Helios™ Products

COHU HD | COSTAR

INSTALLATION MANUAL

Series
3960HD
3960SD
5970SD

Camera Positioner System

Technical Manual 6X-1089F

July 15, 2014

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Table of Contents

About this document

This manual contains information on the installation and maintenance of the following CohuHD Helios™ products:

- 3960^{HD} - High Definition Camera Positioning System
- 3960^{SD} - Standard Definition Camera Positioning System
- 5970^{SD} - Standard Definition Thermal Long Wave Infrared (LWIR) Camera Positioning System

The information in this manual is subject to change without notice. Please refer to the above website for the latest information.

NOTE: *All graphics contained within this document, including screenshots and other displays, are for reference use only and are subject to change.*

Additional information and documents related to the camera system

For information on the camera system operation and configuration, please see Operation manual 6x-1090. The manual is available from the CohuHD website at:

http://www.CohuHD.com/Files/operation_manual/HeliosOperationManual.pdf

Copyright/Intellectual Property Rights Statement

Copyright 2014 by CohuHD Costar, LLC. CohuHD Costar, LLC has intellectual property rights to technology embodied in the product described in this manual.

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FCC compliance

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

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications to this device void the warranty.

Support services

Please contact the Customer Service Department for technical assistance.

Returns

This item was thoroughly tested and carefully packed at the factory prior to shipping. Upon acceptance by the carrier, the carrier assumes responsibility for the item's safe arrival. If you receive the item in a damaged condition, apparent or concealed, a claim for damage must be made to the carrier.

If a visual inspection shows damage upon receipt of this shipment, it must be noted on the freight bill or express receipt and the notation signed by the carrier's agent. Failure to do this can result in the carrier refusing to honor the claim.

When the damage is not apparent until the unit is unpacked, a claim for concealed damage must be made. Make a mail or phone request to the carrier for inspection immediately upon discovery of the concealed damage. Keep all cartons and packing materials.

To return the product to the factory for service, please contact the Customer Service Department for a Return Material Authorization (RMA) Number.

Prominently display the RMA number on the outside of the shipping container(s) and on paperwork contained inside. Give a brief description of why the equipment is being returned and list the symptoms of any problems being experienced with the equipment.

Shipment

IMPORTANT

If the camera needs to be shipped, please use the original packaging material which was designed to protect the product during transportation. If the original packaging is lost or damaged, please order a replacement from Customer Service.

Safety instructions

WARNING:
Power supplies used with these Cameras operate from 115 Vac or 24 Vac. These voltages are dangerous. Use extreme care working with equipment connected to either 115 Vac or 24 Vac.

WARNING:
Do not remove covers. There are no user-serviceable parts inside.

CAUTION:
(Applies to 3960^{HD}/3960^{SD})
In order to avoid deterioration of the color filter of the CCD and potential discoloration of the image avoid pointing the Camera directly toward the sun or other bright source.

CAUTION:
(Applies to 5970^{SD})
Although 5970^{SD} has a vanadium oxide (VOx) microbolometer detector which is less susceptible to image burn, it is not recommended to point the Camera directly toward the sun.

CAUTION:
(Applies to 5970^{SD})
Do not use any water or abrasive to clean lens.

CAUTION:
Mount the camera system before the power is applied. After the power is applied the camera system will start a configuration sequence and pan and tilt movement will occur.

- Installation should be done only by qualified installers and conform to all local codes.
- It is the users' responsibility to ensure that the mounting methods are safe and adequate for the location.
- Use only stainless steel hardware to fasten the mount to an outdoor surface.
- All servicing should be performed by qualified service personnel. Procedures in this manual do not require entry into the housing of the camera positioning system. The unit contains potential high voltage. It also contains sensitive devices that can be damaged by static discharge. To reduce the risk of electric shock and damage to the unit by static discharge do not perform any servicing other that described in these instructions. If the unit is defective, please contact the Customer Service Department for technical assistance.
- Liability: It is the sole responsibility of the installer to provide proper installation in compliance with all local codes and regulations

1.0 Introduction

The CohuHD Helios™ products are the part of next generation of IP network camera systems ranging from high-definition (HD) to standard-definition (SD) camera positioning systems. The camera systems are IP (Internet Protocol) based with a full function built-in web server. Operator functions and administrative features are controlled from the standard Internet browser window.

A drive system positioned within the 3960^{HD}/3960^{SD}/5970^{SD} permits full 360° continuous pan and ±90° tilt movements. The camera systems comply with NEMA TS 2 standards for temperature, shock, and vibration specifications. For environmental protection the camera systems use an IP67 camera head enclosure and IP66 positioner enclosure.

- 3960^{HD}/3960^{SD} series camera system are digital day/night zoom lens cameras system with mechanical IR cut filter that increases camera sensitivity in low light situations.
- 5970^{SD} camera system is an infrared thermal imaging camera system developed with an uncooled, vanadium oxide(VOx) microbolometer, long wave infrared (LWIR), focal plane array (FPA) detector.
- H.264 video standard, which provides sharper image quality at lower bit rates than previous standards, is used for video compression along with Motion JPEG (M-JPEG) standard.
- 3960^{HD} image resolution is 1280(H) x 720(V)
- 3960^{SD} image resolution is 768(H) x 494 (V)
- 5970^{SD} image resolution is 640(H) x 480(V) or 320(H) x 240(V)

  The 5970^{SD} is available with different lens configurations and 2X or 4X digital zoom. See datasheet.

Ability to send data out in two independent H.264 streams or one H.264 stream and one M-JPEG stream gives flexibility of using benefits of both compression types on the end-user side.

Analog outputs are available for the end-users allowing integration of the 3960^{HD}/3960^{SD}/5970^{SD} with existing analog based camera systems. The analog output is a standard composite video (4:3) with RS-422 control channel.

For more information on specifications and datasheets, please refer to specific product pages at CohuHD's website.

1.1 Equipment Supplied

Connector or Connector Kit

If a cable is not ordered, each of the 3960^{HD}/3960^{SD}/5970^{SD} Cameras is supplied with a connector to mate with the pigtail cable connector.

3960^{HD}/3960^{SD} Series

Depending on the Camera model the 3960^{HD}/3960^{SD} series may be supplied with:

- an 18-pin MS type metal connector (CohuHD p/n1310230-011) or
- a 16 pin AMP type plastic connector kit (CohuHD p/n 8498-1)

AMP type plastic connector kit includes

- 16-pin Connector, Plug
- Backshell
- Contacts (14 each)

5970^{SD} Series

May be supplied with:

- 18-pin MS type metal connector (CohuHD p/n1310230-011)

For more information on each type of connector see Chapter 2 of this manual.

Optional Mounts

The Camera can be mounted in any one of six options depending on the mounting accessories supplied. Table 1 shows the mounting items provided for each of the configurations available with the Camera. For more information on each type of accessory see Chapter 3 of this manual.

Table 1. Mounting Configurations

Mount CohuHD P/n	Mount Description	Standard Base (part of the Camera)	Large Base	Wall Brackets	Pole Mount Brackets	Corner Mount Brackets	Parapet Mount Brackets
n/a	no special mount, standard base (part of the Camera)	•					
8481-9	large base	•	•				
8425-7	wall	•		•			
8503-0	pole	•		•	•		
8503-1	corner	•		•		•	
8503-2	parapet	•		•			•

Note: A dot "•" designates an item supplied for each mounting configuration.
Example: a 8503-2 - parapet mount configuration consists of the standard base as a part of the Camera, wall brackets, and parapet mount brackets.

2.0 Installation

This chapter covers the general installation and cable requirements of the 3960^{HD}/3960^{SD}/5970^{SD} series.

NOTE: All graphics contained within this document, including screenshots and other displays, are for reference use only and are subject to change.

Before starting installation:

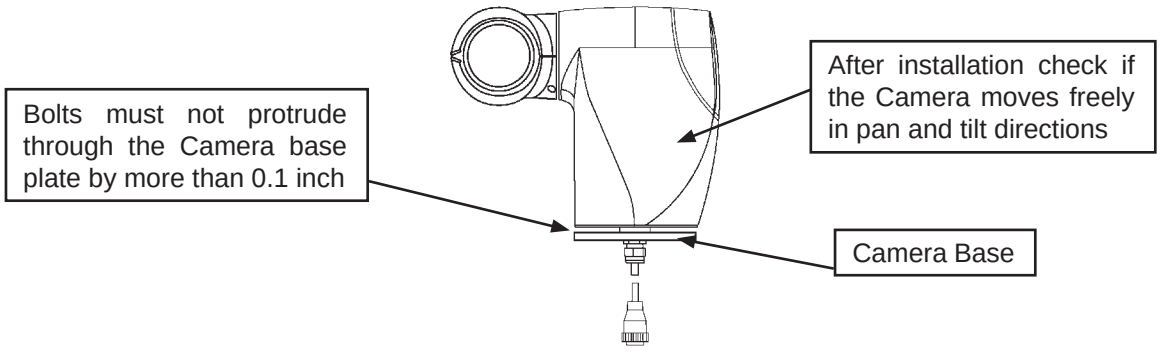
- choose the installation mounting method. See Chapter 3 of this manual
- choose an interconnect method (IP and/or analog video)
- have the system cable available. Manufactured cables can be purchased through CohuHD. See Section 2.2.3
- verify that the system cable can be routed to the location of the mounting assembly

IMPORTANT: The camera must be mounted in the vertical axis with the cable at the bottom of the camera. If the camera is installed upside down, the cable will be at the top.

CAUTION:

The bolts that are used to install the Camera must be securely fastened but not protrude through the Camera base plate by more than 0.1 inch. More than this would jam the bolts into the housing.

After installation and before turning on the Camera check if the Camera moves freely and has enough clearance for pan and tilt movements without any obstructions.



Installation should be done only by qualified personnel:

- install a bracket set, if required
- mount the Camera to the bracket or a suitable base
- connect the pigtail cable connector to the system cable
- check for clearance
- apply power

This assumes that the other end of the system cable is properly connected to a source of power and any other required equipment.

Two figures below show interconnection diagrams for the 3960^{HD}/3960^{SD}/5970^{SD} series Cameras:

- Figure 1 shows a typical set up interconnection diagram for the Camera using IP output
- Figure 2 shows a setup of the Camera using analog and IP output.

These diagrams give some idea of a typical installation. Each installation site will have its own unique requirements.

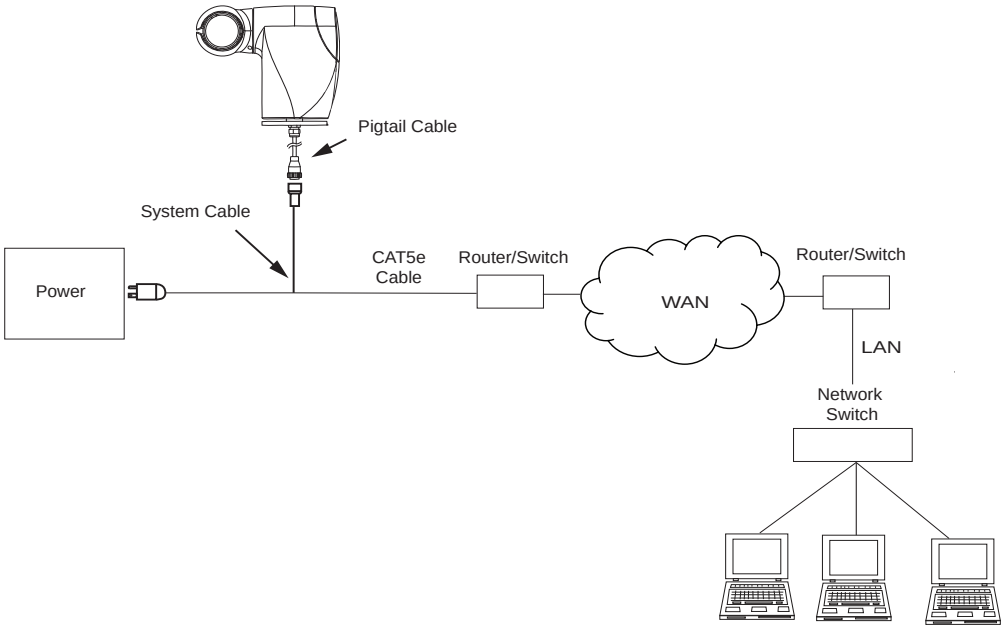


Figure 1. Interconnection Diagram, IP Output

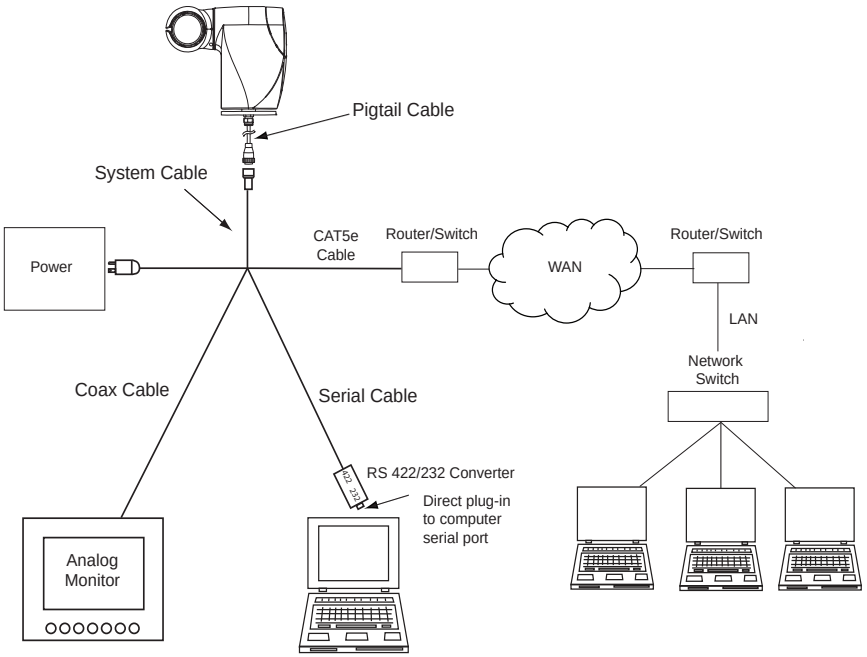


Figure 2. Interconnection Diagram, Analog and IP Output

2.1 System Cable Requirements

To build the Camera system cable CohuHD recommends:

- For Ethernet: CAT5e or better cable is recommended. For distances up to a maximum of 100 meters (328 feet), use CAT5e cable with four pairs of copper wire, 24 AWG.
- For Analog Video: The coax for analog video should be rated at 75 ohms, and should not exceed a maximum attenuation of 6dB at 10MHz for the length of coax required. For example, Belden 9221 miniature coax is a small, extremely flexible, 75 ohm coax that has an attenuation of 2.2dB per 100 feet. It should never be used for distances longer than 270 feet ((6dB / 2.2dB) x 100ft. = 272 feet). An excellent mid range coax would be the Belden 8241F (RG-59/U type with 100% copper core), with an attenuation of 0.9dB per 100 feet, or a maximum recommended distance of 650 feet. For longer cable runs, the Belden 8238 (RG-11/U type) has an attenuation of 0.7dB per 100 feet, which would allow for a maximum cable length of over 850 feet. There are triaxial cables available that can accommodate even longer cable distances, but a video cable equalizer or fiber optics may prove to be more cost effective as a long distance solution.
- For Data: Shielded, two twisted pair data cable is recommended. For lower baud rates (9,600 or less), the Belden 8723 shielded cable is usually suitable for distances up to 750 feet. For longer cable runs, and/or faster baud rates, a cable with a lower capacitance per foot should be selected. The Belden 8162 (12.5pf/ft. capacitance), would be suitable for distances well in excess of 1,000 feet at baud rates up to 115KB.
- For Power: Three wires, insulated for 300 V minimum, 18 AWG cord for power. Use for distances up to maximum 750 feet (230 m) for 115 Vac cables. Use for distances up to a maximum of 80 feet (29 m) for 24 Vac cables.

When wiring to the Ethernet pins, be sure to consider whether they should be wired for the NIC in a PC or for system connections to a hub, switch, router, or similar device. See tables 2.3.

Table 2. Ethernet Cable Wiring to a Hub, Switch, or Router (Straight Wiring)

Ethernet Function	Camera Connector Ethernet Pins		Corresponding RJ-45 Ethernet Pins
	MS	AMP	
Tx+	D	8	1
Tx-	E	9	2
Rx+	F	10	3
Rx-	H	11	6
This Ethernet wiring is intended to connect directly to a hub, switch, or router. For connection directly to a PC it will be necessary to use either a crossover cable or a crossover adapter. See table35.			

