A-200 Speed Dome

Installation Manual

V1.0.2

Thank you for purchasing our product. If there is any question or request, please do not hesitate to contact the dealer or **tech support at (713) 621-9779**
This manual is applicable to **A-200.**
This manual may contain several technically inaccurate points or printing errors, and the content is subject to change without notice. The updates will be added into the new version of this manual. We will readily improve or update the products or procedures described in the manual.

DISCLAIMER STATEMENT

"Underwriters Laboratories Inc. ("UL") has not tested the performance or reliability of the security or signaling aspects of this product. UL has only tested for fire, shock or casualty hazards as outlined in UL's Standard(s) for Safety, UL60950-1. 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."

Regulatory Information

FCC Information

FCC compliance: This equipment has been tested and found to comply with the limits for a digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Conditions

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

EU Conformity Statement

CE

This product and - if applicable - the supplied accessories too are marked with "CE" and comply therefore with the applicable harmonized European standards listed under the Low Voltage Directive 2006/95/EC, the EMC Directive 2004/108/EC.

2002/96/EC (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: www.recyclethis.info.

2006/66/EC (battery directive): This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling, return the battery to your supplier or to a designated collection point. For more information see: www.recyclethis.info.

Safety Instruction

These instructions are intended to ensure that user can use the product correctly to avoid danger or property loss. The precaution measure is divided into **Warnings** and **Cautions**:

Warnings: Neglecting any of the warnings may cause serious injury or death.

Cautions: Neglecting any of the cautions may cause injury or equipment damage.

	
Warnings: Follow these safeguards to prevent serious injury or death.	**Cautions**: Follow these precautions to prevent potential injury or material damage.

 **Warnings**

- All the electronic operation should be strictly compliance with the electrical safety regulations, fire prevention regulations and other related regulations in your local region.
- Please use the power adapter, which is provided by normal company. The standard of the power adapter is 24VAC±10% or 12VDC±10% (depending on models). The power consumption cannot be less than the required value.
- Do not connect several devices to one power adapter as adapter overload may cause over-heat or fire hazard.
- Please make sure that the power has been disconnected before you wire, install or dismantle the speed dome.
- When the product is installed on wall or ceiling, the device shall be firmly fixed.
- If smoke, odors or noise rise from the device, turn off the power at once and unplug the power cable, and then please contact the service center.
- If the product does not work properly, please contact your dealer or the nearest service center. Never attempt to disassemble the camera yourself. (We shall not assume any responsibility for problems caused by unauthorized repair or maintenance.)

 **Cautions**

- Do not drop the dome or subject it to physical shock, and do not expose it to high electromagnetism radiation. Avoid the equipment installation on vibrations surface or places subject to shock (ignorance can cause equipment damage).
- Do not place the dome in extremely hot, cold, dusty or damp locations, otherwise fire or electrical shock will occur. The operating temperature should be -30°C ~ 65°C (outdoor speed dome) and -10°C ~ 50°C (indoor speed dome).
- The dome cover for indoor use shall be kept from rain and moisture.
- Exposing the equipment to direct sun light, low ventilation or heat source such as heater or radiator is forbidden (ignorance can cause fire danger).

- Do not aim the camera at the sun or extra bright places. A blooming or smear may occur otherwise (which is not a malfunction however), and affecting the endurance of sensor at the same time.
- Please use the provided glove when open up the dome cover, avoid direct contact with the dome cover, because the acidic sweat of the fingers may erode the surface coating of the dome cover.
- Please use a soft and dry cloth when clean inside and outside surfaces of the dome cover, do not use alkaline detergents.
- Please keep all wrappers after unpack them for future use. In case of any failure occurred, please return the speed dome to the factory with the original wrapper. Transportation without the original wrapper may result in damage on the speed dome and cost additional charge.

Table of Contents

Chapter 1 Installation

1.1 Package Contents

Please make sure that the device in the package is in good condition and all the assembly parts are included. The main package contents are shown in Figure 1-1.

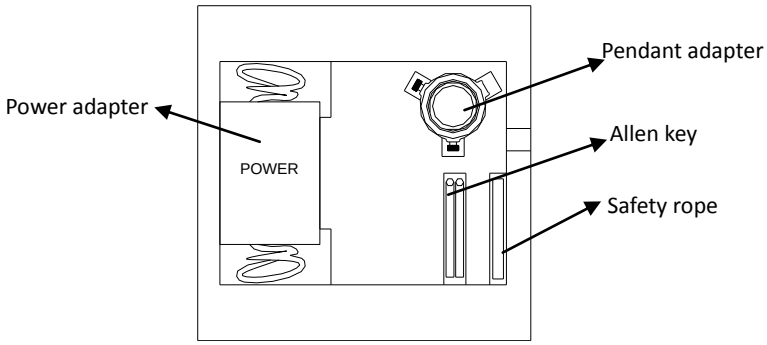

Figure 1-1 Package Contents

Note: Do not lift the speed dome with its waterproof cables as shown in Figure 1-2, otherwise the waterproof performance is affected.

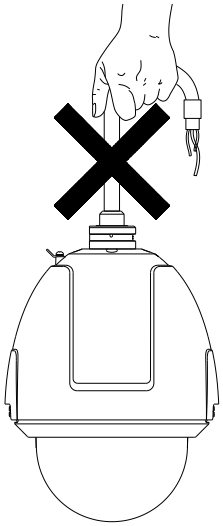

Figure 1-2 Do Not Lift by the Cables

1.2 Installation and Cabling

1.2.1 Installing the Speed Dome

Steps:

1. Loosen the two lock screws on both sides of the speed dome. Pull the lower dome to separate it from the back box as shown in Figure 1-3.

Note: Please do not remove the lock screws from the dome.

2. Remove the protective foam, sticker and lens cover from the dome drive.
3. Align the slots on the lower dome with the lock screws on the back box to reinstall the lower dome. Tighten the lock screws.

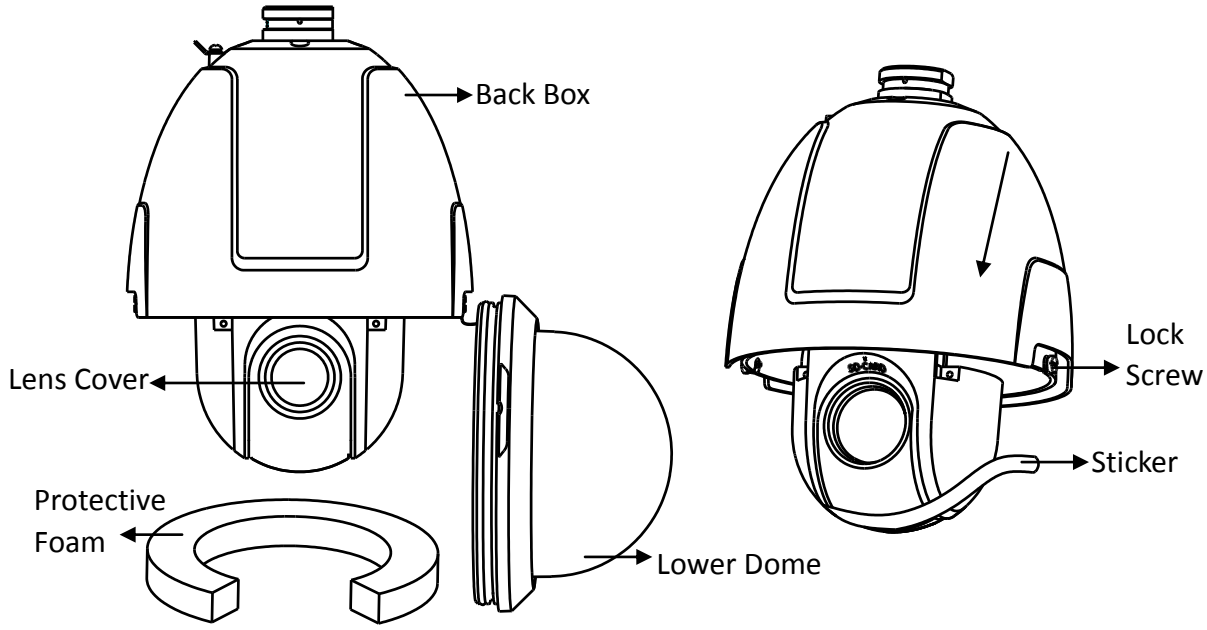

Figure 1-3 Remove the Lower Dome

4. Install the dome mount. Please refer to the related sections in *Chapter 2* and *Chapter 3* for specific installation methods with different mounts.

Notes:

- For cement wall, you need to use the expansion screws to fix the mount. The mounting hole of the expansion pipe on the wall should align with the mounting hole on the mount.
- For wooden wall, you can just use the self-tapping screw to fix the mount.
- Please make sure that the wall is strong enough to withstand more than 8 times the weight of the dome and the mount.

5. Configure the dome address, baud rate, protocol and other parameters through DIP switch SW1 and SW2 which you can see after removing the lower dome. Please refer to *Section* ***1.3 DIP Switch Settings*** for details.

Notes:

- You do not have to set the address, baud rate, protocol and other parameters of network speed dome through DIP switches.
- The SD card slot of network speed dome is shown in Figure 1-5.

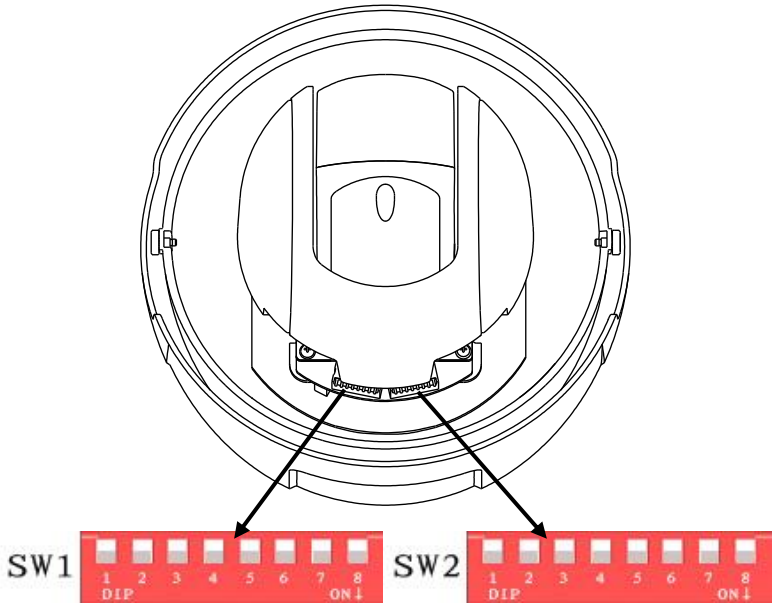

Figure 1-4 DIP Switches

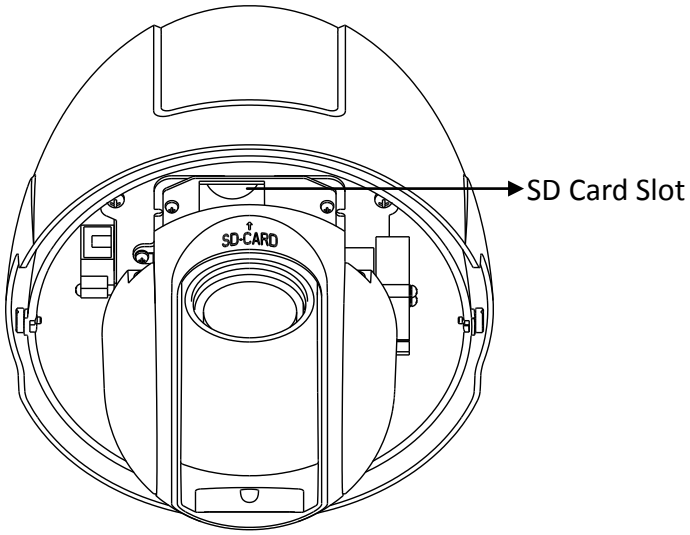

Figure 1-5 SD Card Slot for Network Dome

6. Mounting the speed dome to the A-200-WM.

   Steps:

   (1) Apply thread tape to the thread of the pendant adapter and rotate the pendant adapter to the mount. Secure the pendant adapter to the mount with a set screw (supplied).

