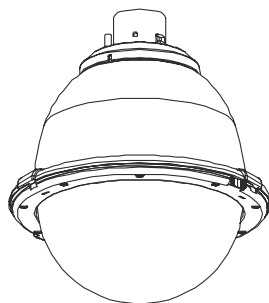# SpeedDome® Ultra Pressurized Outdoor Dome Housing

*Installation and Service Guide*

**RHODULP-01 (clear bubble)**
**RHODULP-02 (smoked bubble)**

## About this Guide

This guide explains how to install and service the pressurized outdoor dome housing.

⚠ The exclamation point within an equilateral triangle is intended to alert the user to presence of important operating and maintenance (servicing) instructions in the literature accompanying the outdoor dome.

## If you need assistance...

Contact your Sales Representative.

**Note:** This housing is designed to operate with the bubble pointing down. Installing the housing upside down can damage its internal equipment, and will void the warranty.

## About the Product

The outdoor housing is pressurized with dry nitrogen to eliminate the effects of moisture, dust, insects, and corrosive exhaust fumes on the CCTV camera. Dry nitrogen is added during installation.

The housing is pre-wired for RS-422 Installations. See the "Reference" section in this guide for details on how to configure the housing on SensorNet/Manchester networks.

**Note:** This product is equipped with an absolute low-pressure sensor. The sensor is connected to IO PCB ALARM INPUT 1 and can be used to detect if pressure inside the housing is less than 0.5psi. The sensor will open at 0.5psi and close at 1psi. See "Calibrating the Pressure Sensor" section in this guide for details on how to calibrate the sensor. Also, consult the controller's operation guide for details on how to program the alarm input.

## Contents

# Important Safeguards

 **CAUTION:** The housing is a pressurized enclosure. As such, certain care is required for the safe use of the product.

1. Inspect the housing upon opening the box. Ensure it was not damaged during shipping. Immediately replace housings that have been cracked or show signs of damage.

2. Always use safety goggles when servicing the housing.

3. Never use an unregulated gas supply to pressurize the housing. The valve should be regulated with a maximum of 10psi output.

4. PRESSURIZE USING DRY NITROGEN GAS ONLY!

5. Periodically examine the housing and structure to which it's attached. If any wear is noticed, replace immediately.

## Additional Safeguards

1. Read Instructions – Read all safety and operating instructions before operating the unit.

2. Retain Instructions – Retain safety and operating instructions for future reference.

3. Heed Warnings – Heed all warnings on the unit and in the operating instructions.

4. Follow Instructions – Follow all operating and user instructions.

5. Electrical Connections – Only a qualified electrician should make electrical connections.

6. Attachments – Attachments not recommended by the product manufacturer may cause hazards.

7. Cable Runs – All cable runs must be within permissible distance.

8. Mounting - This housing must be properly secured to a supporting structure capable of sustaining the weight of the unit. Accordingly:

   a. The installation should be made by a qualified installer and be in compliance with local codes.

   b. Select suitable installation hardware for the mounting surface and weight of the unit and periodically examine the housing and supporting structure to ensure the integrity of the installation. Otherwise, the housing could separate from the support structure and fall, causing damage or injury.

## Unpacking

Unpack carefully. Electronic components can be damaged if improperly handled or dropped. If an item appears to have been damaged in shipment, replace it properly in its carton and notify the shipper.

Be sure to save:

1. The shipping carton and packaging material. They are the safest material in which to make future shipments of the equipment.

2. These instructions.

 **WARNING!** TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT EXPOSE COMPONENTS TO WATER OR MOISTURE.

# Installation

**Note:** This section assumes cables are routed to the mounting site.

## Tools Required:

- .100in flat head screwdriver
- Phillips-head torque screwdriver
- 7/16in socket
- Nitrogen tank kit RHONKIT or equivalent 99.998% $N_2$.

## Mounting the Housing

1. Carefully remove the housing from the package. Ensure all parts are present.

   **Note:** The standard model is a pendant mount housing. A 1.5in NPT housing coupling is provided for use with a standard 1.5in (NPT) pipe.