Table 3. Ethernet Cable Wiring to a PC (Crossover Wiring)

Ethernet Function	Camera Connector Ethernet Pins		Corresponding RJ-45 Ethernet Pins
	MS	AMP	
Tx+	D	8	3
Tx-	E	9	6
Rx+	F	10	1
Rx-	H	11	2
This Ethernet wiring is intended to connect a Camera to the NIC card in a PC.			

In the 3960HD/3960SD/5970SD series the RS-422 interface is used for sending and receiving serial data. Therefore, a RS-232/422 converter should be used between the Camera and a computer. Figure 3 shows a typical RS-232/422 converter from B&B that could be used with 3960HD/3960SD/5970SD. Table 4 shows cable wiring between the Camera and a converter.

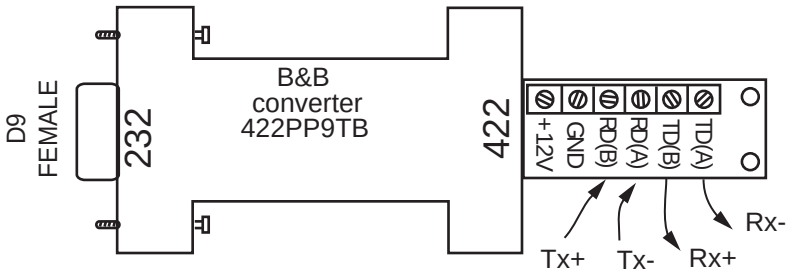


Figure 3. Typical RS- 232/422 Converter

Table 4. RS-422 Cable Wiring to B&B Converter

Camera Side			Converter Side
RS-422 Camera	Camera Connector Pins		RS-422 Device
	MS	AMP	
Rx+	M	8	TD(B)
Rx-	N	9	TD(A)
Tx+	S	10	RD(B)
Tx-	R	11	RD(A)

2.2 Pigtail Cable Connector and Its Mating System Cable Connector

All system electrical connections for the 3960HD/3960SD/5970SD series route through an approximately 40-inch long cable permanently attached to the Camera base. The Camera's model number identifies whether the pigtail cable is configured for 115 Vac or 24 Vac operation, and whether the pigtail connector is an 18-pin MS or 16-pin AMP connector.

A mating connector is supplied for making system interconnections. It will either be the plastic AMP type connector or the metal MS type (depending on the type of the pigtail cable connector) and configured for 24 Vac or 115 Vac operating power.

Base Plate with the Pigtail Cable (shown with MS metal connector)

2.2.1 18-pin MS (Metal) Connector and Its Mating Connector.

(Applies to 3960^{HD}/3960^{SD}/5970^{SD})

The following section describes 18-pin pigtail cable metal connector and its mating cable connector.

Figure 4 is the pin location diagram of the pigtail cable connector viewed from the mating side of the pigtail connector. The view is identical to the wiring view (see Figure 5) of a mating connector (supplied) for the system cable. Figures 6 and 7 show pin functions of the connector for 115 Vac and the 24 Vac. Those functions are identical to the corresponding pin functions of the mating system cable connectors.

Figure 4. Pin Location Diagram.
MS type Pigtail Cable Connector
View from the front (mating) side

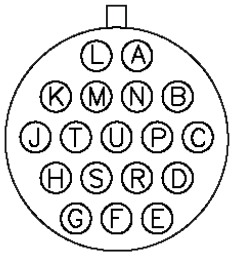


Figure 5. Pin Location Diagram.
MS type Mating Cable Connector
View from the back (wiring) side

Pin	Function
L	Analog Video Out
A	Analog Video Ground
U	115 Vac High
G	AC Ground
T	115 Vac Low
B	SPARE
P	ALARM GRD
C	ALARM IN
J	RELAY OUT
K	RELAY IN
M	RS-422 RX +
N	RS-422 RX -
S	RS-422 TX +
R	RS-422 TX -
D	Ethernet TX +
E	Ethernet TX -
F	Ethernet RX +
H	Ethernet RX -

Figure 6. MS (Metal) Connector Pinouts 115 Vac

Pin	Function
L	Analog Video Out
A	Analog Video Ground
U	SPARE
G	AC Ground
T	24 Vac Low
B	24 Vac High
P	ALARM GRD
C	ALARM IN
J	RELAY OUT
K	RELAY IN
M	RS-422 RX +
N	RS-422 RX -
S	RS-422 TX +
R	RS-422 TX -
D	Ethernet TX +
E	Ethernet TX -
F	Ethernet RX +
H	Ethernet RX -

Figure 7. MS (Metal) Connector Pinouts 24 Vac

2.2.2 16-pin AMP (Plastic) Connector and Its Mating Connector.

(Applies to 3960^{HD}/3960^{SD})

The following section describes 16-pin AMP (plastic) connector and its mating system cable connector. Figure 8 is the pin location diagram of the pigtail cable AMP connector viewed from the mating side. The view is identical to the wiring view of a mating plug (supplied) for the system cable. See Figure 9. Figures 10 and 11 show pin functions of the 24 Vac and the 115 Vac pigtail cables, which are identical to the corresponding pin functions of mating system cables.

Figure 8. Pin Location Diagram.
AMP type Pigtail Cable Connector
View from the front (mating) side

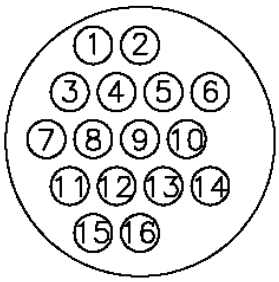


Figure 9. Pin Location Diagram.
AMP type Mating Cable Connector
View from the back (wiring) side

Pin	Function
1	Analog Video Out
2	Analog Video Ground
3	SPARE
4	RS-422 TX -
5	RS-422 TX +
6	RS-422 RX +
7	RS-422 RX -
8	Ethernet TX +
9	Ethernet TX -
10	Ethernet RX +
11	Ethernet RX -
12	115 Vac High
13	115 Vac Low
14	SPARE
15	115 Vac Ground
16	SPARE

Figure 10. AMP (Plastic) Connector Pinouts 115 Vac

Pin	Function
1	Analog Video Out
2	Analog Video Ground
3	SPARE
4	RS-422 TX -
5	RS-422 TX +
6	RS-422 RX +
7	RS-422 RX -
8	Ethernet TX +
9	Ethernet TX -
10	Ethernet RX +
11	Ethernet RX -
12	SPARE
13	24 Vac Low
14	SPARE
15	24 Vac Ground
16	24 Vac High

Figure 11. AMP (Plastic) Connector Pinouts 24 Vac

2.3 CohuHD Manufactured System Cables

CohuHD manufactured cables are available for:

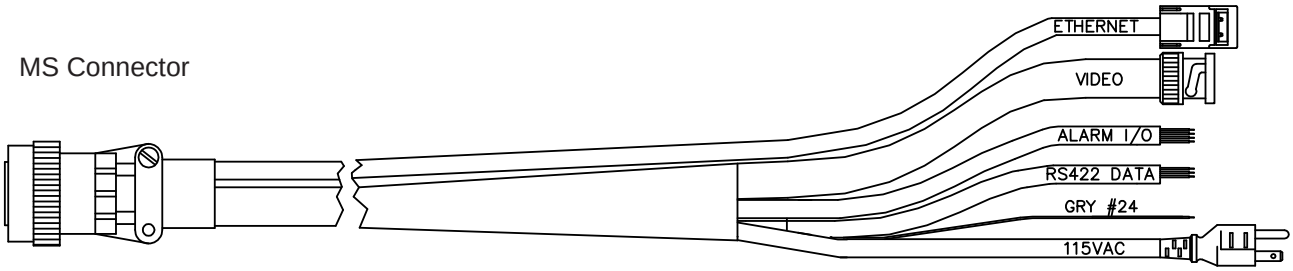
- 3960^{HD}/3960^{SD} series operating from 115 Vac power or 24 Vac with MS or AMP connectors
- 5970^{SD} series operating from 115 Vac power or 24 Vac with MS connectors.

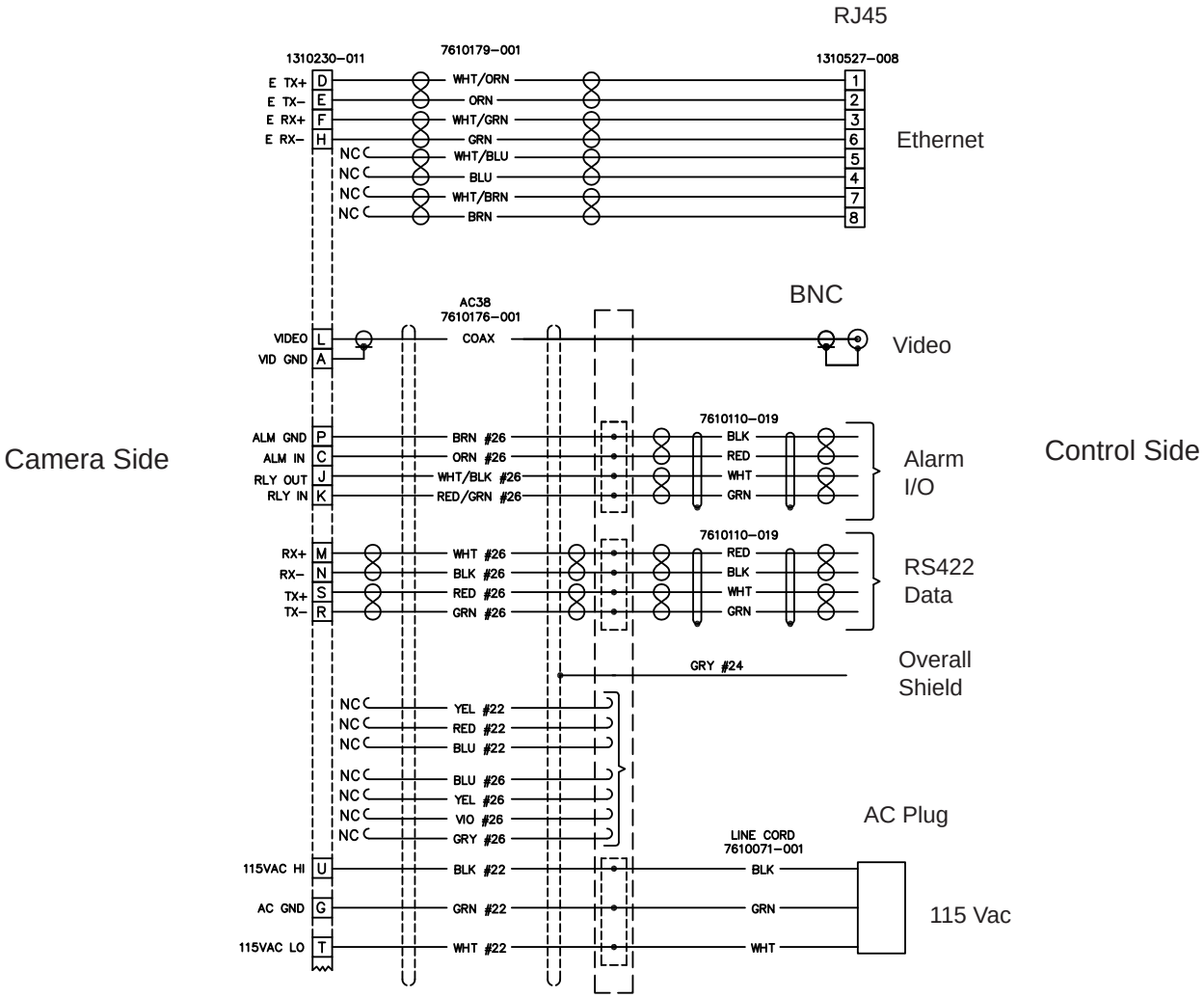
For ordering information please contact your sales representative.

The CohuHD cables are made with either stripped (prepared) leads or with various combinations of connectors and a 232/422 converter. Maximum cable length for Cameras with operating power 24 Vac is 80 feet. The length limitation is due to voltage drop in the wires. Maximum cable length for Cameras with operating power 115 Vac is 328 feet. This length limitation is due to Ethernet signal degradation which increases with the cable length. For Ethernet cables longer than 100 m (328') an Ethernet extender may be required.

NOTE: The maximum recommended cable length for Ethernet is 100 m (328'). However, other factors may reduce the distance Ethernet can be successfully used, such as EMI from other sources.

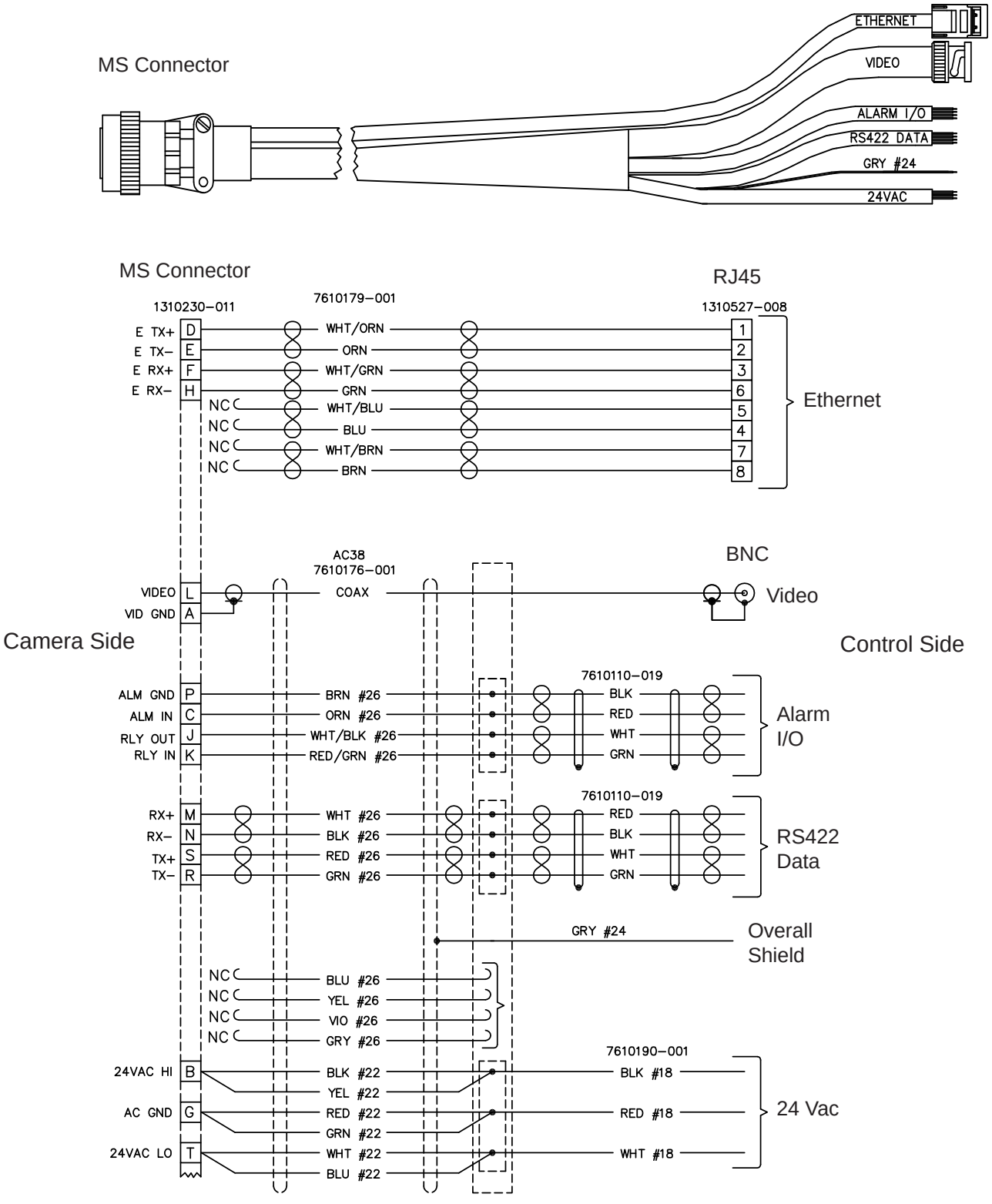
Figures 12 and 13 show two versions of the MS system cables: CA252S for 115 Vac operating power and CA255S for 24 Vac power. Figures 14 and 15 give examples of the AMP system cables: CA272Q for 115 Vac and CA271Q for 24 Vac.