   (2) Loosen the lock screws of the adapter, as shown below:

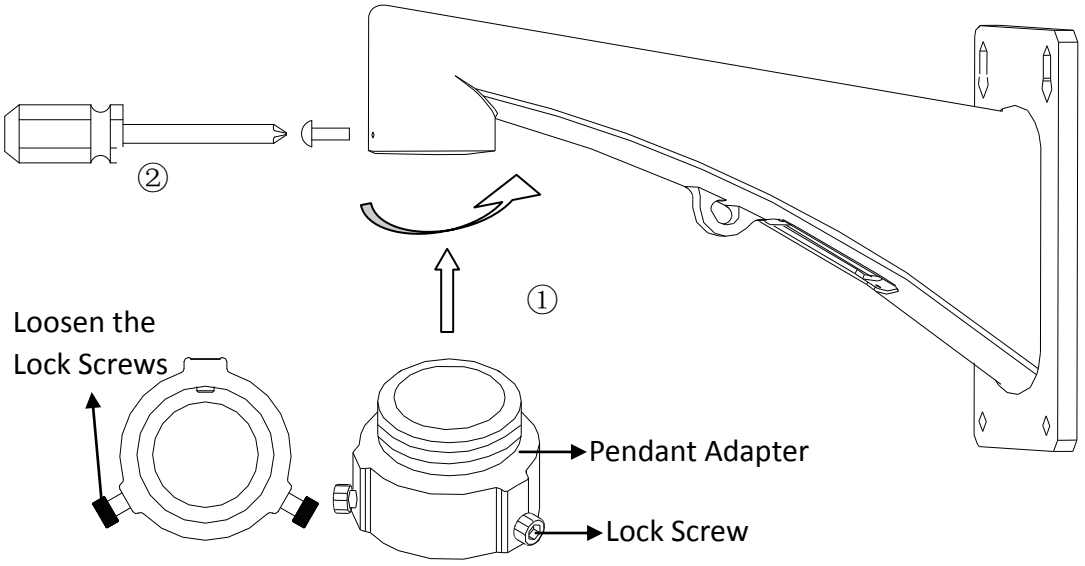

Figure 1-6 Install the Pendant Adapter

(3) Hook the back box of the speed dome to the mount with the safety cable. Route the cables through the mount.

(4) Align the direction label of pendant adapter with the label of the back box to install the speed dome. Rotate the back box counterclockwise or clockwise tightly. Secure the back box and the pendant adapter with two lock screws.

Note: Please remove the protective film on the lower dome after the installation is finished.

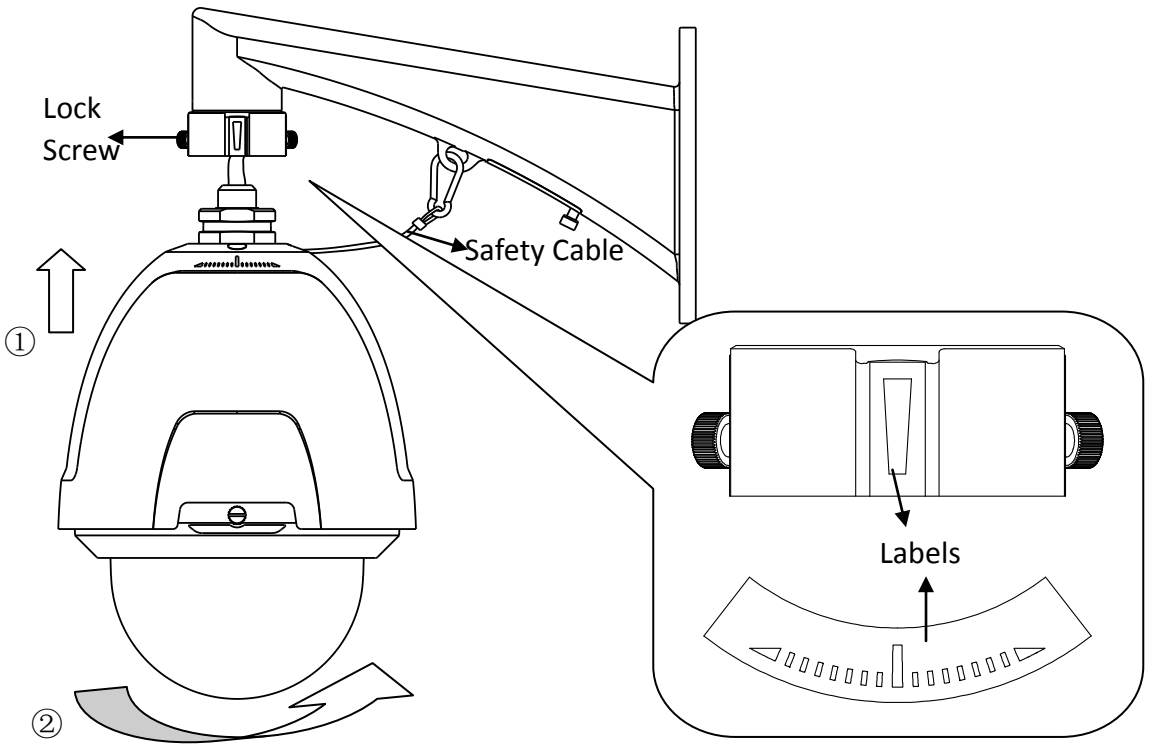

Figure 1-7 Align the Direction Label

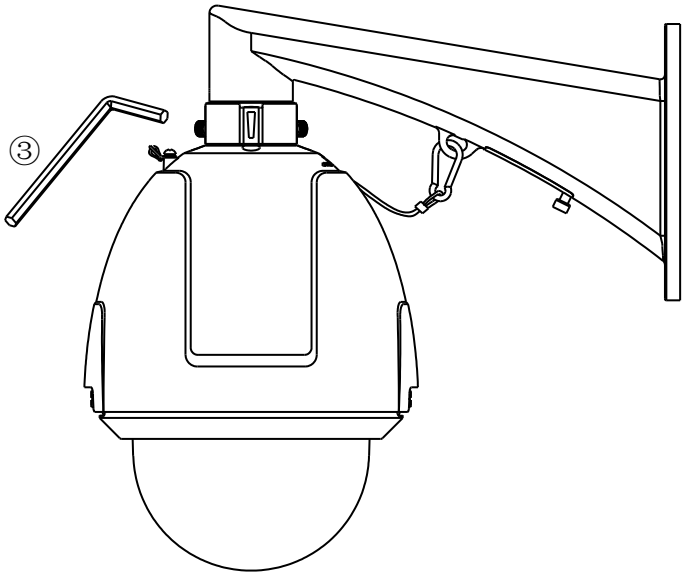

Figure 1-8 Mount the Dome

1.2.2 Connecting the Cables

Before you start:

Please make sure there is no power applied to the dome before connecting the cables.

- Choose the video cable according to the transmission length. The video should meet the following minimum requirements: 75Ω resistance; 100% copper core conducting wire; 95% copper shield.
- RS485 communication cable, please refer to Appendix 2
- 24V AC power cable, please refer to Appendix 3

The cable connections of the A-200 speed dome are shown in the following figures. Please refer to the following figure for connecting the RS-485, power and video cables.

As shown in the following figures, label ① instructs you to connect the power cables. Labels ② and ③ instruct you to connect the RS-485 cables.

Table 1-1 Connections

Name	Description
24V AC	Alternating current power supply interface
RS485+, RS485-	Interfaces for receiving commands
IN1/2/3/4/5/6/7, GND	Alarm input interfaces
OUT1/2, COM1/2	Alarm output interfaces
VIDEO	Video output interface
AUDIO-IN, GND	Audio input interface
AUDIO-OUT, GND	Audio output interface

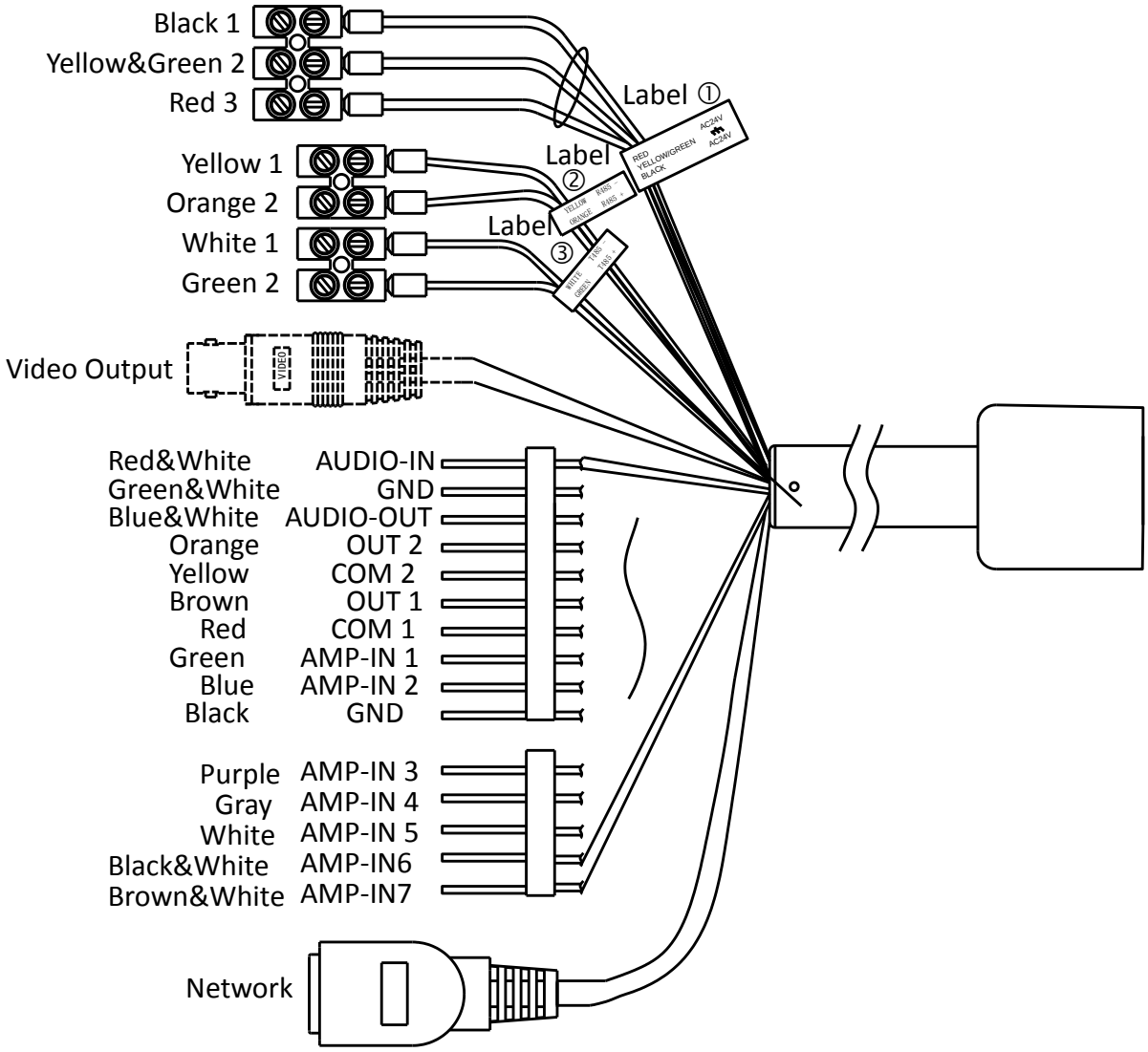

Figure 1-9 Cables of Network Speed Dome

1.3 DIP Switch Settings

1.3.1 DIP Switches

Two DIP switches *SW1* and *SW2* are for setting the speed dome address, baudrate, protocol, etc., with value ON=1 and OFF=0, as shown in Figure 1-10. Each number of the switch represents a DIP value, ranging from 1 to 8 for the lowest to highest. Please refer to *Section **1.3.2*** to ***1.3.6*** for detailed settings.

