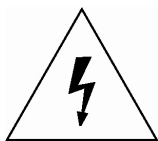


INSTRUCTION MANUAL Ver 1.4

Megapixel IP PTZ Camera



CAUTION

**RISK OF ELECTRIC SHOCK
DO NOT OPEN**



**CAUTION : TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT OPEN THE COVERS.
NO USER SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONAL**



This lightning flash with arrowhead symbol is intended to alert the user to the presence of un-insulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This exclamation point symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



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 interface, and
- (2) This device must accept any interference received, including interference that may cause undesired operations.





Important Safety Guide

1. Read, heed and follow all the Instructions

Read all the safety and operating instructions before using the product.

2. Keep this manual

Keep this manual for reference in future.

3. Attachments / Accessories

Use only the attachments or accessories specified by the manufacturer.

4. Installation

- Do not install near any heat resources such as radiators, heat registers, stoves, or other apparatus including amplifiers that produce heat. Improperly installed product may fall, cause serious injury to a child or adult and damage the product.
- Do not block any ventilation holes or openings. Install in accordance with the manufacturer's instructions.
- Use only with the cart, stand, tripod, bracket, mounting devices, or table specified by the manufacturer.
- Installation should be done only by qualified personnel and conform to all the instructions by the manufacturer.
- Refer all servicing to qualified service personnel.
- Unless the product is specifically marked as IP67, more than IP67 or confirmed by the manufacturer, it is designed for indoor use only and it must not be installed where exposed to rain and moisture.
- Do not load on the product.
- Use stainless steel hardware to fasten the mount.
- To prevent damage from water leakage when installing a mount outdoors on a roof or wall, apply sealant properly around holes.
- These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.
- Use only replacement parts specified by the manufacturer.

5. Power source

This product should be operated only from the type of the power source indicated on the marking label.



Caution**❑ Operating**

- Before using, make sure that the power supply and others are properly installed.
- While operating, if any abnormal condition or malfunction is observed, stop using the product immediately and then contact your local dealer.

❑ Handling

- Do not disassemble or tamper with the parts inside the product.
- Do not drop or subject the product to shock and vibration as this can damage the product.
- Care must be taken when you clean the clear dome cover. Especially, scratch and dust will ruin the quality of the product.

❑ Installation and Storage

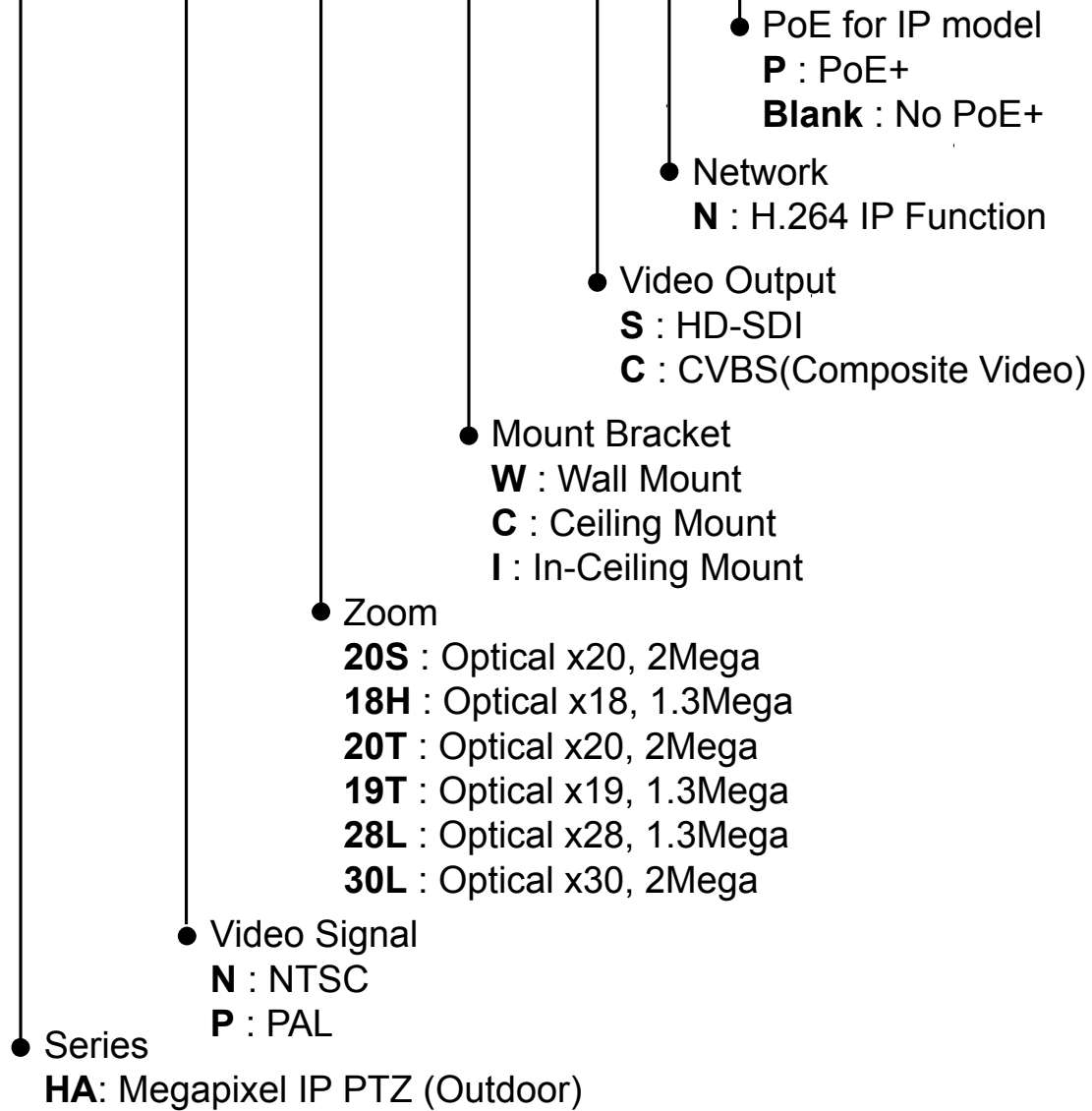
- Do not install the product in areas of extreme temperature, which exceed the allowable range.
- Avoid installing in humid or dusty places.
- Avoid installing in places where radiation is present.
- Avoid installing in places where there are strong magnetic fields and electric signals.
- Avoid installing in places where the product would be subject to strong vibrations.



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Model Code

HA - N 20 S W - S N P



Features

❑ Powerful Zoom Camera & Setup Options

- Image Sensor : 1/3" Exmor CMOS Image Sensor, 2 Mega pixels (20S model)
1/3" Solid State Progressive Scan CCD, 1.3 Mega pixels (18H model)
1/3" PS CMOS Image Sensor, 2 Mega pixels (20T model)
1/3" PS CMOS Image Sensor, 1.3 Mega pixels (19T model)
1/4" CMOS Image Sensor, 1.3 Mega pixels (28L model)
1/2.8" CMOS Image Sensor, 3 Mega pixels (30L model)
- Zoom : ×20 Optical Zoom, ×12 Digital Zoom (20S model)
×18 Optical Zoom (18H model)
×20 Optical Zoom, ×8 Digital Zoom (20T model)
×19 Optical Zoom, ×16 Digital Zoom (19T model)
×28 Optical Zoom, ×12 Digital Zoom (28L model)
×30 Optical Zoom, ×12 Digital Zoom (30L model)
- Day & Night, Privacy Mask
- WDR function (20S, 18H, 28L, 30L model)
- HLC function (20T, 19T model)

❑ Network Function over IP

- Video Compression (H.264) & Audio Compression (G.711, AAC)
- Dual Streaming over IP (H.264/H.264 or H.264/M-JPEG)
- Remote Access & Control via IP Network

❑ Powerful Pan/Tilt Functions

- MAX. 360°/sec High Speed Pan/Tilt Motion
- With the Vector Drive Technology, Pan/Tilt motions are accomplished along the shortest path. As a result, the time to target view is remarkably short and the video on the monitor is very natural in monitoring.
- With the Micro-Stepping Control Technology, the video looks very natural at high zoom magnification during a jog operation on a controller since the camera can be controlled by 0.05°/sec. Hence it is very easy to make the camera focus on desired target views at high zoom magnification. Additionally it is easy to make the camera focus on desired positions with zoom-proportional pan/tilt movement.