Note: NC = No Connection

Figure 12. CohuHD Manufactured System Cable CA252S: MS, 115 Vac
(Applies to 3960HD/3960SD/5970SD)



Note: NC = No Connection

Figure 13. CohuHD Manufactured System Cable CA255S: MS, 24 Vac
(Applies to 3960^{HD}/3960^{SD}/5970^{SD})

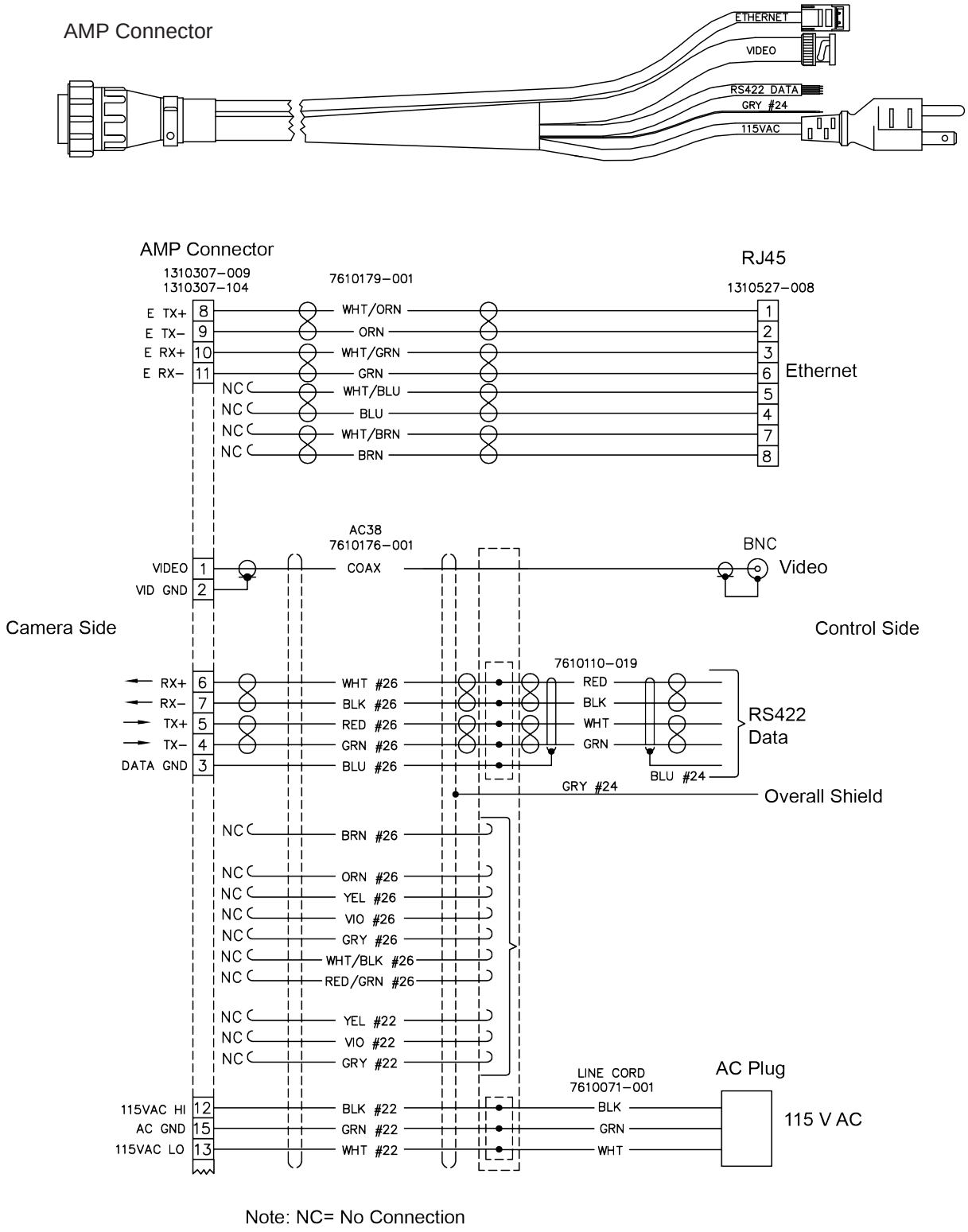
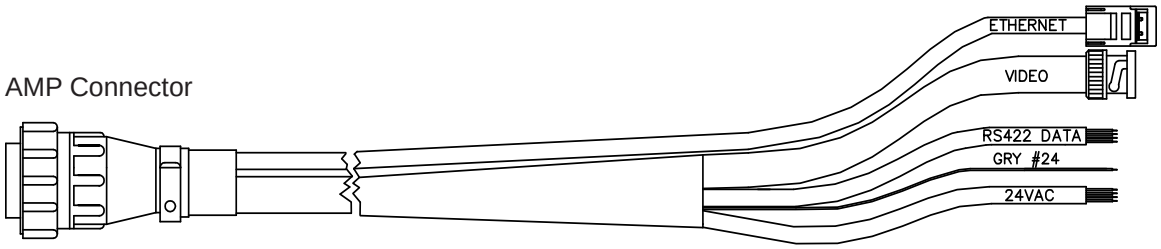
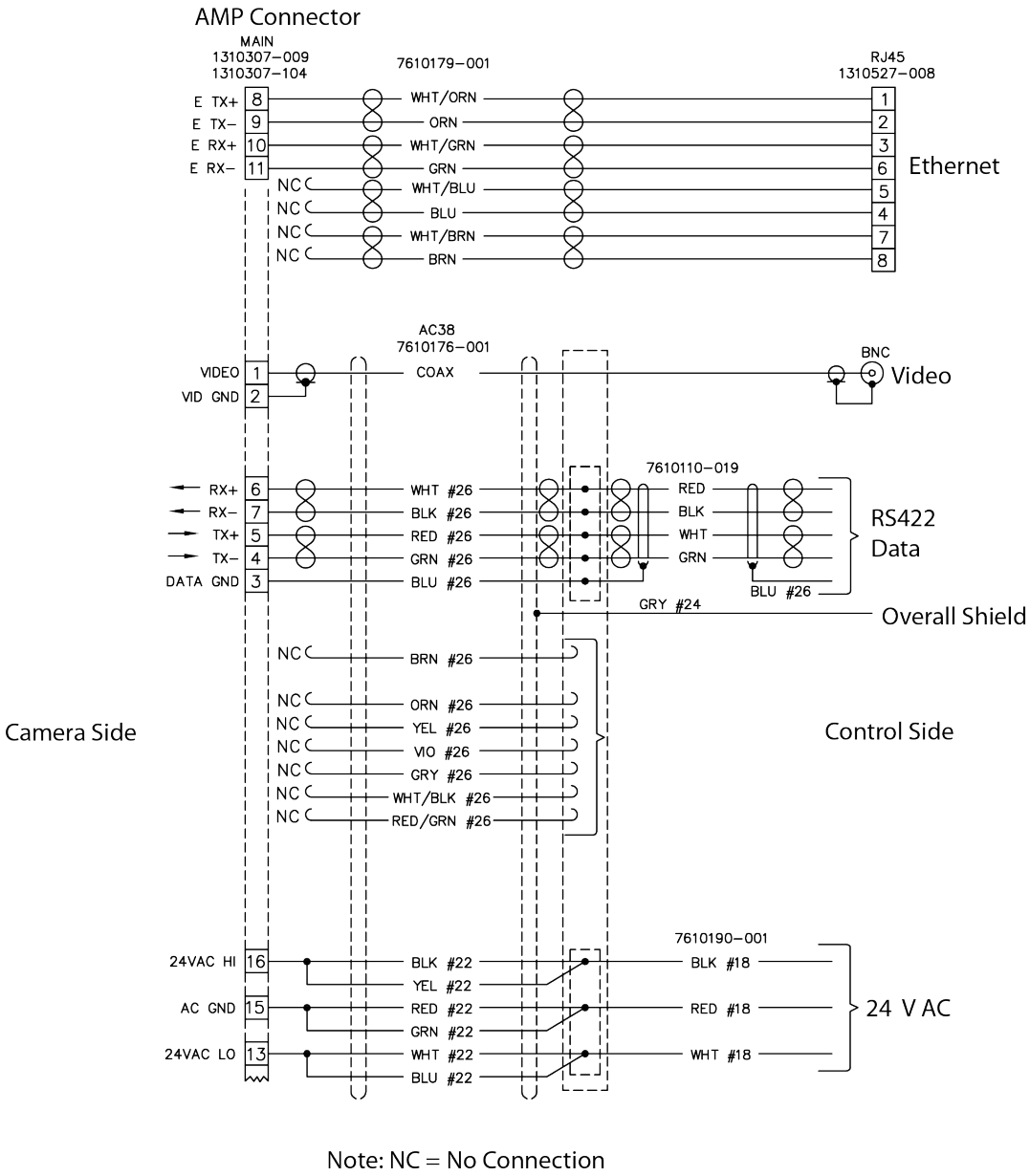


Figure 14. CohuHD Manufactured System Cable CA272Q: AMP, 115 Vac
(Applies to 3960[HD]/3960[SD])





Note: NC = No Connection

Figure 15. CohuHD Manufactured System Cable CA271Q: AMP, 24 Vac
(Applies to 3960^{HD}/3960^{SD})

3.0 Mounting Methods

This section is a generic description of typical installations for the mounting assemblies that are an option with the Camera. Each mounting site will likely have its own unique requirements.

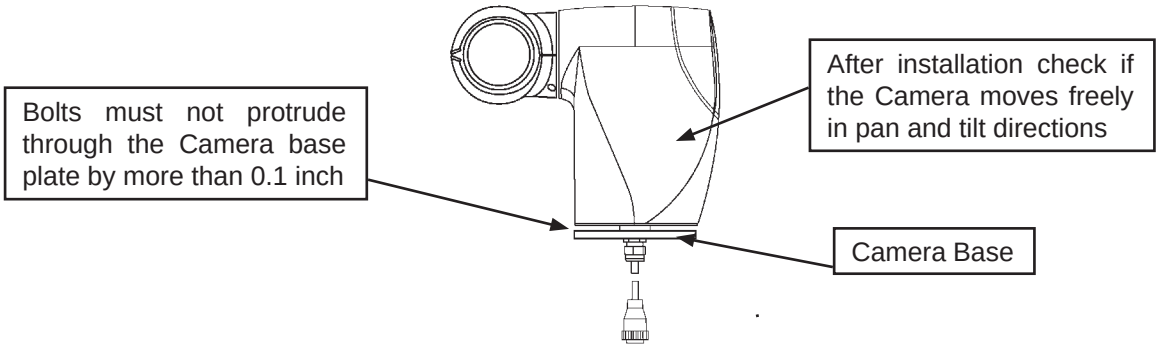
The 3960^{HD}/3960^{SD}/5970^{SD} series can be ordered with any one of six mounting arrangements. Two of these are related to base plates for the Camera and the remaining four are actual mounting arms and brackets for an installation:

1. *Base mount (PEDD)*. See Section 3.1 of this manual. Direct mounting to the base plate on the Camera.
2. *CohuHD p/n 8481-9. Large Base Pedestal Mounting Bracket Set (LPED).* See 3.2 Section of this manual. Mounts to the optional larger circular mounting base, which then mounts to a suitable surface.
3. *CohuHD p/n 8425-7. Wall Mount Brackets (WALL).* See Section 3.3 of this manual. Mounts directly to a wall surface or to pole, corner or parapet mounting bracket sets.
4. *CohuHD p/n 8503-0. Pole Mounting Bracket Set (POLE)*. See Section 3.4 of this manual. Clamps to a pole using stainless steel straps. The wall mount bracket then attaches to the pole mount .
5. *CohuHD p/n 8503-1. Corner Mounting Bracket Set (CONR).* See Section 3.5 of this manual. Bolts to the corner of a building or other structure. The wall mount bracket then attaches to the corner mount.
6. *CohuHD p/n 8503-2. Parapet Mounting Bracket Set (PARP).* See Section 3.6 of this manual. Bolts to the inside of a parapet on a roof of a building or other structure. The wall mount bracket then attaches to the parapet mount.

CAUTION:

The bolts that are used to install the Camera must be securely fastened but not protrude through the Camera base plate by more than 0.1 inch. More than this would jam the bolts into the housing.

After installation and before turning on the Camera check if the Camera moves freely and has enough clearance for pan and tilt movements without any obstructions.



WARNING:

It is the customer's responsibility to ensure that the mounting methods are safe and adequate for the location.

For installation:

- Use stainless steel hardware to fasten the Camera and mounting brackets. This will ensure the resistance of fasteners to corrosion.
- Use anti-seize compound in order to prevent galling on the threads.
- Use gasket materials if needed.
- Use a sealant wrap on the Camera waterproof connectors and its mating system cable plugs for additional protection against moisture in severe conditions.

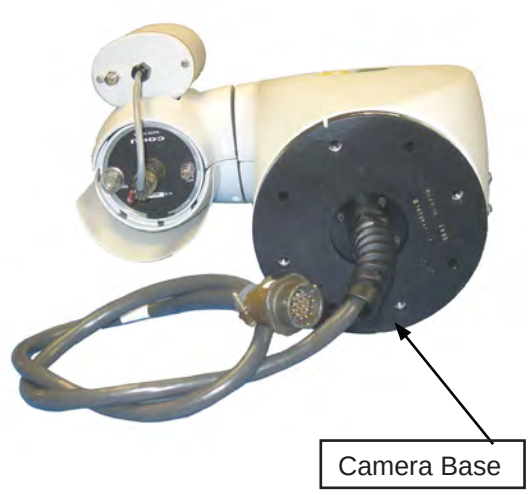
3.1 Base Direct Installation. (PEDD)

If the Camera base hole pattern is compatible with the site-supplied pedestal or site-supplied adapter plate, the Camera can be ordered without any mounting brackets and bolted directly to the pedestal. Figure 17 shows dimensions of the Camera base.

- the Camera weighs 18.5 lb (8 kg) without wiper
- the wiper weighs 2.2 lb (1 kg)

The Camera base:

- is permanently mounted to the positioner
- has an outside diameter of 6-inch and thickness of 1.00-inch
- has four 1/4-20 threaded bolt holes, spaced 90° apart on a 4.75-inch diameter hole pattern for mounting to brackets or pedestal. The 1/4-20 fasteners threaded into these holes must not protrude through the base more than 0.1 inch



The following table 5 contains hardware provided for the Camera installation on the site-supplied pedestal:

Table 5. Items Supplied to Mount 3960^{HD}/3960^{SD} on the Site Pedestal

№	Description	Amount	CohuHD p/n	Characteristics
1	Camera Base	1		Permanently attached to the Camera
2	Camera Base Hardware: • * Bolt, Hex Head 1/4-20x3/4”L (see Figure 16), SS • Washer, Spring Lock 1/4”, SS • Washer, Flat 1/4”, SS	 4 4 4	 2010730-004 2010732-002 2010731-002	1/4-inch hardware is used to bolt a Camera base to a site pedestal

NOTE: * The 3/4”L bolts included fit a mounting surface thickness of 1/4”. Bolts of a different length may be required depending upon the thickness of the mounting surface.

Below are general steps to be followed for a pedestal mount installation. Some sites might require additional special steps not listed:

- Route the pigtail cable down into the pedestal. The cable should be secured by a strain relief and not allowed to hang free within the pedestal if there is a long cable run hanging underneath. (If an access opening is not available at the top of the pedestal, the system cable must first be connected to the pigtail connector.)
- Bolt the Camera to the pedestal using 1/4-inch SS hardware (supplied). Bolts must not protrude through the Camera base plate by more than 0.1 inch. More than this would jam the bolts into the Camera housing.
- Attach the pigtail connector to the system connector.
- Verify that the Camera will have a full range of movement without striking any nearby structure.
- Refer to Section 4 to set up and check out the Camera.