2. Install pendant pipe mount or wall mount bracket in the desired location.

   ⚠ Ensure the mount is properly secured to a supporting structure capable of rigidly holding the weight of the housing once assembled.

3. Remove cover from pipe threads and ensure threads are clean and rust free.

4. Loosen three set screws and detach the bayonet coupling from the housing.



Bayonet Coupling — Set Screws — Housing
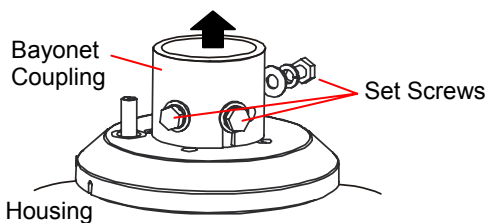
5. Apply pipe sealing tape to the pipe threads and thread the bayonet onto the mount.



Apply pipe sealing tape here.
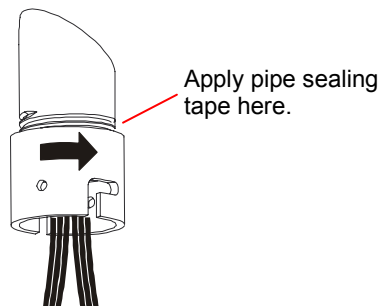
6. Loop the safety cable exiting the top of the housing over one of the set screws on the bayonet coupling and connect cables exiting housing and pipe together using the two screw-down connectors supplied.



Safety Cable — Connectors
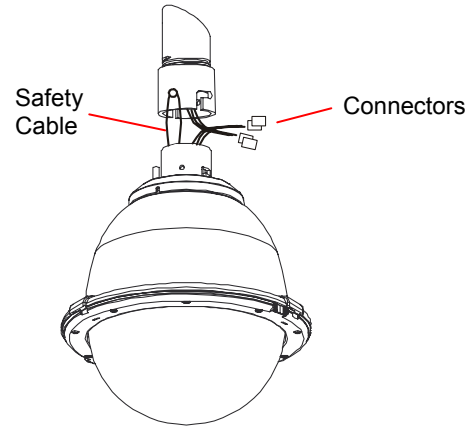
**Power**

| 1 | Camera Power (24Vac) | White |
|---|---|---|
| 2 | Camera Power (earth ground) | Red |
| 3 | Camera Power (24Vac) | Black |

**Data**

| 1 | RS-422 Rx+ (SensorNet) | Orange |
|---|---|---|
| 2 | RS-422 Rx– (SensorNet) | Green |
| 3 | RS-422 Tx+ | Yellow |
| 4 | RS-422 Tx– | Brown |
| 5 | SensorNet | (See Note) |
| 6 | SensorNet | (See Note) |

**Note:** The I/O circuit board wiring factory set up is for RS-422. For SensorNet (or Manchester) installations, disconnect orange and green wires from P1-1 and P1-2 respectively, and reconnect these wires to P1-5 and P1-6.

7. Reattach the housing to the bayonet and secure the three captive screws.

   ⚠ **CAUTION:** Do not over tighten screws. Tighten them only to the point at which the gap closes between the ring and the housing top.

8. Remove the bubble assembly from the housing to access the I/O circuit board inside the housing.

   a. Loosen the nine captive screws on the ring next to the bubble. Do not to back screws all the way out.

   b. Twist the bubble counter clockwise to remove.



Remove the bubble by twisting counterclockwise.

Loosen screws, do not remove them.
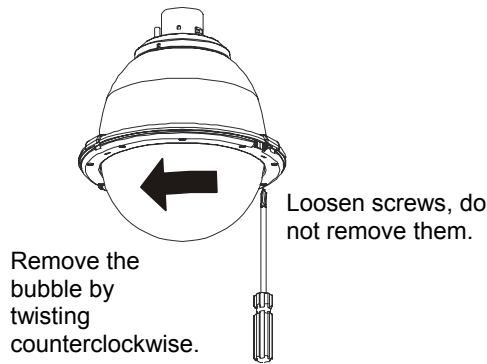


I/O Circuit Board

## Calibrating the Pressure Sensor

The housing includes an absolute pressure sensor that must be calibrated, at the site, just before installation.

