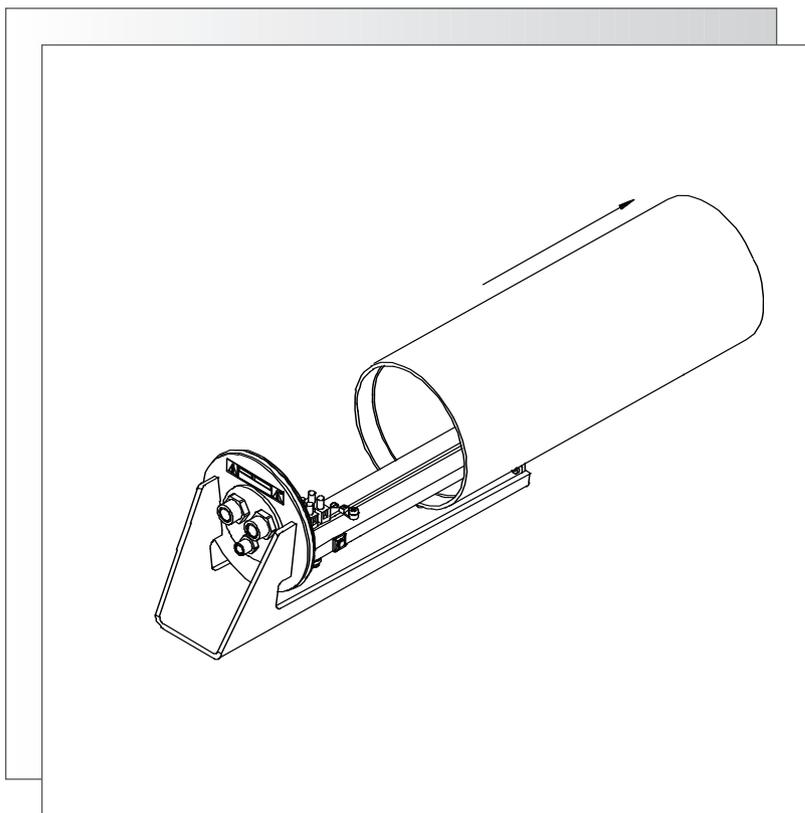


## EXTRA LARGE OUTDOOR HOUSINGS



## HS9386 SERIES

## Important Safeguards

1. **Read, Follow, and Retain Instructions** - All safety and operating instructions should be read and followed before operating the unit. Retain instructions for future reference.
2. **Heed Warnings** - Adhere to all warnings on the unit and in the operating instructions.
3. **Attachments** - Attachments not recommended by the product manufacturer should not be used, as they may cause hazards.
4. **Installation Cautions** - Do not place this unit on an unstable stand, tripod, bracket, or mount. The unit may fall, causing serious injury to a person and serious damage to the unit. Use only manufacturer-recommended accessories, or those sold with the product. Mount the unit per the manufacturer's instructions. Appliance and cart combination should be moved with care. Quick stops, excessive force, or uneven surfaces may cause the appliance and cart combination to overturn.
5. **Cleaning** - Unplug the unit from the outlet before cleaning. Follow any instructions provided with the unit. Generally, using a damp cloth for cleaning is sufficient. Do not use liquid cleaners or aerosol cleaners.
6. **Servicing** - Do not attempt to service this unit yourself. Opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
7. **Damage Requiring Service** - Unplug the unit from the main AC power source and refer servicing to qualified service personnel under the following conditions:
  - When the power supply cord or plug is damaged.
  - If liquid has been spilled or an object has fallen into the unit.
  - If the unit has been exposed to water and/or inclement weather (rain, snow, etc.).
  - If the unit does not operate normally, when following the operating instructions. Adjust only those controls specified in the operating instructions. Improper adjustment of other controls may result in damage, and require extensive work by a qualified technician to restore the unit to normal operation.
  - If the unit has been dropped or the cabinet damaged.
  - If the unit exhibits a distinct change in performance, this indicates that service is needed.
8. **Replacement Parts** - When replacement parts are required, the service technician should use replacement parts specified by the manufacturer or that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electrical shock or other hazards.
9. **Safety Check** - Upon completion of servicing or repairs to the unit, ask the service technician to perform safety checks to ensure proper operating condition.
10. **Power Sources** - Operate the unit only from the type of power source indicated on the label. If unsure of the type of power supply to use, contact your dealer or local power company.
  - For units intended to operate from battery power, refer to the operating instructions.
  - For units intended to operate **with External Power Supplies**, use only the recommended approved power supplies.
  - For units intended to operate with a limited power source, this power source must comply with EN60950. Substitutions may damage the unit or cause fire or shock.
  - For units intended to operate at 24VAC, normal input voltage is **24VAC**. Voltage applied to the unit's power input should not exceed 30VAC. User-supplied wiring, from the 24VAC supply to unit, must be in compliance with electrical codes (Class 2 power levels). Do not ground the 24VAC supply at the terminals or at the unit's power supply terminals.
11. **Coax Grounding** - If an outside cable system is connected to the unit, ensure that the cable system is grounded. U.S.A. models only - Section 810 of the National Electrical Code, ANSI/NFPA No.70, provides information regarding proper grounding of the mount and supporting structure, grounding of the coax to a discharge unit, size of grounding conductors, location of discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.
12. **Grounding or Polarization** - This unit may be equipped with a polarized alternating current line plug (a plug with one blade wider than the other). This safety feature allows the plug to fit into the power outlet in only one way. If unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit, contact an electrician to arrange replacement of the obsolete outlet. Do not defeat the safety purpose of the polarized plug. Alternately, this unit may be equipped with a 3-wire grounding plug (a plug with a third pin, for grounding). This safety feature allows the plug to fit into a grounding power outlet only. If unable to insert the plug into the outlet, contact an electrician to arrange replacement of the obsolete outlet. Do not defeat the safety purpose of the grounding plug.
13. **Lightning** - For added protection during a lightning storm, or when this unit is left unattended and unused for long periods of time, unplug the unit from the wall outlet and disconnect the cable system. This will prevent damage to the unit due to lightning and power line surges

