



**BOSCH**

# **INSTALLATION INSTRUCTIONS**

**REG-D1**



**MAN-REG-D1-03**

## **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 **REG-D1** 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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This installation should be made by a qualified service person and conform to all local codes.

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



EU Directives covered by this declaration:

72/9/EC Low Voltage Directives

89/336/EEC Electromagnetic Compatibility Directive

*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 **REG-D1** license plate capture camera unit consists of one IR-sensitive monochrome camera, one integrated panel of Infrared LEDs, and one color overview camera. The license plate capture camera produces optimum license plate images during day and night settings in all-weather conditions. The camera has optical filtering technology that help block out unwanted ambient light such as headlamps or sunlight, thus ensuring no bloomed-out or washed-out images of the license plates.

The REG-D1 camera you have purchased is designed and configured to capture images of license plates under a wide range of ambient light to weather conditions.

The all-weather housing with a covert acrylic window contains all the electronics. Low voltage operation, low power consumption, LED illuminator, and solid-state CCD technology make this camera very reliable and efficient. A voltage regulator circuit allows for *DC* or *AC* operation between 12 and 24 VAC/VDC. It also provides protection from voltage surges, transient spikes, and reverse voltage.

# UNPACKING

Care should be taken when unpacking the shipped unit. 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)

- **REG-D1** camera assembly
- Installation Instructions booklet
- One 3mm Allen key

## **ITEMS REQUIRED FOR INSTALLATION** (not supplied with units)

- Mounting hardware
- Mounting tools
- Proper Power Supply



## INITIAL PREPARATIONS

- Determine the operating voltage at the installation site. The camera's Voltage Regulator Board accepts both 12-24VDC/VAC input without change to internal connections. See *Section 2, Input Power Connections*.
- Determine the optimum location for the camera. See *Section 3, Mounting Specification*.
- 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.

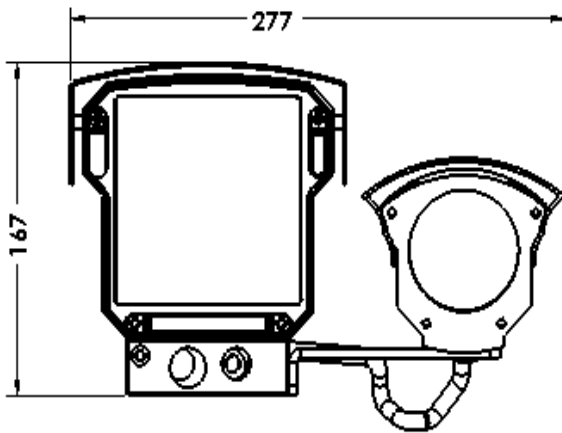
## GUIDELINES

The installation of the **REG-D1** camera is explained in Sections 1 to 3.

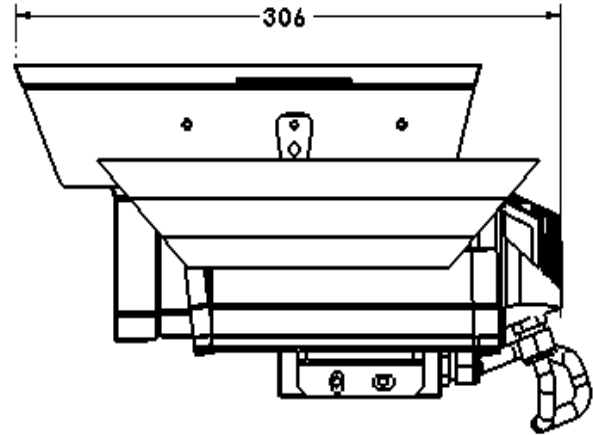
It is important that these steps are followed and to practice proper installation procedures with proper safety equipment.