❑ **Preset, Pattern, Swing, Group, Privacy Mask and More...**

- MAX. 128 Presets are programmable.
- MAX. 8 sets of Swing are programmable. This function is that a camera moves repetitively between two preset positions at programmed speeds.
- MAX. 4 Patterns are programmable. This function is that a camera memorizes the path (mostly curve path) by the joystick of the controller and revives the trajectory operated by the joystick as closely as possible.
- MAX. 8 sets of Group are programmable. This function is that a camera memorizes the combination of Presets, Pattern and/or Swings sequentially and runs Presets, Pattern and/or Swings repetitively. A Group can be combined up to 20 functions with any of Preset/Pattern/Swing.
- MAX. 8 or 4 Privacy Masks are programmable, not to intrude on any other's privacy.

❑ **PTZ(Pan/Tilt/Zoom) Control**

- With the RS-485 communication connection, MAX. 255 units of cameras can be connected to a single controller.
- Pelco-D or Pelco-P protocols can be selected as a control protocol in the current firmware version.

❑ **Alarm In/Out Function**

- 2 alarm sensor inputs and 2 alarm sensor outputs are available.
- Both of N.O.(Normal Open) sensors and N.C.(Normal Close) sensors can be used.
- The camera can be set to move to a Preset position when there are external sensor activations.

❑ **Rated Power**

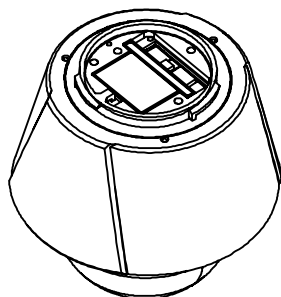
- Default : DC 12V
- Option : PoE+ (PoE Model Only)

❑ **Perfect Outdoor Environment Compatibility and Easy Installation**

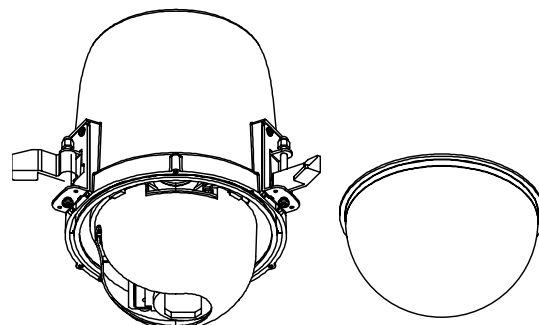
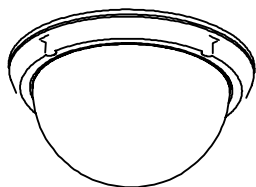
- The fans and heaters are built-in in the camera for cold and hot temperature environment. Also idealistic mechanical design protects the camera from water and dust. (IP67 when installed properly with wall mount bracket only / Only for outdoor models)
- It is easy to install and repair the camera.

Package Component

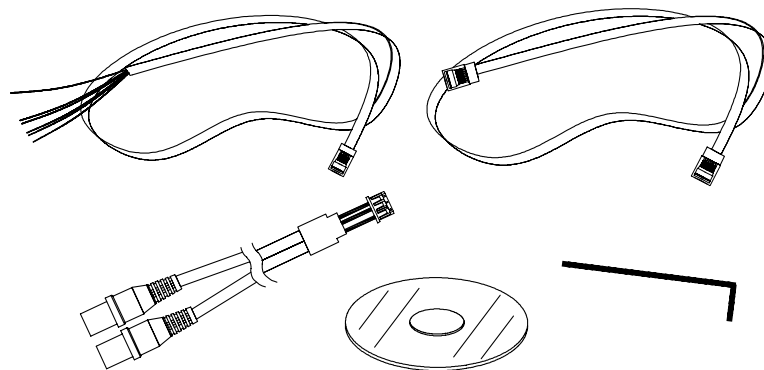
Product & Accessories



● Main Body & Dome Cover (Wall/Ceiling model)



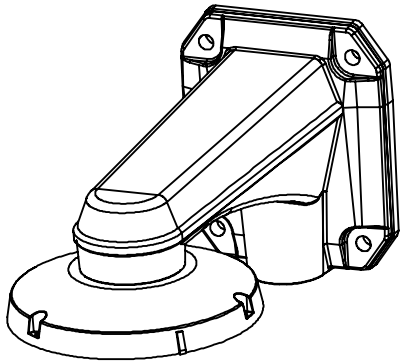
● Main Body & Dome Cover (In-ceiling model)



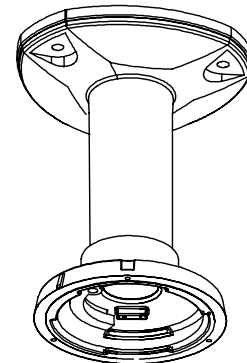
● Default Accessories

[Main Cable, Wrench, Cross LAN cable, Audio cable, CD]

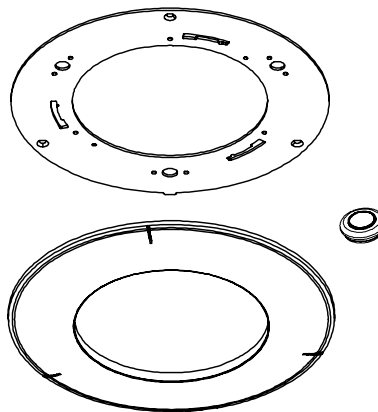
□ Brackets (Optional)



● Wall Mount Bracket
[Screws :TORX Machine M4×L18, Hex Lag #14×50]