1. To access the pressure sensor, pull on the dust cover to remove the I/O circuit board from base.



Green LED

Calibration Button
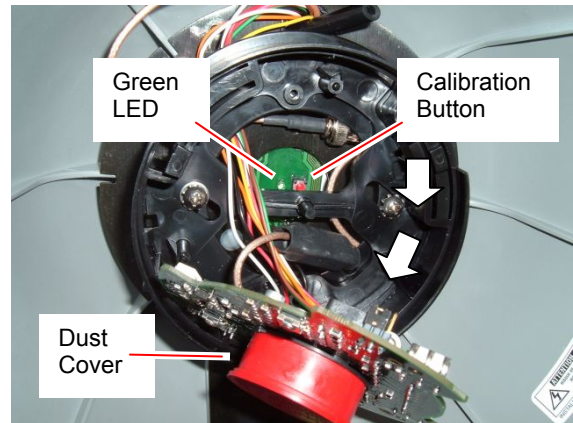
Dust Cover

2. Apply power to the housing and wait about 30 seconds for the green LED to start blinking.

3. Press the calibration button until the LED goes out.

4. Snap the I/O circuit board back into its installed position and remove the dust cover.

# Installing the Dome

Connect the dome camera by aligning the protrusion on the dome with the protrusion on the mounting base (or white mark on the I/O board). Then turn the dome clockwise to lock it.

**Note:** At this point, the dome should begin its homing routine. During this routine, the camera lens moves up into the housing, down to the floor, pans slowly, and moves up to its home position. The controller can then be used to call up and control the dome.



White mark on I/O board



Turn dome clockwise to lock.
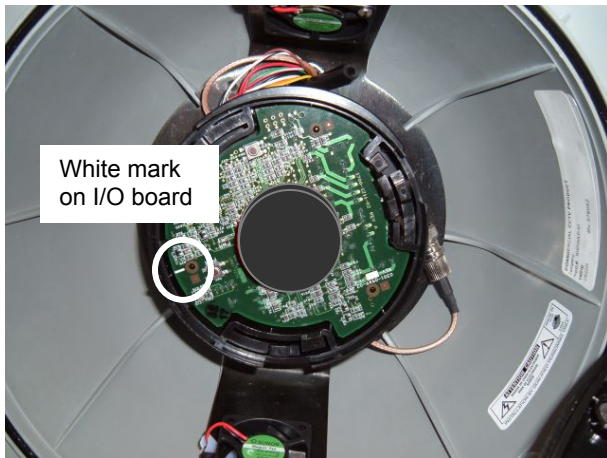
# Installing the Desiccant Bag Bracket

Two desiccant bag brackets, each with two desiccant bags, are installed in the housing to absorb moisture after the purge process.

Before closing the bubble:

1. Remove a desiccant bag bracket from the sealed plastic bag.

2. Pull the blower bracket away from the housing, and slide the desiccant bag bracket behind it as shown until the top of the bracket snaps behind the lip in the blower bracket.