# 1. MECHANICAL SPECIFICATIONS—REG D1

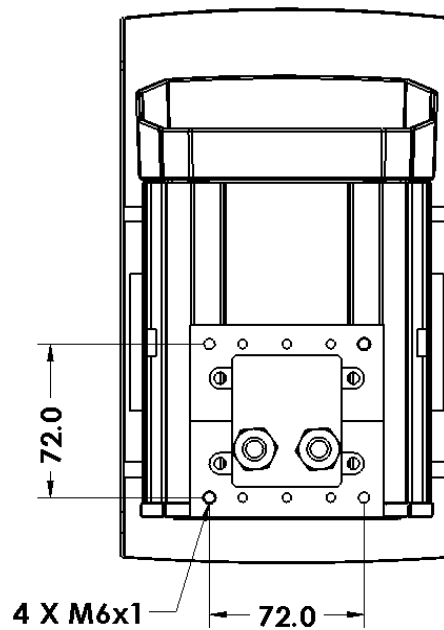
(See Section 6 - General Specifications, for more information)



Front View



Side View



Bottom View

\*Optional mounting kits: EXMB028 or EXMB029

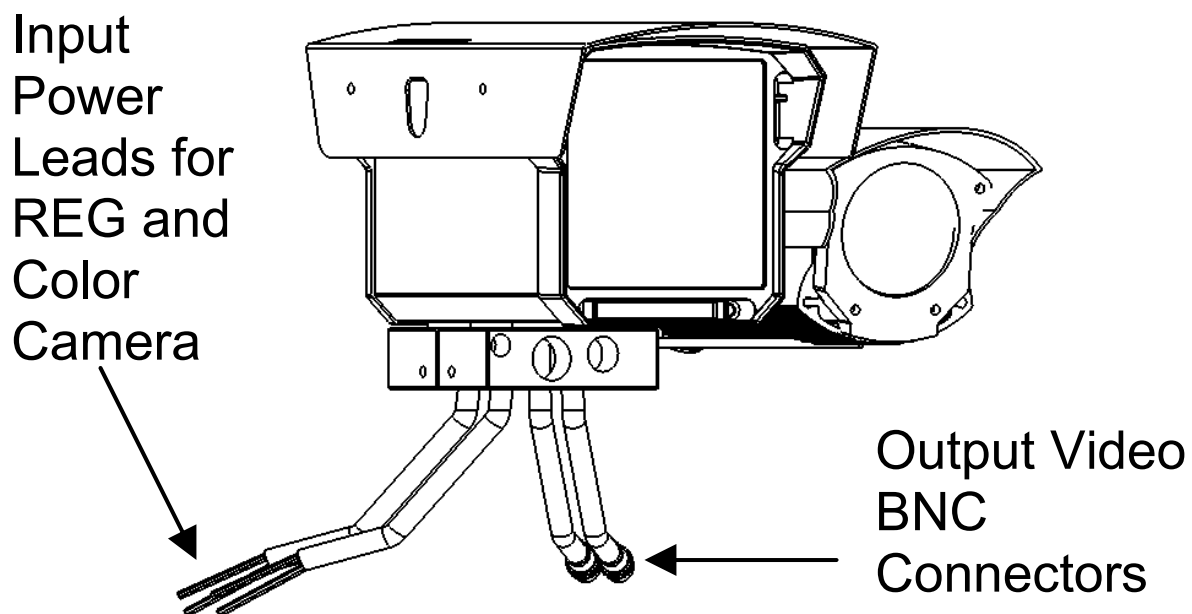
**Figure 1 General Mechanical Specifications**

## 2. INPUT POWER / VIDEO OUTPUT CONNECTIONS

The camera unit is pre-connected with a electrically isolated power board for 12 to 24 VDC/VAC operation with no wiring change or wiring polarity.

Note:

Input voltage is 12VDC to 24VDC for DC input.  
The AC input range is 12VAC to 24VAC.



***Figure 2 Power and Video Connections***

### 3. MOUNTING SPECIFICATION

*Caution: Install with appropriate screws to suit mounting surface. Select a suitable location that is protected from accidental damage, tampering and environmental conditions exceeding the camera's specifications.  
See page 20.*

*Caution: Ensure the selected location is protected from falling objects, accidental contact with moving objects, and unintentional interference from personnel. Follow all applicable building codes.*

☞ The following installation guidelines must be followed:

- Locate the camera such that it cannot be easily interfered with, either intentionally or accidentally.
- Select a mounting surface capable of supporting the combined weight of the camera and mounting hardware under all expected conditions of vibration and temperature.
- Secure all cabling.