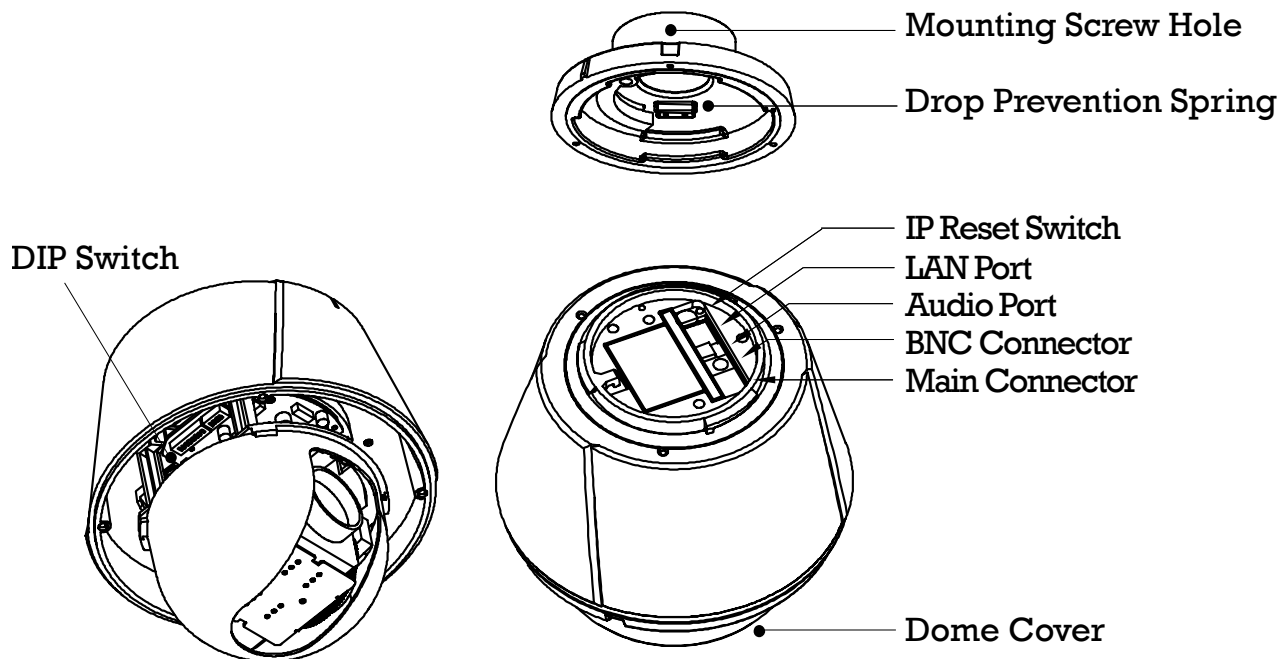


● Ceiling Mount Bracket
[Screws :TORX Machine M4×L18, Anchor Bolt 3/8"×70]



● In-Ceiling Mount Bracket
[Screws :Tapping FH Ø4×L20, Machine Sams M3×L8]

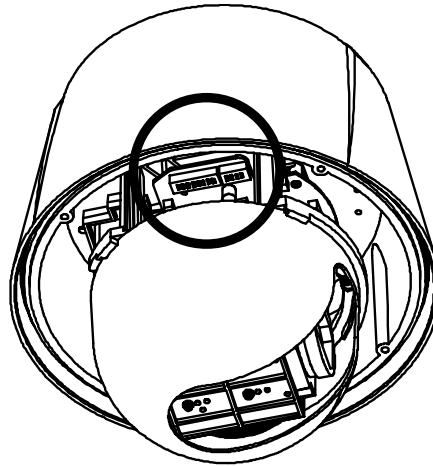
Main Part Description



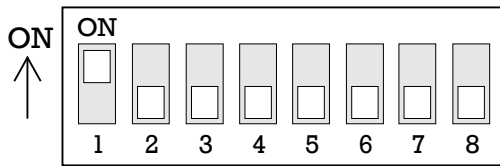
- **Dome Cover** Do not detach the protection vinyl from the dome cover before finishing all the installation process to protect the dome cover from scratches or dust.
- **DIP Switch** Used to set up camera IDs and protocols.
- **Drop Prevention Spring** This part keeps the camera from dropping during installation and maintenance. After install the Bracket, please, hang the spring to the drop prevention hook of main body as shown in picture for further tasks.
- **Mounting Screw Hole** Used to assemble the main body with a bracket with screws.
- **Main Connector** Used for the power wire, sensor in/out and the RS-485 communication cable connection.
- **BNC Connector** Used for video signal connection.
- **LAN Port** Used for Ethernet connection.
- **Audio Port** Used for audio in/out connection.
- **IP Reset Switch** Used to initialize all network configurations to the factory default. Press the button for more than 5 seconds to initialize the network configurations.

DIP Switch Setup

Before installing the camera, set up the DIP switch to configure the camera ID and the communication protocol.



□ Camera ID Setup

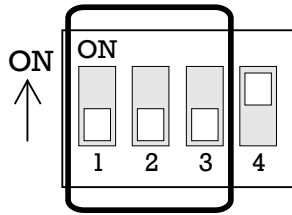


- ID numbers of cameras are set up with binary numbers. See the examples shown below.

Pin	1	2	3	4	5	6	7	8
Binary Value	1	2	4	8	16	32	64	128
ex) ID=5	on	off	on	off	off	off	off	off
ex) ID=10	off	on	off	on	off	off	off	off

- The camera ID range is “1~255”. **Camera ID must not be “0”!**
- The factory default of the camera ID is “1”.
- Match the camera ID with the Cam ID setting of your DVR or Controller to control the camera.
- If you are connecting a single camera to a controller, terminate the camera. When connecting more than one camera to a single controller, terminate the last camera on the communication line. The last camera means the camera farthest in cable length from the controller.
- Note that the total length of the communication cable between a controller and the camera(s) on the same communication line must be less than 1.2Km.

❑ Communication Protocol Setup



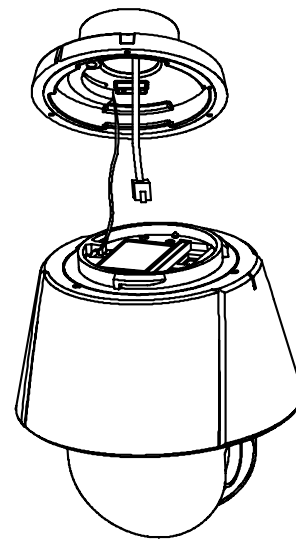
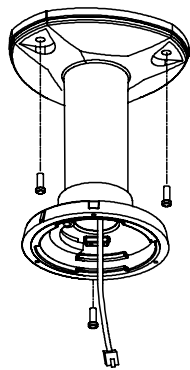
- Select an appropriate Protocol with the DIP switch combination.

Switch Mode			Protocol
P0 (Pin 1)	P1 (Pin 2)	P2 (Pin 3)	
OFF	OFF	OFF	PELCO-D, 2400 bps
ON	OFF	OFF	PELCO-D, 9600 bps
OFF	ON	OFF	PELCO-P, 4800 bps
ON	ON	OFF	PELCO-P, 9600 bps
Others			Reserved

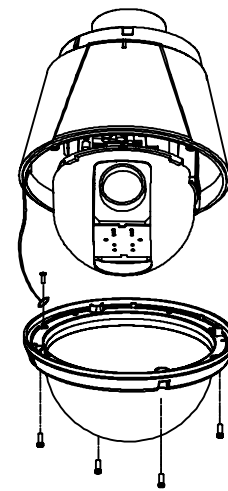
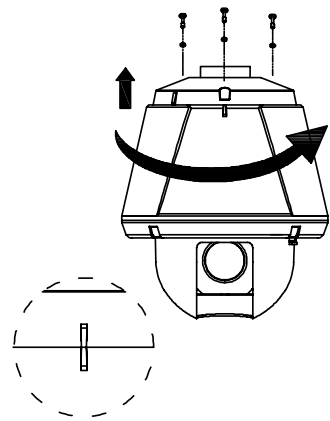
- Match the camera protocol with the camera protocol in the setting of your DVR or controller to control the camera.
- Adjust the DIP switch after turning off the camera. If you changed the camera protocol by changing the DIP S/W, the change will be effective after you reboot the camera.
- The factory default protocol is “Pelco-D, 2400 bps”.

Installation with Ceiling Mount Bracket

- ① Remove the ceiling tile from the ceiling and cut a hole whose diameter is 30~40mm on the ceiling tile to pass the wire(s) and cable(s) through to the upside of the ceiling. (In case of the wiring and cabling through the mounting surface only) Then prepare the ceiling mount bracket. Pull the wire(s) for the system as below. (Anchor Bolt 3/8"×70)
- ② Hook up "Drop Prevention Spring" on main body to prevent camera from unexpected drop and pull the wire(s) and cable(s) for the system as below.



