IR Intelligent Speed Dome Installation Manual

Version 1.0.0

Table of Contents

Welcome

Thank you for purchasing our speed dome!

Please read the following safeguards and warnings carefully before you install or use the product!

Important Safeguards and Warnings

Safety Measures

1. Qualified Engineer Needed

- The installation engineer or maintenance engineer shall have corresponding CCTV system installation certificate or maintenance qualification certificate.

- The installation engineer or maintenance engineer shall have qualification certificate for work at height.

- The installation engineer or maintenance engineer shall have the basic knowledge and operation technique for low-voltage cable layout and low-voltage electronic cable connection.

- Please read the installation manual carefully and keep it well for future reference,

- We are not liable for any problems caused by unauthorized modifications or attempted repair.

2. Lifting Appliance Requirement

- Please select the proper speed dome installation mode and use the lifting appliances at the safety environment.

- The lifting appliances shall have the enough capacity to reach the installation height.

- The lifting appliances shall have safe performance.

The precaution measures include two types: Warning and Note.
- **Warning**: It is to alert you there is an optional risk of death or series injury!
- **Note**: It is to alert you there is an optional risk of damage or property loss!

Warning

1. All installation and operation here should conform to your local electrical safety codes. We assume no liability or responsibility for all the fires or electrical shock caused by improper handling or installation.
2. Do not connect several speed domes to one power adapter. It may result in overheat or fire if it exceeds the rated load.
3. Before you connect the cable, install or uninstall, or begin the daily maintenance work, please turn off the power and unplug the power cable.
4. Please make sure the product is secured firmly on the wall or the ceiling.
5. Please turn off the power and unplug the power cable, If there is any smoke, disgusting smell, or noise. Please contact your local retailer or customer service center for help.

6. All the examination and repair work should be done by the qualified service engineers. We are not liable for any problems caused by unauthorized modifications or attempted repair.

Note

1. Safety Transportation

- Heavy stress, violent vibration or water splash are not allowed during transportation, storage and installation.
- This series product must use split type package during the transportation.
- We are not liable for any damage or problem resulting from the integrated package during the transportation.

2. When device is malfunction

Shut down the device and disconnect the power cable immediately if there is smoke, abnormal smell or abnormal function. Please contact your local retailer ASAP.

3. Do not try to dismantle or modify the device

- There is risk of personal injury or device damage resulting from opening the shell.
- Please contact your local retailer if there is internal setup or maintenance requirement.
- We are not liable for any problems caused by unauthorized modifications or attempted repair.

4. Do not allow other object falling into the device

- Please make sure there is no metal or inflammable, explosive substance in the speed dome.
- The above mentioned objects in the device may result in fire, short-circuit or damage.
- Please shut down the device and disconnect the power cable if there is water or liquid falling into the camera. Please contact your local retailer ASAP.
- Please pay attention to the camera. Avoid the sea water or rain to erode the camera.

5. Handle carefully

Do not allow this series product fall down to the ground.
Avoid heavy vibration.

6. Installation Environment Requirement

- This series speed dome should be installed in a cool, dry place away from direct sunlight, inflammable, explosive substances and etc.
- This series product shall be away from the strong electromagnetism radiant, please keep it away from wireless power, TV transmitter, transformer and etc.

7. Daily Maintenance

- Please use the soft cloth to clean dust on the shell, or you can use soft cloth with cleaning liquid to clean the shell and then use soft cloth to make it dry.

- Do not use gasoline, dope thinner or other chemical material to clean the shell. It may result in shell transfiguration or paint flake.
- Do not allow the plastic or rubber material to touch the shell for a long time. It may result in paint flake.
- It is highly recommended to use the product with a lightning-proof device, which can realize better lightning-proof effect.

1 Installation Preparation

1.1 Basic Requirement

● All installation and operation here should conform to your local electrical safety codes.
● Make sure if the application location of the speed dome conforms to the installation requirements. Please contact your local dealer if there is any confusion.
● Please use the product according to the environment.
● Please take good care of the original packing material after unpacking the product, use the original packing material to pack the speed dome and send it back for repair in case problems arise.

1.2 Installation Check

● Please make sure the installation environment has enough space to install the speed dome and its corresponding bracket.
● Please make sure the ceiling, wall and the bracket can support the speed dome and its corresponding installation component. It shall sustain the 8X weight of the speed dome and its mounting components.
● Please make sure the wall is thick enough to install expansion bolts (users need to prepare by themselves).
● It needs to guarantee that the installation height is required to be more than 6m if it is a laser speed dome.

1.3 Cable Preparation

Please select the min specification requirement of cable and video coaxial cable according to the transmission distance.

1.3.1 The Min Specification Requirements of Cable

● 75 ohm impedance.
● Full cable with copper conductor
● 95% knitted copper shield
● Please refer to appendix 2 for more information about RS485 communication cable.

International Model	Max Distance (Ft\M)
RG59/U	750ft (229m)
RG6/U	1,000ft (305m)
RG11/U	1,500ft (457m)

Note
The above can be applied to analog speed dome and network speed dome.

1.3.2 Select Power Supply Cable According to Transmission Distance

Refer to appendix III for AC 24V power supply device.

2 Install IR Intelligent Speed Dome

2.1 Check Accessories

Before installation, please check the accessories one by one according to the packing list. Please make sure all the components listed are includes.

2.2 Open Device

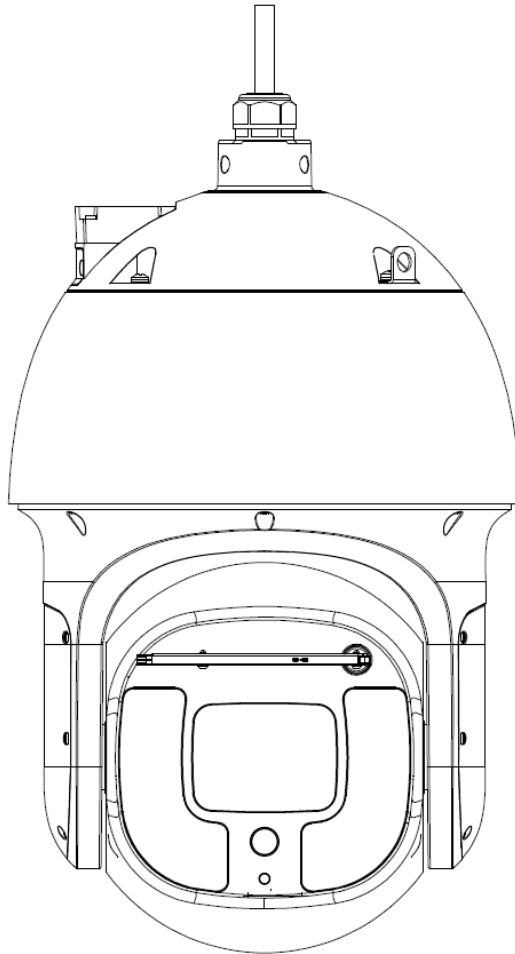Take out the speed dome and refer to Figure 2-1 for its appearance.