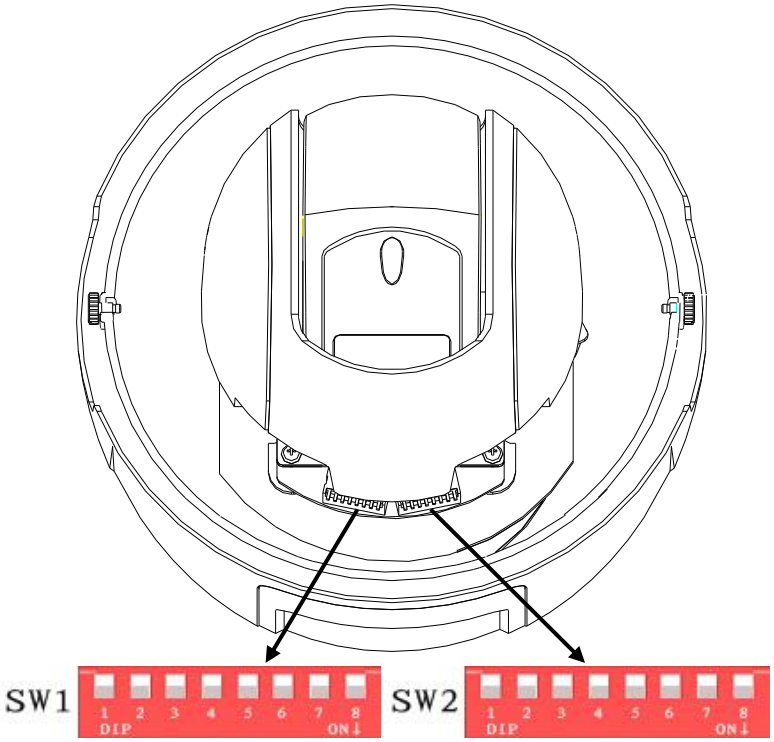

Figure 1-10 DIP Switch Settings

Notes:

- The default dome address is 0; the default baud rate is 2400; and the default value of the 120Ω terminator is OFF.
- For HD-SDI speed dome, it adopts self-adaptive PELCO-D, PELCO-P and private protocol which cannot set by the DIP switches.
- For fiber speed dome, it adopts the protocol according to different vendors, with fixed fiber baud rate as 115200bps.

1.3.2 Address Settings

The DIP switch SW1 is used for setting the address of speed dome. You can refer to Table 1-2 and Table 1-3 for details of setting the speed dome address to a specific number.

Table 1-2 Set the Dome Address

Dome Address	SW1 Settings	1	2	3	4	5	6	7	8
0		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1		ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
-	-	-	-	-	-	-	-	-	-
255		ON	ON	ON	ON	ON	ON	ON	ON

Table 1-3 Set the Dome Address from 0 to 71

	DIP Switch SW1 Settings							
Address	1	2	3	4	5	6	7	8
0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF	OFF	OFF
16	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
17	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
18	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
19	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
20	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
21	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
22	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
23	ON	ON	ON	OFF	ON	OFF	OFF	OFF
24	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
25	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
26	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
27	ON	ON	OFF	ON	ON	OFF	OFF	OFF
28	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
29	ON	OFF	ON	ON	ON	OFF	OFF	OFF
30	OFF	ON	ON	ON	ON	OFF	OFF	OFF
31	ON	ON	ON	ON	ON	OFF	OFF	OFF
32	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
33	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
34	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
35	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
36	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
37	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
38	OFF	ON	ON	OFF	OFF	ON	OFF	OFF

	DIP Switch SW1 Settings							
39	ON	ON	ON	OFF	OFF	ON	OFF	OFF
40	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF
41	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
42	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
43	ON	ON	OFF	ON	OFF	ON	OFF	OFF
44	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
45	ON	OFF	ON	ON	OFF	ON	OFF	OFF
46	OFF	ON	ON	ON	OFF	ON	OFF	OFF
47	ON	ON	ON	ON	OFF	ON	OFF	OFF
48	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
49	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
50	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
51	ON	ON	OFF	OFF	ON	ON	OFF	OFF
52	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
53	ON	OFF	ON	OFF	ON	ON	OFF	OFF
54	OFF	ON	ON	OFF	ON	ON	OFF	OFF
55	ON	ON	ON	OFF	ON	ON	OFF	OFF
56	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
57	ON	OFF	OFF	ON	ON	ON	OFF	OFF
58	OFF	ON	OFF	ON	ON	ON	OFF	OFF
59	ON	ON	OFF	ON	ON	ON	OFF	OFF
60	OFF	OFF	ON	ON	ON	ON	OFF	OFF
61	ON	OFF	ON	ON	ON	ON	OFF	OFF
62	OFF	ON	ON	ON	ON	ON	OFF	OFF
63	ON	ON	ON	ON	ON	ON	OFF	OFF
64	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
65	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
66	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
67	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
68	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
69	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
70	OFF	ON	ON	OFF	OFF	OFF	ON	OFF
71	ON	ON	ON	OFF	OFF	OFF	ON	OFF

1.3.3 Baud rate Settings

Positions 1, 2 and 3 of DIP switch SW2 are for setting the baud rate of the speed dome, and stand for 2400bps, 4800bps, 9600bps, 19200bps and 38400bps respectively. The baud rate will be set as 2400bps by default if it is out of this range. Refer to the following table:

Table 1-4 Set the Baud rate of the Dome

	DIP Switch SW2-Baud Rate Settings			
Baud Rate	Positions1-3 Settings	1	2	3
2400		ON	OFF	OFF
4800		OFF	ON	OFF
9600		ON	ON	OFF
19200		OFF	OFF	ON
38400		ON	OFF	ON

1.3.4 Protocol Settings

Positions 4, 5 and 6 of DIP switch SW2 are for setting the communication protocols of the dome. Refer to the following table:

Table 1-5 Set the Protocol of the Dome

	DIP Switch SW2-Protocol Settings			
Protocol	Positions 4-6 Settings	4	5	6
Bosch Manchester		OFF	ON	ON
AD Manchester		ON	ON	ON
Self-adaptive	Others			

Note: The A-200 does not support Manchester Code protocol.

1.3.5 Communication Mode Settings

Position 7 of DIP switch SW2 is for setting the RS485 communication mode of the dome to simplex or half-duplex.

Table 1-6 Set Communication Mode of the Dome

DIP Switch SW2-Simplex/Half-duplex Settings		
Description	Position 7 Setting	7
Simplex		OFF
Half-duplex		ON

1.3.6 Terminal Resistor Settings

Open the bubble of the dome and you will find the 120Ω terminal resistor on the side of the dome as shown below.

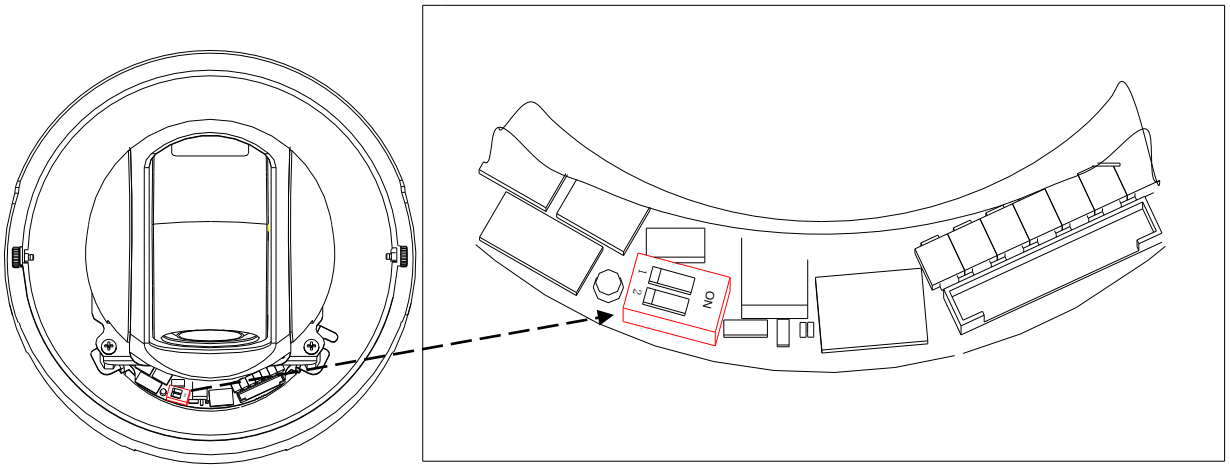

Figure 1-11 Termination Resistor

- In half-duplex mode, you can switch the position 2 to ON to enable the resistor;
- In full-duplex mode, switch position 2 to ON to enable the resistor of the receiving end, and switch position 1 to ON to enable the resistor of the sending end.

Note: The factory default setting for the speed dome is half-duplex.

1.4 Alarm In/Out Connections

The network speed dome can be connected with alarm inputs (0~5VDC) and alarm outputs. Refer to the following diagrams for alarm output:

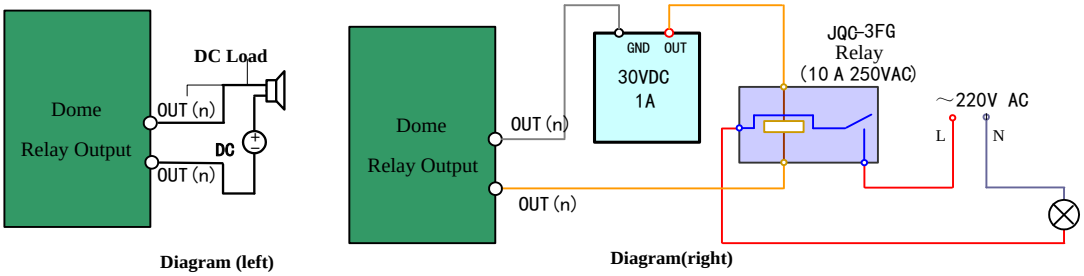

Figure 1-12 Alarm Out Connections

The alarm provides the relay output (no voltage), and the external power supply is required when it connects to the alarm device.

- For DC power supply (left diagram), the input voltage must be no more than 30VDC, 1A.
- For AC power supply, the external relay must be used (right diagram) to prevent damages to the speed dome and avoid risk of electric shock.

Chapter 2 Mount Dimension

2.1 A-200-WM

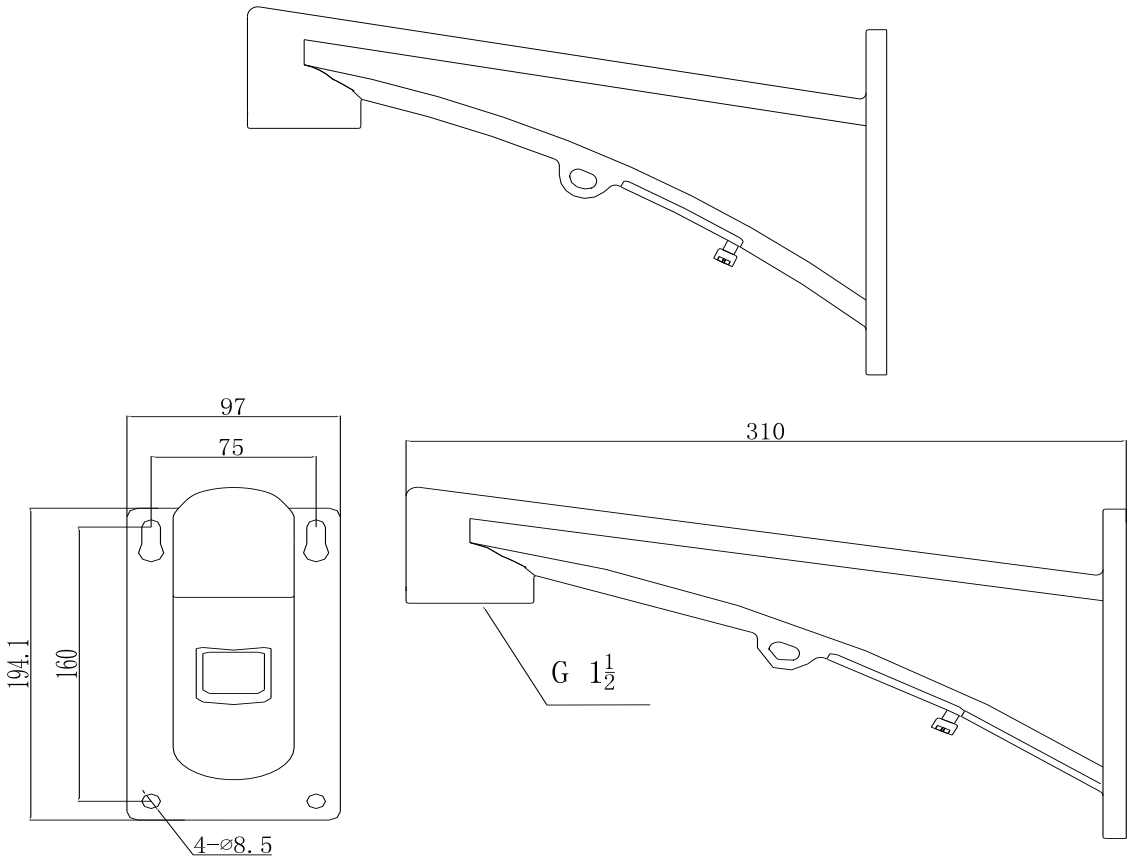

Figure 2-1 Long-arm Wall Mount

2.2 A-200-CornerMount

Please use the wall mount with corner adapter according to your requirements.