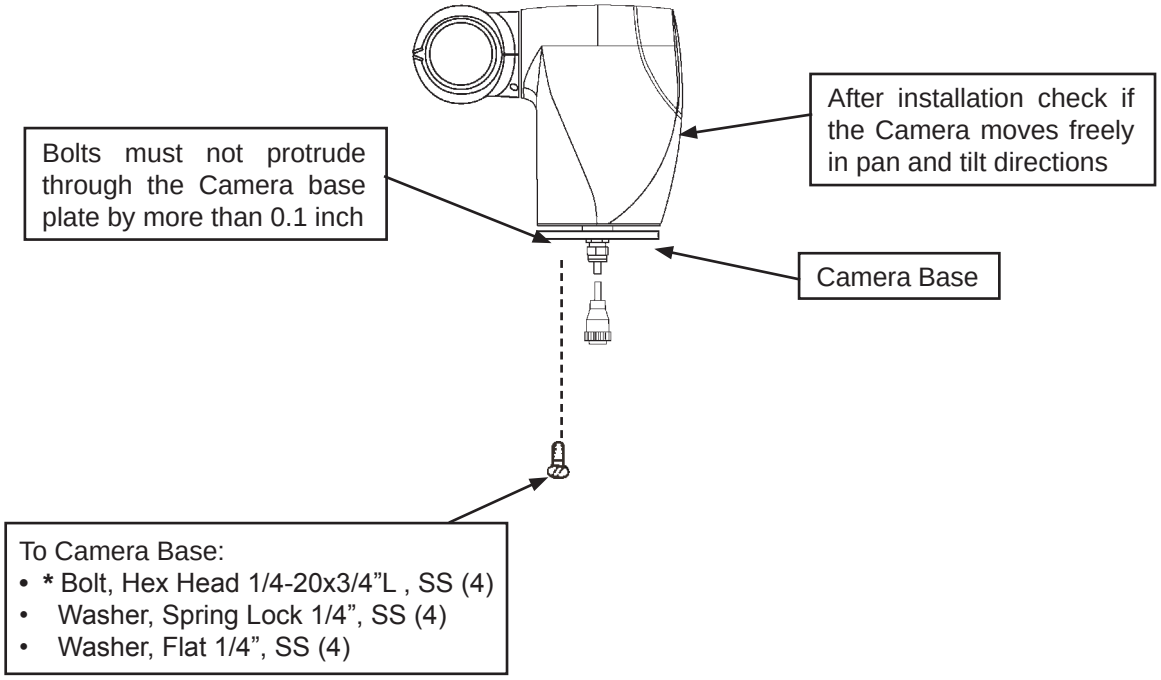


Figure 16. Camera Base Direct Installation

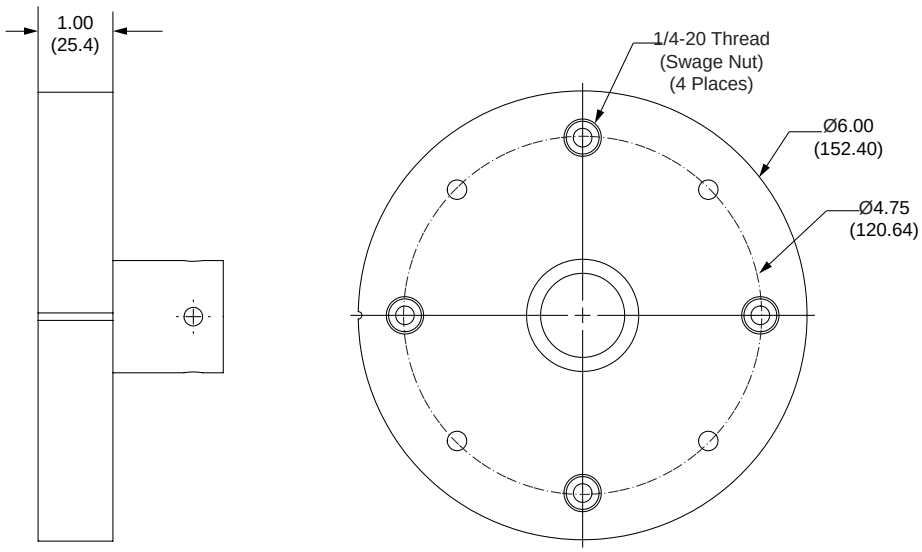


Figure 17. Dimensions, Camera Base. Dimensions in inches (mm)
(part of Base-Tube Assy, CohuHD p/n 8163150-001)

3.2 Large Base Adapter Plate Installation. CohuHD p/n 8481-9. (LPED)

The optional large base adapter plate is designed by CohuHD to provide two additional hole patterns for mounting to a pedestal or other existing on-site mount. The plate attaches directly to the Camera base. See Figure 19 for dimensions.

Large Base Adapter Plate

The large base:

- weighs 1.9 lb (0.86 kg)
- attaches directly to the Camera base with four flat head 1/4-20x 3/4”L screws (supplied). Mounting holes are on a 4.75-inch diameter pattern and have no threads
- has an 8.5-inch outside diameter and 0.375-inch thickness

In addition, the large base adapter plate has two four-hole patterns for mounting to a pedestal or other type mount:

- one pattern is on a 7-inch diameter and
- the other pattern is on a 7.25-inch diameter
- holes on each pattern are spaced 90° from each other
- patterns are offset from each other by 22.72 °
- support mounting holes are 0.380 diameter and have no threads
- 1/4-inch stainless steel hardware (not supplied) is suggested to mount the adapter plate to a site-mount

The following table 6 contains items supplied with an adapter plate:

Table 6. Items Supplied to Mount 3960^{HD}/3960^{SD}/5970^{SD} with Large Adapter Plate on the Site Pedestal

№	Description	Amount	CohuHD p/n	Characteristics
1	Large Base Adapter Plate	1	8481908-001	Bolts to the Camera base with 1/4- inch hardware
2	Adapter Plate Hardware: • Screw, Phillips, Flat Head 1/4-20 x 3/4”L, Nylon Lock Patch, Carbon Steel, Cad Plated	4	2010210-093	1/4-inch hardware is used to bolt an adapter plate to the Camera base
3				1/4-inch stainless steel hardware (not supplied) is suggested to mount an adapter plate to a site mount
4	The following hardware may be included with your shipment that is not intended for this base. Please disregard it.			
	• Bolt, Hex Head 1/4-20x3/4”L , SS • Washer, Spring Lock, 1/4”, SS • Washer, Flat, 1/4”, SS	4 4 4	2010730-004 2010732-002 2010731-002	

Below are general steps to be followed for a pedestal mount installation. Some sites might require additional special steps not listed:

- Attach a large base plate to the Camera base using 1/4-inch SS hardware (supplied). Screws must not protrude through the Camera base plate by more than 0.1 inch. More than this would jam the bolts into the Camera housing.
- Route the pigtail cable down into the pedestal. The cable should be secured by a strain relief and not allowed to hang free within the pedestal if there is a long cable run hanging underneath. (If an access opening is not available at the top of the pedestal, the system cable must first be connected to the pigtail connector.)
- Bolt the Camera to the pedestal using 1/4-inch SS hardware (not supplied).
- Attach the pigtail connector to the system connector.
- Verify that the Camera will have a full range of movement without striking any nearby structure.
- Refer to Section 4 to set up and check out the Camera.

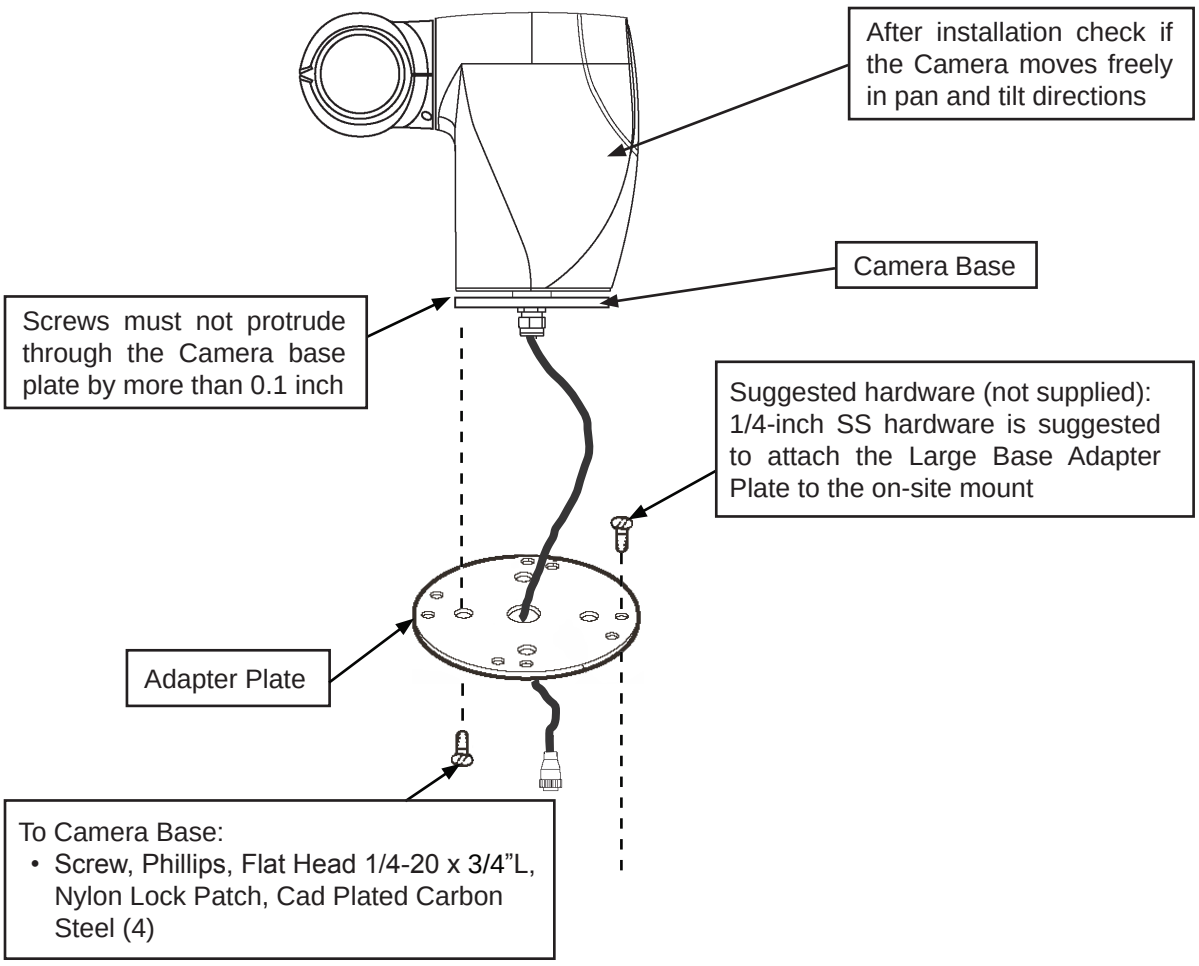


Figure 19. Installation with Large Base Adapter Plate

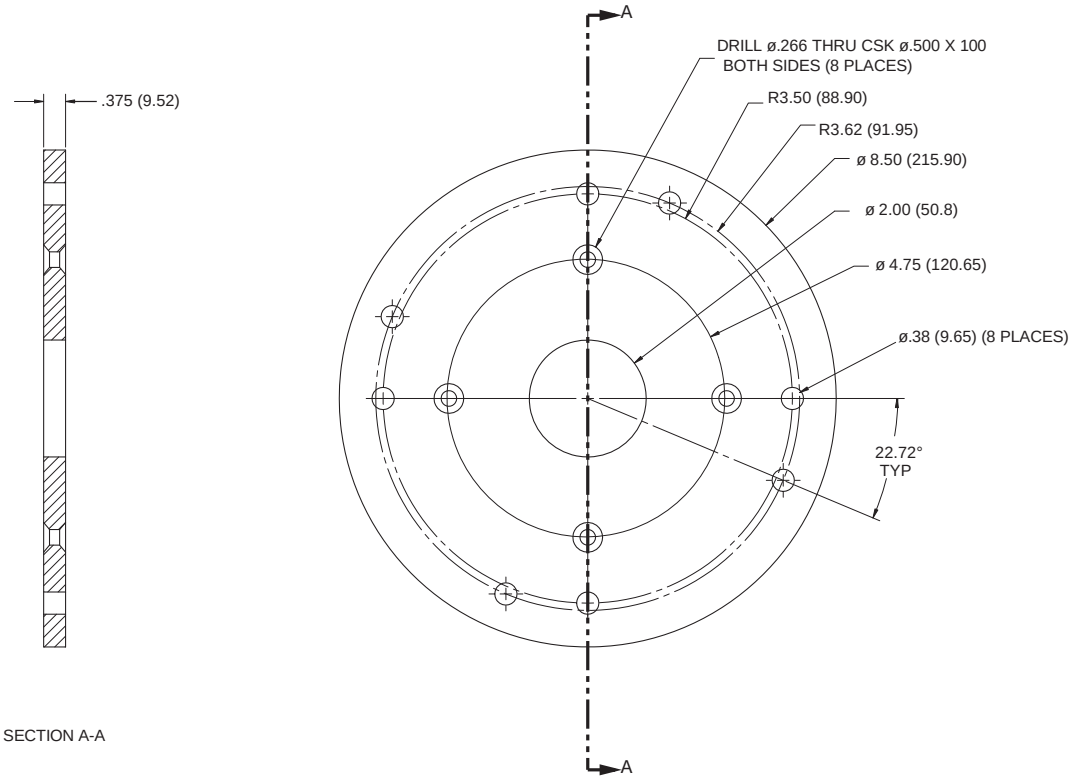


Figure 20. Dimensions, Large Base (LPED). Dimensions in inches (mm)
(CohuHD p/n 8481908-001)

3.3 Wall Mount Installation. CohuHD p/n 8425-7. (WALL)

A wall mount bracket with an adapter mount is designed to be installed directly to the vertical surface or it could be used in corner, pole, and parapet applications. See Figure 22 for the wall mount dimensions. See Figure 23 for mount adapter dimensions.

The wall mount:

- is designed to be used with a mount adapter
- attaches to the wall with 5/16-inch hardware
- has two cable feedthrough holes
- supports up to 75 lb (34 kg)
- weighs (without mount adapter) 3 lb (1.4 kg)

Wall Mount with Mount Adapter

The mount adapter:

- attaches to the wall mount with 1/4-20 screws
- attaches to the Camera with 1/4-inch hardware
- weighs 0.6 lb (0.3 kg)

The following table 7 contains items supplied for the wall mount installation of the Camera:

Table 7. Items Supplied to Mount 3960^{HD}/3960^{SD}/5970^{SD} to the Wall

№	Description	Amount	CohuHD p/n	Characteristics
1	Wall Mount	1	7411417-001	Bolts to a vertical surface with 5/16- inch hardware
2	Wall Mount Hardware: • Bolt, Hex Head, 5/16-18x1½"L, SS • Washer, Flat 5/16, SS • Washer, Spring Lock 5/16, SS • Nut, Hex, 5/16-18, SS	 4 8 4 4	 2010730-002 2010731-003 2010732-003 2010735-001	5/16-inch hardware is used to bolt a wall mount to a vertical surface
3	Mount Adapter Supplied with hardware: • Screw, 1/4-20 (4)	1	7411418-001	Bolts to the wall mount with 1/4-20 screws
4	Camera Base Hardware: • Bolt, Hex Head 1/4-20x3/4"L , SS • Washer, Spring Lock 1/4", SS • Washer, Flat 1/4", SS	 4 4 4	 2010730-004 2010732-002 2010731-002	1/4-inch hardware is used to bolt a Camera base to the mount adapter