Figure 2-1

Note

It is forbidden to make the front part of speed dome face ground when placing the device, which is to avoid damaging the front glass, lens and other optical components. The wrong way of placing the device is shown in Figure 2-2.
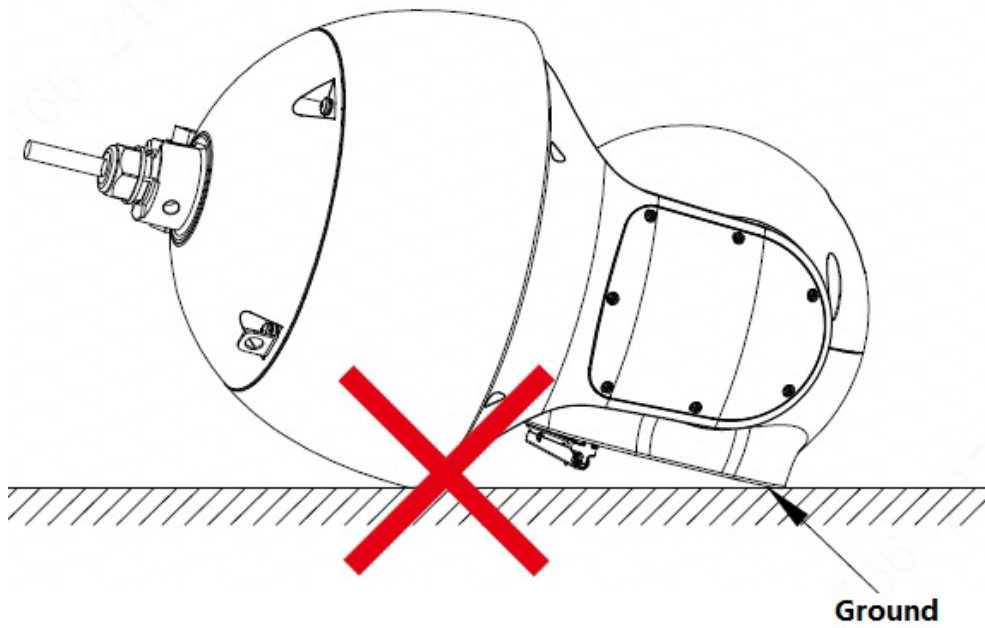
Figure 2-2

2.3 Reset Button, Micro SD Card Slot

You can see the reset button and Micro SD card slot on the PTZ mainboard after opening the speed dome cover, which is shown in Figure 2-3.
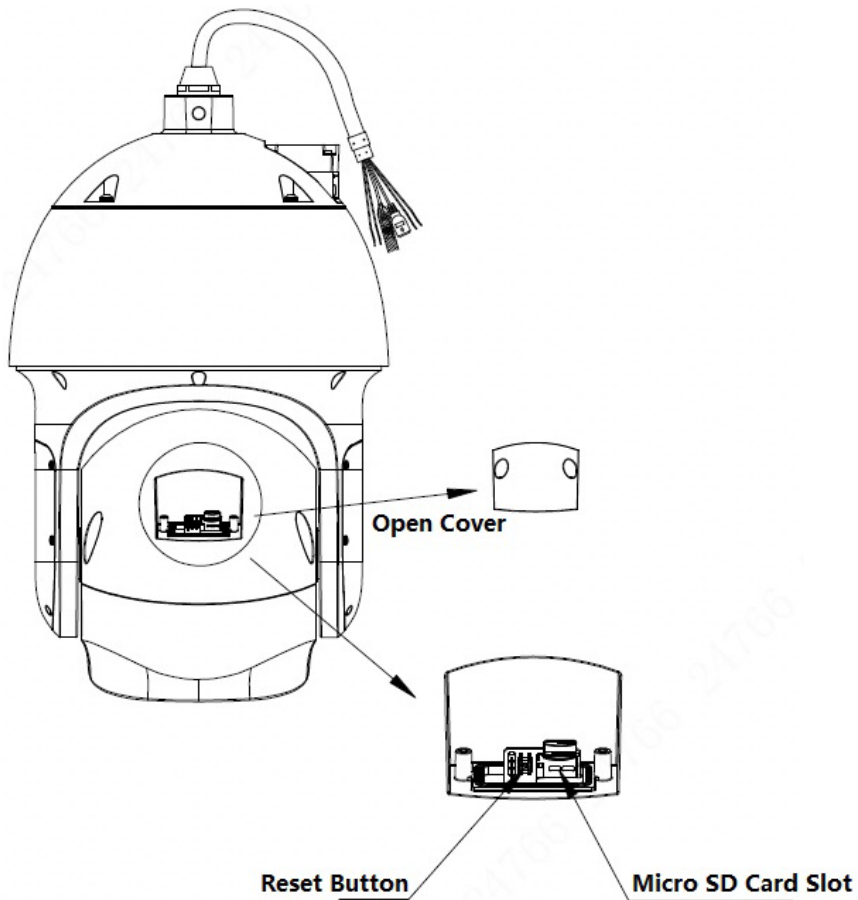

Figure 2-3

2.3.1 Use Reset Button

Long press the reset button (more than 10 seconds) to reset the device.

2.3.2 Install Micro SD Card

Micro SD card is used for data storage. Micro SD card slot is located on PCB inside the dome body; you can see it after you open the speed dome cover, which is shown in Figure 2-3. The installation steps of Micro SD card are shown as follows.

Step 1

Hold the Micro SD card, pay attention that the golden finger of the card faces inward, which means it faces the PCB. Otherwise it cannot be installed.

Step 2

Place the Micro SD card, press the Micro SD card slightly and it is installed in place when you hear the "click" sound.

Note

Push the Micro SD card towards the insert direction and the card will pop out automatically.

2.4 Install Speed Dome

2.4.1 Speed Dome Cable

2.4.1.1 Cable Description

The speed dome is equipped with a multi-functional combination cable by default, which includes power cable, video cable, RS485 control cable, alarm cable, network cable, and optical fiber cable etc. The cable detail is shown in Figure 2-4.
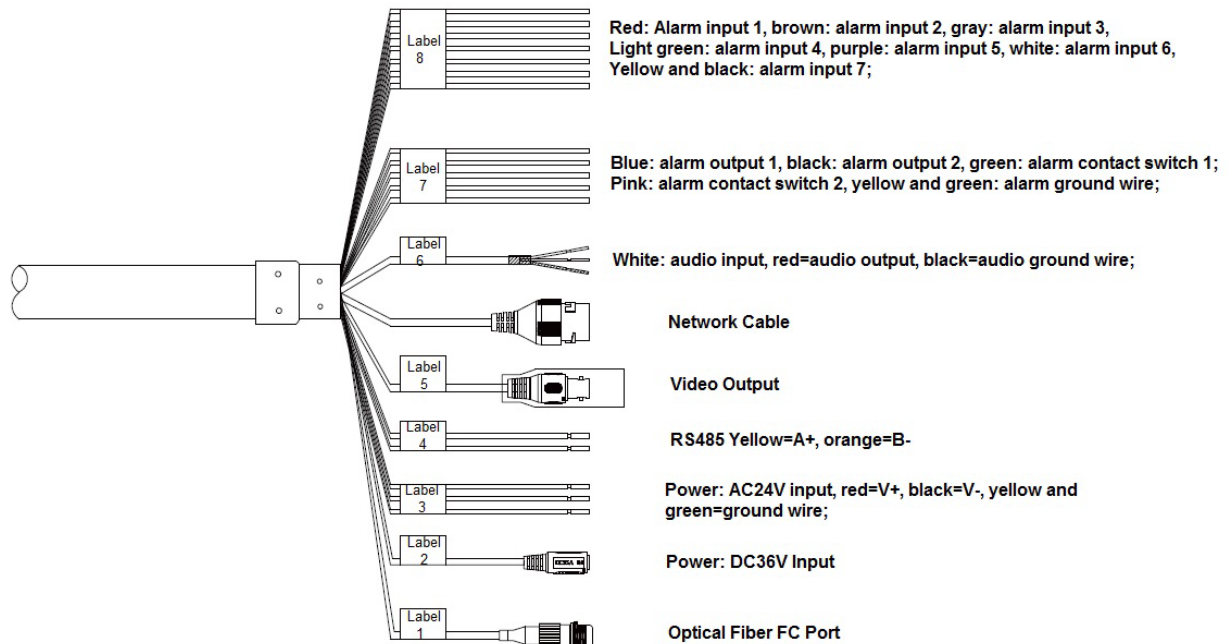

Label 8 — Red: Alarm input 1, brown: alarm input 2, gray: alarm input 3, Light green: alarm input 4, purple: alarm input 5, white: alarm input 6, Yellow and black: alarm input 7;

Label 7 — Blue: alarm output 1, black: alarm output 2, green: alarm contact switch 1; Pink: alarm contact switch 2, yellow and green: alarm ground wire;

Label 6 — White: audio input, red=audio output, black=audio ground wire;

Network Cable

Label 5 — Video Output

Label 4 — RS485 Yellow=A+, orange=B-

Label 3 — Power: AC24V input, red=V+, black=V-, yellow and green=ground wire;

Label 2 — Power: DC36V Input

Label 1 — Optical Fiber FC Port

Figure 2-4

Note

Different models have different cable combinations; please refer to the actual cable combination for more details. The cable combination is the most comprehensive example shown in the figure above.