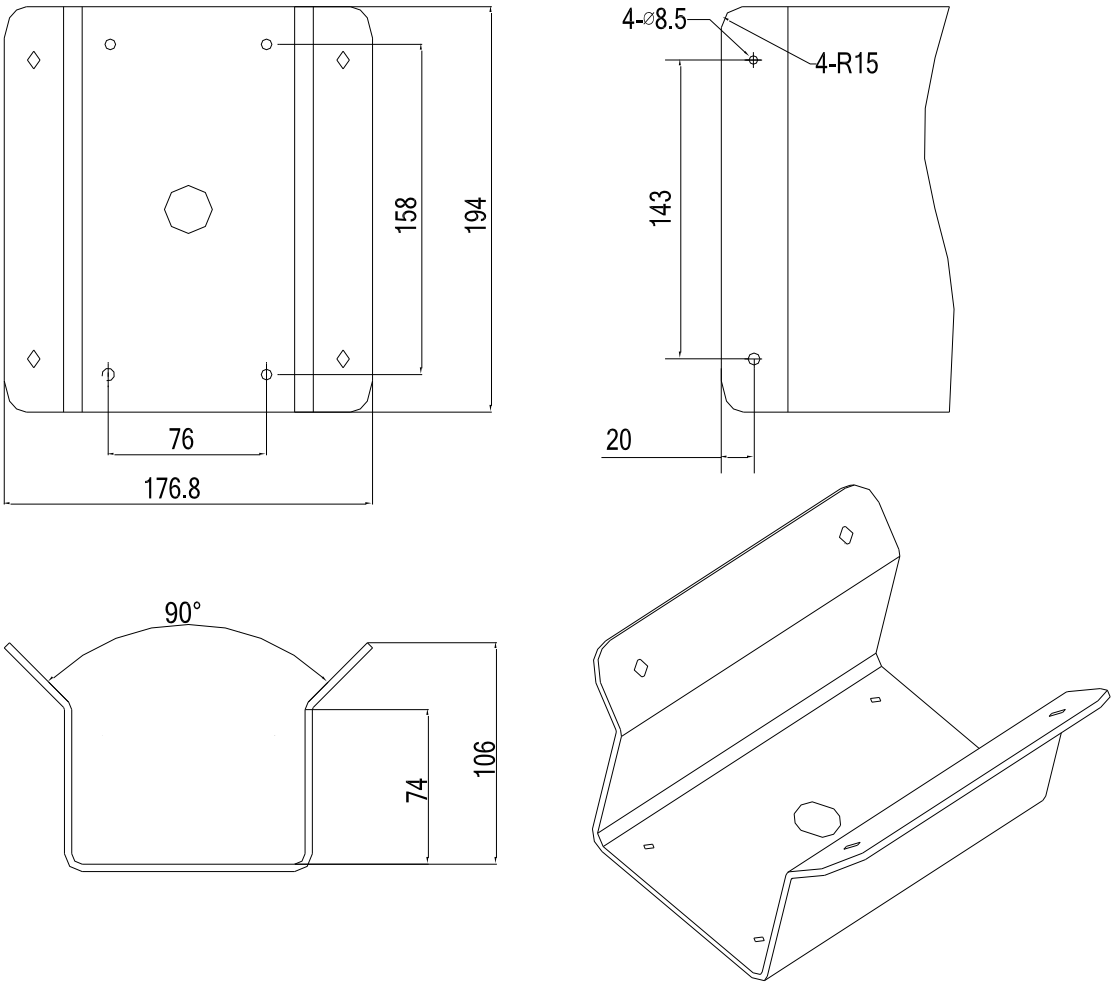

Figure 2-2 Corner Mount

2.3 A-200-PoleMount

Please use the wall mount with pole adapter according to your needs.

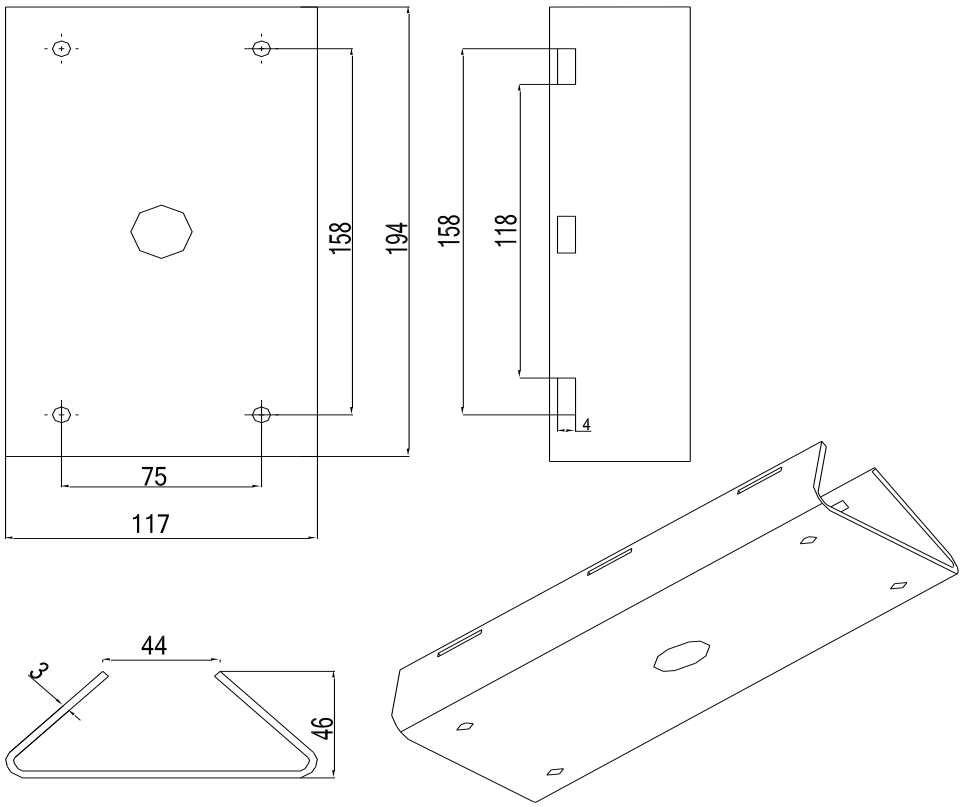

Figure 2-3 Pole Mount

2.4 A-200-LPM

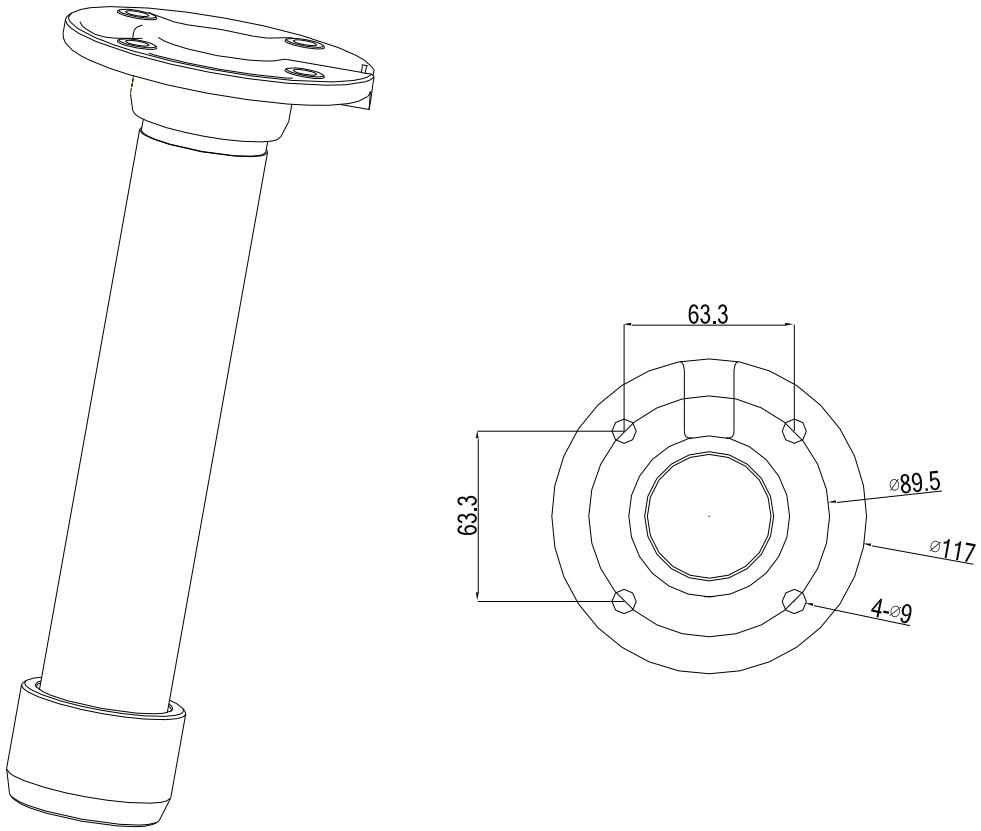

Figure 2-4 Long Pendant Mount

Chapter 3 Mounting Applications

Before you start:

- For cement walls, you will need to use expansion bolts to attach the mount. The mounting hole of the expansion pipe on the wall should align with the mounting hole on the mount.
- For wooden walls, you can just use self-tapping screws to attach the mount.

3.1 Wall Mounting Applications

3.1.1 Mounting Components

- **A-200-WM Wall Mount**

Applicable to indoor/outdoor pendant domes.

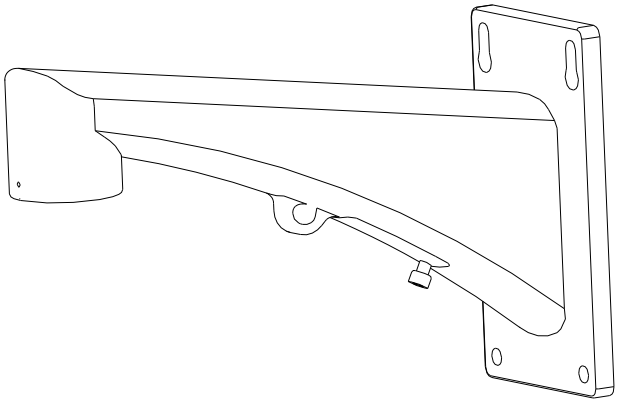

Figure 3-1 Wall Mount

- **Mounting Accessories**

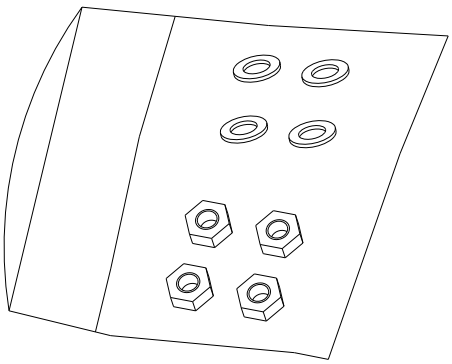

Figure 3-2 Nuts and Flat Washers

3.1.2 Wall Mounting

Before you start:

Wall mounting is applicable to indoor/outdoor solid wall construction. The following are the mandatory requirements for wall mounting:

- The wall must be thick enough to install the expansion screws.
- Please make sure that the wall is strong enough to withstand more than 8 times the weight of the dome and the mount.

Steps:

1. Drill 4 screw holes in the wall according to the holes of the mount, and then insert M8 expansion screws (not supplied) into the mounting holes.

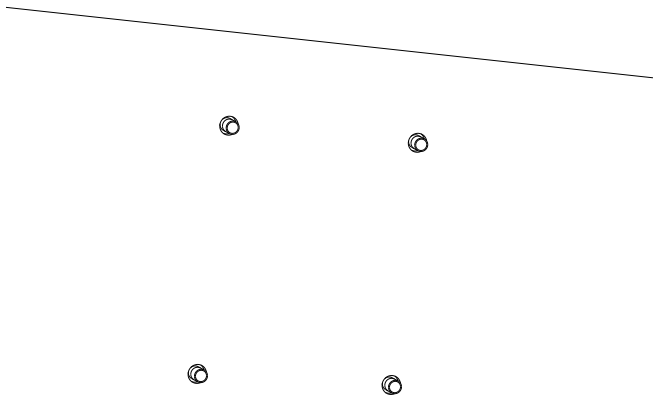

Figure 3-3 Drill Mounting Holes

2. Attach the gasket (not supplied) then wall mount to the wall by aligning the 4 screw holes of the mount with expansion screws on the wall.
3. Secure the wall mount with 4 hex nuts and washers.