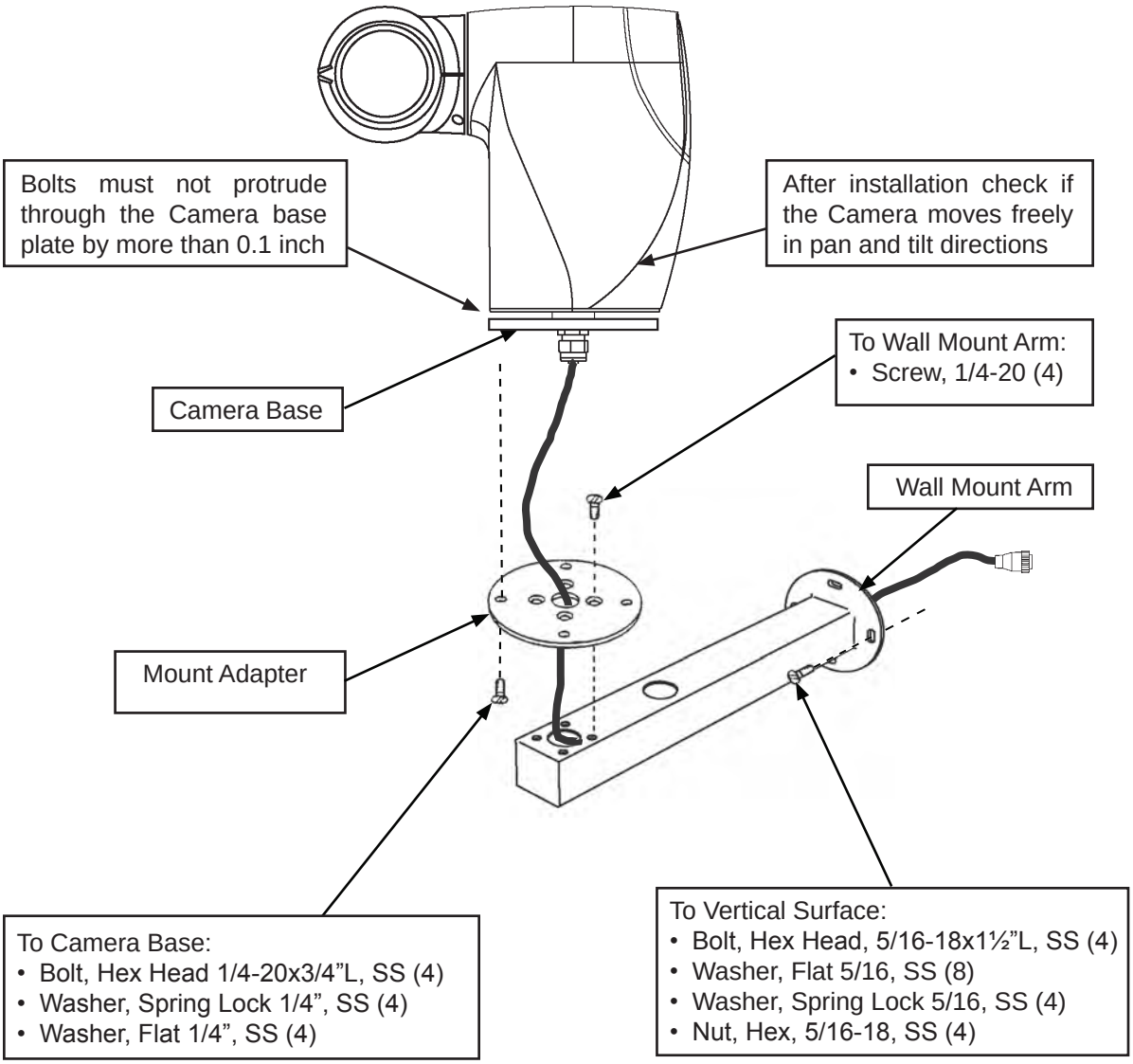


Figure 21. Installation to a Wall

Below are general steps to be followed for a wall mount installation. Some sites might require additional special steps not listed:

- Prepare the mounting surface - using the arm as a template, drill four mounting holes; drill a hole for the cable if required.
- Verify that the system cable is accessible for connection to the Camera pigtail cable at the mounting location.
- Attach the adapter plate to the wall mount arm with the four SS 1/4-20 screws (supplied).
- Install a weather tight gasket or compatible sealant between the arm and the surface of the wall (if required; not supplied).
- Remove plastic plugs on the arm and route the Camera pigtail cable down into the arm and out the back.
- Position the Camera on the arm adapter plate and secure it with the 1/4-inch SS hardware (supplied). Bolts must not protrude through the Camera base plate by more than 0.1 inch. More than this would jam the bolts into the Camera housing.
- Connect the pigtail connector to the system cable connector.
- Pull the system cable back into place so the arm can be positioned to the wall.
- Bolt the arm to the wall with 5/16-inch SS hardware (supplied).
- Apply sealant around the bolt holes between the mount and the mounting surface.
- Verify that the Camera will have a full range of movement without striking any nearby structures.
- Refer to Section 4 to set up and check out the Camera.

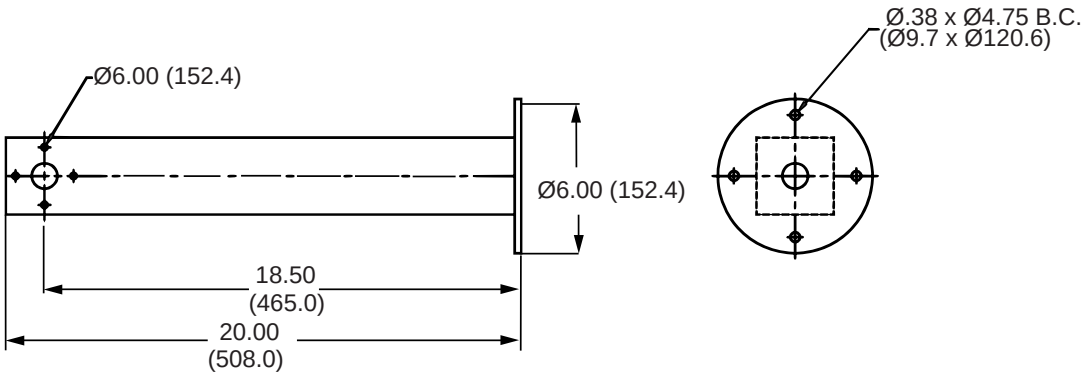


Figure 22. Dimensions, Wall Mount Arm. Dimensions in inches and (mm)
(CohuHD p/n 7411417-001)

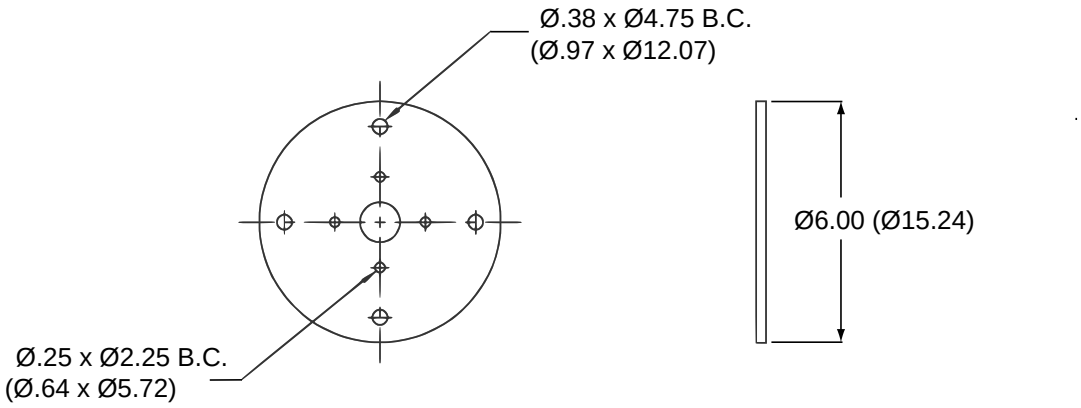


Figure 23. Dimensions, Mount Adapter. Dimensions in inches (mm)
(CohuHD p/n 7411418-001)

3.4 Pole Mount Installation. CohuHD p/n 8503-0. (POLE)

Pole Mount

The pole mount bracket is used when installation of a Camera positioning system is required to be on an existing pole. See Figure 25 for dimensions.

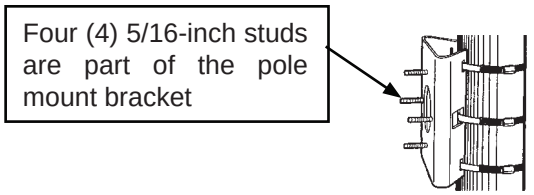
The pole mount:

- is designed to be used with a wall mount
- has four 5/16-inch studs permanently attached for a wall mount installation. See Figure 20
- mounts to the pole using stainless steel straps. See Figure 21
- supports up to 75 lb (34 kg) when is used with the wall mount set
- weighs (without wall mount brackets) 2.2 lb (1 kg)

The following table 8 contains items supplied for the pole mount installation of the Camera:

Table 8. Items Supplied to Mount 3960^{HD}/3960^{SD}/5970^{SD} to the Pole

№	Description	Amount	CohuHD p/n	Characteristics
1	Pole Mount Supplied with: • Studs, 5/16 - part of bracket (4) • SS Straps (3)	1	7411408-001	Mounts to the pole using SS straps. A special tension tool is required (not supplied, CohuHD p/n 7411411-001)
2	Wall Mount	1	7411417-001	Bolts to the pole mount with 5/16-inch hardware
3	Wall Mount Hardware: • Bolt, Hex Head, 5/16-18x1½”L, SS (disregard) • Washer, Flat 5/16, SS • Washer, Spring Lock 5/16, SS • Nut, Hex, 5/16-18, SS	4 8 4 4	2010730-002 2010731-003 2010732-003 2010735-001	5/16-inch hardware is used to bolt a wall mount to the pole mount
3	Mount Adapter Supplied with hardware: • Screw, 1/4-20 (4)	1	7411418-001	Bolts to the wall mount with 1/4-inch screws
5	Camera Base Hardware: • Bolt, Hex Head 1/4-20x3/4”L, SS • Washer, Spring Lock 1/4”, SS • Washer, Flat 1/4”, SS	4 4 4	2010730-004 2010732-002 2010731-002	Bolts a Camera base to the mount adapter with 1/4-inch hardware



Pole Mount

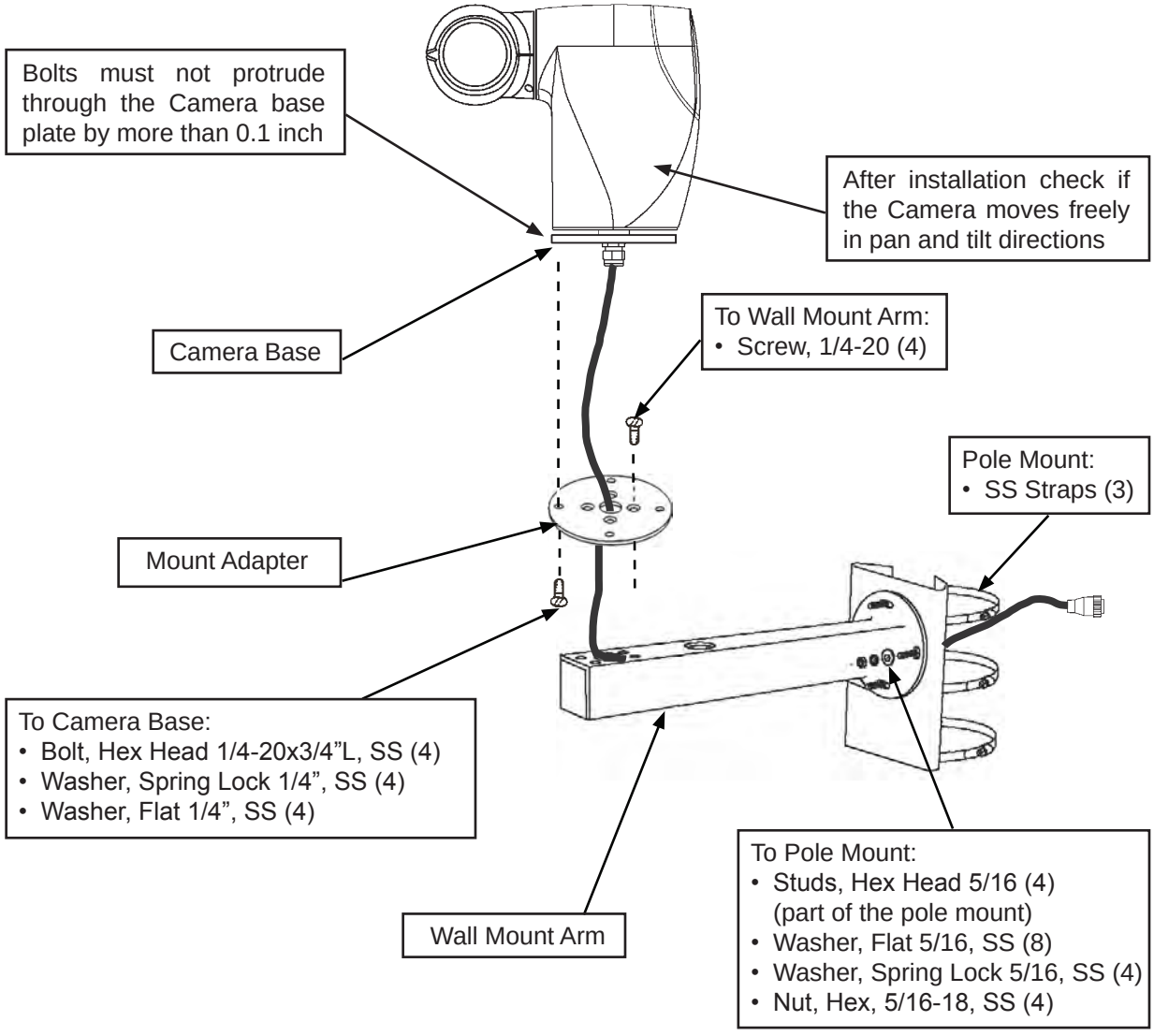


Figure 24. Installation to the Pole

Provisions must be made for routing the system cable up to the Camera location on the pole. If the cable routes up through the pole and exits near location where the pole mount bracket is attached, support the cable inside the pole so that the full cable weight is not loaded solely at the top.

A pole mount installation is similar to the wall mount installation except that the arm fastens to a pole mount bracket instead of directly to a wall. The sequence of installation can vary from site to site:

- Verify that the system cable is accessible for connection to the Camera pigtail cable at the mounting location.
- Fasten the pole-mount bracket to the pole.
- Attach the adapter plate to the wall mount arm with four ss 1/4-20 screws (supplied).
- Install a weather tight gasket or compatible sealant between the arm and the surface of the pole bracket (if required; not supplied).
- Route the Camera pigtail cable down into the arm and out the back. Note that plastic plugs can be removed to aid in this process.
- Position the Camera on the arm adapter plate and secure it with the 1/4-inch SS hardware (supplied). Bolts must not protrude through the Camera base plate by more than 0.1 inch. More than this would jam the bolts into the Camera housing.
- Connect the pigtail connector to the system cable connector.
- Pull the system cable back so the arm can be slid over the pole mount threaded studs.
- Install 5/16-inch SS washers and nuts (supplied) to secure the arm to the bracket.
- Apply sealant around the bolt holes between the mount and the mounting surface.
- Verify that the Camera will have a full range of movement without striking any nearby structures.
- Refer to Section 4 to set up and check out the Camera.

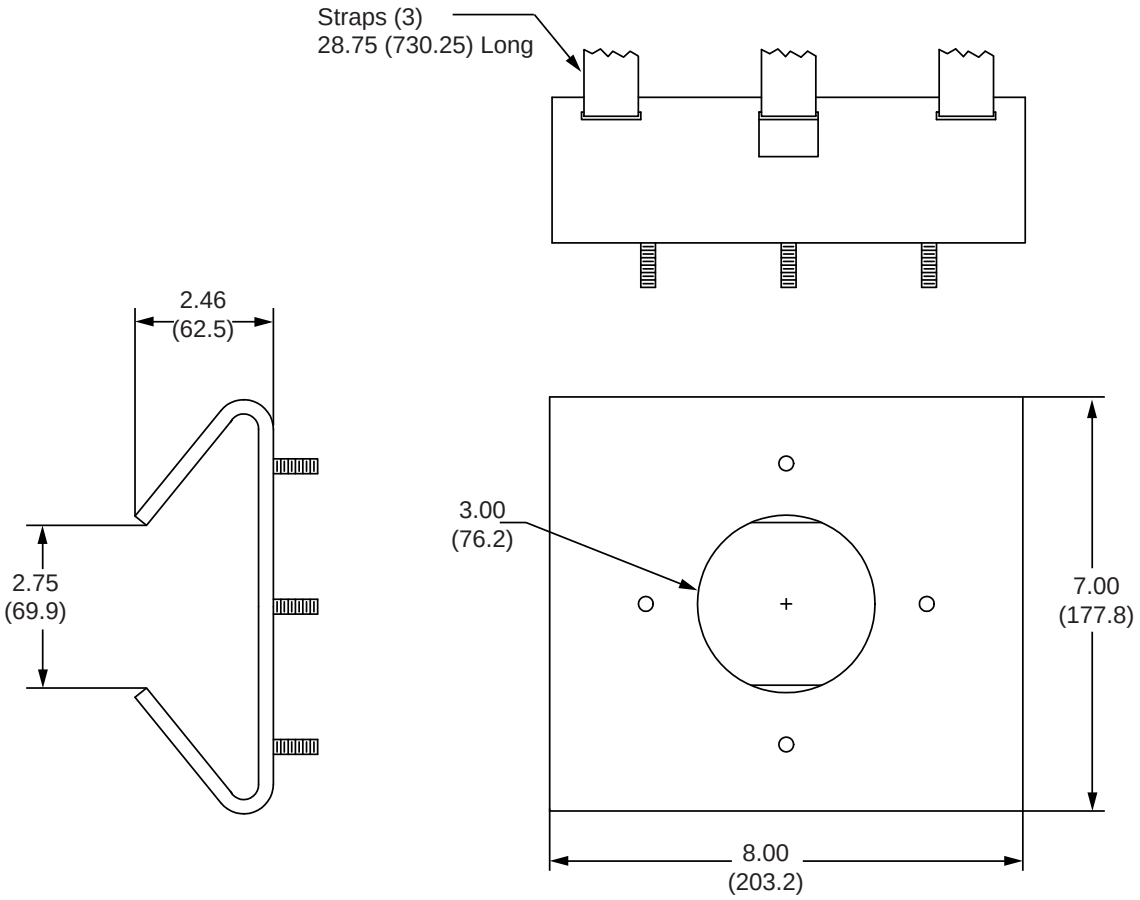


Figure 25. Dimensions, Pole Mount. Dimensions in inches (mm)
(CohuHD p/n 7411408-001)

3.5 Corner Mount Installation. CohuHD p/n 8503-1. (CONR)

A corner mount attaches to the corner of a building or other structure to provide viewing on two sides of the structure. See Figure 27 for dimensions.