## SAFETY PRECAUTIONS

	<b>CAUTION</b> RISK OF ELECTRIC SHOCK. DO NOT OPEN!	
<p><b>CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</b></p>		

	<p>This symbol indicates the presence of uninsulated “dangerous voltage” within the product’s enclosure. This may constitute a risk of electric shock.</p>
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	<p>The user should consult the operating and maintenance (servicing) instructions in the literature accompanying the appliance.</p>
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	<p><b>Attention:</b> Installation should be performed by qualified service personnel only in accordance with the National Electrical Code or applicable local codes.</p>
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	<p><b>Power Disconnect.</b> Units with or without ON-OFF switches have power supplied to the unit whenever the power cord is inserted into the power source; however, the unit is operational only when the ON-OFF switch is in the ON position. The power cord is the main power disconnect for all units.</p>
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## 1 UNPACKING

This electronic equipment should be unpacked and handled carefully.

Check for the following items:

Quantity	Part Description
1	1/4-20 x 3/8in. BHCS (Button Head Cap Screw)
1	1/4-20 x 1/2in. BHCS
1	1/4-20 x 5/8in. BHCS
1	1/4-20 x 3/4in. BHCS
1	1/4-20 x 7/8in. BHCS
4	3.2mm (0.125in.) plastic spacer
4	0.4mm (0.016in.) plastic spacer
2	Nylon bushings

1	3/8in. NPT plug
1	Small flex fitting
2	Pull Seals
2	Large flex fitting
3	Cable ties

If an item appears to have been damaged in shipment, replace it properly in its carton and notify the shipper. If any items are missing, notify Aigis Mechtronics. The shipping carton is the safest container in which the unit may be transported. Save it for possible future use.

## 2 SERVICE

If the unit ever needs repair service, the customer should contact Aigis Mechtronics for return authorization and shipping instructions.

## 3 CARE AND MAINTENANCE

There are no moving parts in this unit. Regularly scheduled maintenance will help prolong the operational life of this unit. Clean the viewing window as needed with a mild, nonabrasive detergent in water and a soft cloth.

## 4 DESCRIPTION

The HS9386 Series of environmental housings are attractive aluminum enclosures designed for outdoor CCD camera installations.

### 4.1 Enclosure Rating

#### 4.1.1 NEMA-3R and IP54

The HS9386 Series housings include a *breather* hole in the front face plate. The *breather* hole prevents the accumulation of moisture inside the housing when installed in areas of high humidity. With the *breather* hole open, the HS9386 Series housings meet the enclosure rating requirements of NEMA-3R and IP54.

#### 4.1.2 NEMA-4 and IP65

For installations requiring an enclosure rating of NEMA-4 or IP65, the *breather* hole must be plugged using the *pull seal* (Part No. 315 2569 001) provided in the hardware kit. Refer to *Final Assembly* under INSTALLATION for proper installation.

## 5 INSTALLATION



This installation should be made by a qualified service person and conform to all local codes.

### 5.1 Model Designation

Model No.	Rated Input	Range	Power Consumption <sup>1</sup>
HS9386-6	115VAC, 50/60Hz	108 to 132	50W
HS9386-2	24VAC, 50/60Hz	21.6 to 26.4	50W
HS9386-5	230VAC, 50/60Hz	207 to 253	50W

<sup>1</sup>Heater requires 40 watts.

Do Not Exceed 30VAC Input on 24VAC models. Operation above 30VAC violates low voltage operation (Class 2 Specifications). Normal operation is 24VAC.

Maximum Camera/Lens Size: Accepts cameras up to 102W x 71H mm (4.0 x 2.8in.), lenses up to 102W x 92H mm (4.0 x 3.6in.), and camera/lens combinations up to 200L mm (7.8 in.).

