intended to operate with a limited power source. The unit is intended to operate at 24 VAC (if PoE+ is not available). User supplied wiring must be in compliance with electrical codes (Class 2 power levels).

**PoE:** Use only approved PoE+ devices. Power-over-Ethernet can be connected at the same time as a 24 VAC power supply.

If auxiliary power (24 VAC) and PoE+ are applied simultaneously, the camera selects auxiliary input and shuts off PoE+.

## 1.6 Important notices



### Notice!

This is a **class B** product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
  - This device may not cause harmful interference.
  - This device must accept any interference received, including interference that may cause undesired operation.
2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**Note:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### UL 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 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.

For use in China: CHINA ROHS DISCLOSURE TABLE

**Moving cameras**

| <b>Hazardous substance table according to SJ/T 11364-2014</b>  |            |            |            |                  |              |                |
|--|------------|------------|------------|------------------|--------------|----------------|
|  | Pb<br>(Pb) | Hg<br>(Hg) | Cd<br>(Cd) | Cr 6+<br>(Cr 6+) | PBB<br>(PBB) | PBDE<br>(PBDE) |
| Housing & enclosures   | X          | ○          | ○          | ○                | ○            | ○              |
| PCBA with connectors   | X          | ○          | X          | ○                | ○            | ○              |
| Cable assemblies   | ○          | ○          | ○          | ○                | ○            | ○              |
| Image sensor assembly  | X          | ○          | X          | ○                | ○            | ○              |
| Lens assembly  | X          | ○          | X          | ○                | ○            | ○              |
| PT Motor control assembly  | X          | ○          | X          | ○                | ○            | ○              |
| Fan assembly   | X          | ○          | X          | ○                | ○            | ○              |
| This table was created according to the provisions of SJ/T 11364   |            |            |            |                  |              |                |
| ○: The content of such hazardous substance in all homogeneous materials of such component is below the limit defined in GB/T 26572 |            |            |            |                  |              |                |
| X: The content of such hazardous substance in a certain homogeneous material is above the limit defined in GB/T 26572              |            |            |            |                  |              |                |

The manufacturing datecodes of the products are explained in:  
<http://www.boschsecurity.com/datecodes/>

## 1.7 Customer support and service

If this unit needs service, contact the nearest Bosch Security Systems Service Center for authorization to return and shipping instructions.

### **USA**

Telephone: 800-366-2283

Fax: 800-366-1329

Email: [cctv.repair@us.bosch.com](mailto:cctv.repair@us.bosch.com)

### **Customer Service**

Telephone: 888-289-0096

Fax: 585-223-9180

Email: [security.sales@us.bosch.com](mailto:security.sales@us.bosch.com)

### **Technical Support**

Telephone: 800-326-1450

Fax: 717-735-6560

Email: [technical.support@us.bosch.com](mailto:technical.support@us.bosch.com)

### **Canada**

Telephone: 514-738-2434

Fax: 514-738-8480

### **Europe, Middle East, Africa, and Asia Pacific Regions**

Please contact your local distributor or Bosch sales office. Use this link:

<https://www.boschsecurity.com/corporate/where-to-buy/index.html>

### **More Information**

For more information, please contact the nearest Bosch Security Systems location or visit [www.boschsecurity.com](http://www.boschsecurity.com).

## 2 Introduction

- 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

| Quantity | Component                          |
|----------|------------------------------------|
| 1        | AUTODOME IP starlight 5000i camera |
| 1        | Screwdriver, T15 Torx              |
| 4        | MAC address labels                 |
| 1        | Pendant interface plate            |
| 1        | M4 screw                           |
| 1        | Quick Installation Guide           |
| 1        | Safety instructions                |

### 3 **Product Description**

Specially designed and tuned for applications requiring surveillance in scenes with varying light levels, the AUTODOME IP starlight 5000i camera has an integrated 30X optical zoom to identify people at a maximum distance of 183 m (600 ft) with minimal loss of detail.

## 4 Preparing Wiring

- ▶ Prepare and install all wiring for 24 VAC, PoE+ (Cat5e/Cat6), alarms, and audio as necessary. For 24 VAC, follow the recommendations for maximum cable distance and wire gage.

### Maximum cable distance in meters (feet) per minimum cable diameter

The following table identifies the recommended transmission distance (maximum) in meters (feet), based on the specified wattage, per the minimum cable diameter (in mm<sup>2</sup>), when the cable diameter is fixed and the maximum permitted power consumption for 24 VAC is 10%. For example, for a device of 20 W and a minimum cable diameter of 1.0 mm<sup>2</sup>, the recommended transmission distance is 42 m (141 feet) from the transformer.

| Models           | Watts | 1.0 mm <sup>2</sup> | 1.5 mm <sup>2</sup> | 2.5 mm <sup>2</sup> | 4.0 mm <sup>2</sup> |
|------------------|-------|---------------------|---------------------|---------------------|---------------------|
| Indoor (ceiling) | 20    | 42 m (141 ft)       | 68 m (225 ft)       | 109 m (358 ft)      | 275 m (905 ft)      |
| Outdoor          | 30    | 28 m (94 ft)        | 45 m (150 ft)       | 72 m (238 ft)       | 183 m (603 ft)      |

### Wire Gage

Note: Metric wire sizes are standard DIN sizes, ISO6722, mm<sup>2</sup>.