- ③ Line up the mold lines and assemble main body to mount adaptor and turn it. And assemble the main both with the camera mount adaptor with the 3 screws. (TORX SCREW M4×18).
- ④ Screw the dome cover to the main body and remove the protection vinyl from the dome cover.

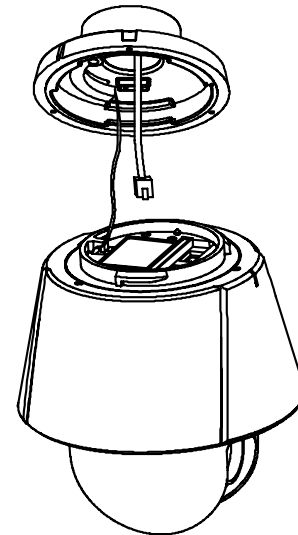
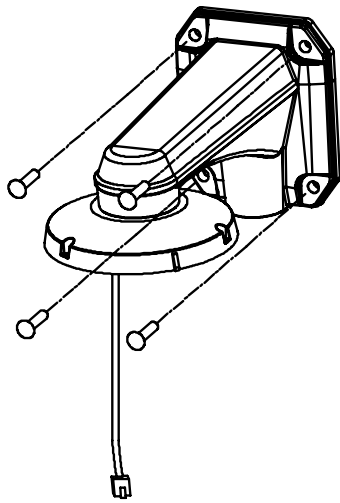


Important Notice

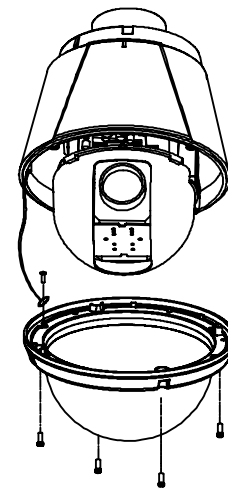
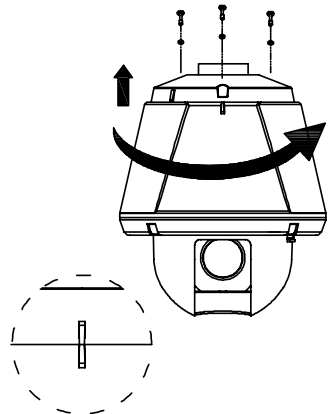
- Before starting the installation, make sure that the Camera ID and Protocol are set up properly.
- To adjust the installation height from the mounting surface, the pipe and coupler should be needed between the surface mount part of the ceiling mount bracket and the camera mount part of the ceiling mount bracket. Note that they are not supplied by the manufacturer.

Installation with Wall Mount Bracket

- ① Make a hole whose diameter is 30~40mm on the mounting surface to pass the wire(s) and cable(s) through the mounting surface. (In case of the wiring and cabling through the mounting surface only) Then prepare the wall mount bracket. Pull the wire(s) and cable(s) for the system as below. Attach the wall mount bracket to the mounting surface. (Hex Lag #14×50)
- ② Hook up “Drop Prevention Spring” on main body to prevent camera from unexpected drop and pull the wire(s) and cable(s) for the system as below.



- ③ Line up the mold lines and assemble main body to mount adaptor and turn it. And assemble the main both with the camera mount adaptor with the 3 screws. (TORX SCREW M4×18).
- ④ Screw the dome cover to the main body and remove the protection vinyl from the dome cover.

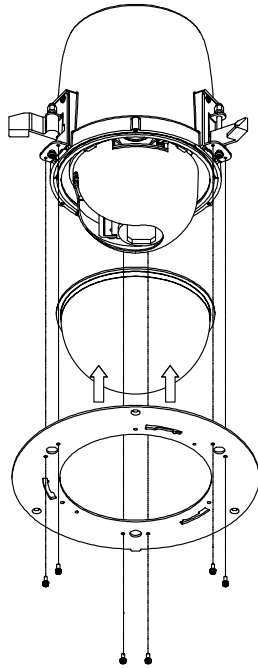


Important Notice

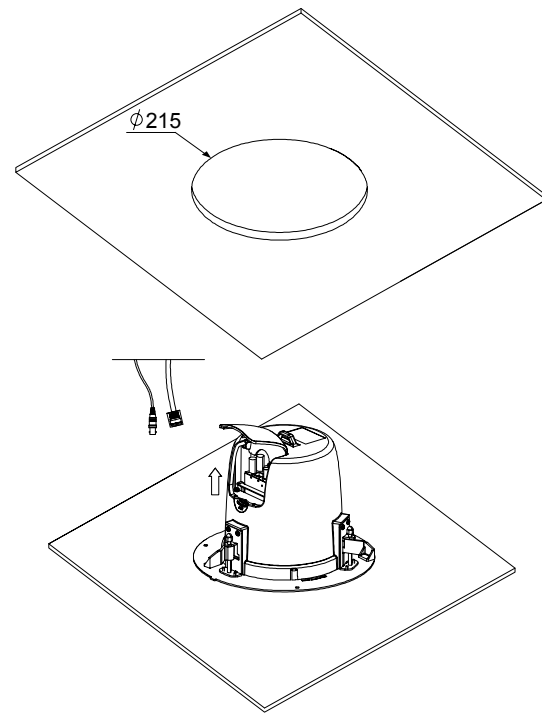
- Before starting the installation, make sure that the Camera ID and Protocol are set up properly.

Installation with In-ceiling Bracket

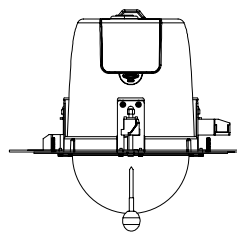
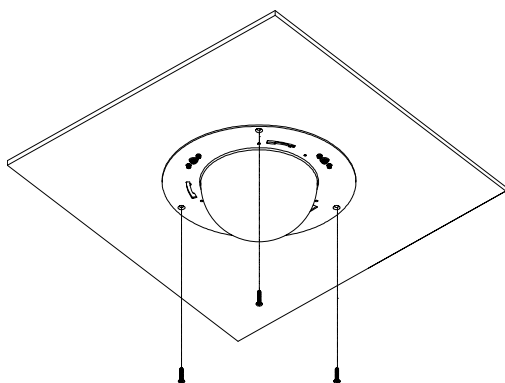
- ① Assemble the dome cover and the bracket with the main body



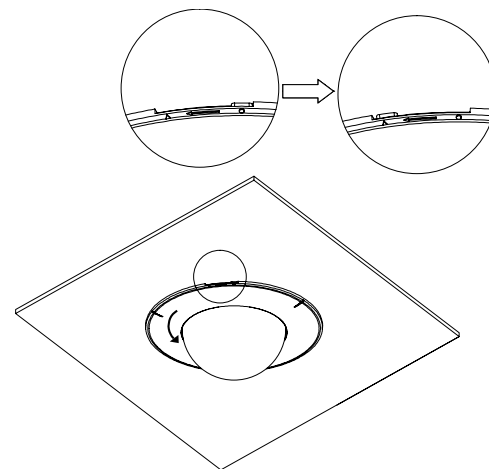
- ② Cut a hole whose diameter is 215mm on the ceiling tile and insert the camera into the hole. Open the cover and make all the connections.



- ③ Install the ceiling tile to the ceiling. Fix the camera to the ceiling tile with the Guide Hook Screws.