### 5.2 Tools Required

- Flat blade screwdriver
- Phillips head screwdriver
- M3 (3mm) hex wrench
- M4 (4mm or 5/32in.) hex wrench
- M8 (8mm or 5/16in.) hex wrench
- Adjustable wrench
- Wire cutter/stripper/crimper tool

### 5.3 Hardware Required

- M6 screws (X3) or 1/4in. screws (X3)
- M6 nuts (X3) or 1/4in. nuts (X3)
- M6 lock washers (X3) or 1/4in. lock washers (X3)

## 5.4 Cable Requirements

Video Transmission (Coaxial)	
Cable Type	RG-59/U (Runs < 1000ft) RG-11/U (Runs < 2000ft)
Cable Size	Outside diameter between 4.6mm and 7.9mm (0.181in. and 0.312in.)
Cable Shape	Round
Shield	≥ 93% Braided Copper Shield
Center Conductor	Stranded Copper Center
DC Resistance	≥ 15Ω/1000ft (RG-59/U) ≥ 6Ω/1000ft (RG-11/U)
Cable Impedance	75Ω
Agency Rating	UL
Environmental	Outdoor rated
Temperature Rating	≥ 80 °C (176 °F)
Sources	Belden 9259 Belden 9238

Input Power Cord - North American	
Cable Type	SJTOW-A Rated
Cable Size	Outside diameter between 4.3mm and 11.9mm (0.170in. and 0.470in.)
Cable Shape	Round
Conductors	3 conductor version and 2 conductor version
Agency Rating	UL/C.S.A., UL VW-1
Environmental	Outdoor rated
Temperature Rating	105 °C
Voltage Rating	300 V
Sources	Belden 19506 Belden 19509 Northwire 573939

Input Power Cord - European	
Cable Type	H05RN-F3G0.75 and H05RN-F3G1.00
Cable Size	Outside diameter between 4.3mm and 11.9mm (0.170in. and 0.470in.)
Cable Shape	Round
Conductors	3 conductor version and 2 conductor version
Agency Rating	VDE
Environmental	Outdoor rated
Sources	Olflex 1600252 Olflex 1600253

Lens Control Cable	
Cable Type	Jacketed Multiconductor Cable
Cable Size	Outside diameter between 4.3mm and 11.9mm (0.170in. and 0.470in.)
Cable Shape	Round
Shield	Overall shielding
Conductors	Stranded 20 to 16 AWG wire
No. of Conductors	4 and 8
Conductor Insulation	Color coded
Sources	Belden 9552 Belden 9554

## 5.5 Disassembly and Mounting

1. Detach the hardware kit from the housing.
2. Use a screwdriver or socket to loosen the two M4 captive screws from the housing cover. See FIGURE 1.

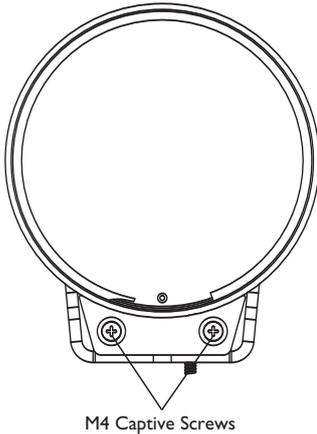


FIGURE 1 Loosening the Captive Cover Screws

3. Remove the cover from the base assembly by grasping the cover and gently pulling forward. See FIGURE 2 Removing the Cover. Rest the cover onto the retaining slot to access the cradle area. See FIGURE 3

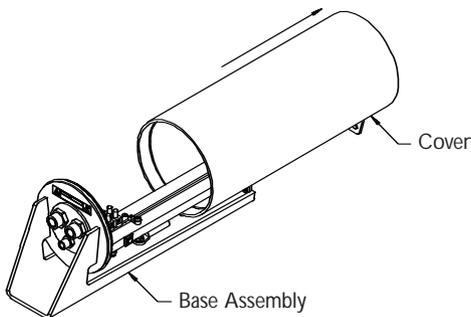


FIGURE 2 Removing the Cover

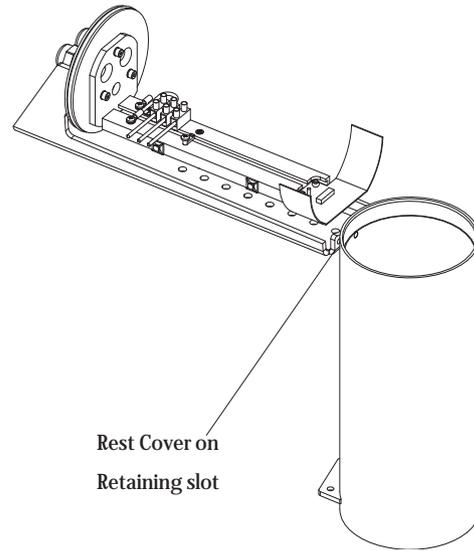


FIGURE 3 Accessing the Cradle/Rail Assembly

4. Attach the housing to an appropriate mount or pan/tilt. Use the instructions provided with the mount or pan/tilt. The base assembly has eight clearance holes for mounting. Use a minimum of three M6 screws and nuts or three 1/4in. screws and nuts (not provided). Lock washers are required (not provided). Rotating the rail assembly will allow access to the mounting holes. This can be accomplished by loosening the three M4 screws. See 5.11 Camera/Lens Orientation. It will be easier to mount the base before installing the camera, but it may be mounted anytime during the installation process. See FIGURE 4.