The corner mount:

- is designed to be used with a wall mount
- has 5/16-inch studs permanently attached for a wall mount installation. See Figure 24
- has eight 0.37 diameter holes for mounting to a corner surface with fasteners of a suitable size. Fasteners are not supplied
- supports up to 75 lb (34 kg)
- weighs 3.0 lb (1.4 kg)

Corner Mount

The following table 9 contains items supplied for the corner mount installation of the Camera:

Table 9. Items Supplied to Mount 3960^{HD}/3960^{SD}/5970^{SD} to the Corner

№	Description	Amount	CohuHD p/n	Characteristics
1	Corner Mount Adapter Assembly consists of items : • Corner Mounting Brackets (2) • Studs, 5/16 (4) - part of bracket	1	7411425-001	Mounts to a corner surface with eight stainless steel fasteners of a suitable size (not supplied).
2	Wall Mount	1	7411417-001	Bolts to the corner mount brackets set with 5/16 hardware
3	Wall Mount Hardware: • Bolt, Hex Head, 5/16-18x1½"L, SS (disregard) • Washer, Flat 5/16, SS • Washer, Spring Lock 5/16, SS • Nut, Hex, 5/16-18, SS	4 8 4 4	2010730-002 2010731-003 2010732-003 2010735-001	5/16 hardware is used to bolt wall mount to the corner mount brackets set
4	Mount Adapter Supplied with hardware: • Screw, 1/4-20 (4)	1	7411418-001	Bolts to the wall mount with 1/4-inch screws
5	Camera Base Hardware: • Bolt, Hex Head 1/4-20x3/4"L, SS • Washer, Spring Lock 1/4", SS • Washer, Flat 1/4", SS	4 4 4	2010730-004 2010732-002 2010731-002	1/4-inch hardware is used to bolt a Camera base to the mount adapter with 1/4-inch hardware

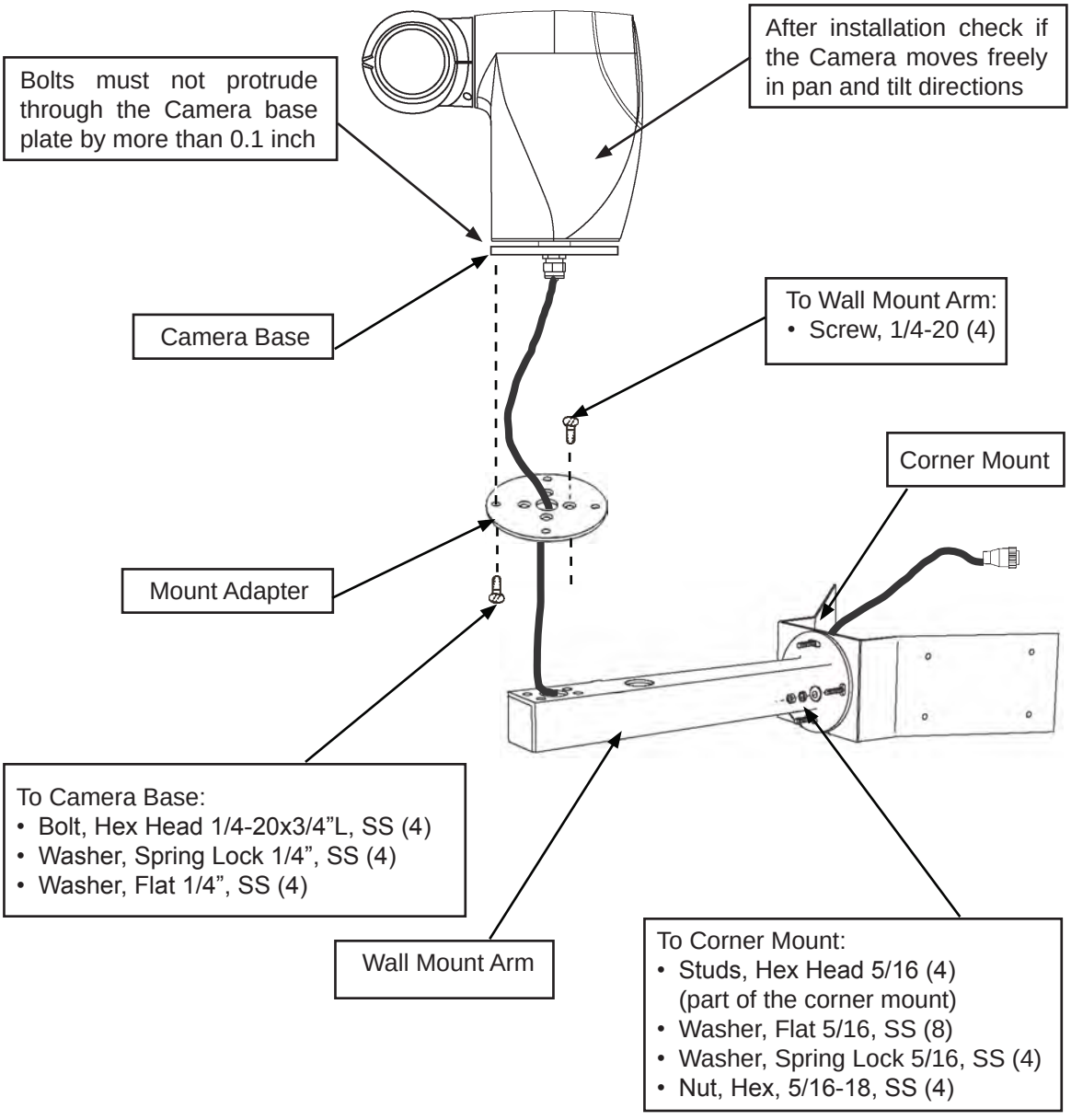
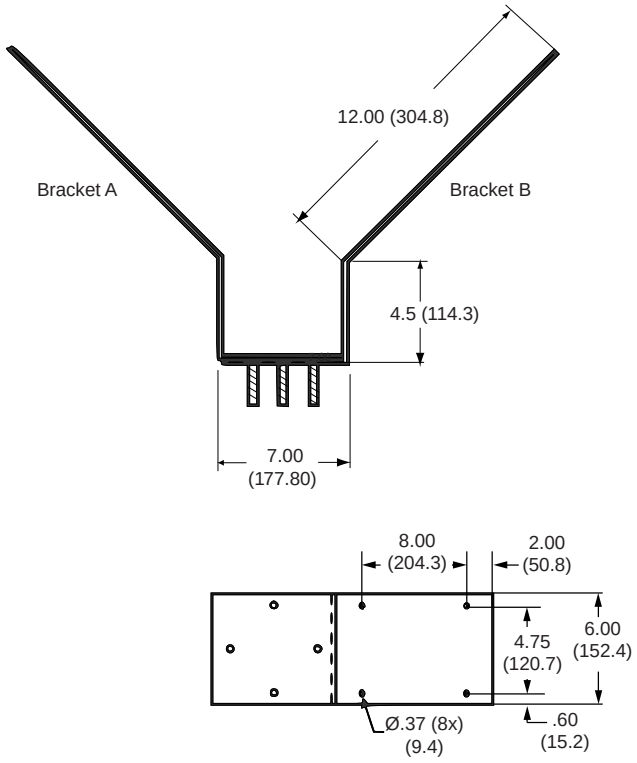


Figure 26. Installation to the Corner

A corner mount installation is similar to the wall mount installation except that the arm fastens to a corner mount bracket instead of directly to a wall. The sequence of installation can vary from site to site:

- Prepare the mounting surface - using the arm as a template, drill four mounting holes into each corner surface.
- Verify that the system cable has been properly routed to a location where the corner mount bracket will be attached. Plan the routing before doing any installation.
- Fasten the corner mount bracket to the structure with eight stainless steel fasteners of a suitable size (not supplied).
- Attach the adapter plate to the wall mount arm with the four 1/4-20 SS screws (supplied).
- Position the Camera on the arm adapter plate and secure it with the 1/4-inch hardware (supplied). Bolts must not protrude through the Camera base plate by more than 0.1 inch. More than this would jam the bolts into the Camera housing.
- Route the Camera pigtail cable down into the arm and out the hole at the bottom near the back. Note that plastic plugs can be removed to aid in this process.
- Pull the system cable back so the arm can be slid over the corner mount threaded studs.
- Install 5/16-inch SS washers and nuts to secure the arm to the bracket.
- Apply sealant around the bolt holes between the mount adapter and the mounting surface.
- Verify that the Camera will have a full range of movement without striking any nearby structures.
- Refer to Section 4 to set up and check out the Camera.

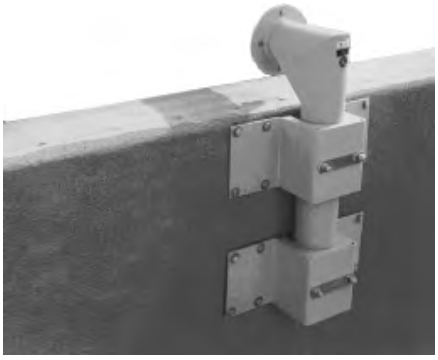


Note: Studs in bracket A are inserted in holes of bracket B

Figure 27. Dimensions, Corner Mount. Dimensions in inches and (mm)
(CohuHD p/n 7411425-001)

3.6 Parapet Mount Installation. CohuHD p/n 8503-2. (PARP)

The parapet mount (see Figure 28) is used when a camera positioning system needs to be positioned anywhere on a parapet, including corners. See Figure 30 for dimensions.



Parapet Mount

The parapet mount:

- installs on the inside of a parapet that is at least 18 inches (45.72 cm) high
- has sixteen 0.37 diameter holes for mounting to a parapet with fasteners of a suitable size. Fasteners are not supplied
- has a 3.5-inch diameter feedthrough hole for an 18 pin connector
- is rotatable 360° so the camera positioning system can be installed from the roof
- is designed to be used with a wall mount arm. The wall mount arm bolts to the parapet mount with 5/16-inch hardware.
- supports up to 75 lb (34 kg) when used with the wall mount set
- weighs (without wall mount brackets) 10 lb (4.5 kg)

The following table 10 contains items supplied for mounting a camera positioning system on a parapet:

Table 10. Items Supplied to Mount 3960^{HD}/3960^{SD} /5970^{SD} to the Parapet

№	Description	Amount	CohuHD p/n	Characteristics
1	Parapet Mount Adapter Assembly consists of items : • Tube Assembly (1) • Wall Mounting Brackets (2) • U Bolts , 5/16-18-UNC x 3.5”L (2) • Hex Nuts, 5/16-18-UNC (4)	1	7411426-001	Mounts to the inside of a parapet wall with sixteen fasteners of a suitable size - min 1/4” DIA (not supplied). See Figure 19
2	Wall Mount	1	7411417-001	Bolts to the parapet mount flange with 5/16-inch hardware
3	Wall Mount Hardware: • Bolt, Hex Head, 5/16-18x1½”L, SS • Washer, Flat 5/16, SS • Washer, Spring Lock 5/16, SS • Nut, Hex, 5/16-18, SS	 4 8 4 4	 2010730-002 2010731-003 2010732-003 2010735-001	5/16-inch hardware is used to bolt a wall mount to the parapet mount flange
4	Mount Adapter Supplied with hardware: • Screw, 1/4-20 (4)	1	7411418-001	Bolts a mount adapter to the wall mount with 1/4 -inch screws
5	Camera Base Hardware: • Bolt, Hex Head 1/4-20x3/4”L, SS • Washer, Spring Lock 1/4”, SS • Washer, Flat 1/4”, SS	 4 4 4	 2010730-004 2010732-002 2010731-002	1/4-inch hardware is used to bolt a camera base to the mount adapter

Below are general steps to be followed for a parapet mount installation. Some sites might require additional special steps not listed:

- Verify that the system cable has been properly routed to a location where the parapet mount adapter will be attached. Plan the routing before doing any installation.
- Fasten the parapet mount adapter to the structure (see Figure 29) in accordance with instructions:
    1. Slip the wall mounting brackets onto the tube assembly. The bracket with the strap on the lower end is installed last. Seat the bottom of the tube against the strap and snug the U bolt.
    2. Hold the adapter mount against the parapet and position it as far down as possible so that the 6-inch flange clears the top of the parapet by one or two inches.
    3. Slide the top bracket up to the edge of the parapet (or as close to the edge as practical) and anchor the fasteners securely. Snug the U bolt and mark the drill pattern. The top bracket should be as close to the edge as practical.
    4. Drill holes, insert fasteners, and secure to parapet.
    5. After the parapet mount is securely attached to the parapet, loosen both U bolts and swirl the tube.
- Apply sealant around the bolt holes between the mount and the mounting surface.
- Attach the adapter plate to the wall mount arm with the four 1/4-20 SS screws (supplied).
- Remove plastic plugs on the arm and route the Camera pigtail cable down into the arm and out the back.
- Position the Camera on the arm adapter plate and secure it with the 1/4-inch SS hardware (supplied). Bolts must not protrude through the Camera base plate by more than 0.1 inch. More than this would jam the bolts into the Camera housing.

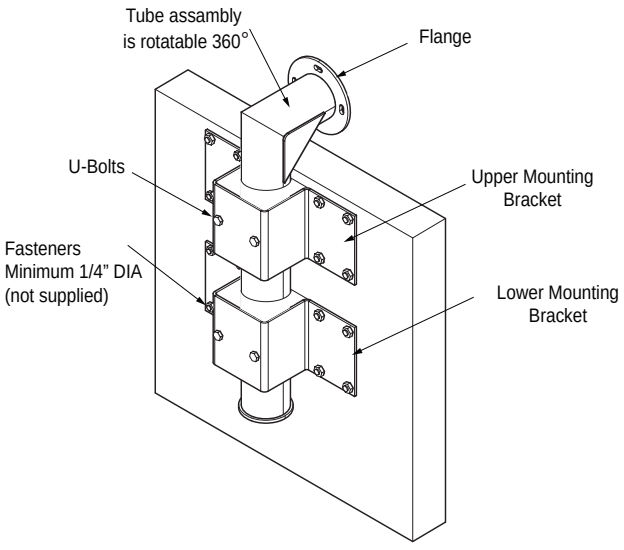


Figure 28. Parapet Mount Installation

- Connect the pigtail connector to the system cable connector.
- Pull the system cable back so the arm can be slid over the parapet mount threaded studs.
- Install 5/16-inch SS washers and nuts to secure the arm to the bracket.
- Loosen both U bolts so that the tube can swirl freely.
- Rotate the Camera over the parapet and lock securely into position by tightening two U bolts.
- Verify that the Camera will have a full range of movement without striking any nearby structures.
- Refer to Section 4 to set up and check out the Camera.