3. Repeat for the second desiccant bag bracket.





Brackets installed.
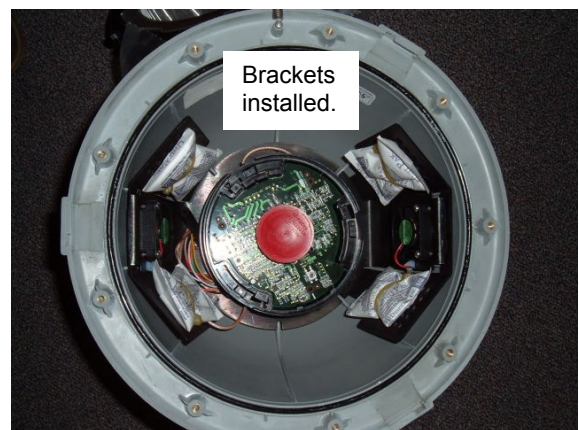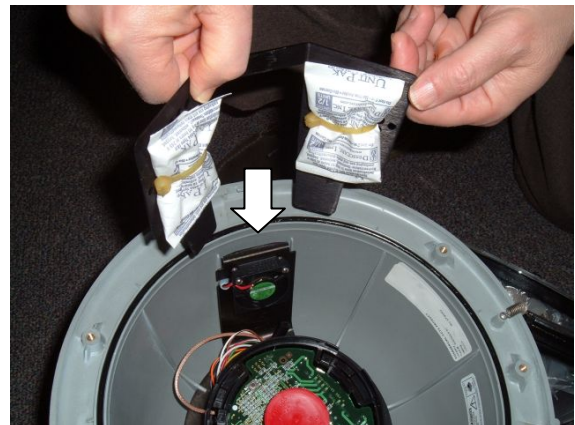
# Attaching the Bubble

1. Line up tabs in the bubble assembly with the slots in the housing.

   ⚠ **CAUTION:**
   - Inspect the O-ring gasket/bubble to ensure no debris affects the seal.
   - Ensure the lanyard does not interfere with the bubble assembly.

2. Turn the bubble assembly clockwise to lock it.

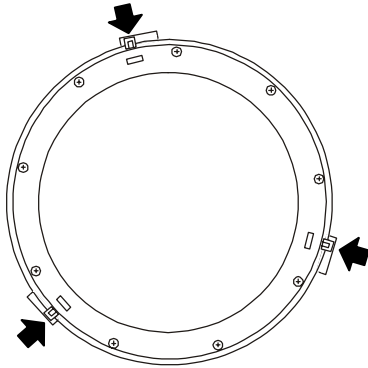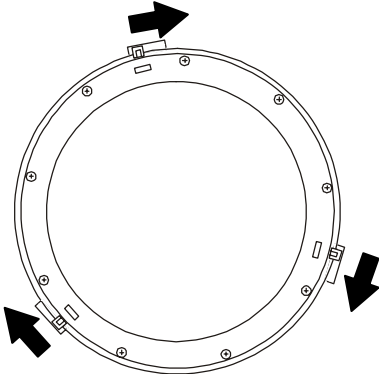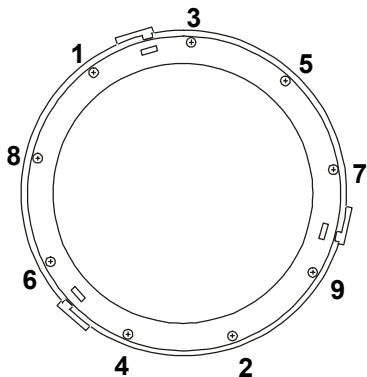3. Tighten the screws in the order shown below.
   **CAUTION:** Tighten each screw to 12 in-lbs using a torque screwdriver.

# Pressurizing the Housing

## Before You Begin

Have the following on hand:

- **A tank of dry nitrogen.** Dry nitrogen is readily available. To obtain supplies, check with a medical or industrial gas provider. If the tank is to be carried transported, a 40 cubic foot tank is recommended.

  ⚠ **WARNING!** Handle the tank with care. Although nitrogen is an inert gas, the tank is highly pressurized and if the valve or regulator is damaged the tank could be dangerous.

- **A regulator on the tank.** Nitrogen tanks have a standard 580 fitting. However, a regulator is required.

- **A hose with an air chuck to connect the regulator to the housing's air intake valve.** The intake valve (also called a purge, Schraeder, or dill valve) is similar to the intake valve on a bicycle tire. To connect the regulator to the purge valve on the housing, a hose is needed with a ¼-inch barb on one end and an air chuck on the other. The barb connects to the regulator on the tank; the chuck connects to the purge valve on the housing.

The American Dynamics product code for the Nitrogen kit (Nitrogen Tank, Hose, and Regulator) is RHONKIT.