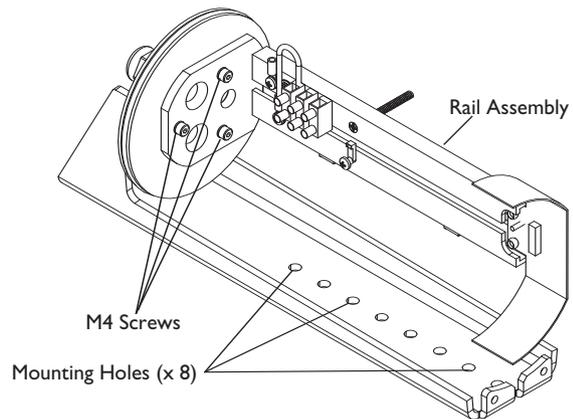


FIGURE 4 Mounting the Base Assembly

## 5.6 Camera/Lens Installation

Place the camera/lens combination onto the rail assembly.

**Fixed Lens Cameras:** Position the camera/lens so that the lens is positioned over the heater but not past it. Secure the camera to the rail assembly with the 1/4-20 x 3/8in. BHC screw, a nylon bushing, and a 0.4mm (0.016in.) plastic spacer. Place the nylon bushing over the screw and slide both between the rails through the front cut-out section. Slide the spacer over the screw so it is positioned in-between the rails and the camera. See FIGURE 5.

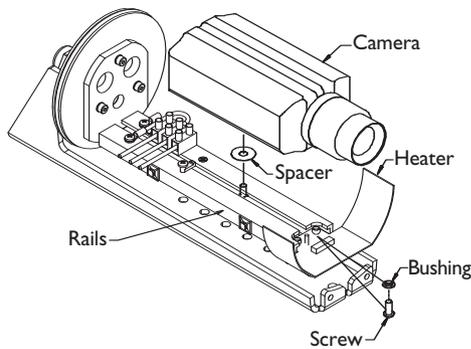


FIGURE 5 Mounting a Fixed Lens Camera

**Zoom Lens Cameras:** Position the camera/lens so that the lens is positioned over the heater but not past it. The camera/lens combination will determine the screws and spacers that will be needed. Secure the camera and lens to the rail assembly with 1/4-20 BHC screws, nylon bushings, and plastic spacers. Place the nylon bushings over the screws and slide both between the rails through the front cut-out section. Slide the spacer over the screw so it is positioned in-between the rails and the camera. There are four large spacers (3.2mm) and four small spacers (0.4mm) provided. See FIGURE 6.

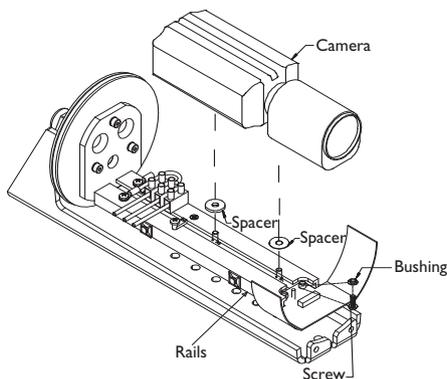


FIGURE 6 Mounting a Zoom Lens Camera

## 5.7 Camera/Lens Wiring

**WARNING:** Only use the cables specified under *INSTALLATION, Cable Requirements* for wiring of all cameras and lenses.

### 5.7.1 Liquid-Tight Fittings

The dual-male threaded portion of the two 1/2in. NPT and one 3/8in. NPT liquid-tight fittings are preinstalled in the rear of the base assembly. If possible, do not remove or loosen these parts. They have been installed to a specified torque to prevent water damage. The small 3/8in. NPT fitting will accept cables with diameters from 4.6mm (0.181in.) to 7.9mm (0.31in.). The two large 1/2in. NPT fittings will accept cables with diameters from 4.3mm (0.170in.) to 11.9mm (0.470in.). See FIGURE 7.



Be sure to securely tighten all fittings to ensure a liquid-tight seal. Not doing so could damage the camera, the housing, or both.



If a sealant will be used, be sure it is a neutral cure type. Sealants that release acetic acid may harm camera electronics.

If it is necessary to use PG type conduit, a HS9385NPT kit is available. The HS9385NPT kit contains a wire grip with two PG11 and one PG7 tapped holes. The NPT wire grip is removed and replaced with the PG version.