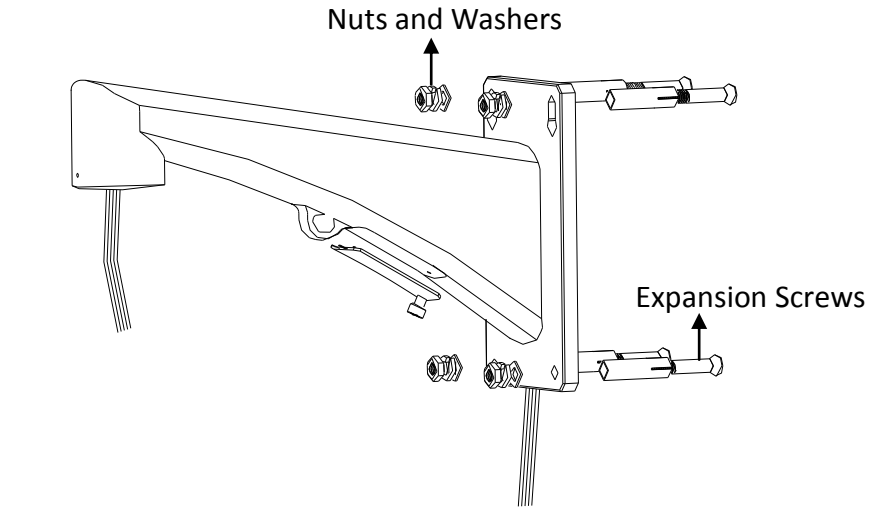

Figure 3-4 Secure the Mount

4. Install the speed dome to the mount. Please refer to *Section* ***1.2 Installation and Cabling*** for installation details.

Note: Follow the same instructions described above for the short-arm wall mounting. For outdoor applications, please use the water-proof measures. The short-arm wall mount is not recommended for outdoor applications.

3.2 Corner Mounting Applications

3.2.1 Mounting Components

- **Wall Mount**

You can use the wall mount with the corner adapter or pole adapter based on your installation environment.

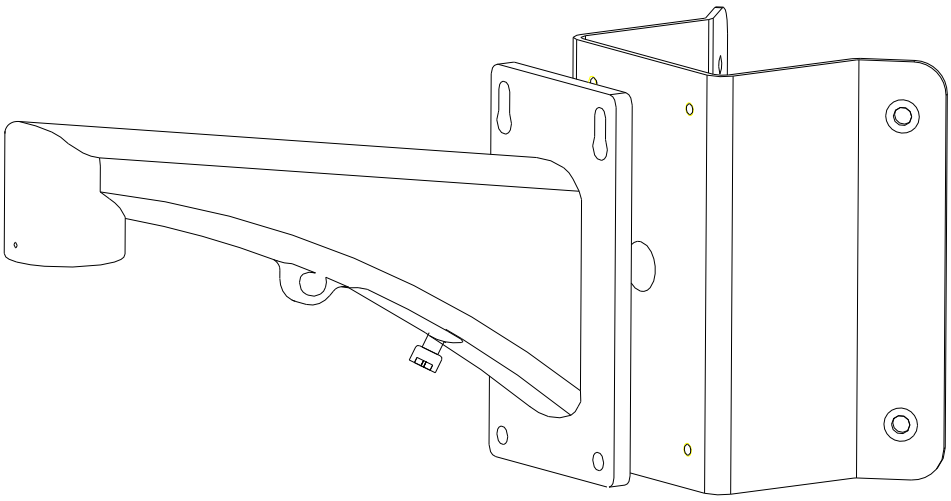

Figure 3-5 Wall Mount

- **Corner Mount**

Please use the corner adapter with the wall mount in corner mounting applications.

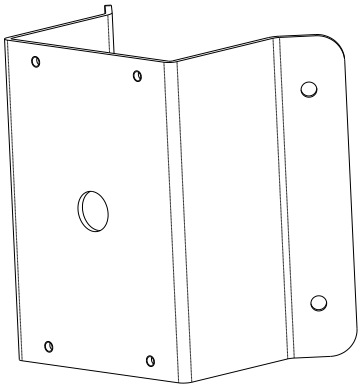

Figure 3-6 Corner Adapter

- **Mounting Accessories**

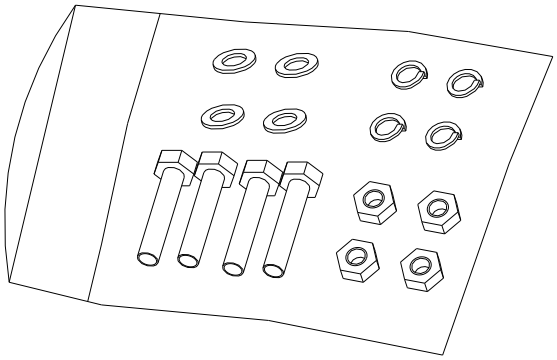

Figure 3-7 Hex Screws (M8×30), Nuts, Spring Washers and Flat Washers

3.2.2 Corner Mounting

Before you start:

The corner mount is applicable to indoor/outdoor 90° solid construction corners. The following are the mandatory requirements for corner mounting:

- The wall must be thick enough to install the expansion screws.
- The wall must be strong enough to withstand more than 8 times the weight of the dome and its accessories.

Steps:

1. Install the corner adapter.

   Steps:

   (1) Drill four holes in the corner according to the screw holes of the corner adapter, and then insert M8 expansion screws (not supplied) into the holes.

   (2) Pull the power line, video cable and control line through the center hole of the corner adapter.

   (3) Attach the corner adapter to the corner by aligning the 4 screw holes of the corner adapter with expansion screws on the corner.

   (4) Secure the corner adapter to the corner with the nuts and washers to tighten the four expansion screws.

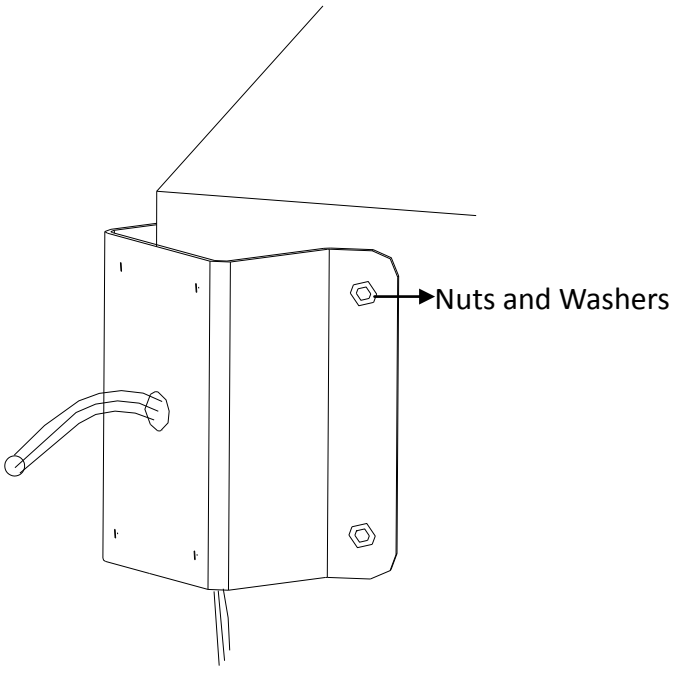

Figure 3-8 Pull the Power Line

Note: Make sure that the cables have enough length. For outdoor applications, please apply sealant around the center hole to waterproof it.

2. Attach the gasket then the wall mount to the corner adapter.
3. Secure the wall mount to the corner adapter with 4 hex screws and spring washers.

Note: When tightening the screw, it is better to compress the spring washer tightly first and then rotate it a half-turn to allow for water-proof without damaging the threads.

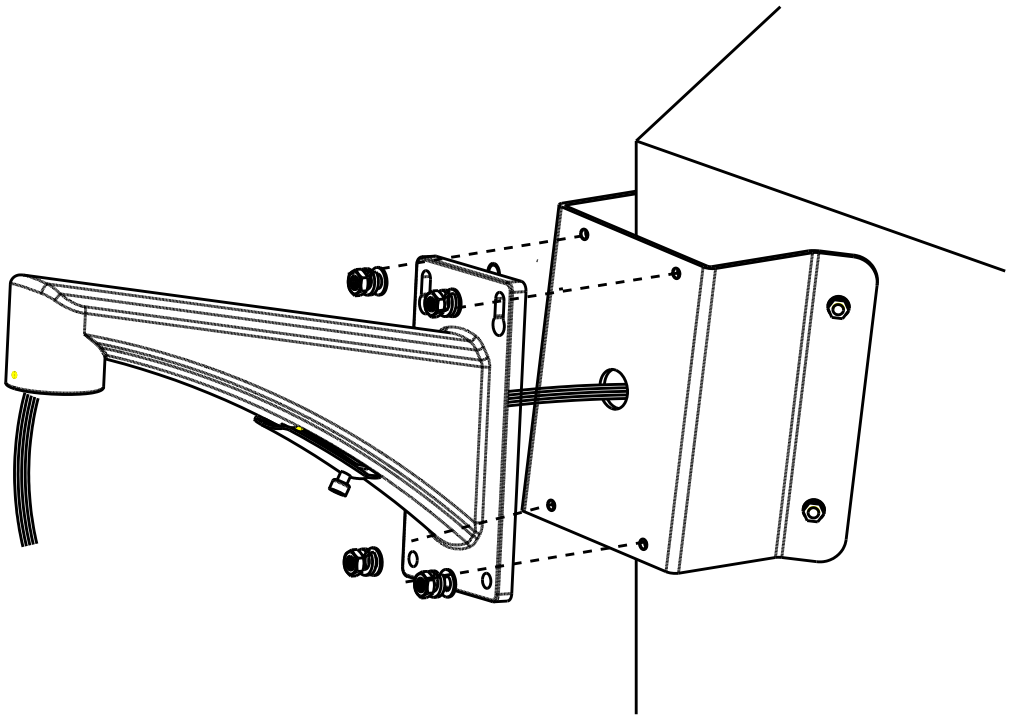

Figure 3-9 Secure the Wall Mount to the Corner

4. Install dome to the mount. Please refer to *Section **1.2 Installation and Cabling*** for installation details.

Note: Follow the same instructions described above for the short-arm wall mounting. For outdoor applications, please use the prescribed water-proofing measures. The short-arm wall mount is not recommended for outdoor applications.

3.3 Pole Mounting Applications

3.3.1 Mounting Components

- **Wall Mount**

Please use the wall mount with corner adapter or pole adapter according to different installation environments.

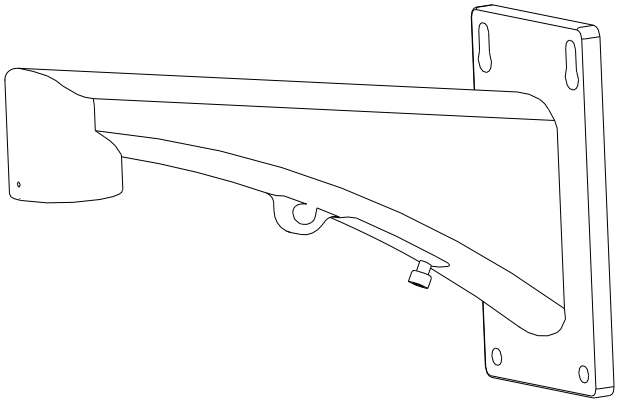

Figure 3-10 Wall Mount

- **Pole Adapter**

Please use the pole adapter with the wall mount in the pole mounting applications.

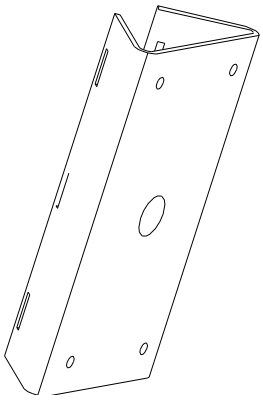

Figure 3-11 Pole Adapter

- **Pole Mounting Hoops**

Please use the with the pole adapter. The following dimensions of stainless steel pipe clamps are optional:ϕ59-82mm, ϕ84-108mm, ϕ103-127mm, ϕ130-152mm, ϕ155-178mm, ϕ180-203mm, ϕ194-216mm.

Note: The dimensions of the pole mounting pipe clamps must match with the diameter of the pole adapter.