It is prohibited to pull the cable to lift the speed dome when moving the device, the wrong way of carrying device is shown in Figure 2-5.
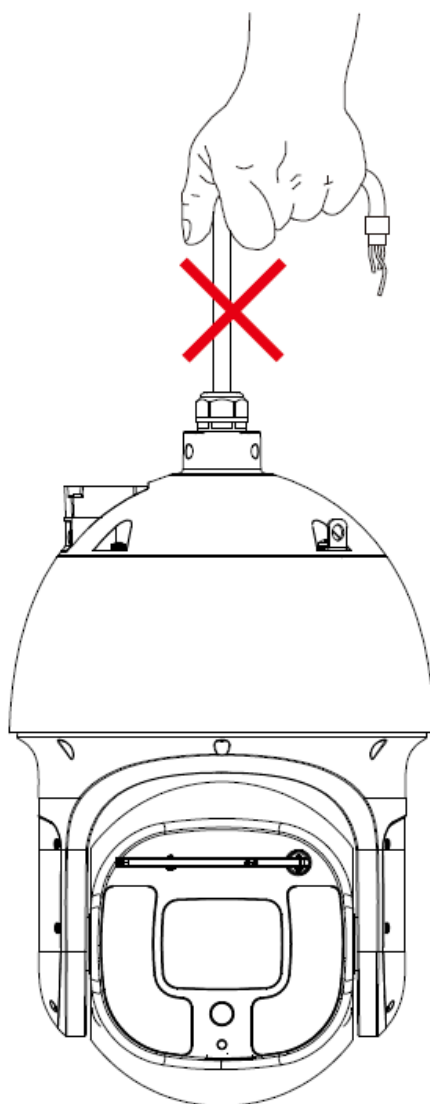

Figure 2-5

2.4.1.2 Cable Connection

Install the safety rope buckle on the quick mounting connector (it can also be installed on the hook of the wall-mounted bracket), connect the integrated cable which is reserved by wall-mounted bracket to the corresponding power cable, video cable, audio cable, RS485 control cable, alarm cable, network cable, high frequency cable and optical fiber cable etc. (according to the actual requirements), and then twine the cable connector with insulated tape to make it waterproof, which is shown in Figure 2-6.

Note

● During actual installation, make sure the wire diameter of the cable which is to connect to RS485 control cable can't be too big; otherwise it will affect the control effect. Please refer to appendix 2 RS485 bus for relevant introduction.

● The video port is covered with the heat shrink tube of high shrinking ratio. After the video port is well connected, please heat the tube to make sure the video port is damp proof and water proof.
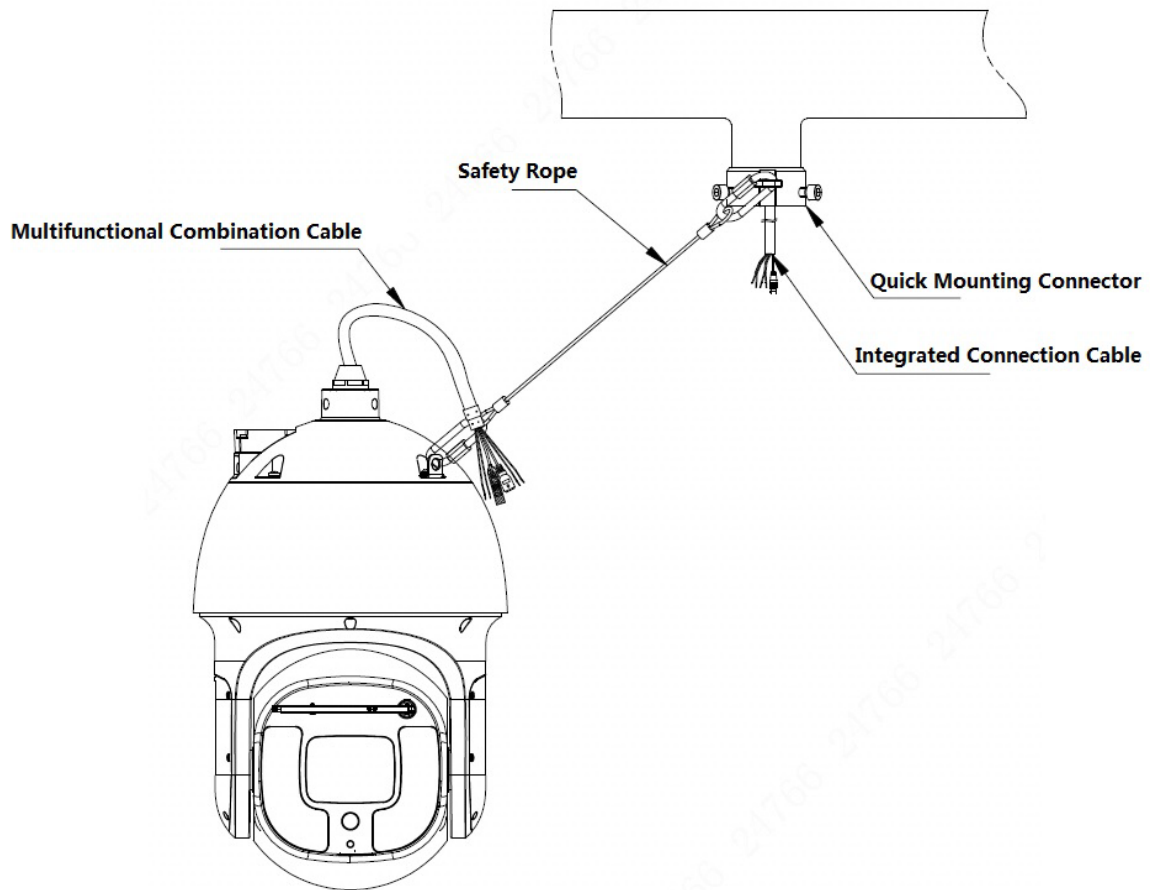
Figure 2-6

2.4.1.3 Connect Alarm Cable

The alarm cable connection and config steps are shown as follows:

Step 1

Connect alarm input device to the ALARM IN and ALARM GND of the user cable.

Step 2

Connect alarm output device to the ALARM OUT and ALARM COM of the user cable, alarm output is the relay switch output.

Step 3

Open the device WEB interface, make corresponding settings to the alarm input and output device in "Setup > Event > Alarm Setup".

The alarm input of WEB is corresponding to the alarm input of the user cable. It is to set the corresponding NO and NC output according to the high and low level signal generated by alarm input device when alarm triggers.

Step 4

Set the alarm output situation of user cable on the WEB.

2.4.1.4 Connect GND Cable

Connect the power line YELLOW & GREEN of the combination cable to the lightning protection device, and make sure the lightning protection device is well grounded.

2.4.2 Install Speed Dome

2.4.2.1 Install Device with Quick Mounting Connector

Step 1

Fix the quick mounting connector on the bracket, and pull out the wall cable from the quick mounting connector.

Step 2

Fix one side of the safety rope on the speed dome and the other side on the quick mounting connector.