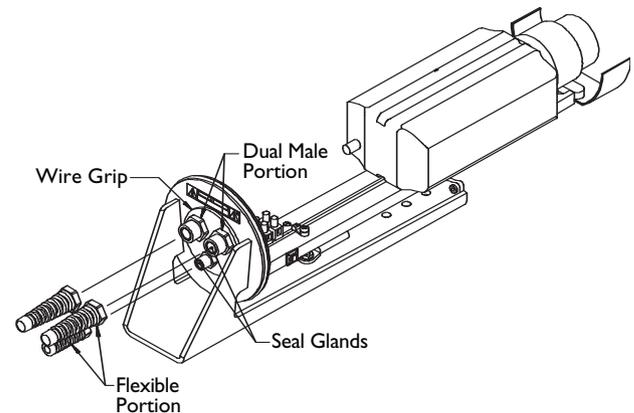


FIGURE 7 Liquid-tight Fitting Assembly

## 5.8 Plug Insertion

If no lens control or feed-through wiring will be used, install the 3/8in. NPT plug provided. Remove the liquid-tight fitting and insert the plug in the small bottom center 3/8in. NPT hole. Use a 8mm or a 5/16in. hex wrench to tighten securely. Failure to do so will result in water damage to all electronic parts. See FIGURE 8.

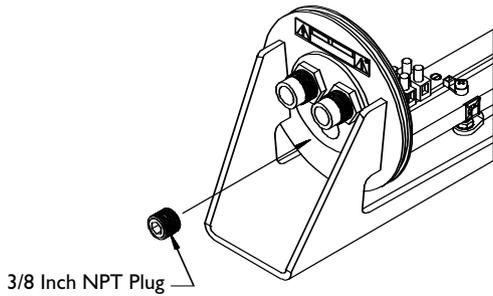


FIGURE 8 3/8in. NPT Plug Insertion

### 5.8.1 Supply Power Connections

The HS9386 Series housings offer the user one of three voltage configurations. The suffix to the housing model number will determine the supply voltage required.

Any camera installed in the HS9386 Series housings must be of the same voltage type as the housing. The integral heater/defogger also requires the same voltage as the housing. These housings do not contain step down or isolation transformers. See the **Model Designation** chart for suffixes and supply voltages required. Power connection into the housings is to be supplied through a minimum type UL Standard *SJ* cord acceptable for outdoor use. Installation must conform to applicable NEC and local codes. Use the **Recommended Maximum Cable Lengths** chart below for proper wire size selection.

#### Recommended Maximum Cable Lengths

Models	Wire Size		Distance	
	mm <sup>2</sup>	AWG	meters	feet
-6 (115 VAC)	1.5	16	1000	3280
	2.5	14	1600	5250
	4	12	2500	8200
-2 (24 VAC)	0.5	22	10	30
	0.5	20	15	50
	1	18	25	80
	1.5	16	40	120
	2.5	14	70	210
-5 (230 VAC)	1.5	16	4000	13000
	2.5	14	6400	21000
	4	12	10000	32800

1. Use the liquid-tight fitting on the left of the housing to route the power supply cord into the housing.
2. Allow enough cord for connection to the terminal block; approximately, 130mm (5in.). Strip no less than 6mm (0.24in.) and no more than 8mm (0.31in.) of insulation away from the wires making sure not to nick the wires.

3. A screw/terminal lug is provided for securing a safety ground. To attach the safety grounding wire of the power cord (green 115volt, green/yellow 230volt), first unscrew the terminal lug and strip and crimp the grounding wire into the lug. Next, reattach the terminal lug to the rail assembly using the M4 x 10 screw and lock washer provided. See FIGURE 9.

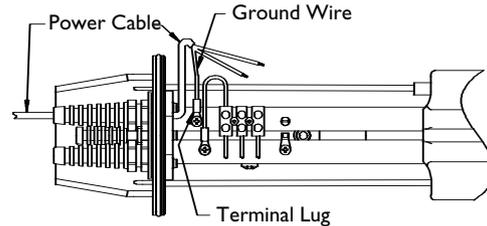


FIGURE 9 Securing the Ground Wire

4. Connect both the line and neutral wires of the power cord to the terminal block. Make sure the line and neutral wires are connected to the correct positions on the terminal block that are across from the appropriate colored wire. See FIGURE 10.

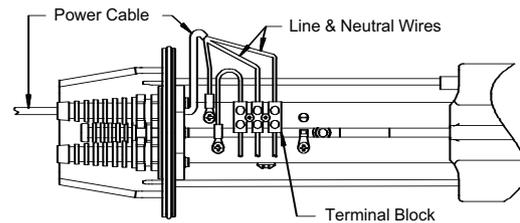


FIGURE 10 Attaching Line and Neutral Wires

5. Pull any excess cord through the liquid-tight fitting and tighten the flex fitting to 8.5N-m to 9.0N-m (75in. lb to 80in. lb). This torque rating is approximately 1 to 1 1/2 turns past the point that the fitting starts to grip the cord. Failure to do so will result in water damage to all electronic parts. Use a tie wrap (included) to provide strain relief on the power cord at the exit point (inside the unit).