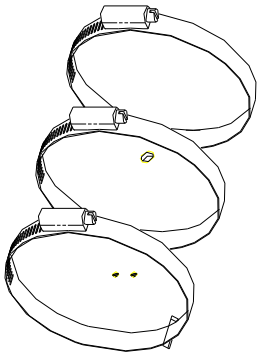

Figure 3-12 Stainless Steel Pipe Clamp

- **Mounting Accessories**

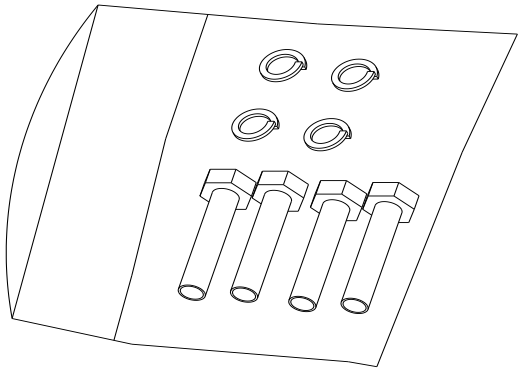

Figure 3-13 Hex Screws (M8×30) and Spring Washers

3.3.2 Pole Mounting

Before you start:

The pole mounting is applicable to the indoor/outdoor solid pole construction. The followings are the mandatory requirements for mounting:

- The mounting dimensions of the stainless steel pipe clamps must meet the diameter of pole.
- The pole construction must be strong enough to withstand more than 8 times the weight of the dome and its accessories.

Steps:

1. Assemble the pole adapter.
   (1) Loosen the three stainless steel pipe clamps with a screwdriver.
   (2) Insert them through the rectangle holes of the pole adapter.

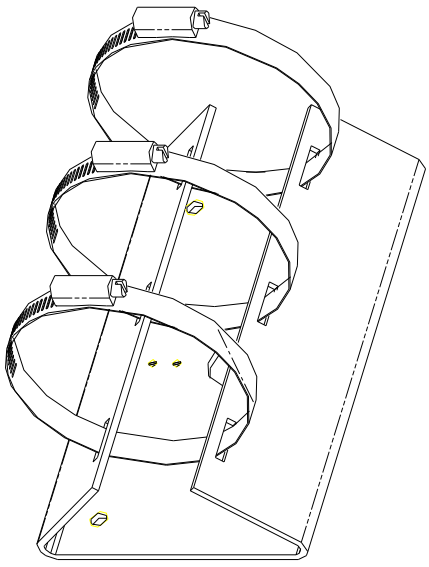

Figure 3-14 Assemble the Pole Adapter

2. Install the pole adapter.
   (1) Pull the control wire, video cable and power cable through the center hole.
   (2) Secure the three stainless steel pipe clamps to the pole, and tighten the screws of the clamps with a screwdriver.

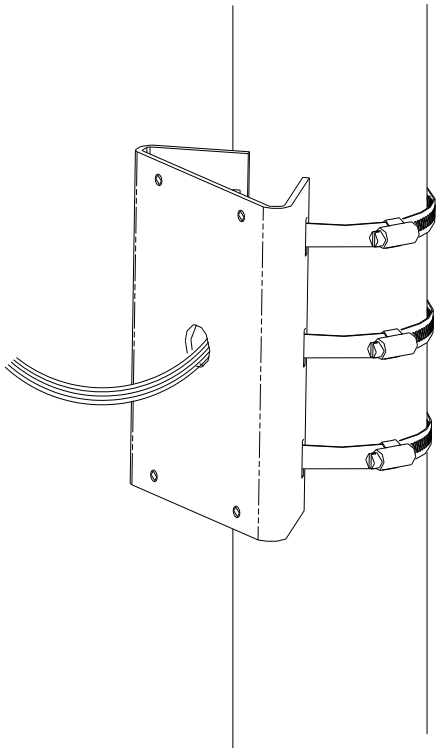

Figure 3-15 Install the Pole Adapter

Note: For outdoor applications, please adopt the water-proof measures.

3. Install the wall mount.
   (1) Attach the gasket then wall mount to the pole adapter.
   (2) Secure the wall mount to the pole adapter with 4 hex screws and the spring washers.

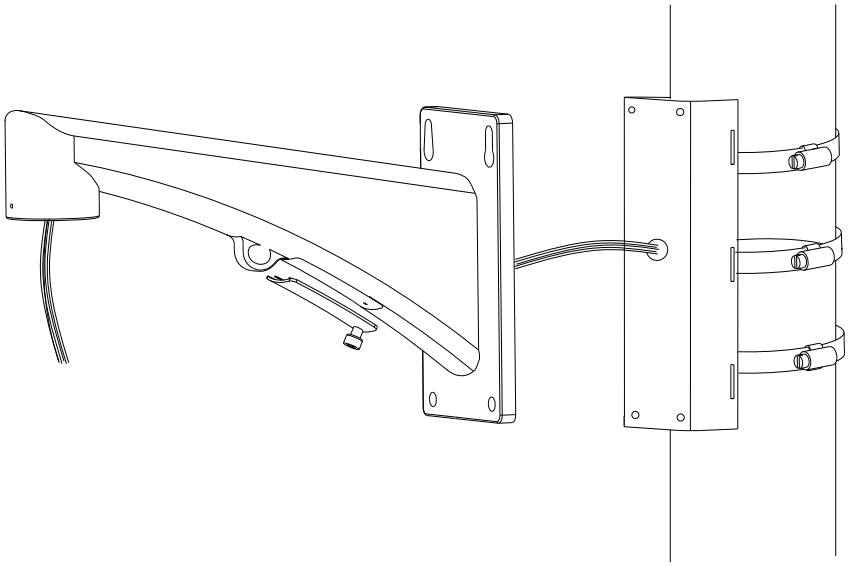

Figure 3-16 Install the Wall Mount

4. Install the speed dome to the mount. Please refer to *Section* ***1.2 Installation and Cabling*** for

installation details.

Note: Follow the same instructions described above for the short-arm wall mounting. For outdoor applications, please use the prescribed water-proofing measures. The short-arm wall mount is not recommended for outdoor applications.

3.4 Pendant Mounting Applications

3.4.1 Mounting Components

- **Mounting Base**

Please use the mounting base with the pendant pole and pole adapter in pendant mounting applications.

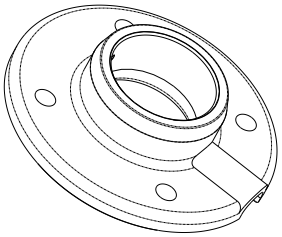

Figure 3-17 Mounting Base

- **Pendant Pole**

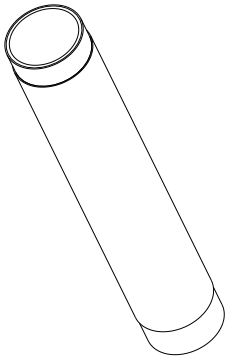

Figure 3-18 Pendant Pole

- **Pendant Adapter**

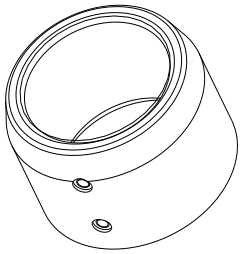

Figure 3-19 Pendant Adapter

3.4.2 Pendant Mounting

Before you start:

Pendant mounting is applicable to indoor/outdoor solid ceiling construction. The following are the mandatory requirements for pendant mounting:

- The ceiling must be thick enough to mount the expansion screws.
- The ceiling must be strong enough to withstand more than 8 times the weight of the dome and its accessories.

Steps:

1. Install the mounting base.

   Steps:

   (1) Drill four ϕ8 holes in the ceiling according to the screw holes of the mounting base, and then insert M8 expansion screws (not supplied) into the holes.

   (2) Pull the power cable, video cable and control wire through the cable hole of the mounting base.

   (3) Attach the mounting base to the ceiling by aligning the screw holes of the mounting base with the expansion screws on the ceiling.

   (4) Secure the mounting base by using nuts and washers to tighten the four expansion screws.

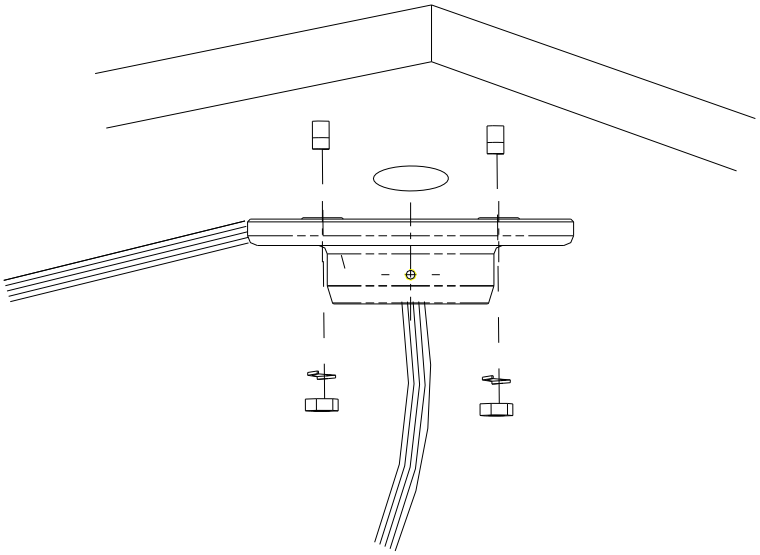

Figure 3-20 Install the Mounting Base

Note: Make sure that the cables are long enough. For outdoor applications, please apply waterproof sealant between the ceiling surface and mounting base and around the cable hole. The pendant mounting application is not recommended for places where the speed dome is susceptible to rain.

2. Install the pendant pole.

   Steps:

(1) Screw the pendant adapter into the matching pendant pole
(2) Secure the pendant adapter to pendant pole with the set screws.
(3) Pull the cables through the pendant pole and screw the pendant pole into the mounting base.
(4) Secure the pendant pole and mounting base with the set screws.

Note: For outdoor applications, please apply the water-proof thread compound to the threads.

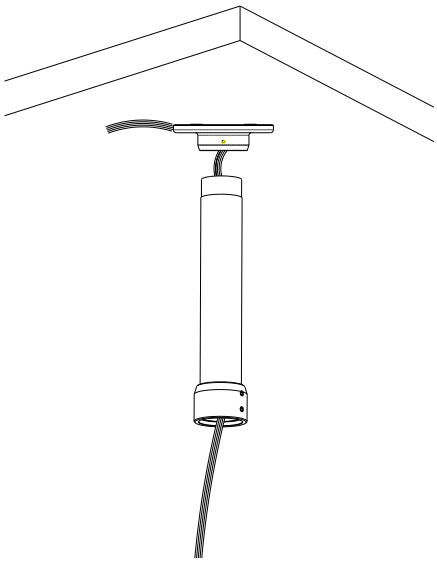

Figure 3-21 Install the Pendant Pole

3. Install the A-200 speed dome to the mount. Please refer to *Section* ***1.2 Installation and Cabling*** for installation details.

***Note*:** If the ceiling is not high enough, you can install the dome to the mounting base without using pendant pole.

Appendix

Appendix 1 Static, Interference Lightning and Surge Protection

This product adopts TVS plate lightning protection technology to avoid damage caused by pulse signals below 3000W, like lightning strikes, surges, etc. Based on the actual outdoor situation, necessary protection measures must be taken.

- The distance between signal transmission wires and High-voltage equipment or high-voltage cable is at least 50m.
- Outdoor wiring should be routed under eaves as much as possible.
- In open field, wiring should be buried underground in sealed steel pipe, and the steel-pipe should be one-point grounded. Overhead routing method is forbidden.
- In strong thunderstorm areas or high induction voltage areas (such as a high-voltage transformer substations), high power lightning protection apparatus and lightning conductor are necessary to be added.
- The design of lightning protection and grounding of the outdoor devices and cables should be considered together with the lightning protection demand of the building. It also must conform to the related local and industrial standards.
- The system should be equipotential grounded. The grounding equipment must conform to the demands of both system anti-jamming and electrical safety and it must not be short circuited or mixed circuit with the zero conductor of strong grid. When the system is grounded alone, the resistance should be no more than 4Ω. The sectional area of the grounding cable should be no less than 25mm2. For grounding instructions, please refer to the Installation Manual of Speed Dome.