The REG-D1 units have a recommended operation range with specified optimal capture distance for each model as shown below. Any number plate recognition installation should aim to control the traffic through a lane.

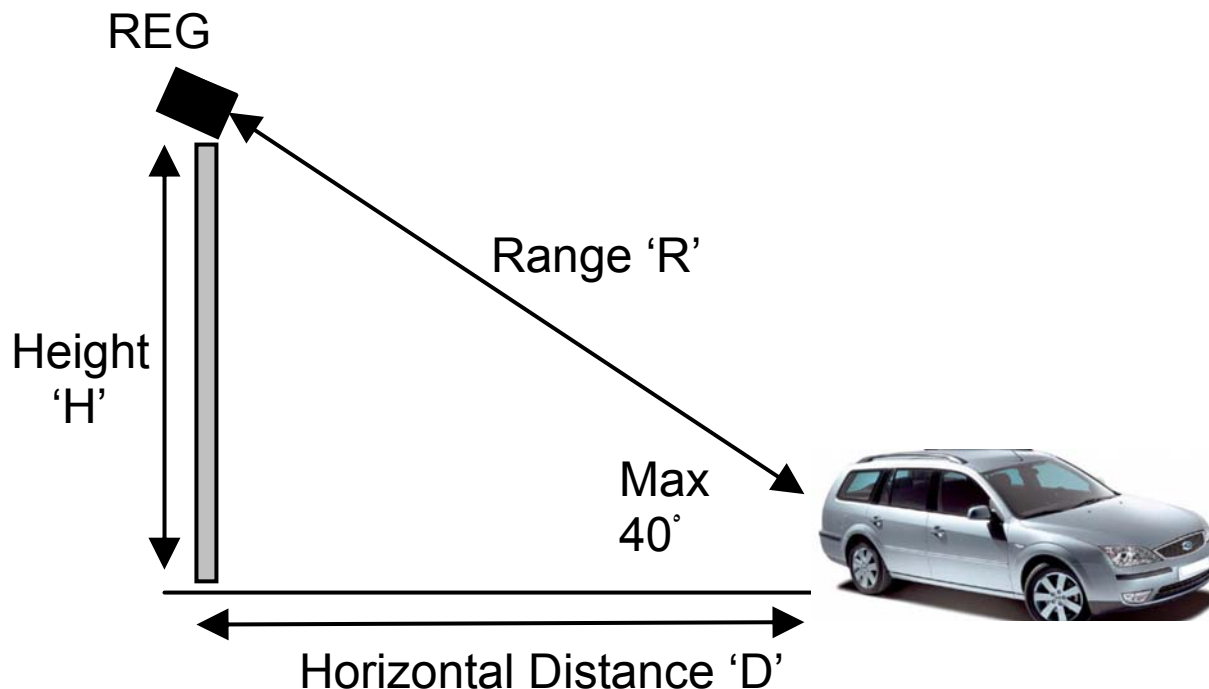
<b>Model</b>	<b>Range, 'R'</b>	<b>Optimal Distance*</b>
REG-D1-816	12 – 22 ft   3.7 – 6.7 m	16 ft   4.9 m
REG-D1-825	20 – 34 ft   6.1 – 10.4 m	25 ft   7.6 m
REG-D1-835	27 ft – 48 ft   8.2 – 14.6 m	35 ft   10.7 m
REG-D1-850	40 ft – 68 ft   12.2 – 20.7 m	50 ft   15.2 m
REG-D1-875	55 ft – 80 ft   16.8 – 24.4 m	75 ft   22.9 m
ranges for use with number plates of size 12in x 6in (305mm x 152mm) – common in North America.		

<b>Model</b>	<b>Range, 'R'</b>	<b>Optimal Distance*</b>
REG-D1-812	10 – 20 ft   3 – 6 m	16 ft   5 m
REG-D1-816	16 – 26 ft   5 – 8 m	23 ft   7 m
REG-D1-825	23 – 40 ft   7 – 12 m	33 ft   10 m
REG-D1-835	34 – 60 ft   11 – 18 m	50 ft   15 m
REG-D1-850	56 – 82 ft   17 – 25 m	72 ft   22 m
REG-D1-875	72 – 100 ft   22 – 30 m	92 ft   28 m
ranges for use with number plates of size 20.6in x 4.4in (524mm x 112mm) – common in the UK.		