Securely tighten all fittings to ensure a liquid-tight seal. Not doing so could damage the camera, the housing, or both.

## 5.8.2 Camera Power Connections

### HS9386-6 Housings

These housings are to be connected to 115VAC, and are designed for use where site power is 115volts. The HS9386-6 housings should only be used with 115volt cameras. The integral heater/defogger requires 115volts. The housing is shipped with the heater/defogger connected to the terminal block.

**Installing a 115 volt camera** into the HS9386-6 housing simply requires the camera's line cord to be plugged into the NEMA 5-15R receptacle provided. See FIGURE 11.

### HS9386-2 Housings

These housings are to be connected to 24VAC, and are designed for use where site power is 24volts. The HS9386-2 housings should only be used with 24volt cameras. The integral heater/defogger requires 24volts. The housing is shipped with the heater/ defogger connected to the terminal block.

**Installing a 24 volt camera** into the HS9386-2 housing simply requires the two flying leads be attached to the camera's terminal block. See FIGURE 11.

### HS9386-5 Housings

These housings are to be connected to 230VAC, and are designed for use where site power is 230volts. The HS9386-5 housings should only be used with 230volt cameras. The integral heater/defogger requires 230volts. The housing is shipped with the heater/defogger connected to the terminal block.

**Installing a 230 volt camera** into the HS9386-5 housing simply requires the camera's line cord to be plugged into the *Schuko* inline receptacle provided. See FIGURE 11.

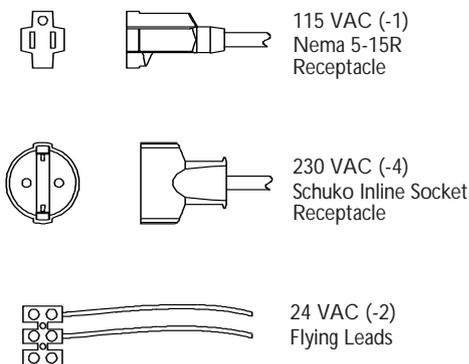


FIGURE 11 Camera Connections

## 5.9 Video Coax Connection

**WARNING:** Only use the cables specified under *INSTALLATION, Cable Requirements* for wiring of the video coax connection.

If lens control or feed-through wires will be used:

1. Install the long flexible portion of the small liquid-tight fitting on the video coax cable and pull the cable through the small fitting on the rear end of the base assembly. The fitting will accept cables with diameters from 4.6mm (0.181in.) to 7.9mm (0.312in.). See FIGURE 12.
2. Attach a BNC connector to the coax and connect it to the camera. Pull any excess cable through the liquid-tight fitting and tighten the flex fitting to 4.0N-m to 4.5N-m (35in. lb to 40in. lb). This torque rating is approximately 1 to 1 1/2 turns past the point that the fitting starts to grip the cable. Failure to do so will result in water damage to all electronic parts. Use a tie wrap (included) to provide strain relief on the video cable at the exit point (inside the unit).



Be sure to securely tighten all fittings to ensure a liquid-tight seal. Not doing so could damage the camera, the housing, or both.

If no lens control or feed-through wires will be used:

1. Install the long flexible portion of a large liquid-tight fitting on the video coax cable and pull the cable through the large right fitting on the rear end of the base assembly. Refer to FIGURES 12 and 13.
2. Attach a BNC connector to the coax and connect it to the camera. Pull any excess cable through the liquid tight fitting and tighten the flex fitting to 8.5N-m to 9.0N-m (75in. lb to 80in. lb). This torque rating is approximately 1 to 1 1/2 turns past the point that the fitting starts to grip the wire. Failure to do so will result in water damage to all electronic parts. Use a tie wrap (included) to provide strain relief on the video cable at the exit point (inside the unit).



Be sure to securely tighten all fittings to ensure a liquid-tight seal. Not doing so could damage the camera, the housing, or both.

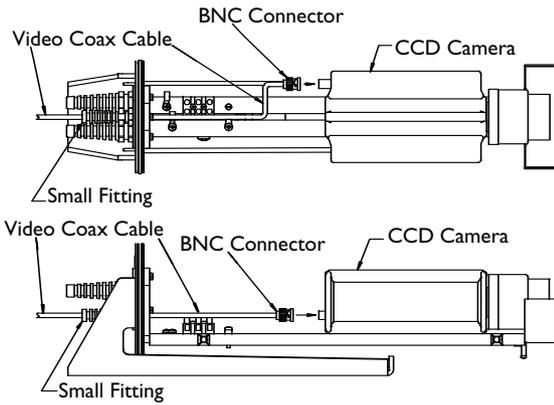


FIGURE 12 Video Coax Connection

## 5.10 Lens Wiring



**WARNING:** Only use the cables specified under *INSTALLATION, Cable Requirements* for wiring of the lens.

**If installing a zoom lens,** insert the lens control cable with installed flexible fitting in through the fitting on the right rear of the base assembly. Attach the lens wiring to the lens mating connector and connect it to the lens. If mating connector is not available, connect directly to the lens cable. Pull any excess cable through the liquid-tight fitting and tighten the flex fitting to 8.5N-m to 9.0N-m (75in. lb to 80in. lb). This torque rating is approximately 1 to 1 1/2 turns past finger-tight, depending on the size of the wire. Failure to do so will result in water damage to all electronic parts. Use a tie wrap (included) to provide strain relief on the lens control cable at the exit point (inside the unit). See FIGURE 13.