Step 3

Align the flange edge with that of the quick mounting connector; push the speed dome into the quick mounting connector, which is shown in Figure 2-7.
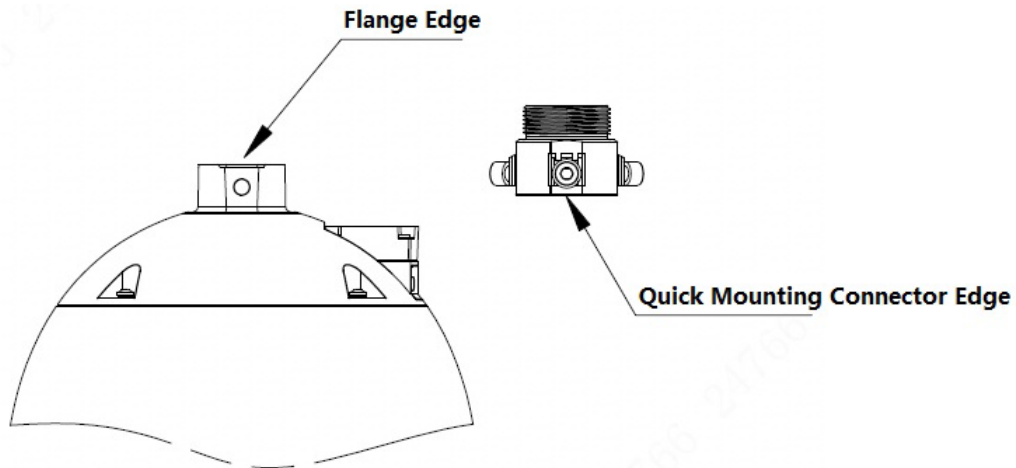
Figure 2-7

Step 4

Connect Speed dome cable and wall cable, make sure both are waterproof. Please refer to "2.4.1 Speed Dome Cable" for more details about cable connection.

Step 5

Twist three stainless screws into the corresponding screw holes of flange, use inner hex tool to tighten three stainless screws, which is shown in Figure 2-8.
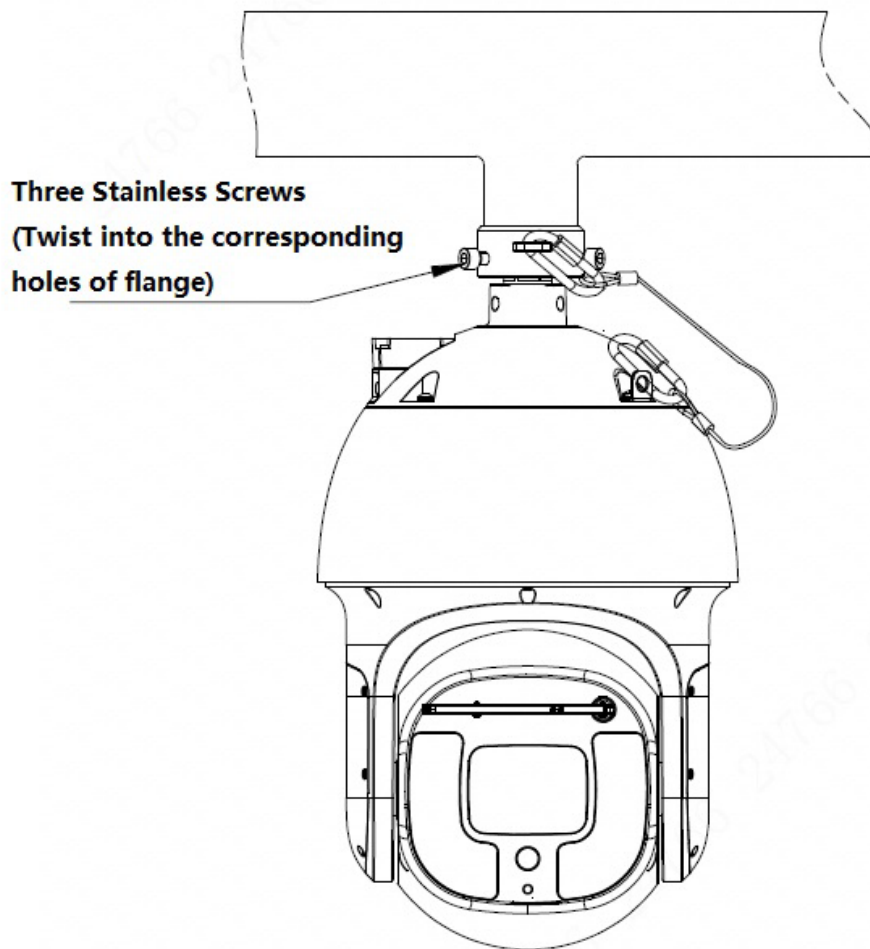
Three Stainless Screws
(Twist into the corresponding
holes of flange)

Figure 2-8

Step 6
Check if the screws on the quick mounting connector are firmly tightened, the safety buckle is reliably connected and the speed dome is firmly fixed. The speed dome installation is completed after confirmation, which is shown in Figure 2-9.
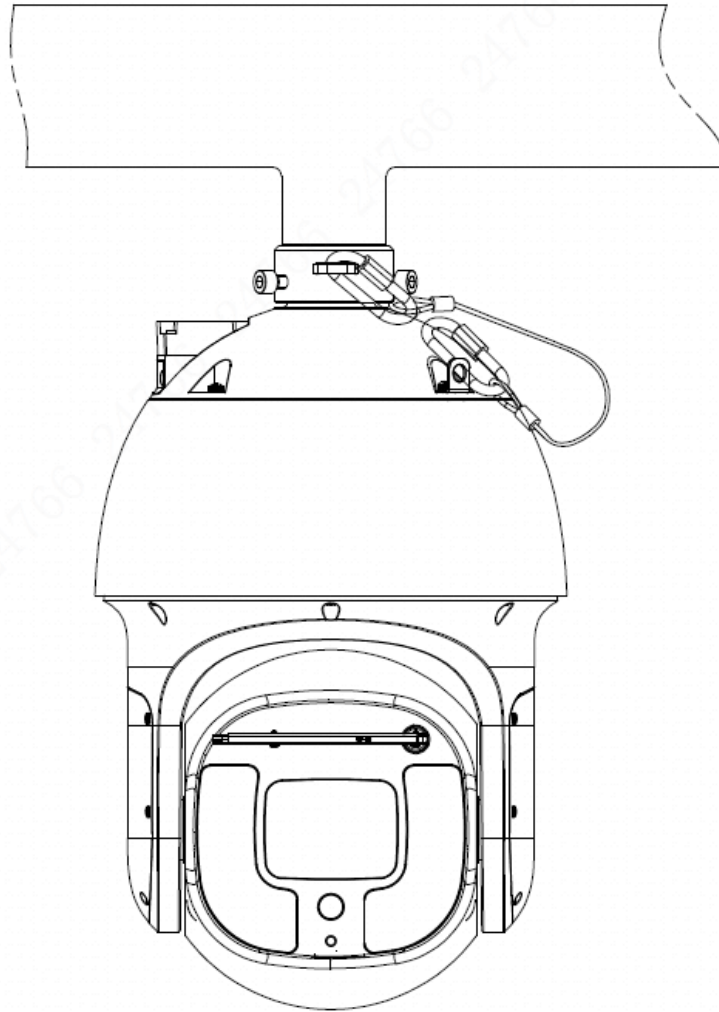
Figure 2-9