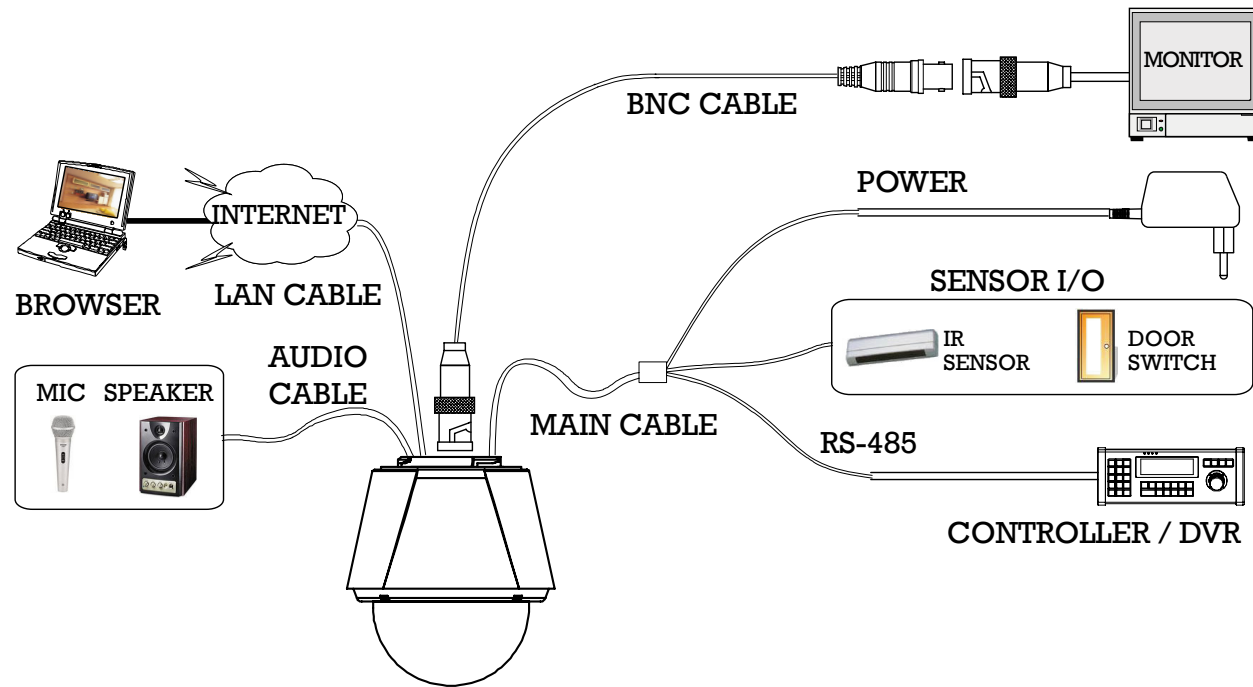
- ④ Assemble the Deco-Ring with the camera by spinning.



Important Notice

- Before starting the installation, make sure that the Camera ID and Protocol are set up properly.

Wiring and Cabling



Port Description

● Main Cable

Port Pin Number	Wire Color	Signal
1	Black	RS-485 +
2	Brown	RS-485 -
3	Red	DC 12V
4	Orange	GND
5	Yellow	OUT COM (Relay Output Common)
6	Green	OUT 2 (Relay Output 2)
7	Blue	OUT 1 (Relay Output 1)
8	Violet	IN COM (Sensor Input Common)
9	Gray	IN 1 (Sensor Input 1)
10	White	IN 2 (Sensor Input 2)

● Audio Cable

Port Pin Number	Connector / Wire Color	Signal
1	RCA (Yellow)	Audio IN
2		Audio GND
3	RCA (White)	Audio OUT

❑ Power Description

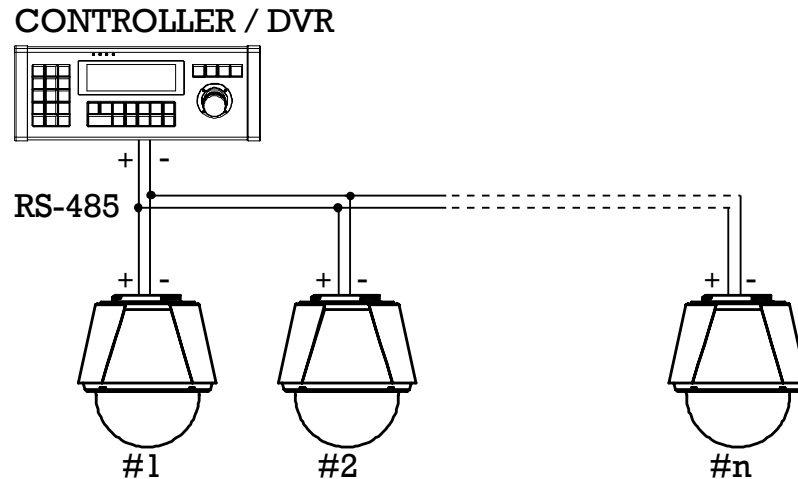
- Carefully check the voltage and current capacity of the rated power.

Input Voltage Range	Current Consumption
DC 11V~18V	2.0A

- For the DC input, be careful with the polarity of DC power. The system should be permanently damaged by wrong DC input.
- In case that the length of the power wire is very long, there may be voltage drop and the system may not work properly. Make the length of the power wire as short as possible.
- When the rated power input is PoE+(High PoE), make connections only with the equipments whose rated power is PoE+(30W). (PoE+ 802.3aT)

❑ RS-485 Communication

- For PTZ control, connect the cable(s) to your keyboard or DVR. To connect multiple cameras to a single controller, RS-485 communication should be connected in parallel as shown below. If you are connecting a single camera to a controller, terminate the camera. When connecting more than one camera to a single controller, terminate the last camera on the communication line. The last camera means the camera farthest in cable length from the controller. Note that the total length of the communication cable between a controller and the camera(s) on the same communication line must be less than 1.2Km.

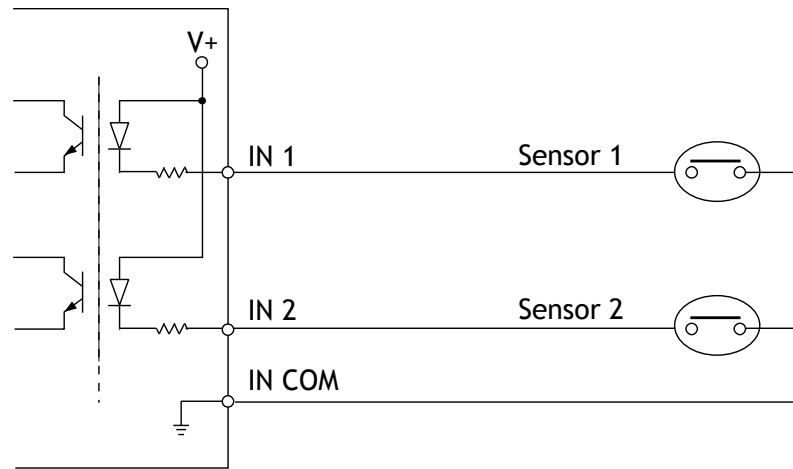


❑ Video (HD-SDI or CBVS)

- Use BNC coaxial cable only.
- Transmission Distance of HD-SDI Video Signal should be variable by cables. There may be no video on a monitor due to cable quality or specification. Use proper BNC Coaxial Cables after considering transmission distance.
- For your reference, see the below table. It shows transmission distances by cables.