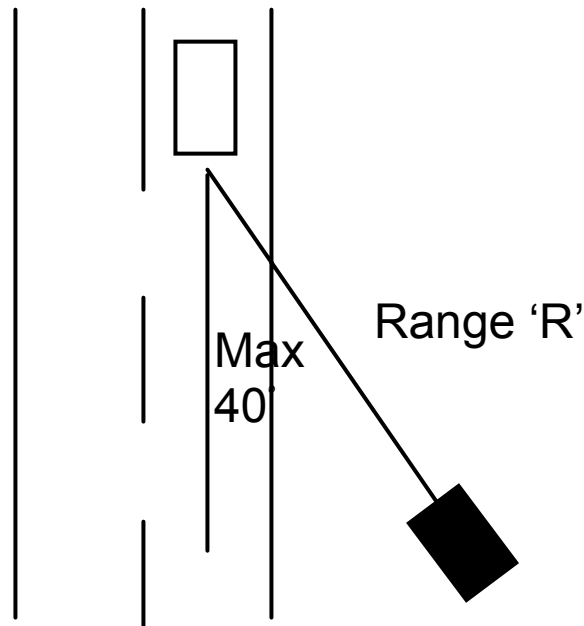
***Figure 3 REG-D1 Range Chart***

*\* Optimal distance calculated to allow license plates of 120 pixels wide. Most DVR application can provide readable plates larger than 80 pixels depending on level of image compression set on DVR.*

The maximum angle of the unit to the car is 40°. This is both horizontally and vertically. This limits the amount of skew of the letters on the number plate. If the letters are skewed too much they will start to become unrecognizable and will reduce automatic software recognition rates.



**Figure 4 Maximum Vertical Angle**



**Figure 5 Maximum Horizontal Angle**

If the maximum range is exceeded the letters will become smaller and be more difficult to read. At the max range the width of the number plate covers approximately 12% of the width of the screen.

*Note: The 'R', Range is the distance from the camera to the license plate. Working below max range gives larger number plates and hence more accurate recognition but less lane area to be covered. If too close the license plate could disappear from the Field-of-View, especially for side-mounted plates.*

## 4. COLOR OVERVIEW CAMERA LENS SETTING

The following steps show the installer how to access the camera board and the camera lens.

Step 4.1 - Remove sunshield by loosening top bolt with a standard Philips screwdriver.

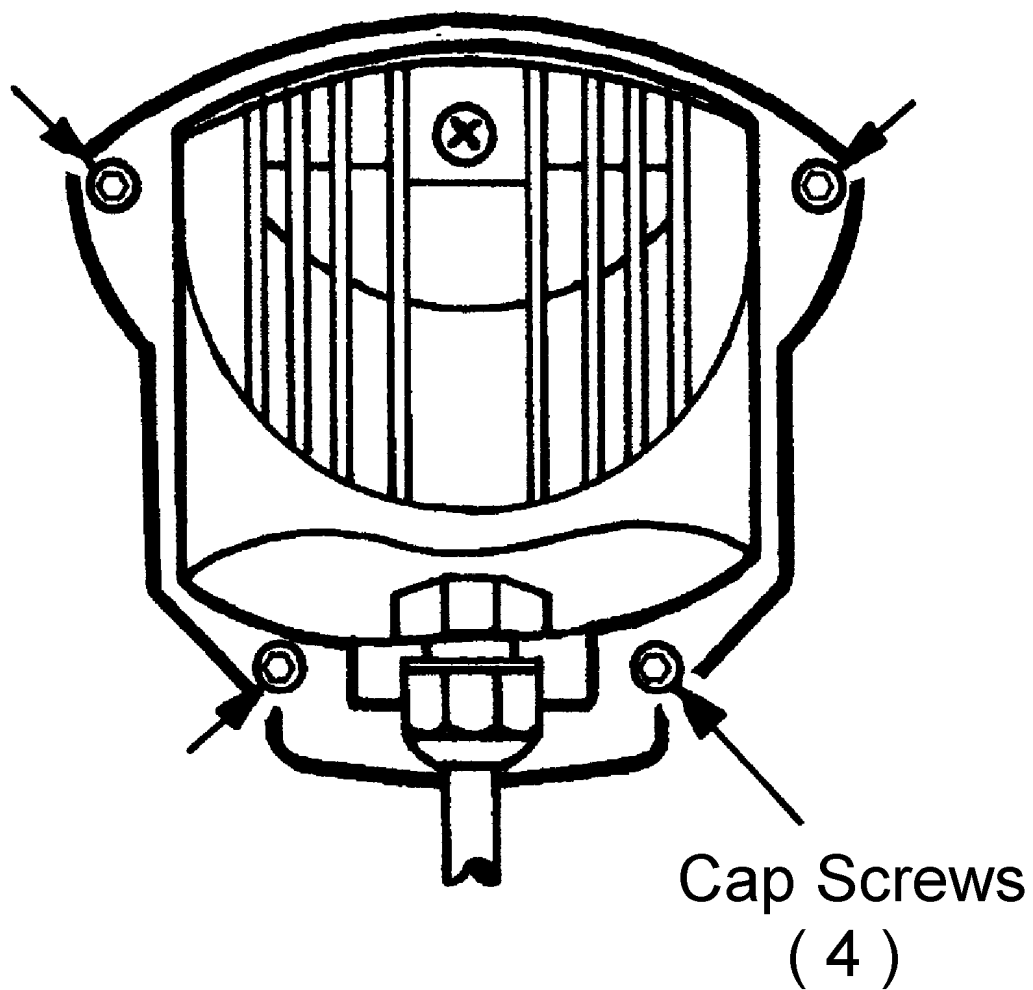
Step 4.2 - Disconnect the power source to the camera and the video signal at the BNC connector.