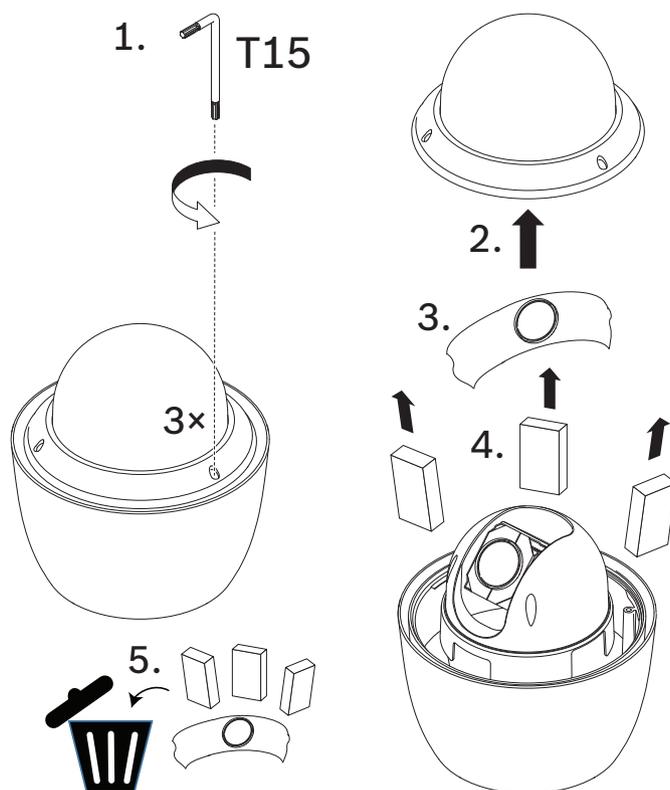
| Wire diameter (mm <sup>2</sup> ) | AWG |
|----------------------------------|-----|
| 1.0                              | 18  |
| 1.5                              | 16  |
| 2.5                              | 14  |
| 4.0                              | 12  |

## 5 Preparing the Camera

**Note:** For *pendant* models, use T15.

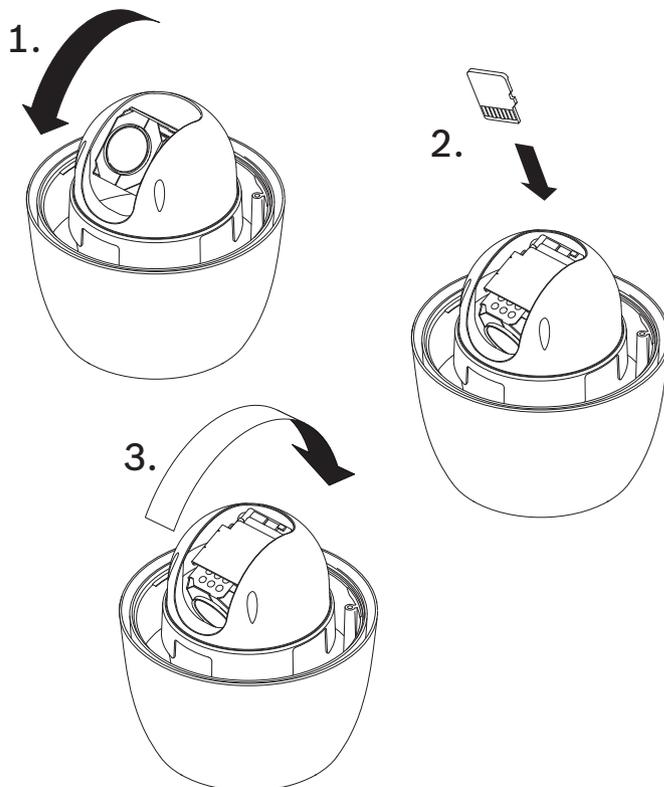
For *in-ceiling* models, use T10.

1. Loosen the three (3) Hex screws in the trim ring / bubble enclosure with the appropriate Torx screwdriver.
2. Remove the trim ring / bubble enclosure.
3. Remove the foam insert that protects the camera block.
4. Remove the tape holding the plastic lens protector; remove the lens protector.



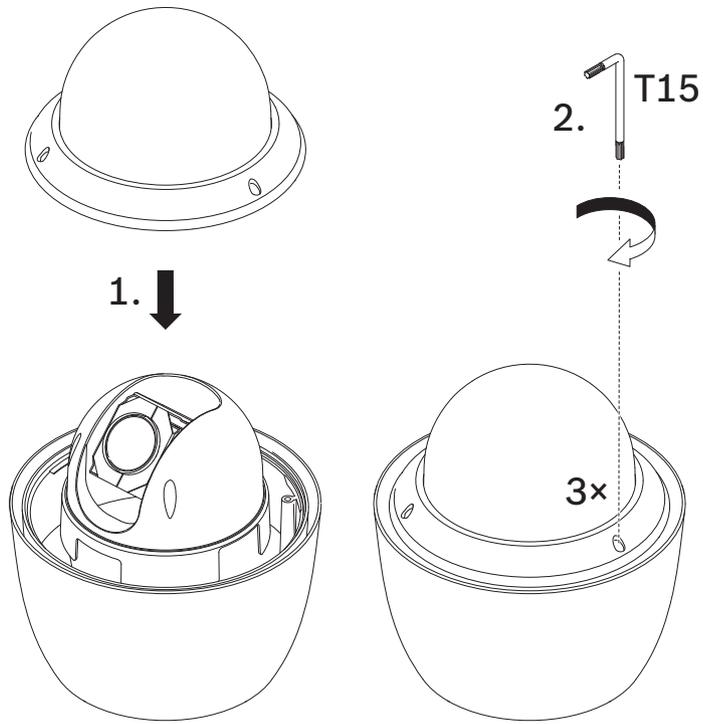
## 6 Installing a microSD card (optional)

1. Push the camera block until you see the card slot (item 1 in the following figure).
2. Insert the card into the slot (item 2 in the following figure).
3. Push the camera block into its original position (item 3 in the following figure).