2.4.2.2 Install Device without Quick Mounting Connector
Step 1

Fix one end of the safety rope on the speed dome and the other end on the bracket hook, which is shown in Figure 2-10.
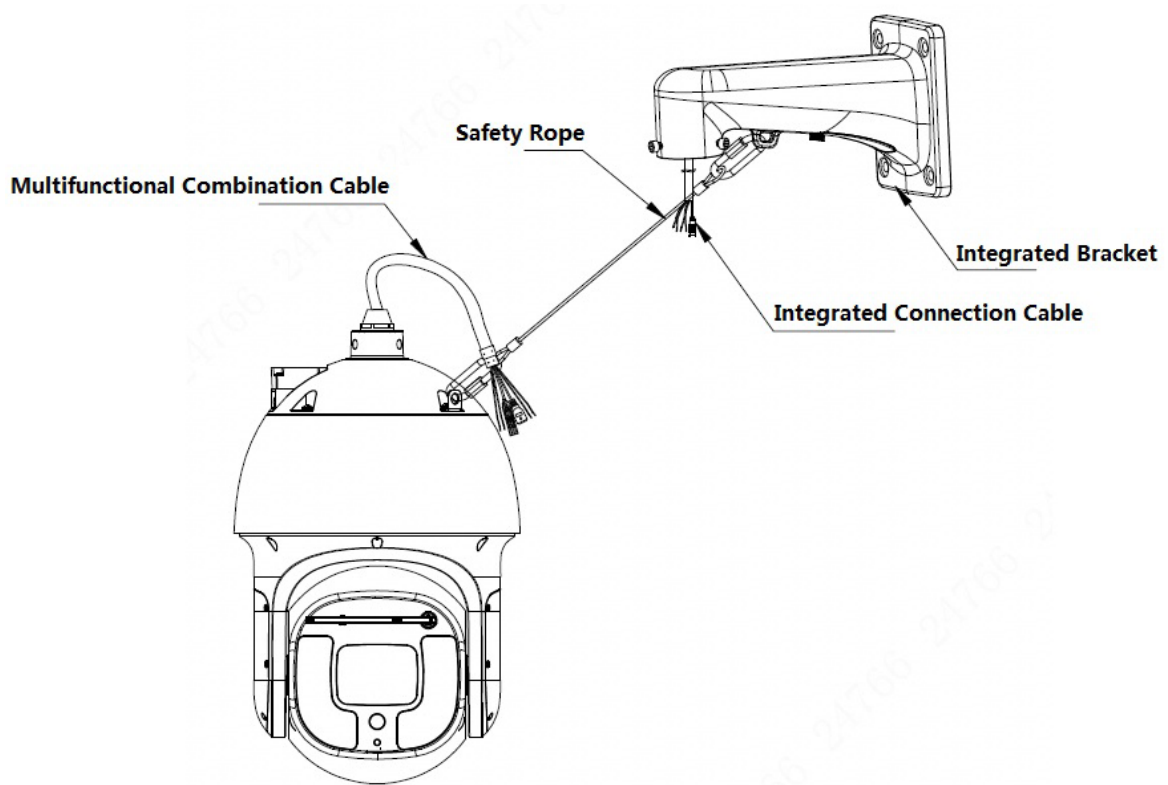
Figure 2-10

Step 2

Connect Speed dome cable and wall cable well, make sure both are waterproof. Please refer to "2.4.1 Speed Dome Cable" for more details about cable connection.

Step 3

Align the flange edge with that of the bracket; push the speed dome into the bracket, twist three stainless screws into the corresponding screw holes of the flange, and then use inner hex tool to fix three stainless screws, which is shown in Figure 2-11.
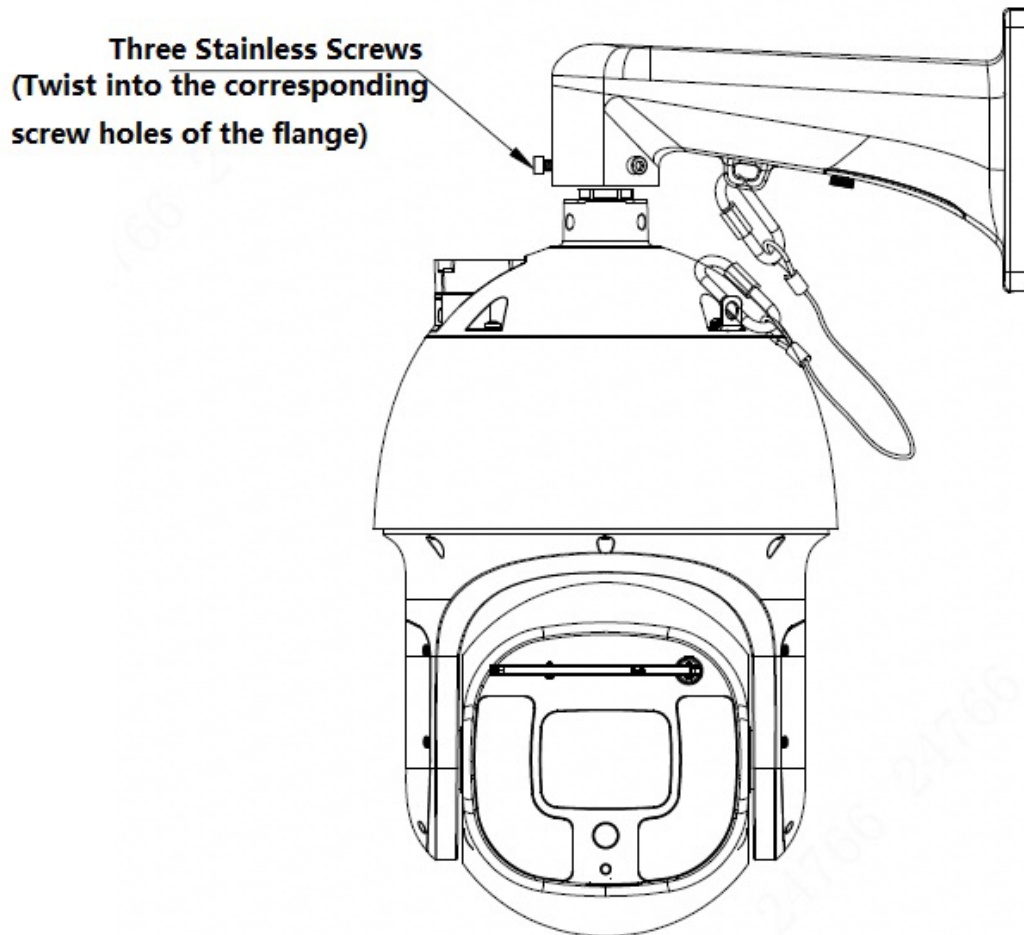
Figure 2-11

Step 4

Check if the screws on the bracket are firmly tightened, the safety buckle is reliably connected and the speed dome is firmly fixed. The speed dome installation is completed after confirmation, which is shown in Figure 2-12.
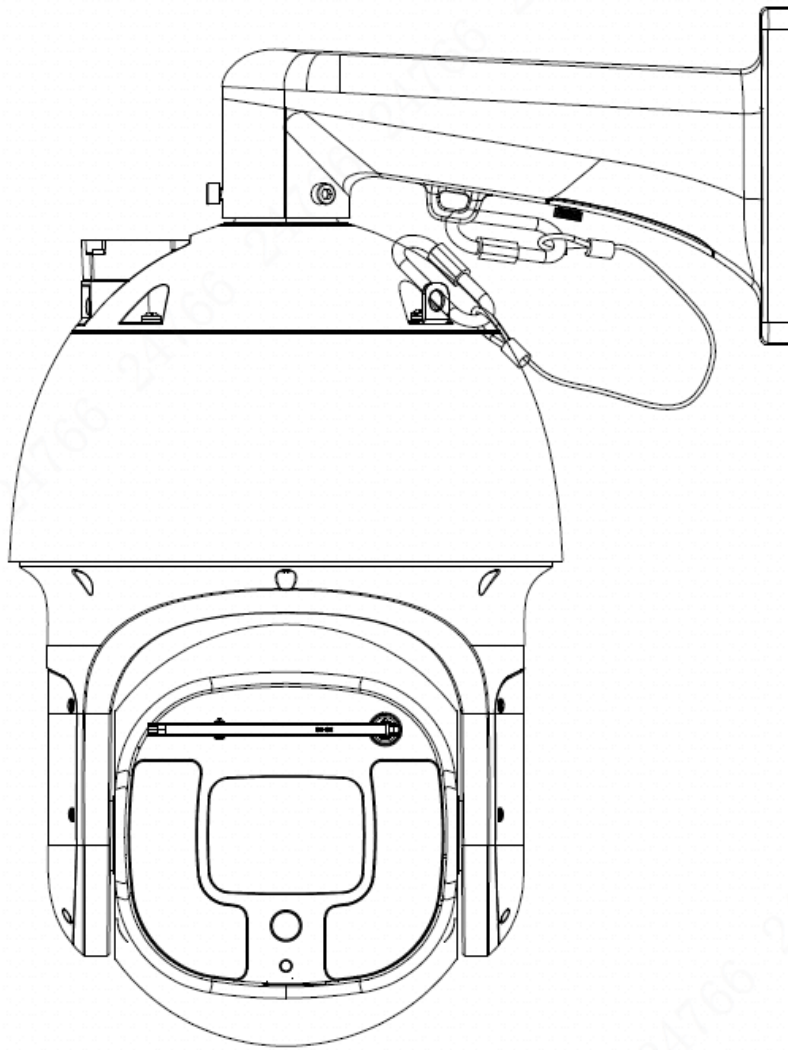
Figure 2-12