Step 4.3 - Remove the four cap screws with a 3mm Allen key. See **Figure 4-1** on page 11.

Step 4.4 - Carefully slide out the rear housing from the main enclosure. Make sure the gasket remains with the rear section.  
See **Figure 4-2** on page 12.

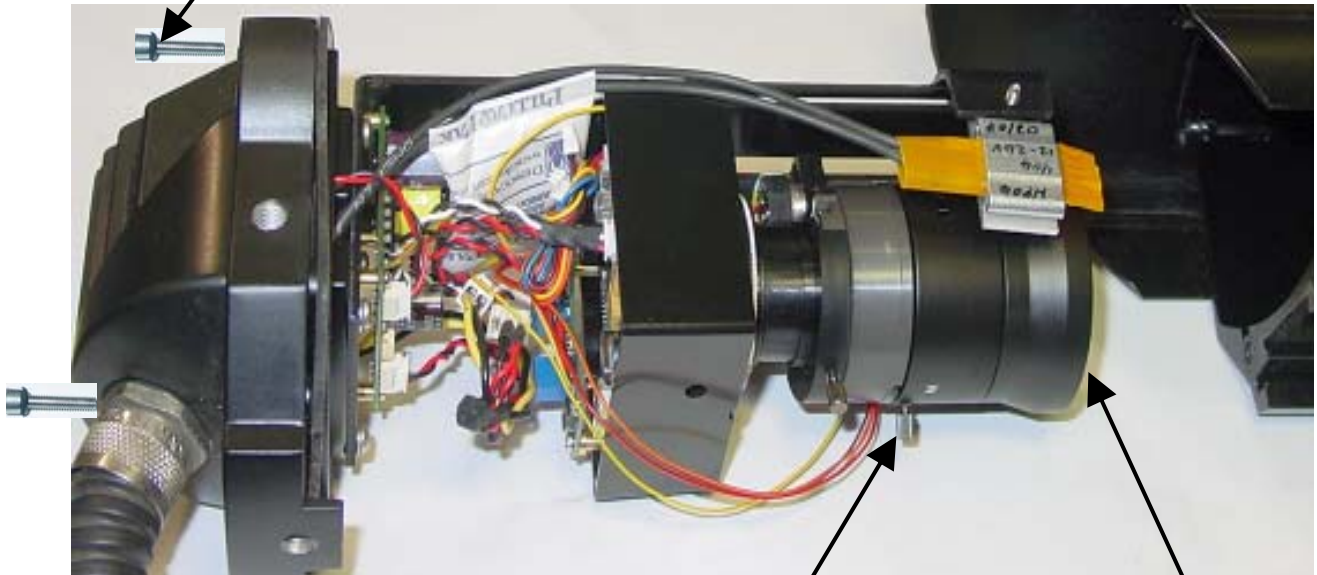
Step 4.6 - Carefully slide the rear section into the main enclosure and tighten the cap screws.