**Note:** The next two steps are for pendant models only.

1. Replace the trim ring / bubble enclosure.
2. Tighten the screws with the T15 Torx screwdriver.



3. Proceed with installation.

## 7 Installing a Camera Directly to an Indoor Wall

### 7.1 Installation Requirements

- The wall is thick enough to install the mounting screws.
- The wall can sustain at least eight (8) times the weight of the camera (1.88 kg (4.14 lb)): > 15 kg (33 lb).

### 7.2 Preparing the Wall for Installation

**Notice!**

Indoor use only!

The instructions in this chapter apply to indoor installation only. For outdoor installation, use either the surveillance cabinet (NDA-U-PAX) or the mount plate (NDA-U-WMP).

1. Determine a secure location for the wall mount. Ensure there is an adequate opening in the wall for the cables to pass through.
2. Use the direct connect plate as a template to mark the location to drill holes for the four mounting screws (and anchors (user-supplied) if necessary), and to cut the hole for the cables.
3. Drill the holes.
4. Insert the wall anchors (user-supplied) (if necessary) into the wall at the locations marked in step 2.
5. Cut an appropriately-sized hole for the cables, using a drywall utility saw or jig saw.

### 7.3 Installing the Wall Mount

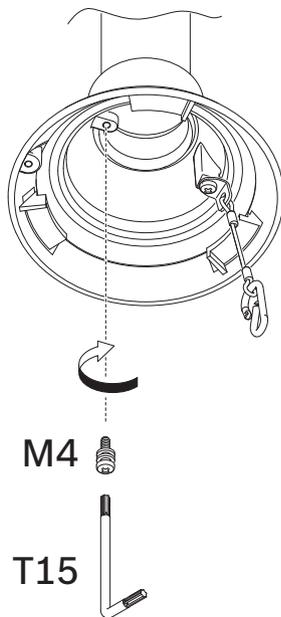
1. Attach the direct connect plate to the wall.
2. Thread the RJ45 cable and 24 VAC cables through the wall and then through the (adapter).

Ensure that the cables are long enough to reach through the mount and the camera's mounting cap to the connections from the camera.

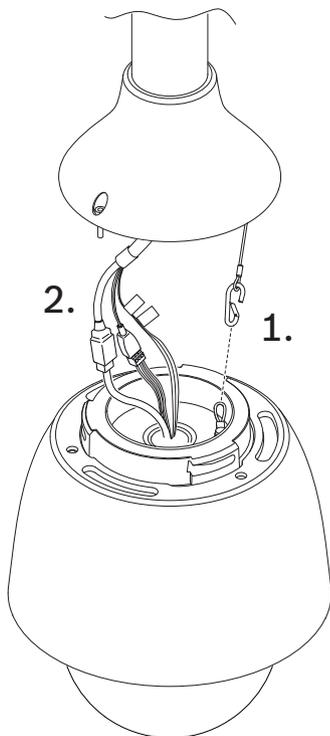
1. Slide the mounting flange over the wall mount.
2. Attach the wall mount to the mounting flange and to the direct connect plate using four M5 screws.
3. Attach the wall mount to the mounting flange and fix them on the front door of the Wall-mount Surveillance Cabinet by using four M5 screws.

### 7.4 Attaching the Mounting Cap and the Camera

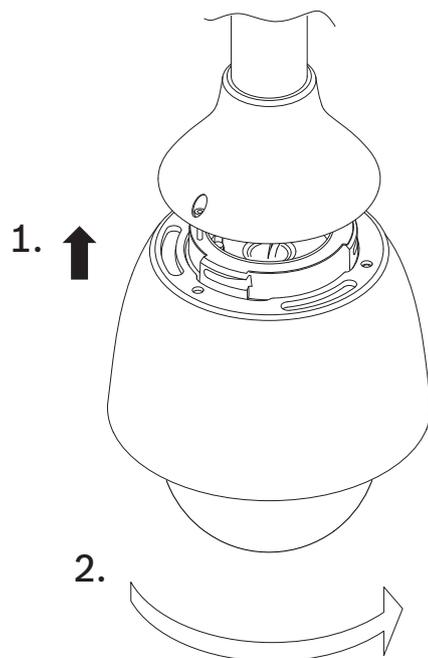
1. To ensure a watertight seal, wrap Teflon tape four times around the threads at the end of the wall mount.
2. Attach the mounting cap to the wall mount.
3. Secure the locking screw with the T15 Torx screwdriver.