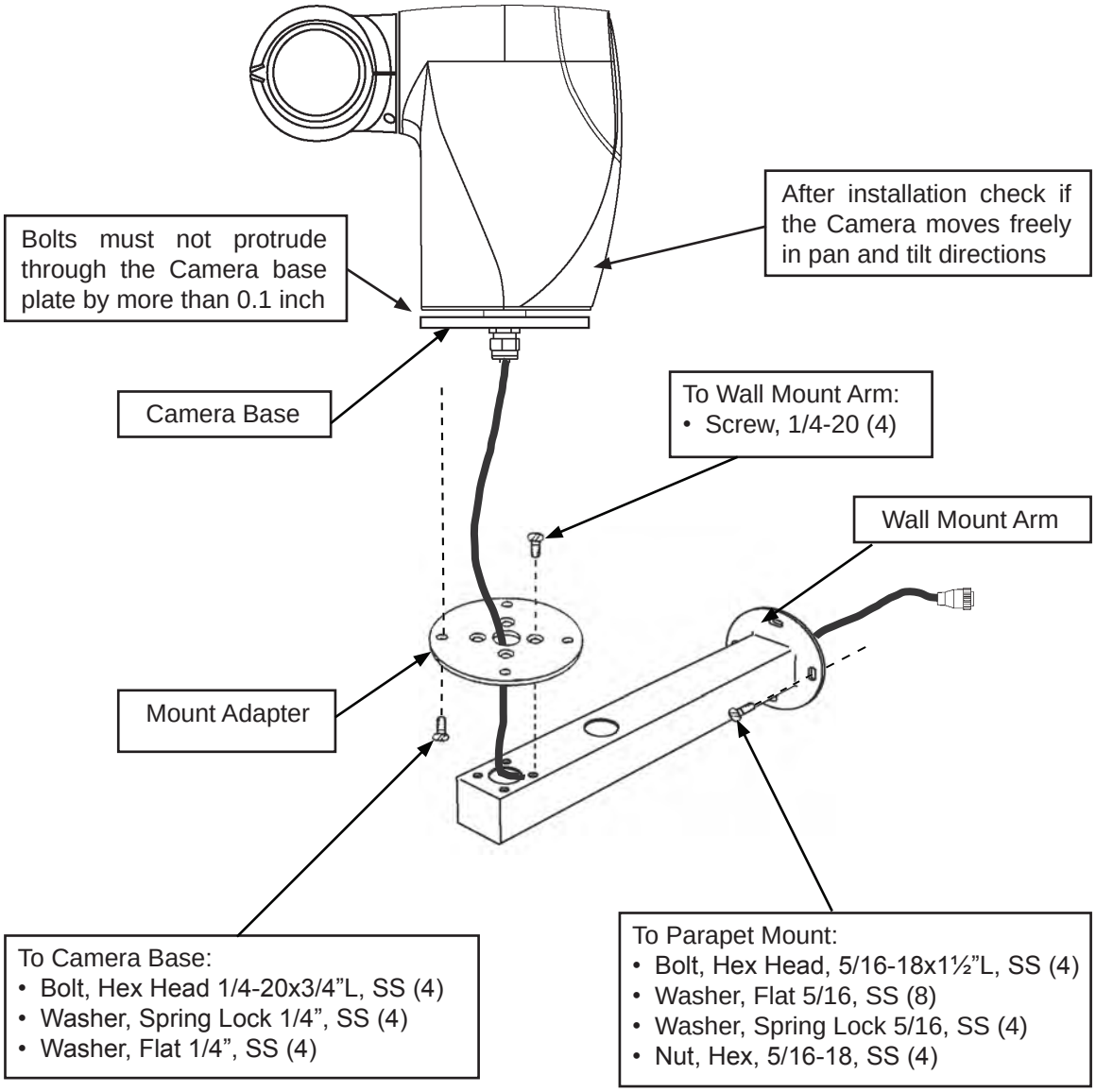


Figure 29. Installation to the Parapet

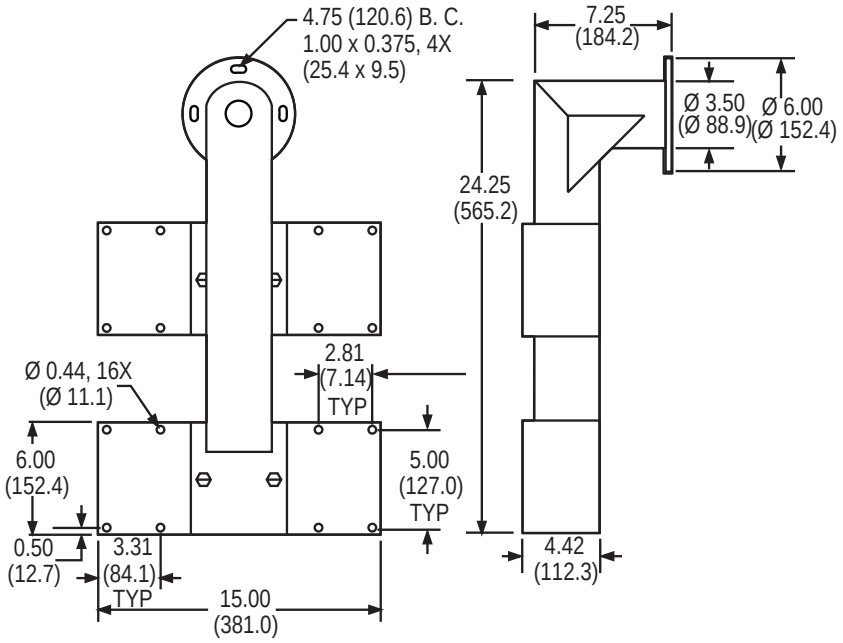


Figure 30. Dimensions, Parapet Mount. Dimensions in inches (mm)
CohuHD p/n 7411426-001

3.7 Overall Dimensions

NOTE: Dashed lines show minimum clearance required for pan movement.

3960HD/3960SD Series

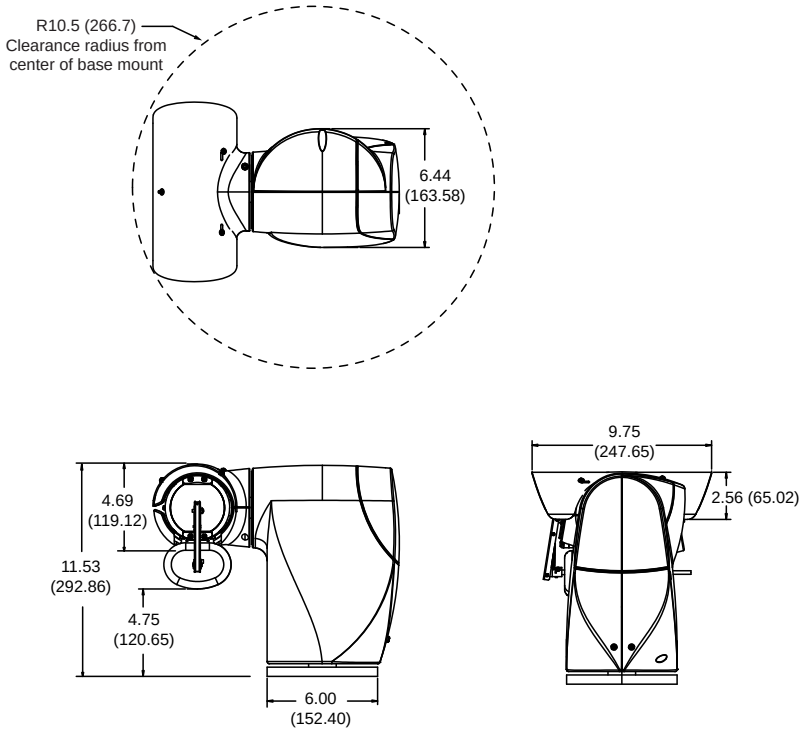


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Figure 31. Dimensions, 3960HD /3960SD series with optional wiper.
Dimensions in inches (mm)

5970SD Series

Depending on lens size the 5970SD Camera has two different overall dimensions. See Figures 32 and 33.

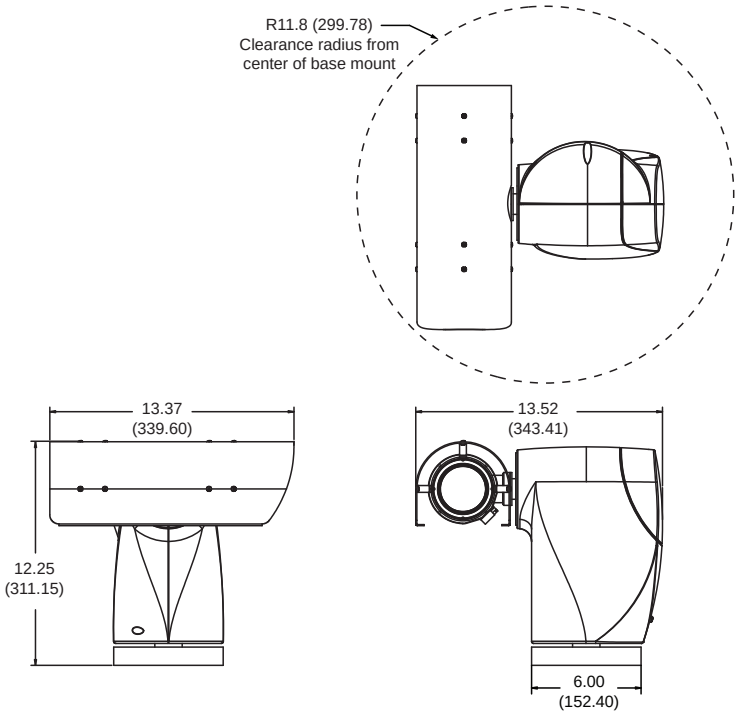


Figure 32. Dimensions, 5970SD, for Camera with 100 mm lens.
Dimensions in inches (mm)

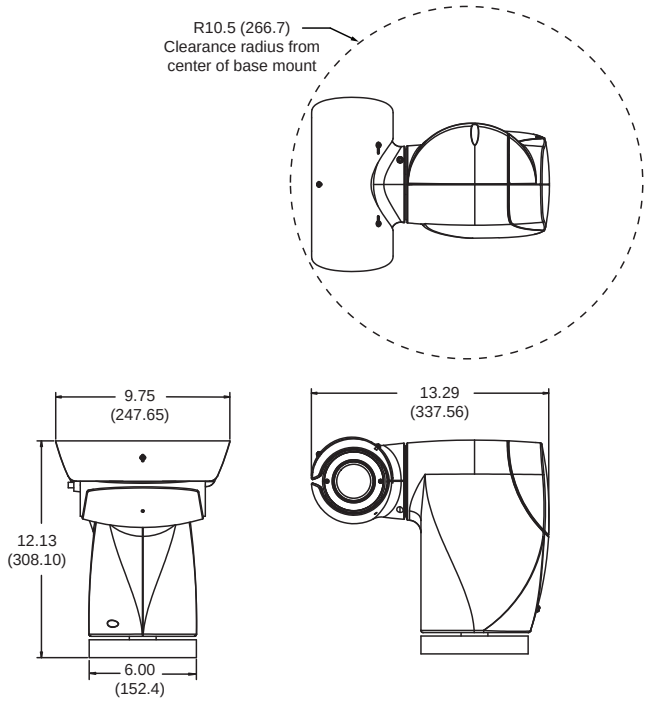


Figure 33. Dimensions, 5970SD, for camera system with other than 100 mm lens.
Dimensions in inches (mm)

4.0 Quick Check

NOTE: *All graphics contained within this document, including screenshots and other displays, are for reference use only and are subject to change.*

In order to test the camera system you need the following items:

- Laptop or desktop computer (for computer requirements see Section 4.1)
- 100/1000BASE-T network card installed in your computer
- Microsoft Internet Explorer, version 8 or 9
- 100/1000BASE-T network switch
- CAT5e cable

4.1 Computer Requirements

- Operating System: Windows XP Service Pack 3 (SP3) or newer
- CPU: Intel i7-860S 2.53 GHz or better
- Memory: 4GB DDR3@1066MHz or better
- Hard Drive: 7200 rpm - minimum speed
- Video Card: NVIDIA® GeForce® 9800 GTX+ with 512 MB RAM or better, or high-end ATI Radeon™ HD series
- Monitor: LCD monitor with 1920 x 1080 or better resolution
- Web Browser: Microsoft Internet Explorer, version 8 or 9

4.2 IP Control and Viewing of Camera

Installation and testing of the camera system can be performed with the built-in Helios Web Interface application. The Helios Web Interface is designed to work with Internet Explorer (IE) 8 or 9. To view video properly in the web interface the signed ActiveX control must be installed in the 32-bit Microsoft® Internet Explorer® (IE) 8 or 9. If ActiveX is not already installed on your computer, you will be prompted to install it the first time you access the camera system.

- Allow the camera system to install Signed ActiveX® control before connecting to the camera system.

4.3 Factory Default IP Address and Settings

The camera is shipped with:

- IP Address - 192.168.2.150
- Subnet mask - 255.255.0.0
- Gateway - 192.168.2.1

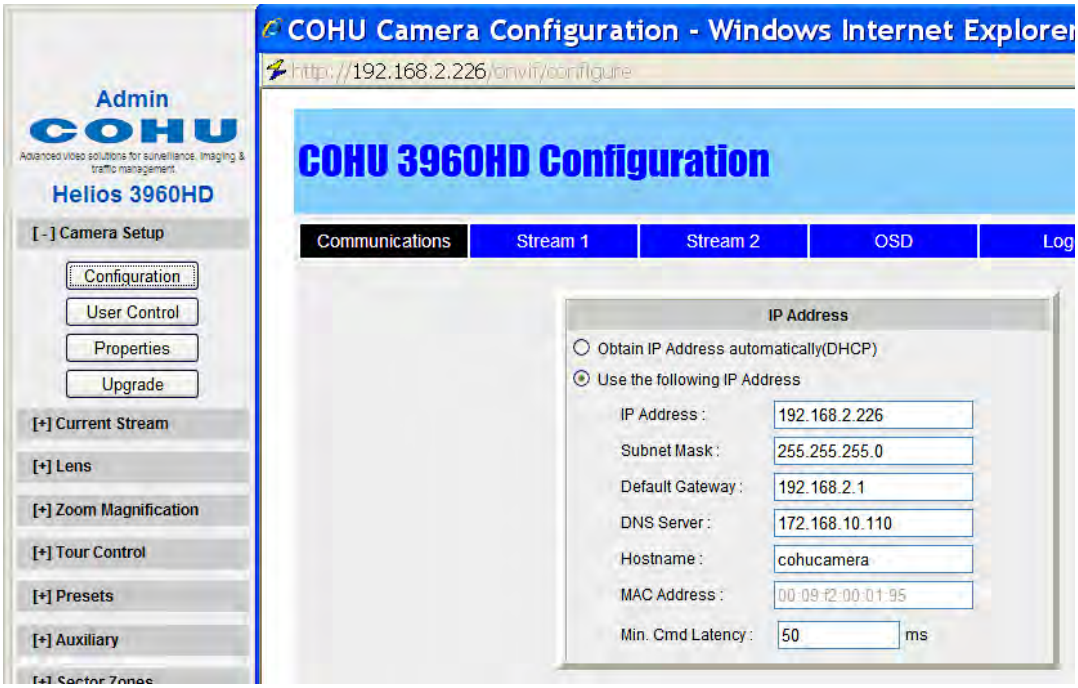
4.4 Factory Default User Names and Passwords

- Admin - Camera, case-sensitive
- Priv - No password
- User - No password
- Guest - No password

4.5 Assigning the New Camera IP Address

No two devices on a single Ethernet network can have the same IP address. Use the following steps to change a camera IP address before a second camera is added to the subnet.

- Set your computer IP address to the same subnet as the camera IP address.



IMPORTANT: In order to make changes in camera configuration the user must be logged in as Administrator.

- Change the camera address. The camera address can be changed manually or through a Dynamic Host Configuration Protocol (DHCP) server. See Operation Manual 6x-1090.
  - Click the camera Setup button.
  - Click the Configuration button.
  - Click the Communication tab.

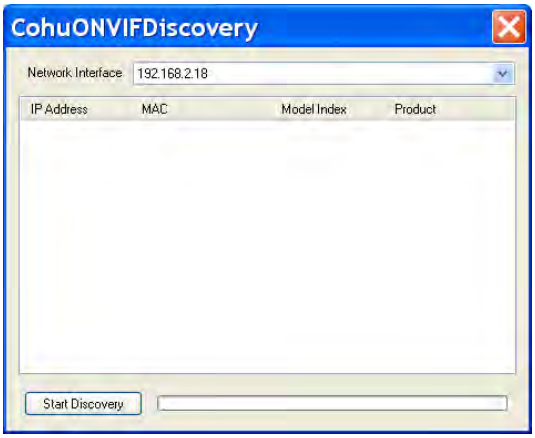
The Communications tab is used for performing network configuration of the camera. Changes to this tab can only be made by the Admin account. Care must be taken when modifying parameters on this page as the changes can make the camera inaccessible through the network. Consult with your network administrator before starting to assign new network settings to ensure that your camera won't conflict with other devices.

- Write down the new camera address to make the camera easy to find later. If the camera IP address becomes lost, use the CohuONVIFDiscovery software to find the camera on a network. The software is available as a free download at *http://www.cohu-cameras.com/content/downloads.* Under *Software & Protocol Downloads* see *Setup & Test Applications.* At *Helios and 7500 Camera Series Discovery Tool* click "download here." See Section 4.6.