**NOTE:** See specification on the lens cord for correct plug connection.



Be sure to securely tighten all fittings to ensure a liquid-tight seal. Not doing so could damage the camera, the housing, or both.

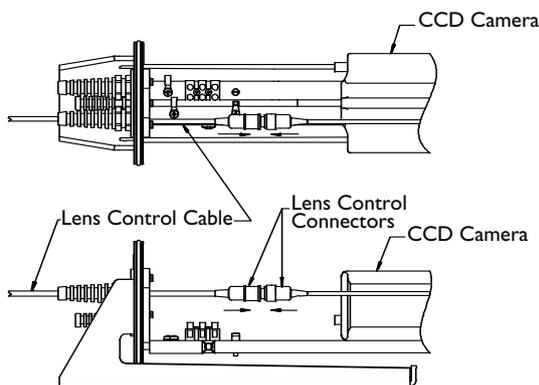


FIGURE 13 Lens Control Cable Wiring

**If using a pan/tilt with a feed-through cable,** insert the camera/lens function cable in through the right fitting at the rear of the cradle. Wire the functions as described above, or as needed.

## 5.11 Camera/Lens Orientation

A unique feature of the HS9386 Series housing is the ability to rotate the mounting base 360° around the rail assembly.

Simply loosen the three M4 screws with a M3 hex wrench. Rotate the base assembly around the rail assembly to any position and tighten the M4 screws. It is preferable to keep the rail assembly under the camera, not over it. See FIGURE 14.

**NOTE:** Make sure the breather hole is located at the bottom of the housing. If it is not, remove both front retaining rings and the face plate. Orient them so the breather hole is located at the bottom and the gaps in the retaining rings are centered over the breather hole. See FIGURE 21.

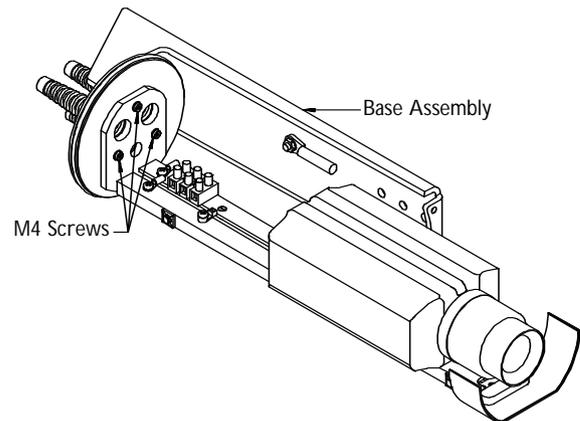


FIGURE 14 Base Assembly Rotation

## 5.12 Camera/Lens Adjustment

Before final assembly of the cover over the rest of housing, verify camera and lens operation. Adjust camera/lens as necessary. See individual camera instructions.

## 5.13 Final Assembly

### 5.13.1 Pull Seal Installation



If the *breather* hole is open, do NOT mount the housing in a position where the front face plate is pointed upward.

To maintain enclosure protection ratings of NEMA-4 and IP65, the pull seal (provided in the hardware kit) must be installed in the front face plate. It is recommended that the pull seal be installed in a cool, dry environment to prevent trapping moisture inside the housing. See FIGURE 154.

NOTE: Pull seal installation allows the housing's front end to be pointed upward.

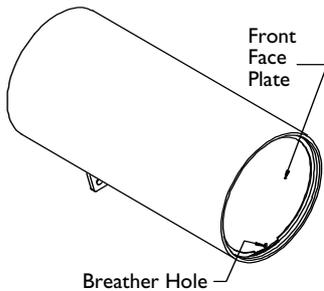


FIGURE 15 Breather Hole

Proper installation of the pull seal is as follows:

1. If the housing assembly is not already removed from the base assembly, do so now; see the *Disassembly and Mounting* section at the beginning of these instructions.
2. Obtain a rubber pull seal from the hardware kit (Part Number 315 2569 001). An extra pull seal is also provided. See FIGURE 16.

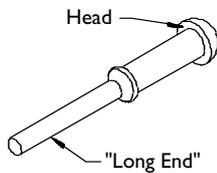


FIGURE 16 Pull Seal

3. Insert the *long end* of the pull seal into the breather hole starting from the front side of the face plate. See FIGURE 17.