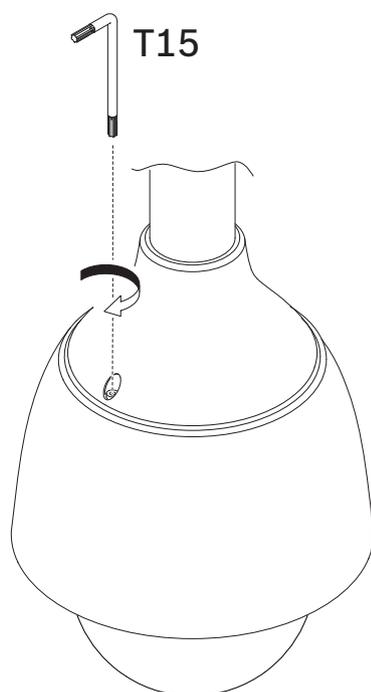
4. Thread all connection cables through the mounting cap.
5. Attach the hook at the end of the Safety Tether to the loop attached to the top of the camera.
6. Connect the mating connectors on the user-supplied cables to the matching connectors on the camera. Refer to the chapter Connection for more information.



7. Place the top of the camera inside the mounting cap.
8. Rotate the camera approximately 15 degrees in a clockwise direction to lock firmly into place.



9. Secure the safety locking screw with the T15 Torx screwdriver.



## 8 Installing a Surveillance Cabinet and Camera

The surveillance cabinet can attach directly to a wall, to a corner mount, or to a pole mount. To install the cabinet (power supply box), follow the instructions in the Surveillance Cabinet *Installation Manual*.

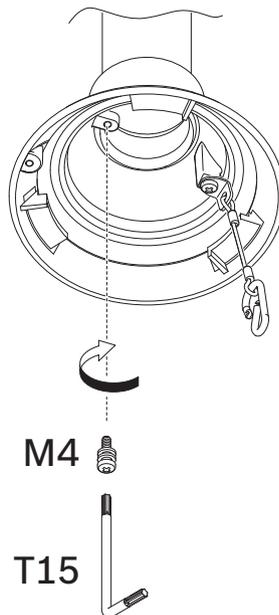
1. Thread the cables through the wall and the mounts.  
Ensure that the cables are long enough to reach through the mount and the camera's mounting cap to the connections from the camera.

### 8.1 Installing the Wall Mount

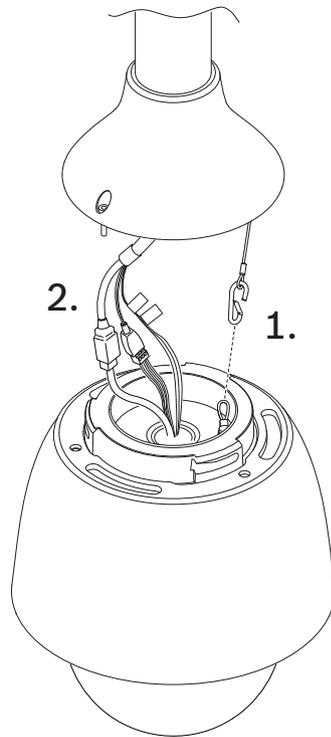
1. Slide the mounting flange over the wall mount.
2. Attach the wall mount to the mounting flange and fix them on the front door of the Wall-mount Surveillance Cabinet by using four M5 screws.

### 8.2 Attaching the Mounting Cap and the Camera

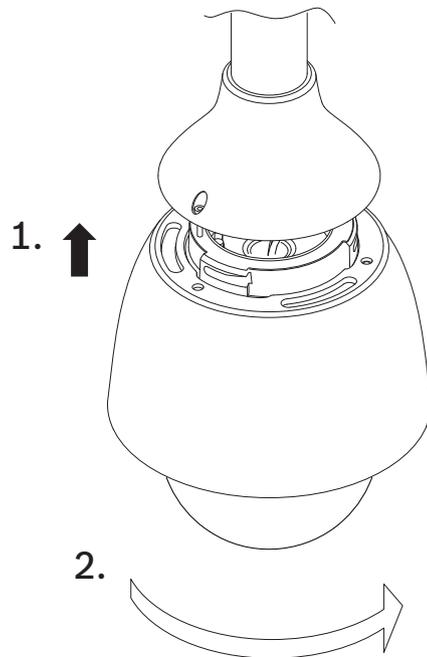
1. To ensure a watertight seal, wrap Teflon tape four times around the threads at the end of the wall mount.
2. Attach the mounting cap to the wall mount.
3. Secure the locking screw with the T15 Torx screwdriver.



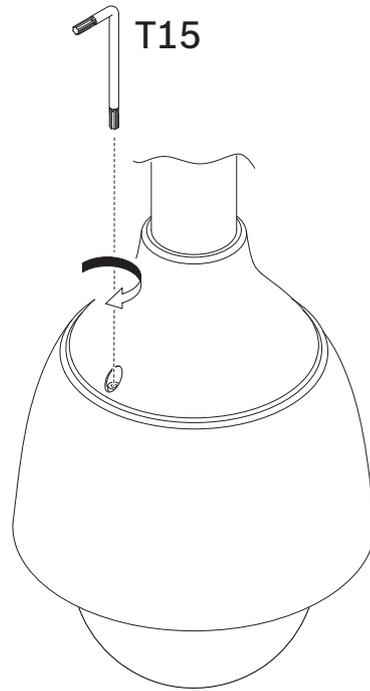
4. Thread all connection cables through the mounting cap.
5. Attach the hook at the end of the Safety Tether to the loop attached to the top of the camera.
6. Connect the mating connectors on the user-supplied cables to the matching connectors on the camera. Refer to the chapter Connection for more information.



