



# BOSCH

Precision Engineered Opto-Electronics™

## INSTALLATION INSTRUCTIONS

### EX10 Waterproof Camera



MAN-10-05

## **IMPORTANT SAFETY INSTRUCTIONS**

1. Read these instructions.
2. Keep this instruction.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with manufacturer instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If

the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the power where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in a way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



## IMPORTANT

For best results, please read this Instruction Booklet prior to installing the EX10 camera.


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## WARNING !

CSA Certified / UL Listed CLASS 2 power adaptors must be used in order to comply with electrical safety standards.

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Made in Canada		Certified to:	
<b>12 Vdc, 10W(max)</b>	c	UL 50 / UL 2044	CSA C22.2 No. 0-M1991
<b>24 Vac, 60 Hz, 10 W(max)</b>	189936	US CSA C22.2 No. 1-M94	CSA C22.2 No. 94-M91
		CSA Type 4X / NEMA 4X	CSA C22.2 No. 94-M91
		NEC Class 2 Limited Power Circuit See Installation Instructions For Proper Connections	



EU Directives covered by this declaration:

72/9/EC Low Voltage Directives

89/336/EEC Electromagnetic Compatibility Directive

Only qualified personnel shall install any **Bosch Security Systems, Inc.** camera.

**Bosch Security Systems, Inc.** will not be responsible for injuries or damages resulting from the improper installation or use of any product sold by **Bosch Security Systems, Inc** their agents, distributors or dealers.

*NOTE: This equipment has been tested and found to comply with the limits for a digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. As part of its' normal operation this device can generate radio frequency energy and if not installed and used in accordance with the installation manual may cause interference to radio communications. However, there is no guarantee that interference will not occur on a particular installation. If the device does cause interference to radio or television reception the user is encouraged to try to correct the interference by one or more of the following measures:*

*1) Fit Ferrite beads on all cable to and from the power supply box, within the box walls.*

*2) Route the composite cable between the camera and the power supply in steel conduit piping over the entire run of the cable up to and including connection to a deep conduit base fitted under the camera and a conduit fitting adaptor in the wall of the PSU box.*

*3) Contact BOSCH Service Center for further advice.*

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## DESCRIPTION

The **EX10** waterproof camera consists of a two-piece injection molded watertight housing with a tough polycarbonate viewing window.

This compact egg-shaped camera can be used for applications wherever environmentally sealed CCD cameras are required. The camera is especially suited for wash-down applications in food processing and industrial clean-room installations or very cold conditions.

The **EX10** can be ordered in monochrome or color versions. A rigid nylon mounting bracket is included with the camera, however, an optional metal U-bracket is also available.

A voltage regulator circuit automatically allows for *12V dc* or *24V ac* operation without any wiring changes. Its wider voltage range also provides protection from voltage surge, transient spikes, and reverse voltage.

The **EX10** is available in several models to meet individual requirements or specific needs.

## UNPACKING

Care should be taken when unpacking. Check the parts list and confirm all items have been located. Inspect the equipment thoroughly to ensure nothing was damaged in transit.

Contact BOSCH Service Center if a problem is noted, see the rear page of this booklet for contact numbers.

### **PARTS LIST** (items supplied with unit)

- *EX10* camera unit
- Installation Instructions booklet
- Mounting bracket

### **ITEMS REQUIRED FOR INSTALLATION**

(not supplied with unit)

- Small slotted screwdriver
- Philips screwdriver
- Hardware for camera mounting (screws, washers, etc.)



## INITIAL PREPARATIONS

- Determine the operating voltage at the installation site. The camera has been pre-wired for 12Vdc or 24V ac operation before shipment. *See Section 2 – Input Power Connections.*
- Determine the optimum location for the camera. *See Section 4 - Camera Mounting*
- All cameras have been tested prior to shipment. After the wiring has been reconnected, it is advisable to check the camera's operation before installation.

## GUIDELINES

The installation of the *EX10* camera is explained in Sections 1 to 4 listed below.