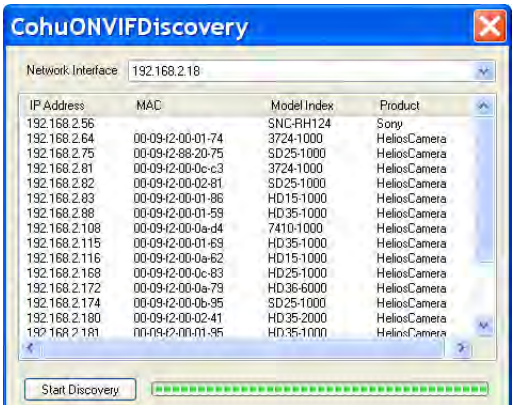
4.6 Using the CohuONVIFDiscovery Software to Discover the Camera

- Download the software. See Section 4.5. Run the CohuONVIFDiscovery.exe file. Click to start it.
- The CohuONVIFDiscovery window will be displayed.

NOTE: Auto discovery feature uses network multicast packets and may not work through network routers.

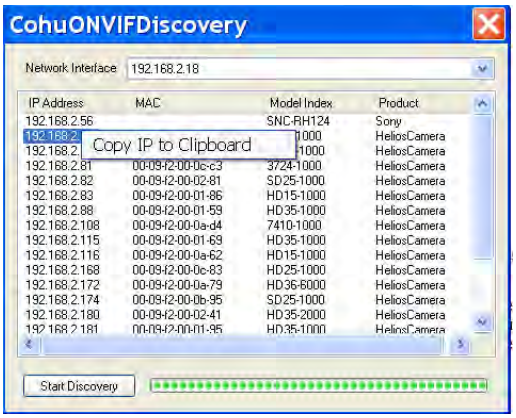


- Click on the “Start Discovery” button. A list of cameras will be automatically displayed.



NOTE: Use the MAC Address or Model Index to identify CohuHD cameras. “00-09-f2” identifies cameras as CohuHD cameras. The MAC address of the camera is on the serial number label.

- Right click a camera entry. Click Copy IP to Clipboard.



NOTE: The CohuONVIFDiscovery software uses the ONVIF device discovery service. If the ONVIF discovery service is disabled, the CohuONVIFDiscovery software will not find the camera.

4.7 Checkout Procedure

When power is applied to the camera system the initialization process begins. All CohuHD cameras initialize on power-up using stored default parameters in the camera's non-volatile memory. The default IP address assigned to the cameras at the factory is 192.168.2.150. For information on accessing the camera using the Helios Web Interface see Operation Manual 6x-1090.

If the camera system does not operate when power is applied, check for:

- Proper input voltage
- Proper cable connections

After communication with the camera has been established and the video stream has been started, various functions must be tested to verify proper operation (e.g. pan/tilt/zoom).

For more detailed information on operation and configuration see Operation Manual 6x-1090. Contact the Customer Service Department for technical assistance.

5.0 Maintenance

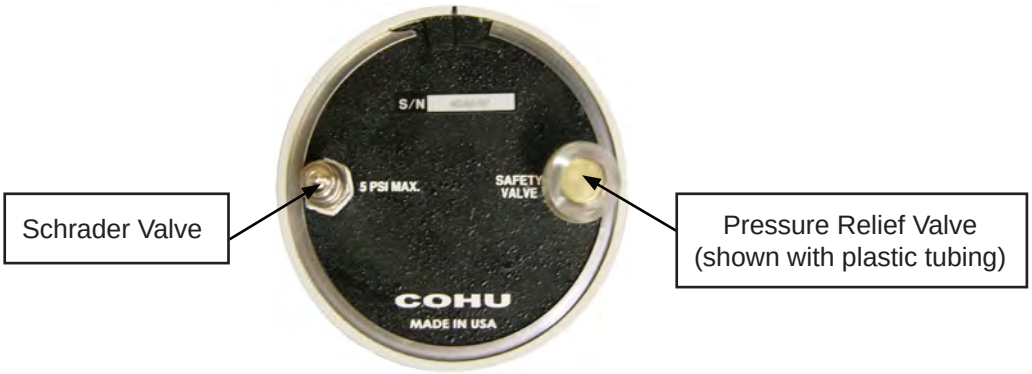
The system is intended for long-term unattended use and the maintenance requirements are minimal:

- Clean positioner exterior as needed.
- Periodically check cables for deterioration and connectors for corrosion.
- **Applies to 3960^{HD}/3960^{SD}:** Clean the front window on the camera head as needed. Use soft non-abrasive cloth like terry cloth or microfiber cloth and a foaming glass cleaner. If present, clean the wiper blade and inspect it. Replace the blade if necessary.
- **Applies to 5970^{SD} :** Clean the lens on the camera head as needed. Use Reagent Grade Acetone or Methanol to wet lens tissue and gently wipe the surface. Do not use water or any abrasives.
- **Applies to 3960^{HD}/3960^{SD}**: Check pressure periodically. Occasional pressurization of the camera housing may be required. See Section 5.1 for more details. Pressure can be checked remotely via the Web Browser by enabling the OSD (On-Screen Display) setup. (Setup > Configuration > OSD> OSDSetup > Enable.) See Operation Manual 6x-1090.

5.1 Camera Head Housing Pressurization. (Applies to 3960^{HD}/3960^{SD})

Before shipping from the factory dry packs of desiccant are secured inside the camera housing. The housing is then sealed and purged with dry nitrogen to remove moist air from inside the housing. The purging process provides an internal relative humidity of five percent or less. The camera housing is then pressurized to approximately 5 -7 psi (pound per square inch) and tested for leaks.

If the camera head housing pressure drops to zero over a period of days, it is likely that a seal is leaking and the camera system should be returned for servicing.



Rear Plate

NOTE: It is not recommended to pressurize the camera head to greater than 5 psi. In operation, pressure variation between 0.1-10 psi is normal, due to temperature variation and other factors.

5.1.1 Schrader Valve

The Schrader Valve is used to pressurize the housing. To maintain pressure in the barrel, add dry nitrogen to approximately 5 psi (34 kPa).

5.1.2 Pressure Relief Valve

The Pressure Relief Valve limits the maximum pressure in the camera head to approximately 20 psi (138 kPa).

IMPORTANT: Due to high temperature, high altitude, or other reasons, the pressure inside the camera head may increase. The pressure relief valve opens when pressure rises above 20 psi (138 kPa), allowing excess internal pressure to bleed off. After the camera system returns to normal conditions, the internal pressure must be checked and the camera housing must be pressurized with dry nitrogen to bring the pressure back to approximately 5 psi +/- 1 psi. See Section 5.1.3 for pressurization procedure.

5.1.3 Pressurizing Procedure

The following items are required for pressurizing:

- A tank of dry nitrogen with a regulator
- A hose with an air chuck to connect to the Schrader valve

NOTE: Preferred gas for pressurization is dry nitrogen. Argon is an acceptable substitute. Do not use compressed air, as it may contain oil, moisture, or other contaminants.

Below are steps for recharging the camera housing:

1. Set the regulator gauge to approximately 7-10 psi. (A regulator kit ER2914 is available for purchase.)
2. Remove the plastic tubing from the pressure relief valve if purge is required.
3. Remove the cap from the Schrader valve, place the air chuck on the Schrader valve and fill the housing with nitrogen.
4. Carefully lift the poppet on the pressure relief valve and purge the camera housing with dry nitrogen for a minimum of one minute by manually lifting the relief valve on the rear plate while injecting the dry nitrogen into the Schrader valve.

CAUTION: Do not use a sharp object to open the pressure relief valve. Use care to avoid damage or contamination of the valve seat.

5. Remove the air chuck and verify with a pressure gauge that the pressure is 5 psi +/- 1 psi. Press the pin in the center of the Schrader valve to release extra pressure from the barrel if needed.
6. Firmly install the cap on the Schrader valve to get a good seat. Cap is required for a proper seal.
7. Install the tubing back on the pressure relief valve if it was removed.

5.2 Wiper Unit

(Applies to 3960HD/3960SD)

3960HD/3960SD are available with a wiper blade option to keep the Camera head window clear in inclement weather. The wiper design allows for easy replacement of the wiper blade or wiper arm.

5.2.1 Wiper Blade Replacement, CohuHD p/n 8157-9

To replace a worn or deteriorated wiper blade, use table 11 with CohuHD part numbers for a replacement:

Table 11. Wiper Blade Replacement Kit. CohuHD p/n 8157-9

№	Description	CohuHD p/n	Characteristics
1	Wiper Blade Replacement Kit Kit consists of: • Wiper Blade Assembly (1) • Screw, Socket Head, Nylon Lock Patch, SS 2-56 x 1/2”L (1) • Lock Nut, Hex, Nonmetallic Insert, 2-56 THD (1)	8157-9 8139078-001 0310232-004 0310003-007	2-56 hardware is used to attach a wiper blade to the wiper arm

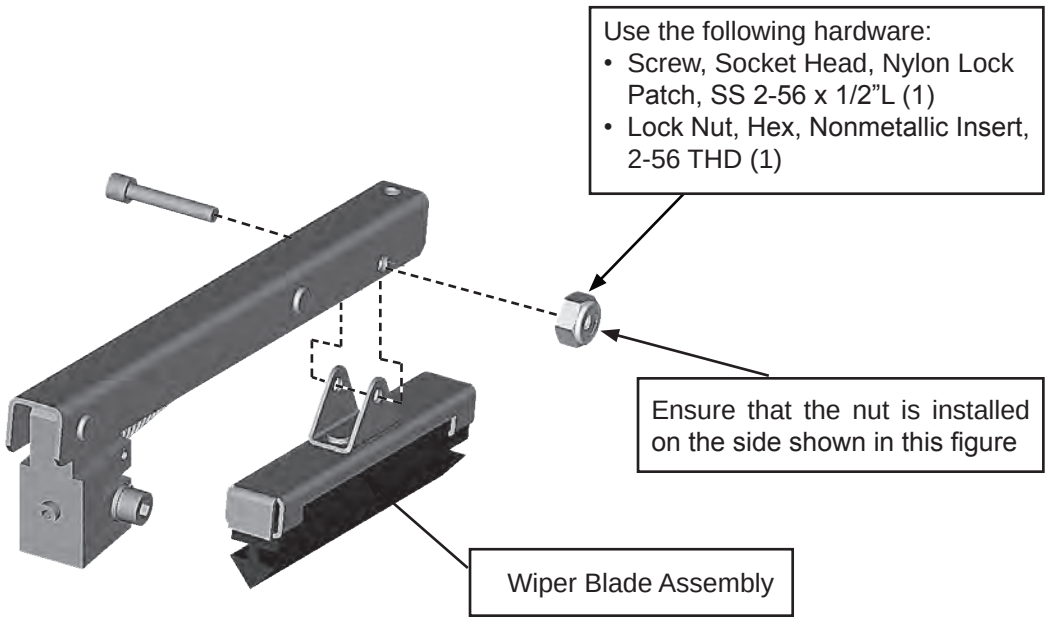


Figure 34. Wiper Blade Replacement

Suggested hex wrench tool:

- 5/64 - inch

Below are steps for replacing the wiper blade:

- switch off the power
- note the free play of the wiper blade on the arm
- replace the blade using 2-56 hardware (see Figure 34) verify that the new wiper blade assembly has free movement on the arm. If not, loosen the screw and check again for free movement

NOTE: Ensure that the nut is installed on the side shown in Figure 34.

CAUTION: Be careful not to scratch the glass.

- position the arm with the blade to the right edge of the Camera window (see Figure 35)
- check to ensure that the wiper arm works properly. When the power is on, the wiper blade must go all the way across the window face.

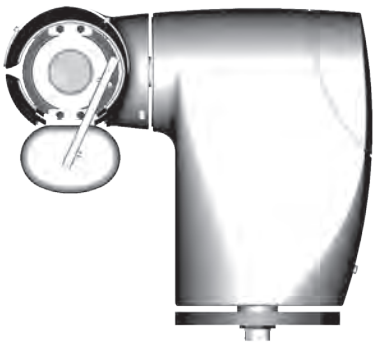


Figure 35.
Wiper Blade Replacement

5.2.2 Wiper Arm Replacement. CohuHD p/n 8208-3

To replace a wiper arm, use table 12 with CohuHD part numbers:

Table 12. Wiper Arm Assembly. CohuHD p/n 8208-3

№	Description	CohuHD p/n	Characteristics
1	Wiper Arm Assembly The following hardware is a part of the wiper arm assembly: • Screw, Socket Head, Nylon Lock Patch, SS 4-40 x 3/8”L • Washer, Spring Lock, SS, #4 • Set Screw, Headless, SS, 4-40 x 1/8”L	8208-3 0310232-010 2010732-004 2010345-020	 Hardware attaches wiper arm to the wiper shaft on the wiper unit

Suggested hex wrench tools:

- 0.050 - inch and
- 3/32 - inch

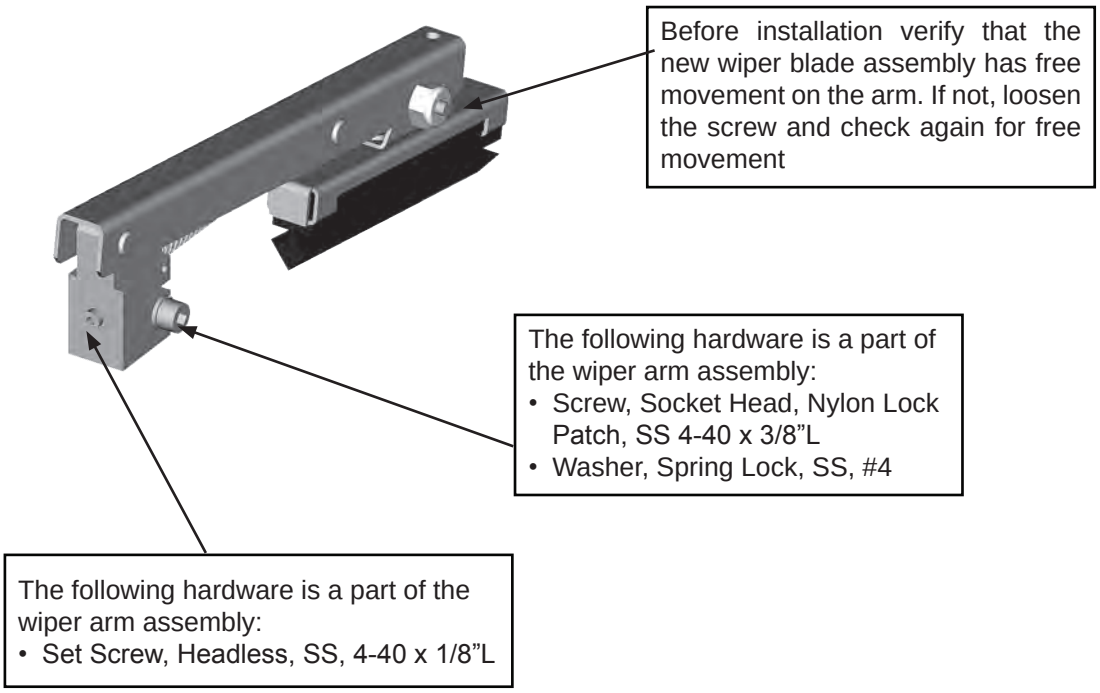


Figure 36. Wiper Arm Replacement

Below are steps for replacing the wiper arm:

NOTE: Before installation verify that the new wiper blade assembly has free movement on the arm. If not, loosen the screw and check again for free movement

- switch off the power
- loosen socket screw and set screw on the old arm
- loosen socket screw and set screw on the new arm
- replace the arm
- tighten both screws on the new arm
- position the arm to the right edge of the Camera window. See Figure 35.
- check to ensure that the wiper arm works properly. When the power is on, the wiper blade must go all the way across the window face.

6.0 Warranty

Please refer to the CohuHD website for product warranty information:

http://www.CohuHD.com/warranty/WarrantyStatement.pdf.

Revision History		
Revision	Date	Comments
Rev Z1	11/17/09	• preliminary
Rev A	03/08/10	• added system cables schematics, pp. 19 - 22 • new Camera base design, pp. 27-29 • pp. 2, 51 are revised
Rev B	05/11/10	• figs. 1, 2, 10, 10a, 11, 11a and tables 9, 10 are revised - ECO 030607, 030608 • pp. 5, 10, 18-24 are revised - the word “prefabricated” changed to “Cohu Manufactured” • p 7 - operating power 120 Vac was changed to 115 Vac • pp. 2, 3, 6, 51 are revised - new website links
Rev C	8/02/10	• the manual is revised to add 3960^{SD} series
Rev D	11/08/11	• the manual is revised to add 5970^{SD} series. See ECO 031117 for the list of changes
Rev E	7/12/12	• the manual is revised to comply with the latest engineering requirement: Chapter 5 was rewritten, contact info was replaced with a link to the website
Rev F	7/15/14	• the manual is revised to change company name