- 7. Place the top of the camera inside the mounting cap.
- 8. Rotate the camera approximately 15 degrees in a clockwise direction to lock firmly into place.



- 9. Secure the safety locking screw with the T15 Torx screwdriver.



## 9 Installing a Pipe Mount and Camera

**Notice!**

Indoor use only!

This mount shall only be installed indoors. No outdoors installation is permitted.

### 9.1 Tools Required

- Appropriate tool for cutting a hole in drywall
- No. 2 Phillips screwdriver
- Torx screwdriver, T-25

### 9.2 Preparing the Ceiling for Installation

1. Determine a secure location for the pipe mount. Ensure there is an adequate opening in the ceiling or mounting structure for the cables to pass through.

**Caution!**

Select a rigid mounting location to prevent excessive vibration to the camera.

**Notice!**

The fasteners and mounting surface must be capable of supporting a maximum load of 11.33 kg (25 pounds).

2. Use the direct connect plate as a template to mark the location to drill holes for the four mounting screws (and anchors (user-supplied) if necessary), and to cut the hole for the cables.
3. Drill the holes for the mounting screws.
4. Drill a hole (maximum of 20 mm [.79 in.]) in the center of the mounting location to feed the cables through the mount.
5. Insert the wall anchors (user-supplied), if necessary, into the ceiling at the locations marked in step 2.

### 9.3 Installing the Pipe Mount

1. Attach the direct connect plate to the ceiling or mounting surface.
2. Thread the RJ45 cable and 24 VAC cables through the ceiling and then through the (adapter).

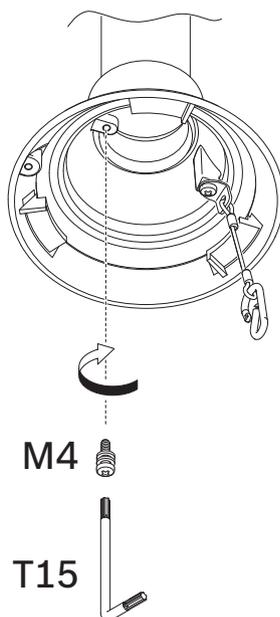
Ensure that the cables are long enough to reach through the mount and the camera's mounting cap to the connections from the camera.

1. Attach the mounting flange and (adapter) to the direct connect plate using four M5 screws.
2. Thread the cables through the pipe mount.
3. Attach the pipe mount to the mounting flange and (adapter).
4. If you choose to install the pipe mount extension, thread the cables through the extension. Attach the pipe extension to the open end of the pipe mount.
5. Attach the hook at the end of the Safety Tether to the loop attached to the top of the camera.

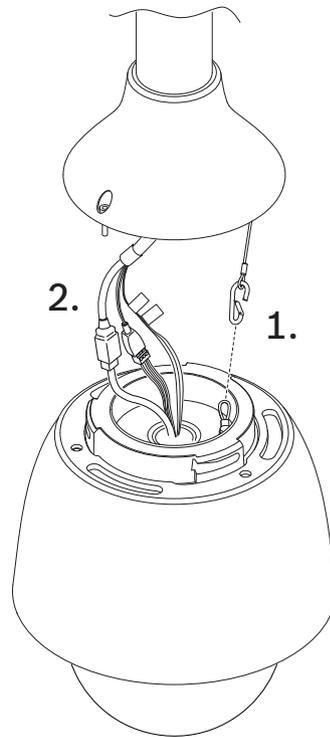
6. Connect the mating connectors from the user-supplied cables from the pipe to the matching connectors from the camera. Refer to the chapter Connection for more information.
7. Place the top of the camera inside the mounting cap.
8. Rotate the camera approximately 15 degrees in a clockwise direction to lock firmly into place.
9. Secure the safety locking screw with the T15 Torx screwdriver.

## 9.4 Attaching the Mounting Cap and the Camera

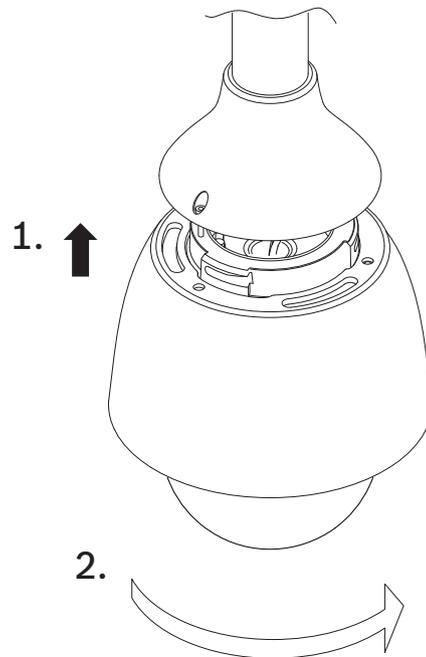
1. To ensure a watertight seal, wrap Teflon tape four times around the threads at the end of the wall mount.
2. Attach the mounting cap to the wall mount.
3. Secure the locking screw with the T15 Torx screwdriver.