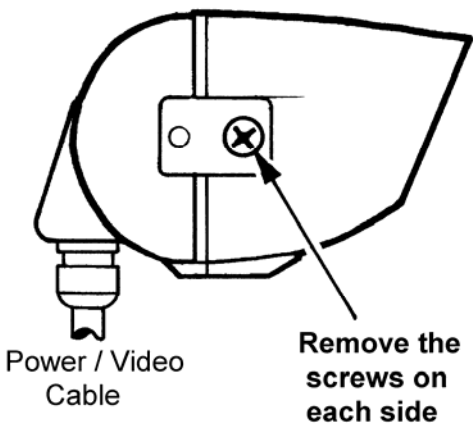
It is important that these steps are followed in sequence:

1. Housing Separation
2. Input Power Connections
3. Camera Re-Assembly
4. Camera Mounting

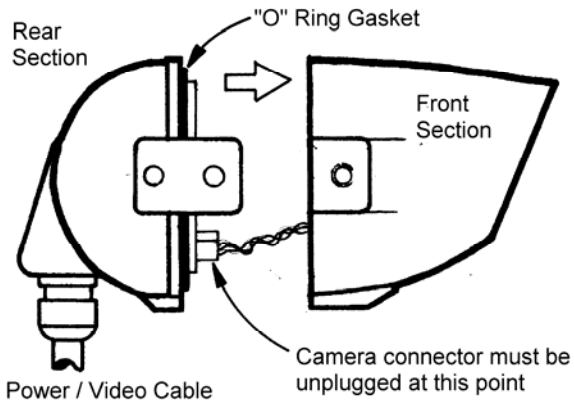
## 1. HOUSING SEPARATION

Separating the two halves of the camera housing allows access to the Voltage Regulator Board (VRB) and camera. This is only used as a reference since all the settings are preset at the factory.

- Step 1.1 - Remove the two housing screws located on each side of the *EX10* camera housing.  
Refer to **Figure 1-1** on page 5.
- Step 1.2 - Slide both sections of the housing apart without damaging the camera connecting leads. Disconnect the camera connector to completely separate the two halves of the housing. Ensure that the “O” ring gasket does not pull out of its groove during separation. If the gasket does separate, it is important that it is not lost. Re-insertion the gasket into the groove.  
Refer to **Figure 1-2** on page 6.



**FIGURE 1 – 1**  
**Housing**  
**Step 1.1 - Screw Removal**



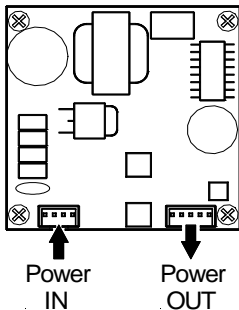
**FIGURE 1 – 2**  
**Housing**  
**Step 1.2 - Housing Separation**

## 2. INPUT POWER CONNECTIONS

The camera unit is pre-connected with an electrically isolated power board for 24V ac or 12V dc operation with no wiring change or wiring polarity. See **Figure 2-1** on page 7 for wiring details.

Note:

Input voltage is 10.5VDC to 40VDC for DC input.  
The AC input range is 12VAC to 28VAC.



**FIGURE 2 - 1**  
**12VDC or 24VAC**  
***Electrically Isolated Board***

### 3. CAMERA RE-ASSEMBLY

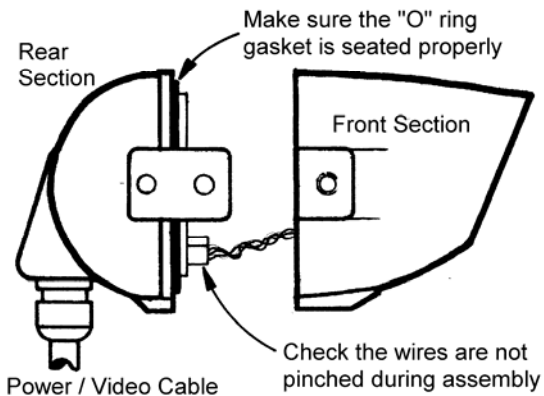
Make sure all wires are properly connected and tightened into the terminal blocks as explained in *Section 2*.

Step 3.1 - Check that the orange “O” ring gasket in the rear half of the camera housing has not been dislodged or distorted.

Step 3.2 - Re-connect the camera wiring harness plug back into its connector on the Voltage Regulator Board.

Step 3.3 - Carefully slide the two halves of the camera housing together, making sure that the “O” ring gasket seats properly and the camera harness wires are not pinched.  
Refer to **Figure 3-1** on page 9.

Step 3.4 - Once the front and rear sections are mated, insert and tighten the housing screws into each side.



**FIGURE 3 – 1**  
**Camera Housing Re-assembly**  
**Steps 3.1, 3.2, 3.3**

## 4. CAMERA MOUNTING

*Caution:* The selected mounting location should not place the camera in a situation where its environmental specifications could be exceeded. See Section 6, page 15.