Cable Type	Transmission Distance
RG11 14AWG	330 Meter
Belden 1694A 18AWG	230 Meter
RG6 18AWG (5C-HFBT)	210 Meter
RG59 20AWG	150 Meter
RG59 23AWG	110 Meter
3C2V 25AWG	90 Meter

□ Alarm Input

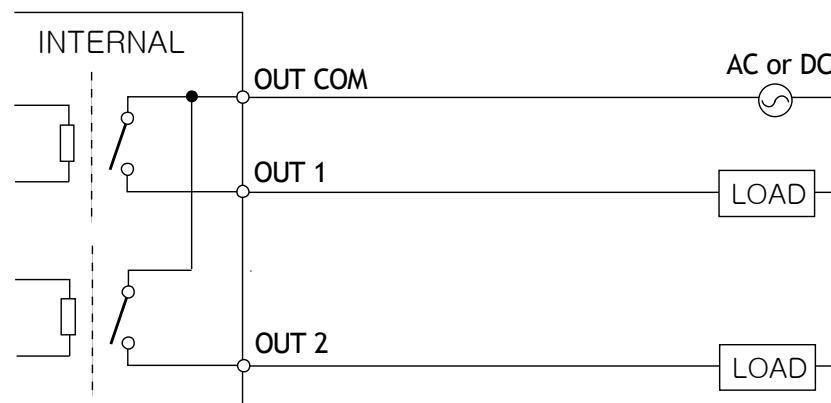


Sensor Input is detected by Short or Open between Sensor IN Terminal and COMMON Terminal.

If you want to use Alarm Input, the types of sensors must be selected. The sensor types are divided into Normal Open and Normal Close. If wrong sensor types are selected, alarms should be activated reversely to sensor inputs.

⊙ Normal Open	A sensor activates when a Sensor IN Terminal and COMMON Terminal are Short
⊙ Normal Close	A sensor activates when a Sensor IN Terminal and COMMON Terminal are Open

□ Relay Output



The maximum loads are as follows.

Power Type	DC Power	AC Power
Maximum Load	MAX. DC 24V, 1A	MAX. AC 125V, 0.5A

Check Points before Operation

- Before turning on the system, check if the wire(s) and cable(s) are connected properly.
- Check if the camera ID on the controller is properly selected. The camera ID must be identical to that of the target camera. The camera ID can be checked by reading the DIP switch of the camera or on Web browser.
- If your controller supports multi-protocols, the protocol must be changed to match to that of the camera.
- Adjust the DIP switch after turning off the camera. If you changed the camera protocol by changing the DIP S/W, the change will be effective after you reboot the camera.
- Since the operation method can be different by controllers, refer to your controller manual if the camera can not be controlled properly. The operation of this manual is based on the standard Pelco® Controller.
- **For more information on IP Function and Web Brower, refer to our IP manual.**

Check Points for Preset and Pattern Function before Operation

- Check fully how to operate preset function and pattern function with your controller or DVR in advance to operate the camera functions when using a controller or a DVR.
- Refer to the following table when using standard Pelco® protocol controllers.

< Go Preset >	Input [Preset Number] and press [Preset] button shortly.
< Set Preset >	Input [Preset Number] and keep pressing [Preset] button for more than 2 seconds.
< Run Pattern >	Input [Pattern Number] and press [Pattern] button shortly.
< Set Pattern >	Input [Pattern Number] and keep pressing [Pattern] button for more than 2 seconds.

- If your controller or DVR has no pattern button or function, use the Hot Keys with preset numbers. For more information, refer to **“Reserved Presets(Hot Keys)”** in this manual.

Reserved Presets (Hot Keys)

- **Description** Some Preset numbers are reserved to change some parameters without entering into OSD menu.

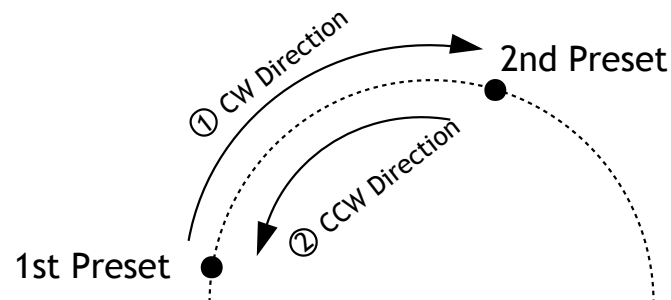
- **Hot Keys**
 - Go Preset [131~134] :Running Pattern Function 1 ~ 4
 - Go Preset [141~148] :Running Swing Function 1 ~ 8
 - Go Preset [151~158] :Running Group Function 1 ~ 8
 - Go Preset [161] :Turning off Relay Output 1
 - Set Preset [161] :Turning on Relay Output 1
 - Go Preset [162] :Turning off Relay Output 2
 - Set Preset [162] :Turning on Relay Output 2
 - Go Preset [167] :Setting Zoom Proportional Function to ON
 - Set Preset [167] :Setting Zoom Proportional Function to OFF
 - Go Preset [170] :Setting Camera BLC/WDR Mode to OFF
 - Go Preset [171] :Setting Camera BLC/WDR Mode to ON
 - Go Preset [174] :Setting Camera Focus Mode to AUTO
 - Go Preset [175] :Setting Camera Focus Mode to Manual
 - Go Preset [177] :Setting Day & Night Mode to AUTO
 - Go Preset [178] :Setting Day & Night Mode to NIGHT
 - Go Preset [179] :Setting Day & Night Mode to DAY

Preset

- Function MAX. 128 presets can be configured.
- Setting Presets Set Preset [1~128]
- Running Presets Go Preset [1~128]
- Deleting Presets To delete Presets, use web browser.

Swing

- Function This function is that the camera moves repetitively between two preset positions at programmed speeds. When a swing function runs, the camera moves from the preset assigned as the 1st point to the preset assigned as the 2nd point in CW(Clockwise) direction. Then the camera moves from the preset assigned as the 2nd point to the preset assigned as the 1st point in CCW(Counterclockwise) direction.



In case that the preset assigned as the 1st point and the preset assigned as the 2nd point are same, the camera turns on its axis by 360° in CW(Clockwise) direction and then it turns back on its axis by 360° in CCW(Counterclockwise) direction. The Swing speed is defined from $1^\circ/\text{sec}$ to $180^\circ/\text{sec}$.

- Setting Swings To set Swing, use web browser.
- Running Swings Method 1) <Run Pattern> [Swing NO. + 10] ex) Run Swing 3 : <Run Pattern> [13]
Method 2) <Go Preset> [Swing NO. + 140] ex) Run Swing 3 : <Go Preset> [143]
- Deleting Swings To delete Swings, use web browser.

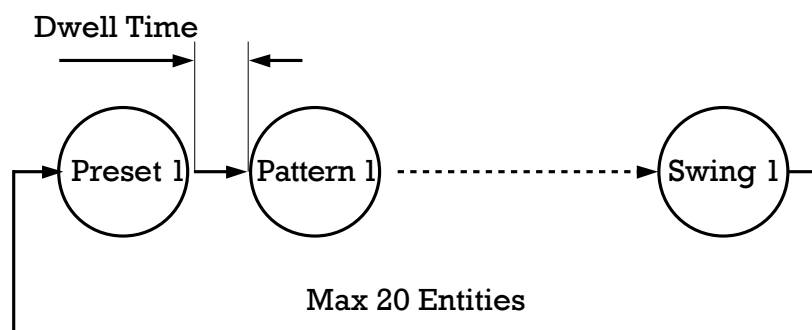
Pattern

- **Function** This function is that the camera memorizes the path (mostly curve path) by the joystick of the controller and revives the trajectory operated by joystick as closely as possible.
MAX. 4 Patterns are programmable and Maximum 768 communication commands can be programmed in a pattern.
- **Setting Patterns** To set Pattern, use web browser.
- **Running Patterns** Method 1) <Run Pattern> [Pattern NO.] ex) Run Pattern 2 : <Run Pattern> [2]
Method 2) <Go Preset> [Pattern NO. + 130] ex) Run Pattern 2 : <Go Preset> [132]
- **Deleting Patterns** To delete Patterns, use web browser.