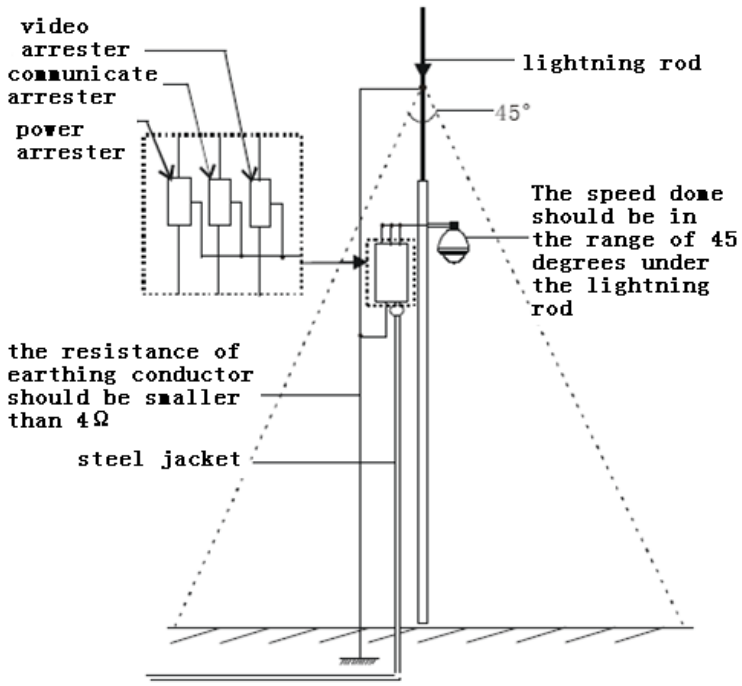

Figure A-1 Lightning & Surge Protection

Grounding for Cement Pole/Wall Installation:

When the speed dome is installed in environment that is relatively insulated from the earth, e.g., cement pole or cement wall, then only the control center requires proper grounding locally. Refer to the following figure.

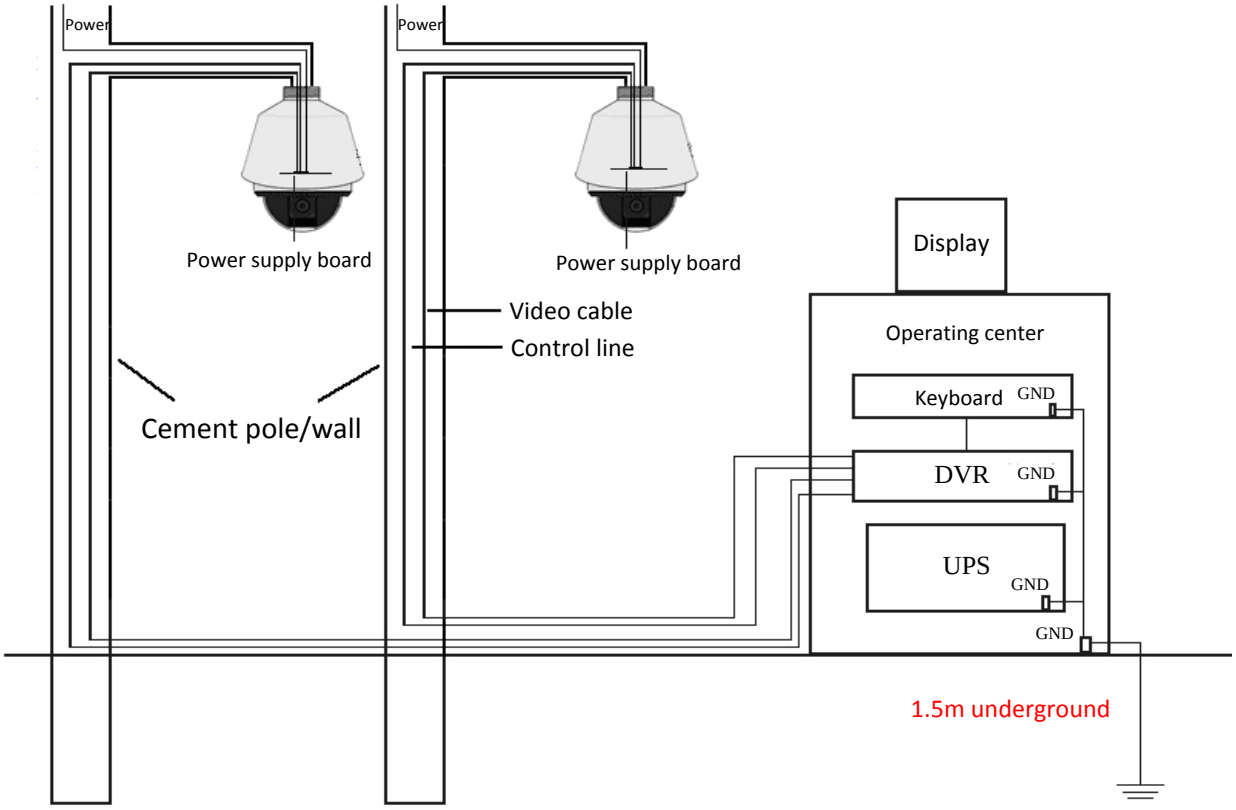

Figure A-2 Grounding in Cement Pole/Wall Installation

Notes:

- Because the signal transmission media of fiber optical speed dome and network speed dome are isolated from the control center, they must be grounded locally to protect dome against damages.
- If the dome is installed in strong thunderstorm area, it must be grounded locally to release lightning or suchlike high energy to protect dome against damages. Refer to the following figure.

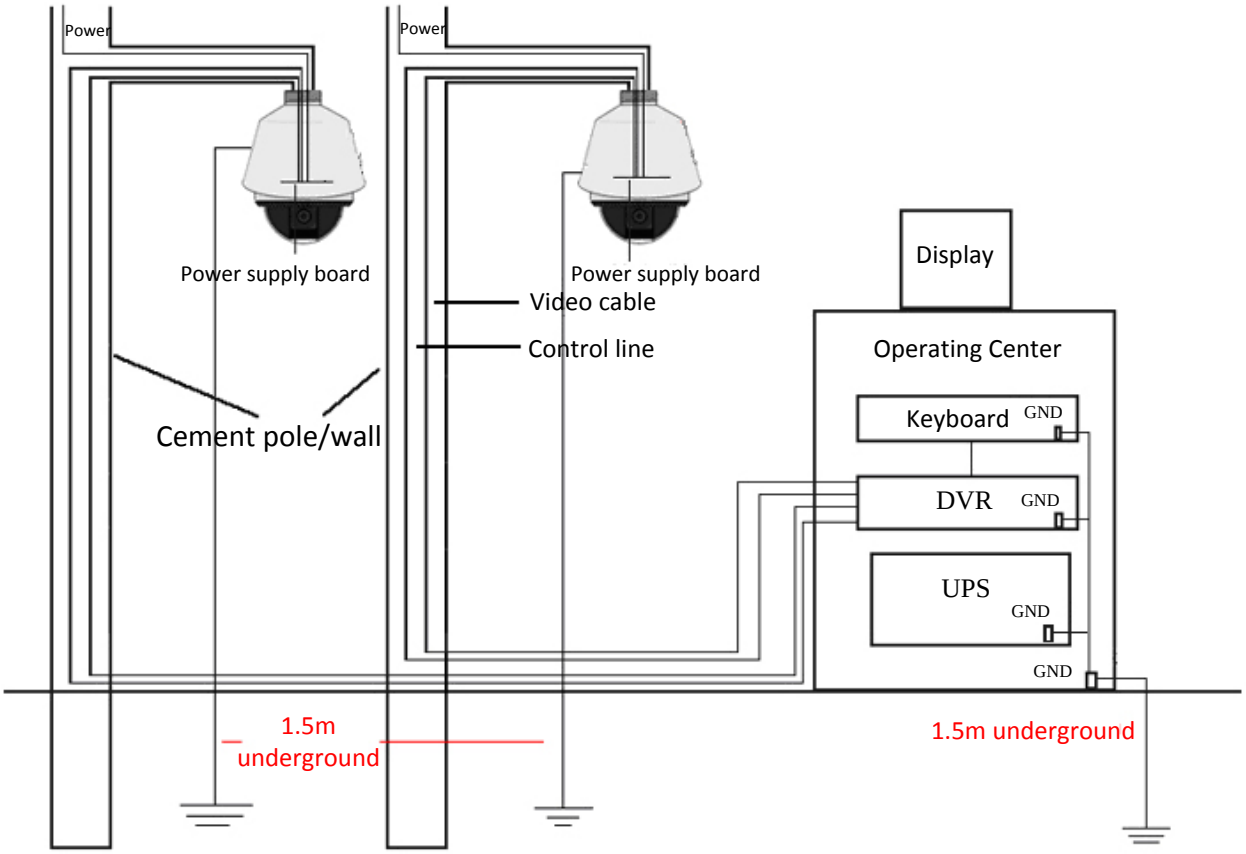

Figure A-3 Lightning-protection Grounding in Cement Pole/Wall Installation

Grounding for Metal Pole Installation:

When the speed dome is installed in an environment that is conductive to the earth, e.g., metal pole, then the grounding of the dome can be achieved by properly grounding metal pole, meanwhile, the control center must be grounded locally as well. Refer to the following figure.

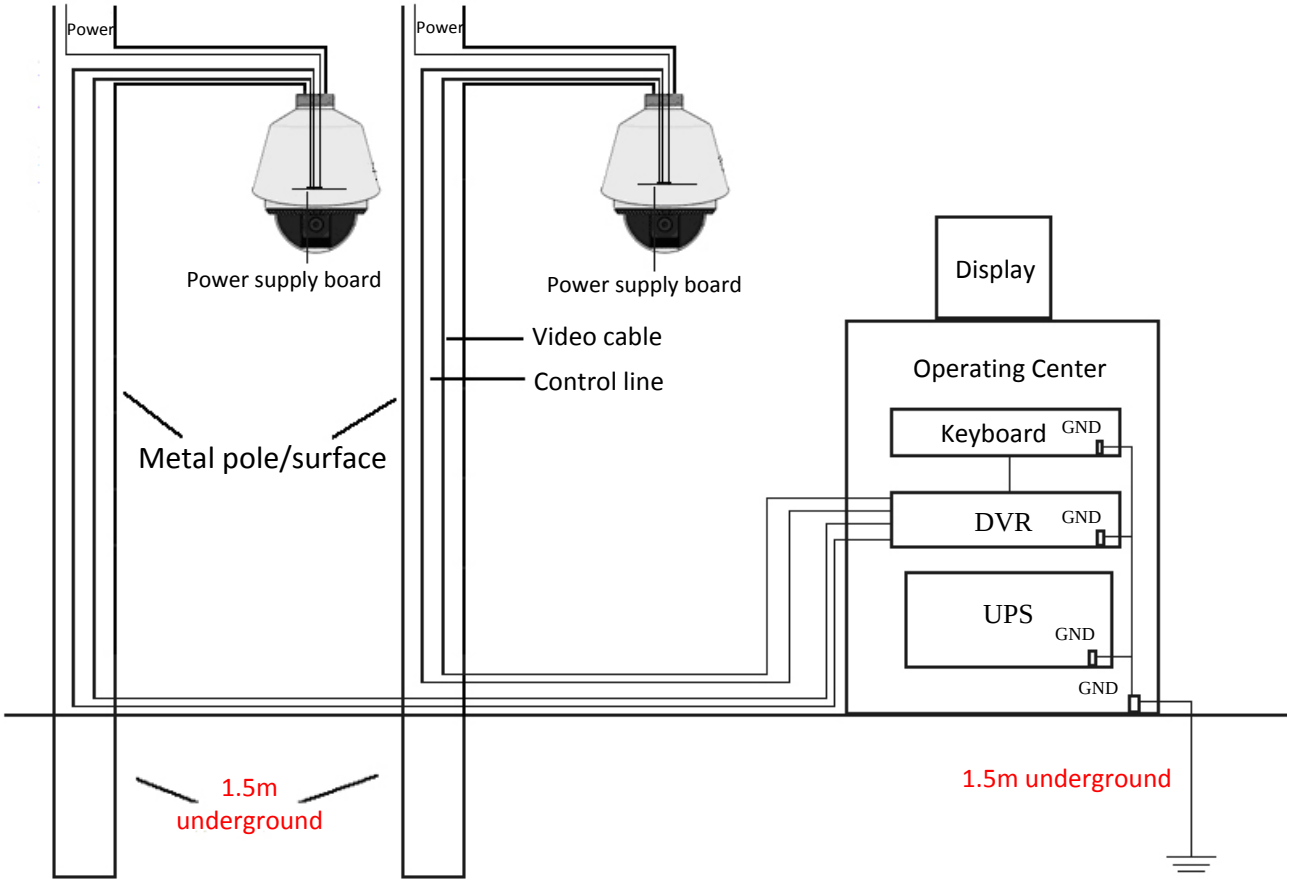

Figure A-4 Grounding in Metal Pole Installation

Note: If the fiber optics, lightning protector, or other devices are used during the transmission of the speed dome, such devices as well as the video cables must be properly grounded.

Appendix 2 Waterproofing

Notes:

- The long-arm wall mount is recommended for the outdoor installation of the A-200 speed dome.
- You cannot use the short-arm wall mount or pendant mount for outdoor application, because it is not water-proof.
- It is recommended to use the mount with inner threaded adapter for the best protection from the elements.
- If you use a mount with outer threaded interface, please use sound waterproofing measures to waterproof the adapter installed between the mount and the dome.
- Do not install indoor speed dome in an outdoor environment.