## Purge Procedure

1. Set the regulator gauge to 10psi.

2. Fill the housing with dry nitrogen.

   ⚠️ Before filling, ensure the two vent holes between the top of the housing and the black cap are free of ice or debris.

   Nitrogen might leak through the bubble gasket when the pressure inside the housing exceeds 5psi.

   a. Place the air chuck on the housing's intake valve and press down on the chuck to fill the housing with dry nitrogen. Air escapes through the two vent holes in the black cap once the pressure inside the housing exceeds 7psi. Continue filling for at least two minutes after air escapes.

   b. Place a pressure gauge on the intake valve to verify pressure is between 3 to 5psi.
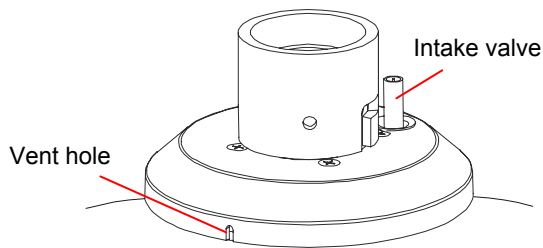


3. Purge nitrogen as follows:

   a. Press the intake valve to release nitrogen from the housing. Continue pressing until air no longer rushes from the valve.

   b. Re-fill the housing with dry nitrogen. Continue filling for at least 10 seconds after the vent holes release air.

   c. Repeat steps (a) and (b) another three times.

   d. Once purging is complete, place a pressure gauge on the intake valve to verify pressure is between 3 to 5psi.

   **Note:** A peculiar sound may be heard when the overpressure sensor opens.

# Servicing the Pressurized Housing

When servicing the pressurized housing includes the removal of the bubble assembly, desiccant bags in the desiccant bag holder must be replaced before reassembly. Two desiccant bag kits (part number 0351-0207-01) provide the four replacement bags required.

**For regions that approach the high end of the housing's operating temperature range of 50°C:**

It is recommended that the technician have available both the desiccant bags kits mentioned above, as a well as a replacement bubble. On rare occasions, a new bubble may be required to properly re-seat the bubble trim ring assembly. The clear bubble (part number RCPFD8-CO) and smoked bubble (part number RCTPFD8-CO) are available for ordering.

# Reference

## Wiring Color Code

**Wiring Color Code for Power and Control Inputs (outside of housing)**

### Power

| 1 | Camera Power (24Vac) | Black |
|---|---|---|
| 2 | Earth Ground | Red |
| 3 | Camera Power (24Vac) | White |

### Data

| 1 | RS-422 Rx+ (SensorNet) | Orange |
|---|---|---|
| 2 | RS-422 Rx– (SensorNet) | Green |
| 3 | RS-422 Tx+ | Yellow |
| 4 | RS-422 Tx– | Brown |
| 5 | SensorNet | (See Note) |
| 6 | SensorNet | (See Note) |

**Note:** The I/O circuit board wiring factory set up is for RS-422. For SensorNet (or Manchester) installations, disconnect orange and green wires from P1-1 and P1-2 respectively, and reconnect these wires to P1-5 and P1-6.

**Wiring Color Code for Power and Data Inputs (on I/O circuit board)**



**I/O BOARD**
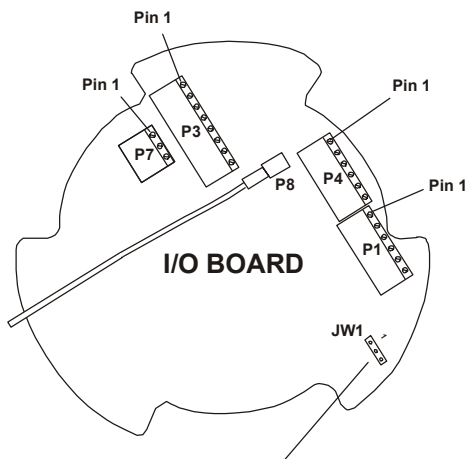
**JW1 Terminations**

| PINS | FUNCTION |
|---|---|
| 1-2 | Unterminated |
| 2-3 | Terminated |

**Power** (Euro Style Connector P7)

| 1 | Camera Power (24Vac) | Black |
|---|---|---|
| 2 | Earth Ground | Red |
| 3 | Camera Power (24Vac) | White |