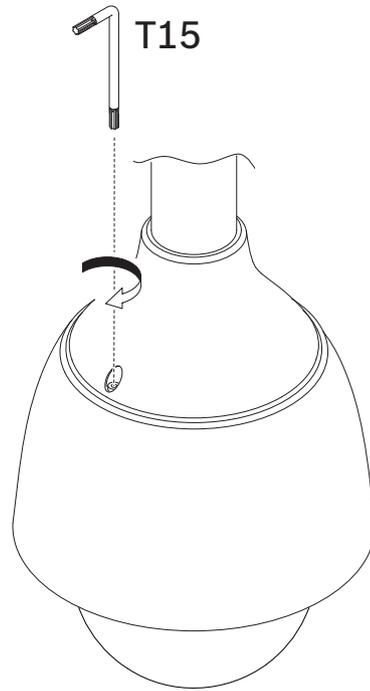
4. Thread all connection cables through the mounting cap.
5. Attach the hook at the end of the Safety Tether to the loop attached to the top of the camera.
6. Connect the mating connectors on the user-supplied cables to the matching connectors on the camera. Refer to the chapter Connection for more information.



- 7. Place the top of the camera inside the mounting cap.
- 8. Rotate the camera approximately 15 degrees in a clockwise direction to lock firmly into place.



- 9. Secure the safety locking screw with the T15 Torx screwdriver.



# 10 Installing a Roof Mount and Camera

## 10.1 Installing the Roof Mount

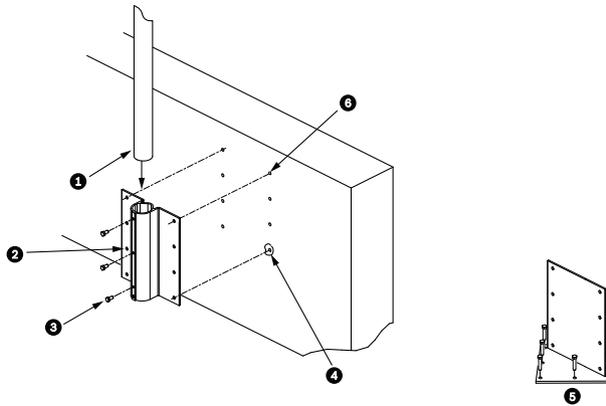
1. Determine the wall location on the roof for the camera and use the Parapet wall mount bracket as a template to mark the hole locations.



**Notice!**

Allow enough room below the Parapet Mount Bracket to route the video, control, and alarm wires up through the Parapet arm. In certain installations, you may need to lift the Parapet arm for the camera to clear the top of the wall when it is swung into position. Provide enough slack in the wires to rotate the pipe arm over the roof and back when camera maintenance is required.

2. Prepare the mounting surface for the type of fastener by drilling holes for the mounting anchors as required.



**Figure 10.1: Parapet Wall Mount Bracket and Roof Mount Plate**

|   |                                    |   |  |
|---|------------------------------------|---|--|
| 1 | Pipe arm                           | 4 | Apply sealant around each fastener hole  |
| 2 | Parapet Wall Bracket               | 5 | Roof Mount Plate   |
| 3 | 3/8-16 SS Hex Head Bolt (supplied) | 6 | Use a minimum of six (6) fasteners (not supplied). Eight (8) fastener holes shown. |



**Notice!**

Fasteners are not supplied with the Roof Parapet Mount Kit because the appropriate fasteners depend on the material to which the mount is attached. The material must accommodate a minimum pull-out strength of 275 kg (600 lb) (for example, 19 mm (3/4 in.) minimum for plywood). Fasteners can include bolts, studs, or lag bolts. All fasteners must be made of corrosion-resistant stainless steel with a diameter of 10 mm (3/8 in.). All bolts must fully extend through the mounting surface and be secured with a flat washer, a lock washer, and a nut. All studs must be anchored to concrete or welded to a steel backing plate. Anchor bolts can be used for blind structures where there is no access to the rear.

3. Apply a weatherproof sealant around each fastener hole at the mounting surface.

4. Attach the Parapet Wall Bracket using at least six (6) stainless steel fasteners, three (3) on each side. (The bracket has eight (8) holes.) Be careful not to overtighten the fasteners because it may strip the threads. If attaching the parapet mount to a flat roof, attach the optional LTC 9230/01 Roof Mount Plate to the roof and then attach the Parapet Wall Bracket to the Roof Mount Plate.
5. Insert the Parapet Pipe Arm into the mounting bracket until it bottoms in the bracket.
6. Remove the End Cap from the front of the arm. Feed the video, control, and power wires up through the bottom of the pipe arm and out the front end.

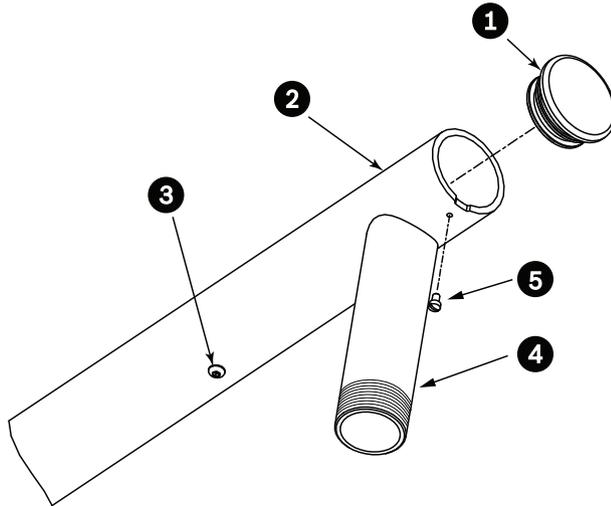


Figure 10.2: NDA-U-RMT

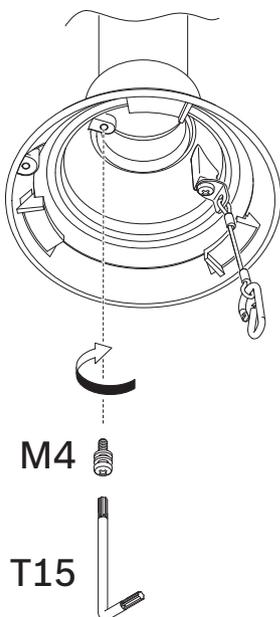
|   |                         |
|---|-------------------------|
| 1 | End Cap with O-ring     |
| 2 | Parapet Pipe Arm        |
| 3 | 1/4-20 SS Cap Screw     |
| 4 | Down Pipe               |
| 5 | 10-24 SS Pan Head Screw |