Note) When the system memorizes Patterns, the commands are stored in the memories, not the positions of Pan/Tilt/Zoom. Hence there might be small differences between the original path and the revived path by path type of Patterns. Note that it is not a problem in position precision.

Group

- **Function** This function is that the camera memorizes the combination of Presets, Pattern and/or Swings sequently and runs Presets, Pattern and/or Swings repetitively. MAX. 8 sets of Group are programmable. Each group can have MAX. 20 actions which are the combination of Preset, Pattern and Swing. Preset speed can be set up and the repeat number of Pattern & Swing can be set up in Group setup. Dwell time between actions can be set up also.



- **Setting Groups** To set Groups, use web browser.
- **Running Groups** Method 1) <Run Pattern> [Group NO. + 20] ex) Run Group 7 : <Run Pattern> [27]
Method 2) <Go Preset> [Group NO. + 150] ex) Run Group 7 : <Go Preset> [157]
- **Deleting Groups** To delete Groups, use web browser.

Specifications

CAMERA PART (20S Model)	
Image Sensor	1/3" Exmor CMOS Sensor
Pixels	2,000K pixels
Zoom	×20 Optical Zoom, ×12 Digital Zoom
Video Signal-to-Noise	50 dB
Focal Length	F1.6~3.9, f=3.5~129.5mm
Angle of View (H)	55.4°(Wide)~2.9°(Tele)
Min. Working Distance	10mm(Wide), 1000(Tele)
Zoom Speed	2.3 sec (Wide to Tele)
Minimum Illuminance	0.5 Lux (Color, 1/30sec, 50 IRE) 0.005 Lux (B/W, 1/4 or 1/3sec, 50 IRE)
Day & Night	Auto / Day / Night(ICR)
Focus	Auto / Manual
AE Mode	Auto / Iris / Shutter / Manual / Brightness
White Balance	Auto / Manual(Red, Blue Gain Adjustable)
BLC	On / Off
WDR	On / Off / Auto
Aperture	Adjustable
NR	Adjustable
Privacy Zone	8 Masks, Spherical Coordinate

CAMERA PART (18H Model)	
Image Sensor	1/3" Slolid State Progressive Scan CCD
Pixels	1,320K pixels
Zoom	×18 Optical Zoom
Forcal Length	F1.6~2.8, f=4.7~84.6mm
Angle of View (H)	55.2°(Wide)~3.2°(Tele)
Min.Working Distance	∞ ~ 1000mm(Tele) ~ 10mm(Wide)
Minimum Illuminance	0.5 Lux (Color) / 0.02 Lux (B/W), F1.5, 50IRE, 1/4s, 28dB
Day & Night	Auto / Manual(ICR)
Focus	Auto / Manual
AE Mode	AE / AER / AE+ / AER+ / Shutter / Exposure / AGC
Iris	Auto / Manual (F1.6 ~ F34)
Gain	Auto / Manual (0 ~ 30dB)
Shutter	Auto / Manual (1/4 ~ 1/10000sec)
White Balance	Auto / Manual(Red, Blue Gain Adjustable)
BLC	Auto / Manual, 256 levels
WDR	On / Off
Privacy Zone	4 Masks, Spherical Coordinate

CAMERA PART (20T Model)	
Image Sensor	1/3" PS CMOS Sensor
Pixels	2,000K pixels
Zoom	×20 Optical Zoom, ×8 Digital Zoom
Video Signal-to-Noise	50 dB
Forcal Length	F1.6~2.9, f=4.45~89mm
Angle of View (H)	H : 55.56°(Wide)~3.10°(Tele) / V : 43.32°(Wide)~2.34°(Tele)
Min. Working Distance	1000mm
Zoom Speed	3.3 sec (Wide to Tele)
Minimum Illuminance	1.5 Lux (Color, F1.6, 50 IRE) / 0.1Lux (B/W, F1.6, 50 IRE)
Day & Night	Auto / Day / Night(ICR)
Focus	Auto / Manual
White Balance	Auto / Manual(Red, Blue Gain Adjustable)
Iris	Auto / Manual
Gain	OFF / Low / Middle / High / Manual
Shutter Speed	Auto / Manual(×60~1/33,000) / A.FLK
BLC	OFF / BLC / HLC
SSNR	Low / Middle / High / OFF
Sens-Up	OFF / Auto (×2~×60)
Brightness	1~100
Sharpness	1~31
Privacy Zone	8 Masks, Spherical Coordinate
Stabilization	ON / OFF

CAMERA PART (19T Model)	
Image Sensor	1/3" PS CMOS Sensor
Pixels	1,300K pixels
Zoom	×19 Optical Zoom, ×16 Digital Zoom
Video Signal-to-Noise	52 dB
Forcal Length	F1.6~2.9, f=4.5~85.5mm
Angle of View (H)	H : 55.24°(Wide)~3.16°(Tele) / V : 44.96°(Wide)~2.542°(Tele)
Min. Working Distance	1000mm
Zoom Speed	3.3 sec (Wide to Tele)
Minimum Illuminance	0.7 Lux (Color, F1.6, 50 IRE) / 0.08 Lux (B/W, F1.6, 50 IRE)
Day & Night	Auto / Day / Night(ICR)
Focus	Auto / Manual
White Balance	Auto / Manual(Red, Blue Gain Adjustable)
Iris	Auto / Manual
Gain	OFF / Low / Middle / High / Manual
Shutter Speed	Auto / Manual(×60~1/30,000) / A.FLK
BLC	OFF / BLC / HLC
SSNR	Low / Middle / High / OFF
Sens-Up	OFF / Auto (×2~×60)
Brightness	1~100
Sharpness	1~31
Privacy Zone	8 Masks, Spherical Coordinate
Stabilization	ON / OFF

CAMERA PART (30L Model)	
Image Sensor	1/2.8" CMOS Sensor
Pixels	3,270K pixels
Zoom	×30 Optical Zoom, ×12 Digital Zoom
Forcal Length	F1.6~5.0, f=4.3~129.0mm
Minimum Illuminance	0.8 Lux (Color, Sens-up Off) / 0.1 Lux (B/W, Sens-up Off)
Day & Night	Auto / Day / Night(ICR)
Focus	Auto / Manual
Iris	Auto / Manual
Shutter Speed	Auto / Manual(×32~1/10,000) / A.FLK
AGC	0 ~ 30
White Balance	Auto / ATW / Manual(Red, Blue Gain Adjustable. 1700°K~11000°K)
BLC	WDR/ BLC / OFF
DNR	Low / Middle / High / Off
Privacy Zone	8 Masks, Spherical Coordinate
Stabilization	ON/OFF

CAMERA PART (28L Model)	
Image Sensor	1/4" CMOS Sensor
Pixels	1.3M pixels
Zoom	×28 Optical Zoom, ×12 Digital Zoom
Forcal Length	F1.5~3.7, f=3.5~98.0mm
Minimum Illuminance	0.8 Lux (Color, Sens-up Off) / 0.01 Lux (B/W, Sens-up Off)
Day & Night	Auto / Day / Night(ICR)
Focus	Auto / Manual
Iris	Auto / Manual
Shutter Speed	Auto / Manual(×32~1/10,000) / A.FLK
AGC	0 ~ 30
White Balance	Auto / ATW / Manual(Red, Blue Gain Adjustable. 1700°K~11000°K)
BLC	WDR/ BLC / OFF
DNR	Low / Middle / High / Off
Privacy Zone	8 Masks, Spherical Coordinate
Stabilization	ON/OFF