3 Wall-mounted Bracket Installation

3.1 Mounting Component and Dimension

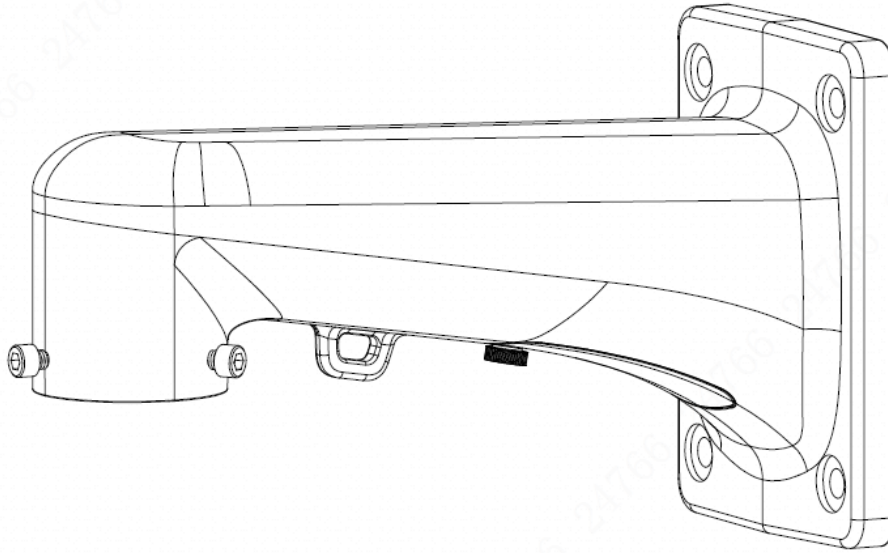The appearance of wall-mounted bracket is shown in Figure 3-1, refer to Figure 3-2 for dimension..
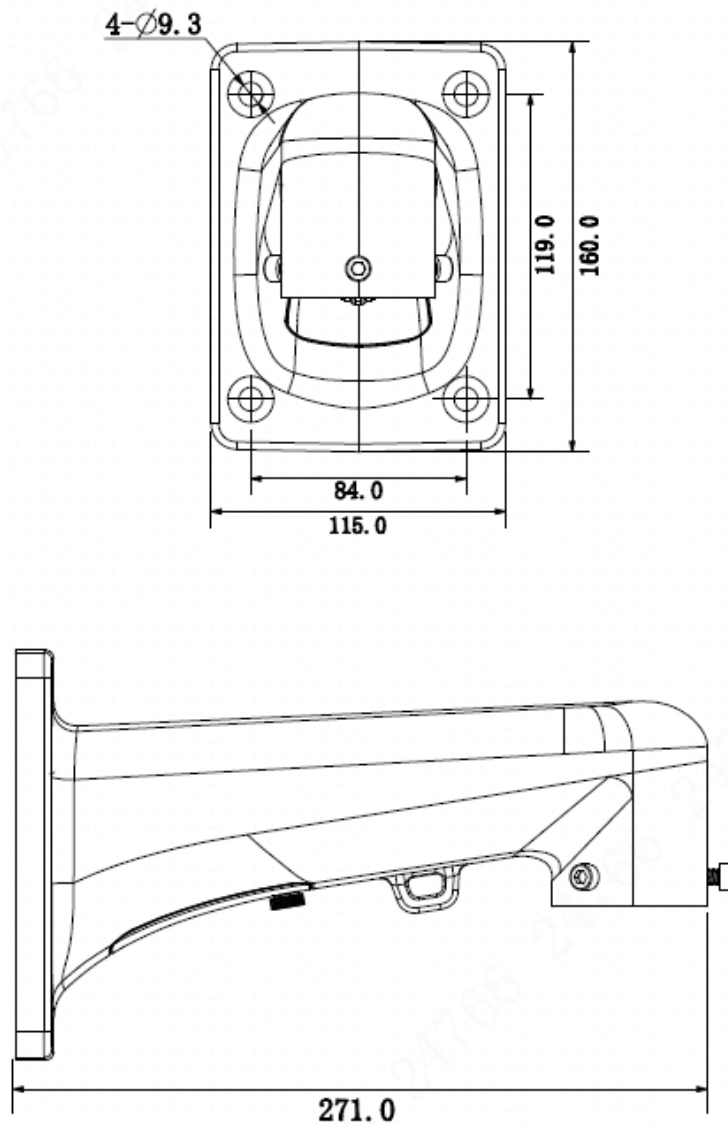

Figure 3-1

Figure 3-2

3.2 Installation Steps of Wall-mounted Bracket

3.2.1 Installation Conditions

Wall-mounted speed dome can be installed on hard wall structure both indoors and outdoors.
The wall needs to meet the following installation conditions.

● The wall should be thick enough to install expansion bolts.
● The wall shall sustain at least 8x weight of the speed dome, bracket and so on.

3.2.2 Installation Steps

Step 1

As it is shown in Figure 3-3, take the mounting holes of the wall-mounted bracket bottom as
template, mark the punch positions on the wall and then dig holes.
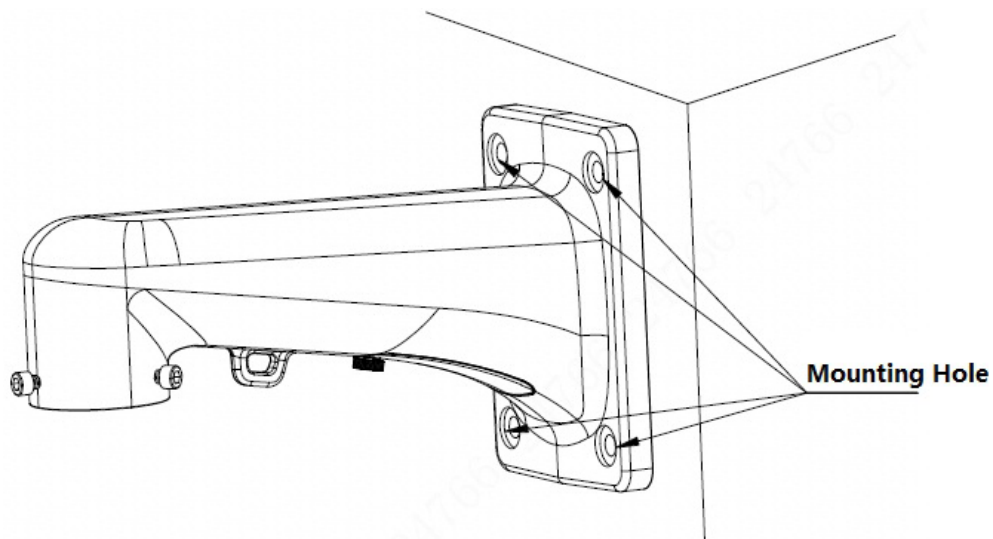
14

Figure 3-3

Step 2

Insert the expansion bolts into the holes you just dug.

Step 3

Use four hex nuts and flat gasket to twist the wall-mounted bracket into the expansion bolts.