7. Fold back the video, control, and power wires at the front end of the arm and route them down and out through the Down Pipe. Replace the End Cap.
8. Wrap at least five layers of Teflon tape around the Down Pipe threads.

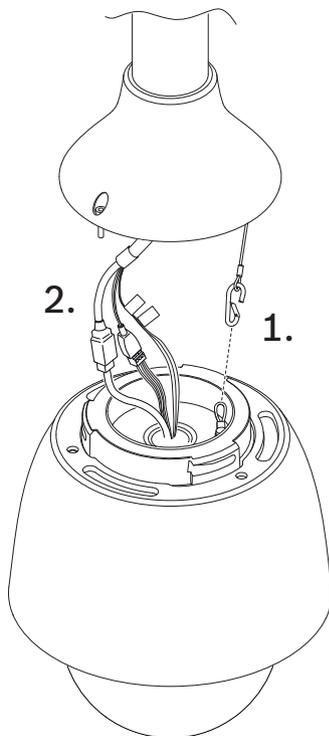
## 10.2

### Attaching the Mounting Cap and the Camera

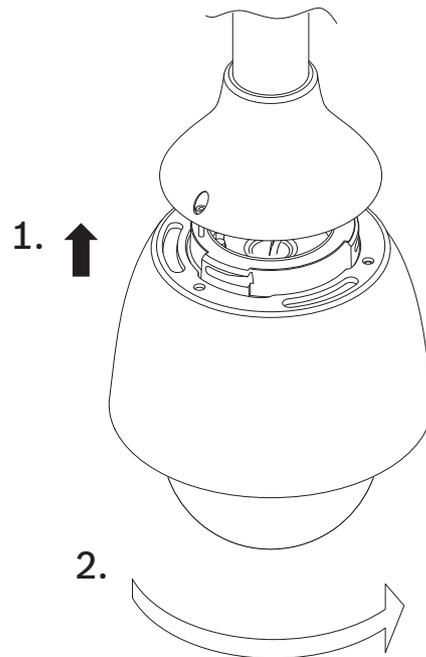
1. To ensure a watertight seal, wrap Teflon tape four times around the threads at the end of the wall mount.
2. Attach the mounting cap to the wall mount.
3. Secure the locking screw with the T15 Torx screwdriver.



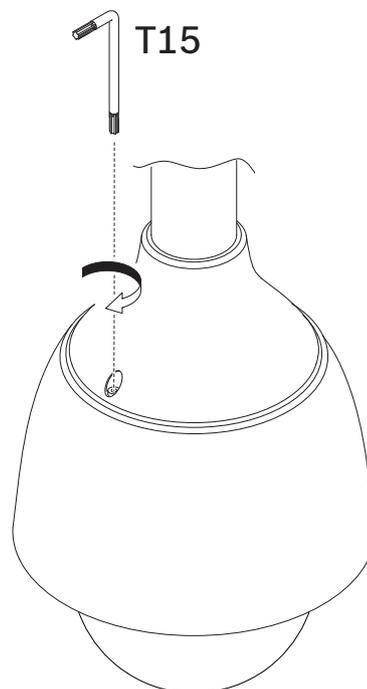
4. Thread all connection cables through the mounting cap.
5. Attach the hook at the end of the Safety Tether to the loop attached to the top of the camera.
6. Connect the mating connectors on the user-supplied cables to the matching connectors on the camera. Refer to the chapter Connection for more information.



7. Place the top of the camera inside the mounting cap.
8. Rotate the camera approximately 15 degrees in a clockwise direction to lock firmly into place.



9. Secure the safety locking screw with the T15 Torx screwdriver.



# 11 Connection



**Caution!**

Compliance with EN50130-4 Alarm Standard – CCTV for Security Applications

To meet the requirements of the EN50130-4 Alarm Standard, an ancillary uninterruptable power (UPS) supply is necessary. The UPS must have a **Transfer Time** between 2–6 ms and a **Backup Runtime** of greater than 5 seconds for the power level as specified on the product datasheet.

**Note:** Consult the National Electrical Code (NEC) for cable bundling requirements and limitations.

- ▶ Connect the cable to the 24 VAC wires from the camera.

| Label ID | Description  | Cable Wire Color |
|----------|--------------|------------------|
| AC24V    | 24 VAC       | Red              |
| AC24V    | 24 VAC       | Black            |
| EARTH    | Earth Ground | Yellow/Green     |

- ▶ Connect the Ethernet cable to the RJ45 connector of the camera. The following figure illustrates a typical system configuration.