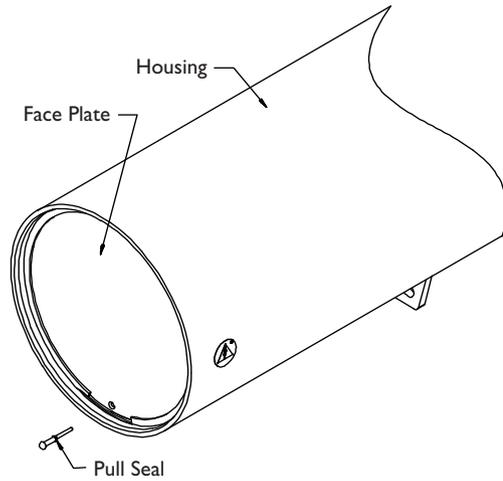


FIGURE 17 Inserting the Pull Seal

4. Reach into the housing and grip the pull seal's *long end* from the back of the front face plate. Steadily pull the *long end* until the head of the pull seal is flat against the front of the end cap. See FIGURE 18.

NOTE: The Pull Seal's *long end* will stretch when pulled through the breather hole.

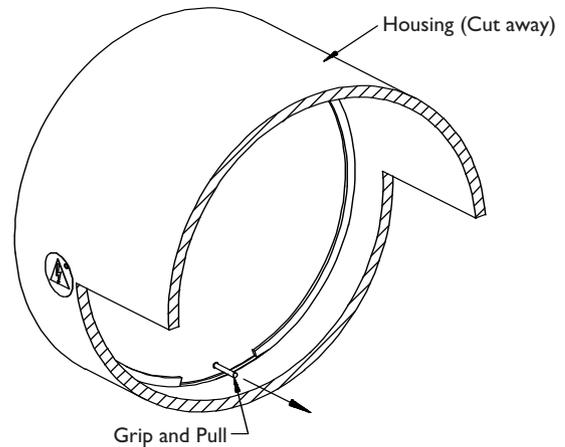


FIGURE 18 Installing the Pull Seal

### 5.13.2 Housing Assembly

1. The lens support screw is provided to support the rail assembly. Adjustment will only be necessary if the rail assembly is rotated at angle other than horizontal. If the screw head is not touching the cover when the cover is installed, loosen the screw until it does. See FIGURE 19.

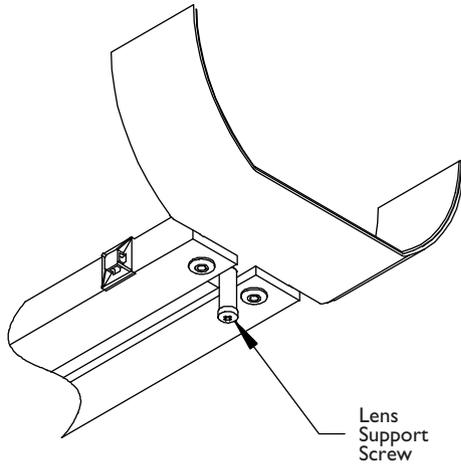


FIGURE 19 Support Screw Adjustment

2. Replace the cover onto the base assembly by grasping the cover and gently pushing it over the end cap and o-ring. Make sure the o-ring is not pinched. See FIGURE 20

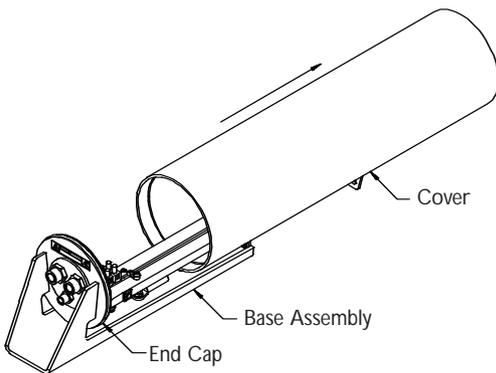


FIGURE 20 Replacing the Cover

3. Align the cover holes with the base assembly holes and tighten the captive M4 screws. This secures the cover onto the rest of the housing.

NOTE: Make sure the breather hole is located at the bottom of the housing. If it is not, remove both front retaining rings and the face plate. Orient them so the breather hole is located at the bottom and the gaps in the retaining rings are centered over the breather hole. See FIGURE 21.

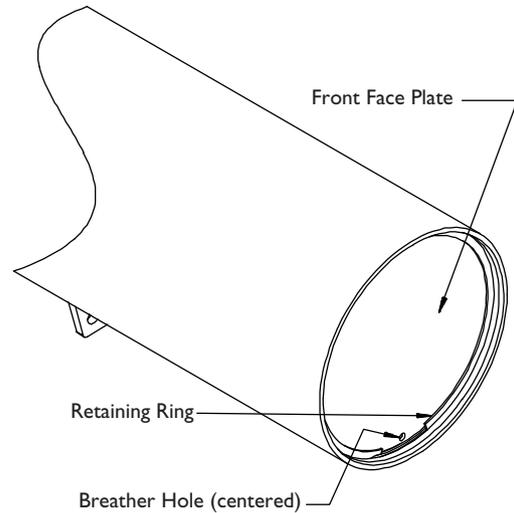


FIGURE 21 Location of the Breather Hole



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