Step 4

Install the speed dome on the wall-mounted bracket, which is shown in Figure 3-4. Please refer to "2.4.2 Install Speed Dome" for the installation modes of the device.
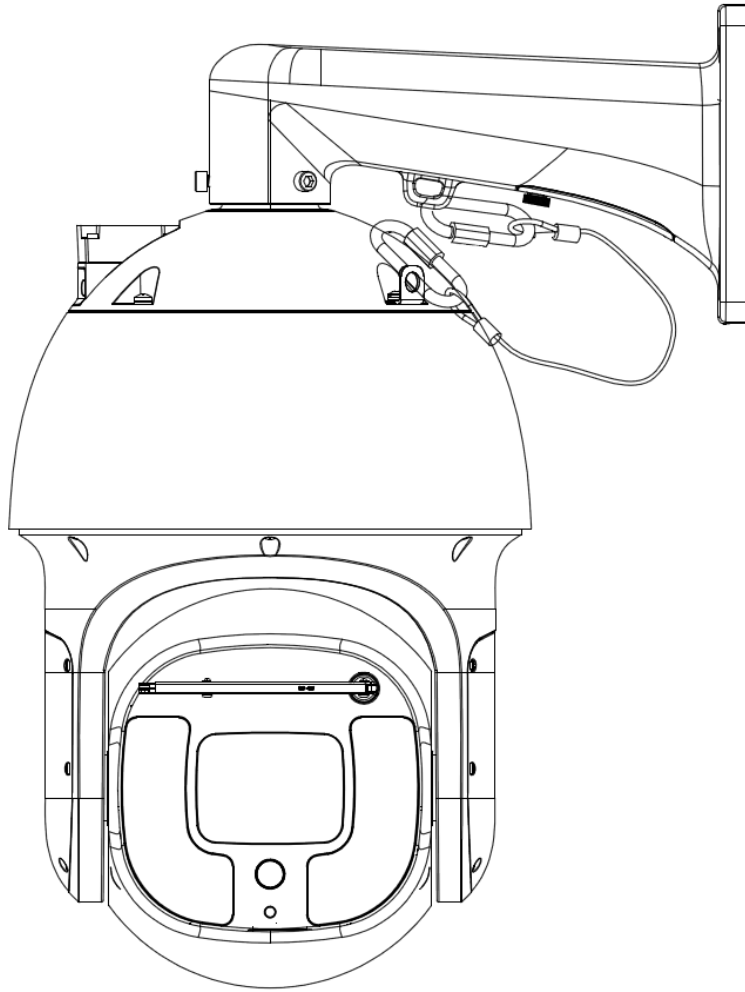
Figure 3-4

4 APPENDIX I LIGHTNING PROOF AND SURGE PROTECTION

4.1 Outdoors

This series speed dome adopts TVS lighting protection technology. It can effectively prevent damages from various pulse signals below 6000W, such as sudden lighting and surge. While maintaining your local electrical safety code, you still need to take necessary precaution measures when installing the speed dome in the outdoor environment.

- The distance between the signal transmission cable and high-voltage device (or high-voltage cable) shall be at least 50 meters.
- Outdoor cable layout shall go under the penthouse if possible.
- For vast land, please use sealing steel tube under the land to implement cable layout and connects one point to the earth. Open floor cable layout is forbidden.
- In area of strong thunderstorm hit or near high sensitive voltage (such as near high-voltage transformer substation), you need to install additional high-power thunder protection device or lightning rod.
- The thunder protection and earth of the outdoor device and cable shall be considered in the building whole thunder protection and conform to your local national or industry standard.
- System shall adopt equal-potential wiring. The earth device shall meet anti-jamming and at the same time conforms to your local electrical safety code. The earth device shall not short circuit to N (neutral) line of high voltage power grid or mixed with other wires. When connect the system to the earth alone, the earth resistance shall not be more than 4Ω and earth cable cross-sectional area shall be no less than 25 mm^2. See Figure 4-1.
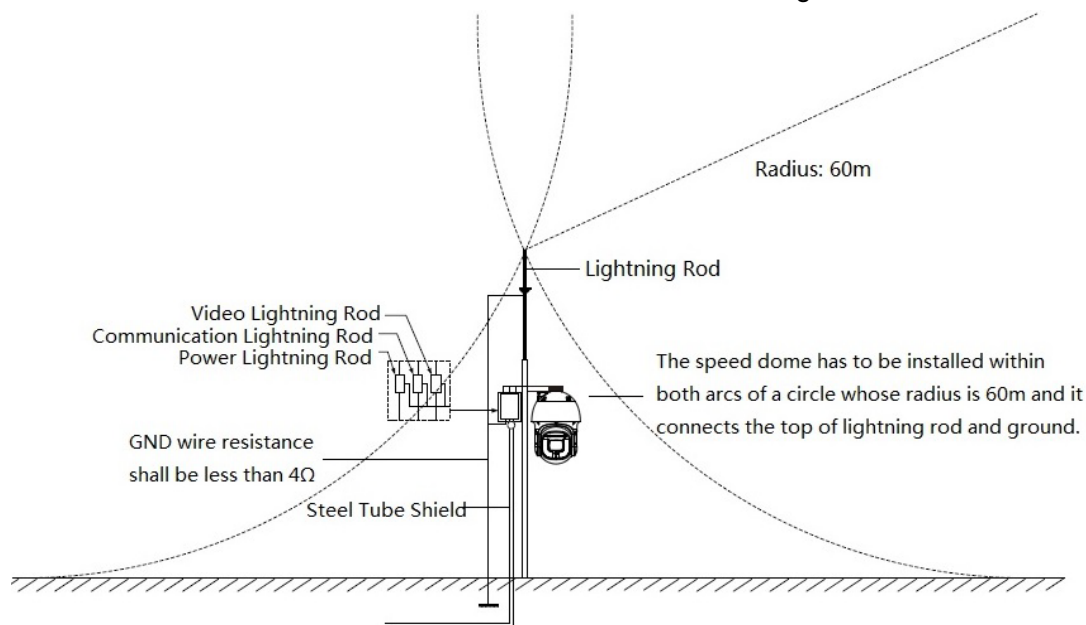

Figure 4-1

4.2 Indoors

The yellow and green GND wire or GND screw of the speed dome should be reliably connected by several strands of copper wire with no less than 25mm^2 and indoor equipotential GND terminal. Please refer to Figure 4-2 for lightningproof installation mode.
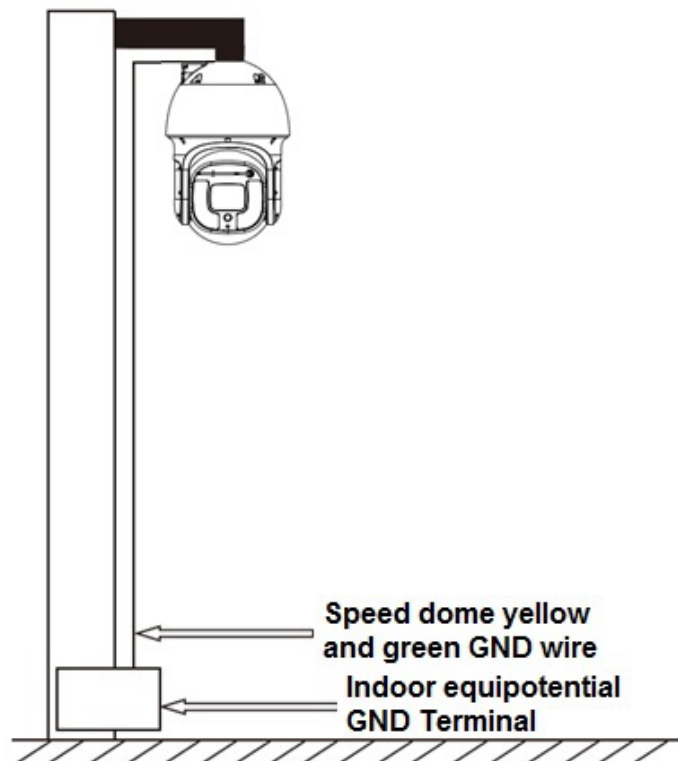

Figure 4-2

5 APPENDIX II ABOUT RS485 BUS

5.1 RS485 Bus Main Feature

RS485 is semi duplex communication cable of impedance 120 Ω. Its max load amount is 32 effective loads (including main control device and devices to be charged).