***Figure 6 Rear Housing Removal***

**Remove  
Cap screw**



**Loosen lens  
set screws**

**Lens**

***Figure 7 Housing Separation for Camera,  
Lens and Voltage Regulator Board  
Access***

## 4.1 Vari-Focal and “Auto-Iris” Control Adjustments

- Step 4.1.1 - Loosen the lens set screws for focus/zoom adjustments.
- Step 4.1.2 - The set screw with no mark is used for image focus.
- Step 4.1.3 - The set screw marked **T** ← → **W** is used for telephoto or wide-angle settings.
- Step 4.1.4 - Re-tighten the set screws after focus adjustments have been completed.
- Step 4.1.5 - Locate the “Auto-Iris” adjustment.
- Step 4.1.6 - After adjustments are complete, re-install the Camera lens back on to the camera assembly

## 5. TROUBLESHOOTING GUIDE

<i><b>PROBLEM</b></i>	<i><b>POSSIBLE CAUSE</b></i>	<i><b>LIKELY SOLUTION</b></i>
<b>No Video</b>	<p>Power Supply Connections</p> <p>Voltage Range</p> <p>Video Connections</p>	<p>Check the input power connections at the terminal block, ensuring no wires are loose.</p> <p>The supply range is:  <i>12 – 24 VDC or 12 – 24 VAC.</i>            Measure the voltage at the terminal block.</p> <p>Determine if the wiring polarity at the “Video Connector” terminal block is correct.            Check BNC connector.</p> <p>If still no video, connect the camera directly to the</p>

<p><b>Horizontal Scan Lines, Rolling Up or Down</b></p> <p><b>Negative, scrambled, or faded image</b></p>	<p>Ground Loop on video cable</p> <p>Low voltage</p>	<p>monitor. Check the video signal. If okay, the problem is with the interconnections.</p> <p>If still no video, contact Bosch Service Center. See rear page of this manual for contact information.</p> <p>Check the coax cable shield is not touching “ground”, e.g. at the couplings. An electrically isolated circuit board or isolation transformer may be required.</p> <p>Check voltage at input power cable. Must be &gt;12VDC/VAC. Video leads reversed connection.</p>
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<b>Poor Color Picture Quality</b>		
Dim Image	Iris closed	Increase iris level on lens
Snowy Image (cont'd.)	Noisy Power Supply	Check connections. Relocate or replace power supply.
Horizontal Scan Lines, Rolling Up or Down	Ground Looping on video cable	Check the coax cable shield is not touching ground, e.g. at couplings. An electrically isolated circuit board or isolation transformer may be required.
Negative, scrambled, or faded image	Low voltage	Check voltage at input power cable. Must be >12VDC/VAC.

## CAUTION

### **Safety and Precaution**

*“Prolonged direct viewing of the REG-D1 camera product at any distance does not pose a hazard to the retina or cornea.”*

*When mounting and installing the REG-D1 camera, make sure proper safety equipment and procedures are used and practiced. This is to ensure the camera installation will not potentially cause any harm to people around the area and also the installer will be safe while performing the installation.*

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

## 6. GENERAL SPECIFICATIONS

Power Consumption:	27W Max.
Input Voltage:	12 – 24 VDC or 12 – 24 VAC
Enclosure (housing):	Aluminum casting and extrusion (sealed to IP66 / NEMA4)
Viewing Windows:	Polycarbonate and Acrylic
Dimensions:	167mm <b>H</b> ( 6.57" ) 277mm <b>W</b> ( 10.9" ) 306mm <b>L</b> ( 12.0" )
Operational Temperatures:	-50 <sup>0</sup> C to +50 <sup>0</sup> C
Weight:	3.6kg (8.0 lbs.)

*Subject to change without notice.*



**Note:**

**Note:**

**Note:**

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