The supplied mounting bracket contains two holes for attachment to any suitable flat surface. The type of mounting hardware is dependent on the selected surface. e.g., wood, metal, plaster, gyproc, etc.

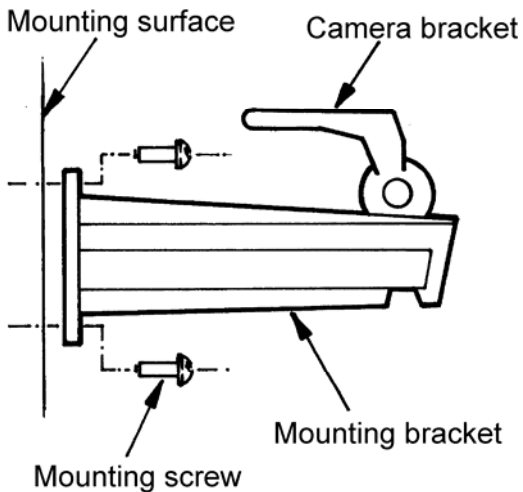
Refer to **Figure 4-1** on page 11.

Once the bracket has been secured, attach the camera housing to the adjustable camera bracket with the supplied mounting knob. Adjust for desired camera viewing angle and tighten the screw located at tip of the mounting bracket.

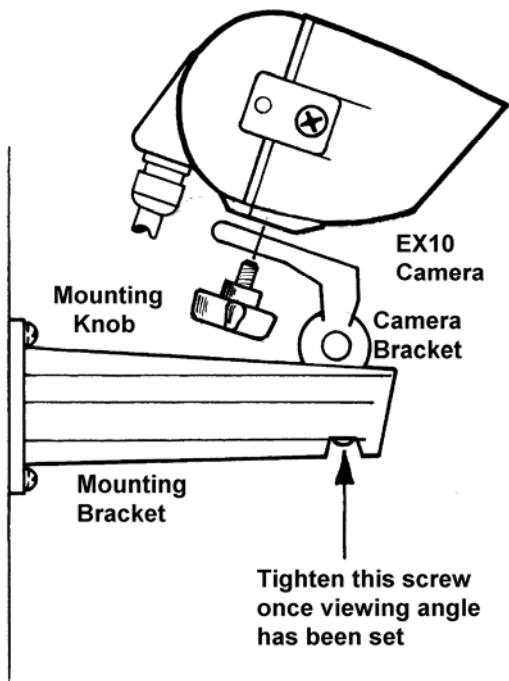
Refer to **Figure 4-2** on page 12.

Note: The power / video cable should be secured in a way that no undue stress is placed on the camera housing or its mounting bracket.





**FIGURE 4 – 1**  
**Mounting Bracket**



**FIGURE 4 – 2**  
**Camera mounting**

## 5. TROUBLESHOOTING GUIDE

<i>PROBLEM</i>	<i>POSSIBLE CAUSE</i>	<i>LIKELY SOLUTION</i>
<b>No Video</b>	<p>1. <u>Power Supply:</u> -Connections....</p> <p>-Voltage Range...</p> <p>2. <u>Video Connections:</u></p>	<p>Check input power connections at the cable leads. Check for loose wires.</p> <p>If connected to DC, check voltage input range of 10.5 – 40 V.</p> <p>If connected to AC, check input voltage range of 12 – 28 V.</p> <p>Measure the voltage at the circuit board's Input Power Connector.</p> <p>Determine if wiring polarity at "Video Connector" terminal block is correct. Check BNC Connector.</p>

<p><b>No Video</b> (cont'd.)</p>	<p>2. Video Connections: (cont'd.)</p>	<p>If still no video, connect the camera directly to the monitor. Check the video signal. If okay, the problem is with the interconnections. If still no video, contact BOSCH Service Center. See rear page of this manual for contact information.</p>
<p><b>Poor Picture Quality</b></p> <p>Snowy Image</p> <p>Horizontal Scan Lines, Rolling Up or Down.</p>	<p>Poor Video Signal</p> <p>Noisy Power Supply</p> <p>Ground Looping on 24V ac.</p>	<p>Ensure video cable is correctly matched and terminated with 75 ohms at each end. Make sure video cables are similar types.</p> <p>Check connections. Relocate or replace power supply.</p> <p>Check the coax cable shield is not touching ground, e.g. at couplings.</p>



**Note:**

**Note:**

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