L-shape Pole Mount

Make sure that the L-shape pole mount is designed as shown in the following figure so that water cannot flow from the pole into the speed dome.

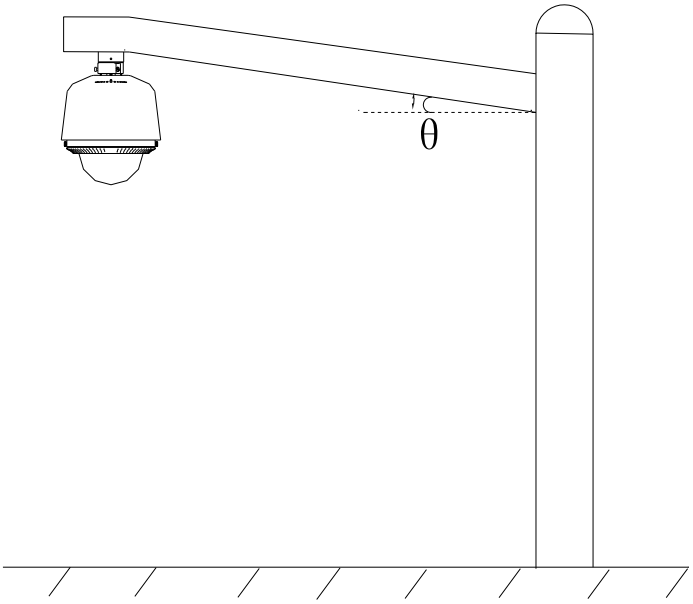

Figure A-5 Customized Mount

Long-arm Wall Mount

The long-arm wall mount is recommended for outdoor applications. The arm of the wall mount is designed to prevent incoming water, as shown in Figure A-6. During outdoor application, the long-arm wall mount can be used with the pole mount adapter or the corner mount adapter.

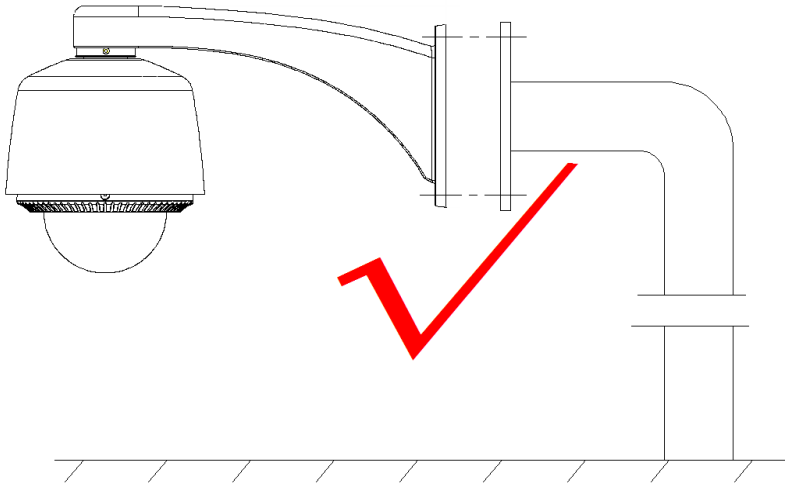

Figure A-6 Long-arm Wall Mount

Appendix 3 Bubble Maintenance

The dome bubble is a transparent plastic. Dust, oil and finger prints, etc. will cause scratches or image blur. Please refer to the following method to clean the bubble.

- Handling dust

Use oil free soft brush or blowing dust ball to clean the dust.

- Handling oil

Steps:

1. Wipe off water-drops or oil using a soft cloth.
2. Use oil free cotton cloth to wipe the bubble with alcohol or detergent.
3. Change the cloth to wipe the bubble until the bubble is clean.

Appendix 4 RS485 Bus Connection

- General Property of RS485 Bus

RS485 is a half-duplex communication bus which has 120Ω characteristic impendence; the maximum load ability is 32 payloads (including controller device and controlled device).

- RS485 Bus Transmission Distance

The table below shows the maximum transmission distance per the given baud rate using 24AWG twisted-pair line, according to different baud rate:

Max. Distance of RS485 Transmission	
Baud Rate	**Max Distance**
2400BPS	1800m
4800BPS	1200m
9600BPS	800m

The transmission distance will be decreased if using thinner cable, or using this product near strong electromagnetic fields.

- Connection Methods

  RS485 industry bus standard requires a daisy-chain connection method between any devices, both sides have to connect a 120Ω terminal resistance (show as Diagram 1), the simplified connection method is shown in diagram 2.

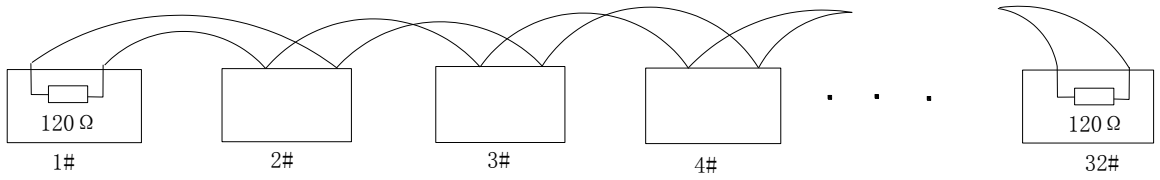

Figure A-7 RS485 Connection 1

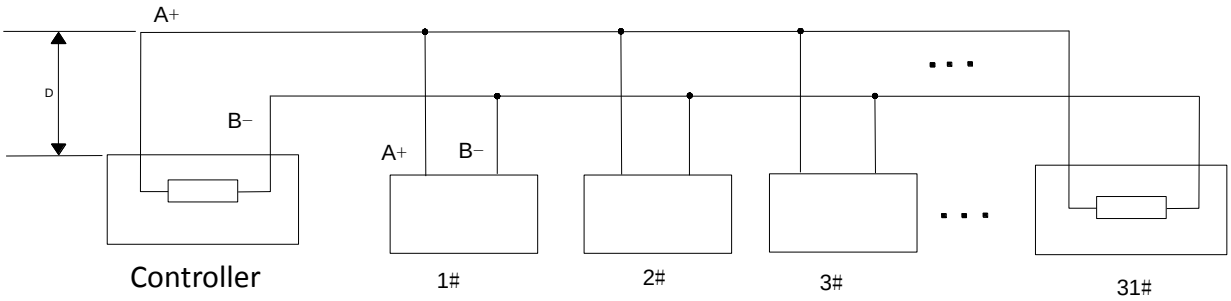

Figure A-8 RS485 Connection 2

- Problems in Practical Application

Normally, users adopt a star-shape connection method in construction, under this situation, the terminal resistors must be connected between the two farthest devices (as Figure A-9, 1# and 15#), but this connection method does not satisfy the requirement of the RS485 industry standard so it may lead to some problems such as signal reflection, and a decline anti-jamming ability when the devices are far away. If this occurs, the dome may be uncontrollable, or self-running, etc.

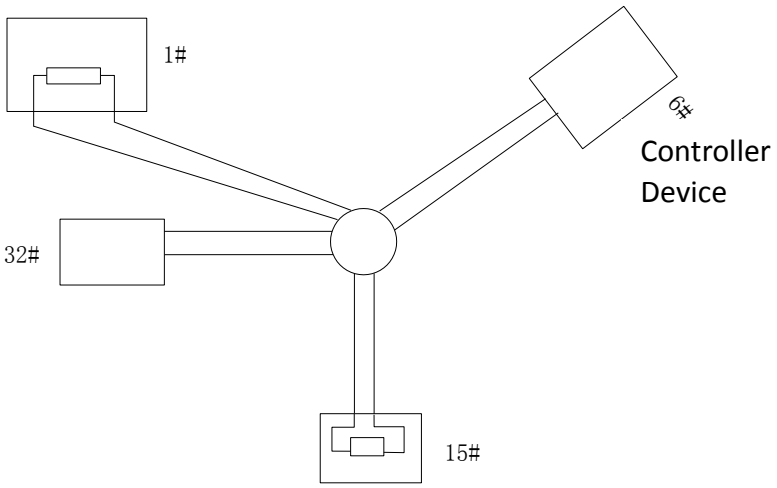

Figure A-9 Star Shape Connection

The best way to overcome this is to add a RS485 distributor. This product can effectively change the star-shape connection to satisfy the requirement of RS485 industry standards, thus avoiding these problems and improving the communication reliability. Refer to the following figure.

RS485 Distributor

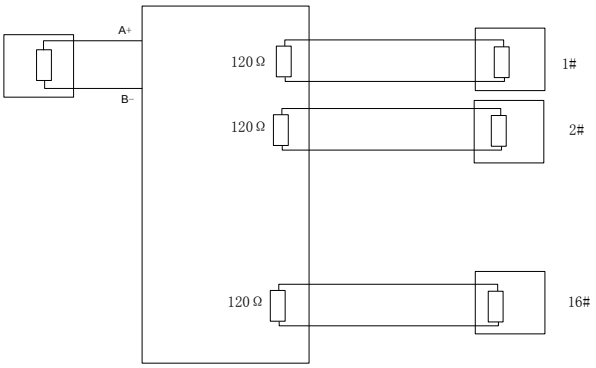

Figure A-10 RS485 Distributor

- Troubleshooting of RS485 communications

Problem	Possible Reasons	To Solve the Problem
The speed dome does the self-test action but cannot be controlled remotely.	1. The address or baud rate of the speed dome does not match with those of remote control device.	1. Adjust the address and baud rate of the remote control device to match those of the speed dome.
	2. The wire RS485+ connects to the interface RS485- and wire RS485- connects to the interface RS485+.	2. Connect the wire RS485+ to the interface RS485+ and wire RS485- to the interface RS485-.
	3. The RS485 wire is disconnected.	3. Reconnect the RS485 wire tightly.
	4. RS485 wire is broken.	4. Repair the RS485 wire.
The speed dome can	1. The connection is loose.	1. Reconnect the RS485 wire tightly.

Problem	Possible Reasons	To Solve the Problem
be controlled but not smoothly.	2. RS485+ or RS485-wire is broken.	2. Repair the RS485 wire.
	3. The speed dome is too far away from the remote control device.	3. Add a terminal resistor.
	4. Too many speed domes are connected.	4. Add a RS485 distributor.

Appendix 5 24VAC Wire Gauge & Transmission Distance

The following table describes the maximum distance of each different wire gauge when the loss rate of 24VAC voltage is less than 10%. For an AC driven device, the maximum voltage loss rate is 10% allowable. For example, for a device with the rating power of 80VAC which is installed at a distance of 35 feet (10m) away from the transformer, then 0.8000mm is required as the minimum wire gauge.

Distance (feet) / Wire Gauge (mm) / Power (va)	0.8000	1.000	1.250	2.000
10	283 (86)	451 (137)	716 (218)	1811 (551)
20	141 (42)	225 (68)	358 (109)	905 (275)
30	94 (28)	150 (45)	238 (72)	603 (183)
40	70 (21)	112 (34)	179 (54)	452 (137)
50	56 (17)	90 (27)	143 (43)	362 (110)
60	47 (14)	75 (22)	119 (36)	301 (91)
70	40 (12)	64 (19)	102 (31)	258 (78)
80	35 (10)	56 (17)	89 (27)	226 (68)
90	31 (9)	50 (15)	79 (24)	201 (61)
100	28 (8)	45 (13)	71 (21)	181 (55)
110	25 (7)	41 (12)	65 (19)	164 (49)
120	23 (7)	37 (11)	59 (17)	150 (45)
130	21 (6)	34 (10)	55 (16)	139 (42)
140	20 (6)	32 (9)	51 (15)	129 (39)
150	18 (5)	30 (9)	47 (14)	120 (36)
160	17 (5)	28 (8)	44 (13)	113 (34)
170	16 (4)	26 (7)	42 (12)	106 (32)
180	15 (4)	25 (7)	39 (11)	100 (30)
190	14 (4)	23 (7)	37 (11)	95 (28)
200	14 (4)	22 (6)	35 (10)	90 (27)

Appendix 6 Table of Wire Gauge Standards

Bare Wire Gauge(mm)	American Wire Gauge AWG	British Wire Gauge SWG	Cross-sectional Area of Bare Wire(mm2)
0.750	21		0.4417
0.800	20	21	0.5027
0.900	19	20	0.6362
1.000	18	19	0.7854
1.250	16	18	1.2266
1.500	15	17	1.7663
2.000	12	14	3.1420
2.500			4.9080
3.000			7.0683