**Control** (Euro Style Connector P1)

| 1 | RS-422 Rx+ (SensorNet) | Orange |
|---|---|---|
| 2 | RS-422 Rx– (SensorNet) | Green |
| 3 | RS-422 Tx+ | Yellow |
| 4 | RS-422 Tx– | Brown |
| 5 | SensorNet/Manchester+ | Orange |
| 6 | SensorNet/Manchester– | Green |

**Wiring Color Code for Power and Control Inputs (on pressure sensor circuit board)**

**Note:** This board is not accessible to the installer. It is between the housing and the fan/heater brackets.

### Power and Control Leads

| 1 | Camera Power (earth ground) | Red |
|---|---|---|
| 2 | Camera Power (24Vac) | White |
| 3 | Accessory Power (24Vac) | Black |
| 4 | RS-422 Rx+ (SensorNet) | Orange |
| 5 | RS-422 Rx– (SensorNet) | Green |
| 6 | RS-422 Tx+ | Yellow |
| 7 | RS-422 Tx– | Brown |
| 8 | Low Pressure Alarm | White/Black |
| 9 | Low Pressure Alarm | White/Red |

# Exploded View of Housing

## Parts List

1. Pressured Sealed Housing
2. Housing Coupling
3. Housing Packet
   a. Screw down connectors (2)
   b. Mounting 8 x 32 x 1/2in Mounting Screws (4)
   c. #8 star washers (4)
   d. Pin shunts (2)
   e. Humidity strip
   f. Instruction Manual