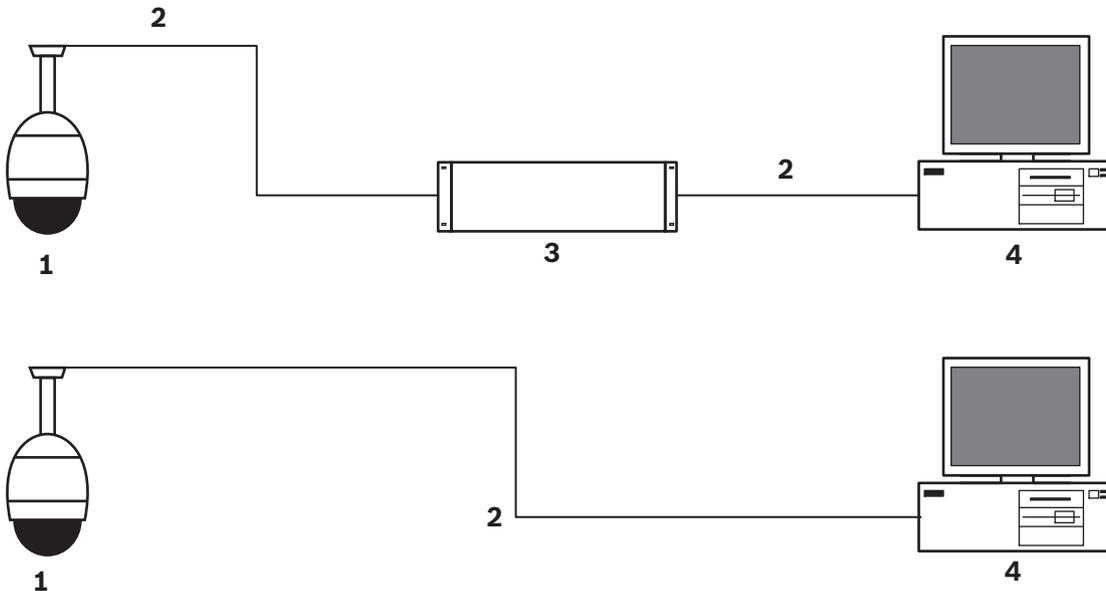


Figure 11.1: AUTODOME IP System Config

|   |   |
|---|---|
| 1 | AUTODOME camera                                       |
| 2 | IP connection (Ethernet/CAT5/CAT6) (100 m maximum)    |
| 3 | Network switch  |
| 4 | Network device (computer with monitor, DVR/NVR, etc.) |

- ▶ If desired, connect the alarm and/or audio wires as identified in the following table.

| Label ID  | Description          | Cable Wire Color |
|-----------|----------------------|------------------|
| ALARM_COM | Alarm Communications | Red              |
| ALARM_OUT | Alarm Out            | Brown            |

| <b>Label ID</b> | <b>Description</b> | <b>Cable Wire Color</b> |
|-----------------|--------------------|-------------------------|
| ALARM_IN1       | Alarm In 1         | White                   |
| ALARM_IN2       | Alarm In 2         | Blue                    |
| AUDIO_OUT       | Audio Out          | Grey                    |
| GND             | Ground             | Black                   |
| AUDIO_GND       | Audio Ground       | Green                   |
| AUDIO_IN        | Audio In           | Purple                  |

## 12

# Troubleshooting

### Table of Troubleshooting Issues

The table below identifies issues that could occur with the camera, and how to resolve them.

**Note:** Refer to the Error Codes section of the manual for descriptions of the error codes that appear on the OSD. The section also lists recommended actions to resolve the error codes.

## 13 Maintenance

All bubbles require special care when handling and cleaning to avoid scratches.



### Notice!

To avoid excessive moisture saturation inside the housing, limit the amount of time that the bubble is disconnected from the housing. Bosch recommends that the bubble be removed from the housing for no more than five (5) minutes.

### Bubble Handling

The bubble may be packaged with a protective plastic sheet. It is recommended that the bubble remain stored this way until it is ready to install. Limit handling the bubble, as any scratches can quickly affect visibility.

### Bubble Cleaning

If cleaning the bubble is required, use the following procedures and comply with all the warnings listed below.

#### Cleaning the Bubble Interior

The extremely soft interior surface should not be cleaned by rubbing or dusting with a cloth. Use clean dry compressed air, preferably from a spray can, to remove any dust from the interior surface.



### Warning!

Do not use alcohol-based solutions to clean the polycarbonate bubble. This will cause the polycarbonate to cloud and over time cause stress aging, which makes the bubble brittle.

#### Cleaning the Bubble Exterior

The exterior of the polycarbonate bubble is hard coated for extra protection. If cleaning becomes necessary, only use cleaning solutions and cloths suitable for cleaning safety glass lenses. Dry the bubble thoroughly with a dry nonabrasive cloth to prevent water spots. Never scrub the bubble with any abrasive material or cleaners.

Bosch recommends cleaning the exterior of the bubble with NOVUS "No. 1" Plastic Clean & Shine (or equivalent), according to manufacturer's instructions. Refer to [www.novuspolish.com](http://www.novuspolish.com) to order or to find a local distributor.

#### Cautions

- Do Not clean bubbles in the hot sun or on very hot days.
- Do Not use abrasive or highly alkaline cleaners on the bubble.
- Do Not scrape the bubble with razor blades or other sharp instruments.
- Do Not use Benzene, Gasoline, Acetone, or Carbon Tetrachloride on the bubble.

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# 14 Decommissioning







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