5.2 RS485 Bus Transmission Distance

When we take 0.56mm (24AWG) twisted-pair as communication cable, the max transmission distance (theoretically) are listed below (according to different baud rates).

Baud Rate	Max Distance
2400 BPS	1800M
4800 BPS	1200M
9600 BPS	800M

In the following situations, the max transmission distance shall become shorter accordingly:
- The communication cable is a little bit thin;
- The surrounding environment has strong electromagnetic interference;
- There are too much devices connected to the RS485 bus;

And vice versa, the max transmission distance shall become longer.

5.3 The Problem in Practical Use

In practical usage, we usually adopt star type connection. The terminal resistance shall connect to the furthest two devices (Such as device 1# and device 15# in Figure 5-1). But this connection way does not conform to RS485 Bus standard. When the distances between devices are too long, the signal reflection occurs and anti-jamming decreases, thus the signal reliability becomes very low. You can see speed dome is not under control or speed dome is running automatically and cannot stop.
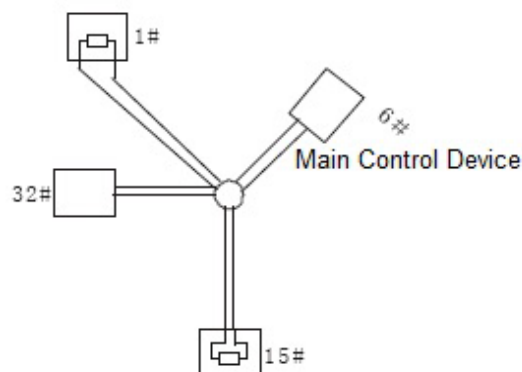

Figure 5-1

In this situation, we recommend RS485 distributor. This device can turn star type connection into the connection that conforms to RS485 bus industry standard, which can avoid the above mentioned problems and enhance communication reliability. See Figure 5-2.
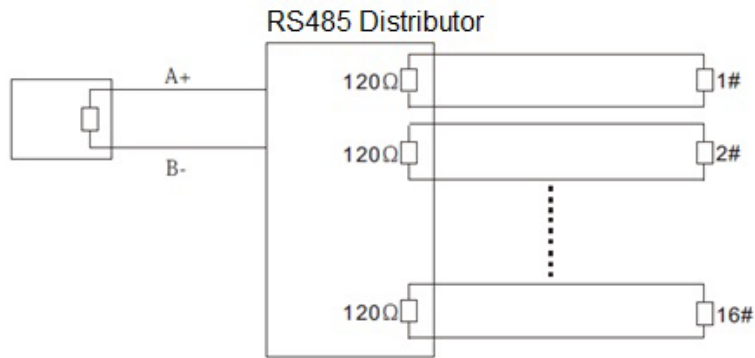
Figure 5-2

5.4 RS485 Bus FAQ

Phenomenon	Possible Reasons	Solution
Speed dome can run self-diagnosis but I cannot control it.	• Host address(baud rate) and speed dome address(baud rate) are not match; • Positive and negative end of RS485 Bus are misconnected; • Connection cable is loose； • RS485 Bus connection are cut off;	• Modify host or speed dome setup ； • Switch RS485 positive end and negative end； • Fix connection cable firmly； • Replace RS485 Bus.
I can control the speed dome but is not smooth	• RS485 Bus connection are not good； • One RS485 bus is off； • The distance between host and speed dome is too far； • Parallel connected too much speed domes.	• Connect RS 485 Bus again； • Replace RS485 Bus； • Add terminal matching resistance； • Add RS485 distributor.

6 APPENDIX III THE RELATIONSHIP BETWEEN AC 24V CABLE DIAMETER AND TRANSMISSION DISTANCE

The max transmission distance is recommended when the cable diameter is fixed and AC 24V voltage loss rate is lower than 10%. For the AC power supply devices, the max allowed voltage loss rate is 10%. For example, a device with rated power of 20W, installed 141 feet (42m) away from the transformer, the minimum wire diameter needed is 0.8000mm.

Feet（m）＼ mm w	0.8000	1.000	1.250	2.000
5	488.52 （148.90）	763.31 （232.66）	1192.67 （363.53）	3053.25 （930.63）
10	244.26 （74.45）	381.66 （116.33）	596.34 （181.76）	1526.62 （465.31）
15	162.84 （49.63）	254.44 （77.55）	397.56 （121.18）	1017.75 （310.21）
20	122.13 （37.23）	190.83 （58.16）	298.17 （90.88）	763.31 （232.66）
25	97.70 （29.78）	152.66 （46.53）	238.53 （72.71）	610.65 （186.13）
30	81.42 （24.82）	127.22 （38.78）	198.78 （60.59）	508.87 （155.10）
35	69.79 （21.27）	109.04 （33.24）	170.38 （51.93）	436.18 （132.95）
40	61.06 （18.61）	95.41 （29.08）	149.08 （45.44）	381.66 （116.33）
45	54.28 （16.54）	84.81 （25.85）	132.52 （40.39）	339.25 （103.40）
50	48.85 （14.89）	76.33 （23.27）	119.27 （36.35）	305.32 （93.06）
55	44.41 （13.54）	69.39 （21.15）	108.42 （33.05）	277.57 （84.60）
60	40.71 （12.41）	63.61 （19.39）	99.39 （30.29）	254.44 （77.55）
65	37.58 （11.45）	58.72 （17.90）	91.74 （27.96）	234.87 （71.59）
70	34.89 （10.64）	54.52 （16.62）	85.19 （25.97）	218.09 （66.47）
75	32.57 （9.93）	50.89 （15.51）	79.51 （24.24）	203.55 （62.04）
80	30.53 （9.31）	47.71 （14.54）	74.54 （22.72）	190.83 （58.16）
85	28.74 （8.76）	44.90 （13.69）	70.16 （21.38）	179.60 （54.74）
90	27.14 （8.27）	42.41 （12.93）	66.26 （20.20）	169.62 （51.70）
95	25.71 （7.84）	40.17 （12.25）	62.77 （19.13）	160.70 （48.98）
100	24.43 （7.45）	38.17 （11.63）	59.63 （18.18）	152.66 （46.53）

7 APPENDIX IV WIRE GAUGE REFERENCE SHEET

Metric bare wire diameter （mm）	AWG	SWG	Bare wire cross section （mm²）
0.050	43	47	0.00196
0.060	42	46	0.00283
0.070	41	45	0.00385
0.080	40	44	0.00503
0.090	39	43	0.00636
0.100	38	42	0.00785
0.110	37	41	0.00950
0.130	36	39	0.01327
0.140	35	/	0.01539
0.160	34	37	0.02011
0.180	33	/	0.02545
0.200	32	35	0.03142
0.230	31	/	0.04115
0.250	30	33	0.04909
0.290	29	31	0.06605
0.330	28	30	0.08553
0.350	27	29	0.09621
0.400	26	28	0.1257
0.450	25	/	0.1602
0.560	24	24	0.2463
0.600	23	23	0.2827
0.710	22	22	0.3958
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	/	1.7663
2.000	12	14	3.1420
2.500	/	/	4.9080
3.000	/	/	7.0683

Note

- This manual is for reference only. Slight difference may be found in the user interface.
- All the designs and software here are subject to change without prior written notice.
- All trademarks and registered trademarks are the properties of their respective owners.
- If there is any uncertainty or controversy, please refer to the final explanation of us.
- Please visit our website or contact your local service engineer for more information.