| Item No. | Description Part No. | Qty |
|---|---|---|
| 1 | 25W Heater w/leads | 2 |
| 2 | Housing Top | 1 |
| 3 | Dome Support Ring | 1 |
| 4 | Captive Screw | 9 |
| n/s | Captive Screw Spring | 9 |
| n/s | Captive Screw Retainer | 9 |
| 5 | Clear Dome Bubble RCPFD8-CO Smoked Dome Bubble RCTPFD8-CO | 1 |
| n/s | PFD8 Tinted Dome | 1 |
| 7 | Main Housing Bracket | 1 |
| n/s | Main Housing 10 x 32 x 1/2in bolts | 3 |
| 8 | Housing Fan | 2 |
| 9 | 1/4 x 20 Set bolts | 3 |
| 10 | Black Plastic Housing Cover | 1 |
| 11 | 4.50in O-ring | 1 |
| 12 | Inner Sealing Plate | 1 |
| 13 | Housing Mounting Coupling | 1 |
| 14 | Main Bracket Standoffs | 3 |
| 15 | 1/4 Lock Washers | 3 |
| 16 | 1/4 Flat Washers | 3 |
| 17 | PC8 | 1 |
| 18 | 5-7psi Release Valve | 1 |
| 19 | Schraeder Valve | 1 |
| 20 | Housing Coupling | 1 |
| 21 | Schraeder Valve Grommet | 1 |
| 22 | Housing Gasket | 1 |
| 23 | 8x32x1/2in Flat Head | 3 |
| 24 | Hermetic Connector | 1 |
| 25 | Desiccant Bag Kit P/N 0351 | 2 |
| n/s | External Leads to Hermetic Connector | 1 |
| n/s | Hermetic to PCB Cable Assembly | 1 |
| n/s | Housing Lanyard | 1 |
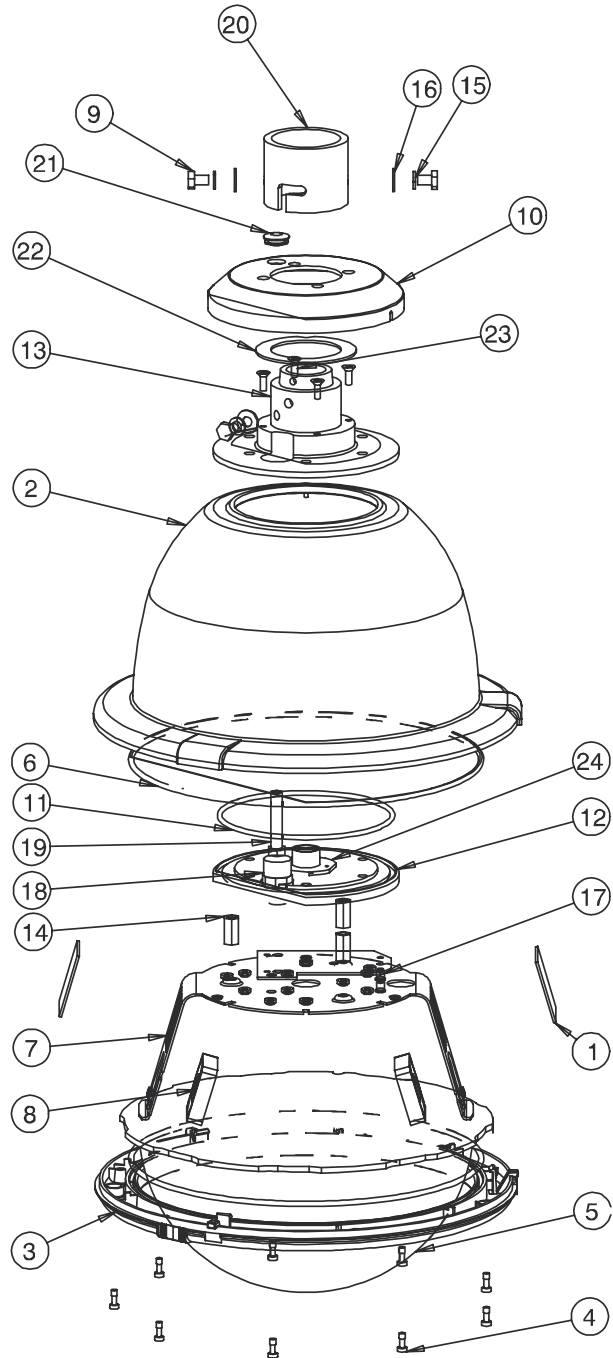
# Specifications

## Electrical

Power input..............................................24vac, Class 2
Housing ................................................. 75W @ 24Vac
   Heaters (2) .................................................. 25W each
   Blowers (2)............................................... 0.84W each
Input connectors:
   Power connector ........................................ 3 positions
   Data connector.......................................... 4 positions
   Video.....................................................................BNC

## Environmental

Operating Temperature ..... –40° to 50°C (–40° to 122°F)
Relative Humidity:....................0 to 90% non-condensing

## Mechanical

Height ......................................................32.5cm (12.8in)
Width ........................................................30cm (11.4in)
Depth ......................................................40.9cm (16.1in)
Weight ........................................................3.6kg (8 lbs)

# Declarations

## Regulatory Compliance

EMC.......................................................47 CFR, Part 15
ICES003 Class A
EN 61000-6-1; 2001
EN50130-4;1996 /A1: 1998/A2: 2003

SAFETY................................. IP67 (Standard EN60529)
IEC 60950
UL 2044
CanCSA-C22.2 No. 1

**FCC COMPLIANCE:** This equipment complies with Part 15 of the FCC rules for intentional radiators and Class A digital devices when installed and used in accordance with the instruction manual. Following these rules provides reasonable protection against harmful interference from equipment operated in a commercial area. This equipment should not be installed in a residential area as it can radiate radio frequency energy that could interfere with radio communications, a situation the user would have to fix at their own expense.

**EQUIPMENT MODIFICATION CAUTION:** Equipment changes or modifications not expressly approved by Sensormatic Electronics Corporation, the party responsible for FCC compliance, could void the user's authority to operate the equipment and could create a hazardous condition.

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MDR 1/05