MECHANISM PART		
Movement Range	Pan	360°(Endless)
	Tilt	90°
Speed	Preset	360°/sec.
	Jog	0.05 ~ 360°/sec. (Proportional to Zoom)
	Swing	1~ 180°/sec.
Preset		128 Presets or 98 Presets
Pattern		4 Patterns [768 Commands(Approx. 5 Minute) / Pattern]
Swing		8 Swings
Group		8 Groups (MAX. 20 Actions with The Combination of Preset, Pattern and Swing)
Other Pan/Tilt Functions		Auto Flip, Auto Parking, Power Up Action and etc.
Video Output		HD-SDI or CVBS
Communication		RS-485
Protocol		Pelco-D, Pelco-P Selectable
Sensor Input		2 Inputs, Photo-Coupler Type, DC 5V~12V
Alarm Outputs		2 Output, Relay Output, MAX. Load DC24V 1A / AC125V 0.5A
Fan		Always ON
Heater		Operation Start from Internal Temperature 10°C
Operation Temperature		-30°C ~ 50°C
PoE		High PoE (PoE+) 802.3aT, Option
Rated Power		DC 12V / 2.0A

IP PART		
Video	Compression	H.264 HP Level4
	Streaming	Primary : H.264, Secondary : H.264/MJPEG
	Data Rate	Primary : 32Kbps ~ 10Mbps, Secondary : 32Kbps ~ 1Mbps
	Resolution	20S model : Max 1920×1080
		18H model : Max 1280×960 or 1280×720
	Frame Rate	20S model : 30fps
		18H model : 20fps(1280×960), 30fps(1280×720)
Backup	SD Card, FTP	
Audio	Compression	G.711, AAC
	Sample Rate	G.711 : 8kHz, AAC : 32kHz
	In / Out	Mono, Line In / Out (RCA cable)
Network	Interface	Ethernet 10/100 Base-T (RJ-45)
	Protocol	TCP/IP, UDP, Multicast, DHCP, SMTP, HTTP, SNMP, RTP, RTSP, UPnP, WS-Discovery, Zero Configuration, DDNS
Software	API	TSDK, PSIA, OnVIF
	VMS, Web Viewer	Live Monitoring, Recording, Search & Playback, Backup

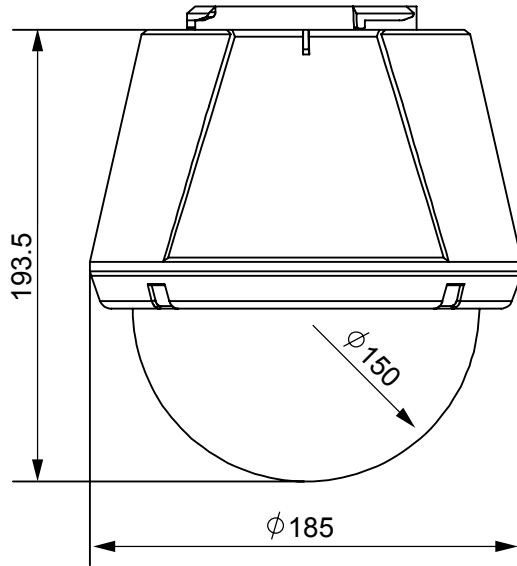
MECHANICAL				
		Ceiling Mount	Wall Mount	In-Ceiling Mount
Material	Dome	Polycarbonate		
	Internal	Polycarbonate, ABS		
	External	Aluminium		Polycarbonate
Dome Size		Ø150mm / Ø 5.9"		
Dimension		Ø192×265.3 mm	296×276.6 mm	Ø253×259 mm
Weight		Approx 3.2 Kg	Approx 3.8 Kg	Approx 2.3 Kg

[Note]

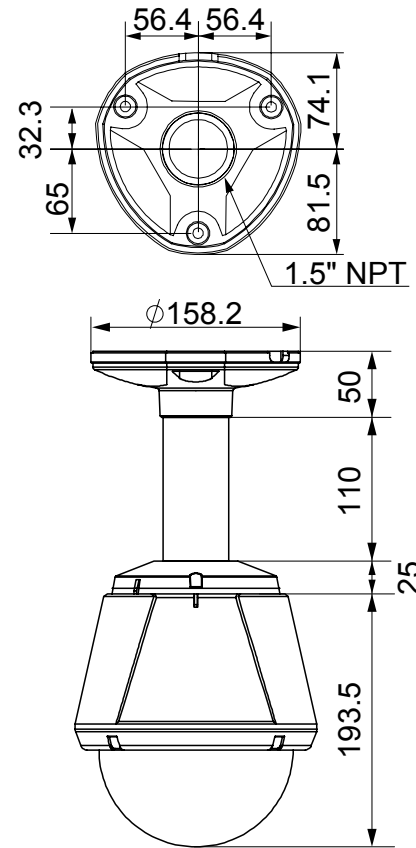
- 1) Specification and features are subject to change without prior notice.**
- 2) Specification and features are different by models.**
- 3) Check the voltage and current capacity of rated power carefully.**

Dimension

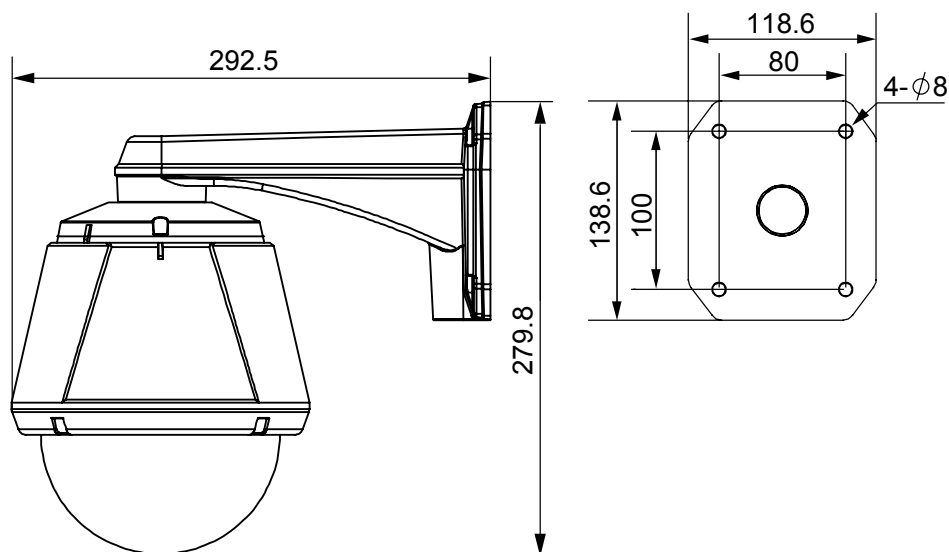
● Main Body



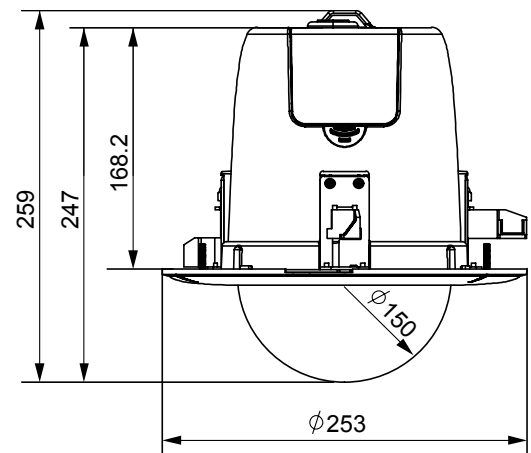
● Ceiling Mount Type



● Wall Mount Type



● In-Ceiling Mount Type



[Unit : mm]