

# MODEL 7140 ENVIRONMENTAL ETHERNET CAMERAS INSTALLATION AND OPERATION MANUAL

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**Figure 1. Model 7140 Camera Housing  
(Shown with Optional Sunshield)**

**Technical Manual 6X-1047b**

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**June 26, 2007**

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**COHU**  
Cohu Inc., Electronics Division

**Table 1. Specifications**

<b>ELECTRICAL</b>	
<b>Image Capture</b>	1/2-inch, 1288 x 1028 progressive scan CMOS
<b>Image size</b>	Depends on camera module installed
<b>Imaging Features</b>	Selectable windowing and subsampling Agc or selectable gain Configurable color balance Variable JPEG Compression Text and time stamp overlay
<b>Browser Support</b>	Microsoft Internet Explorer 4.7 or higher
<b>Networking</b>	10/100 base-T fast Ethernet HTTP and FTP Servers SMTP BOOTP, FTP Server, Telenet, and TFTP
<b>Protocols</b>	TCP, IP, UDP, MP5 encryption for web passwords
<b>Inputs/Outputs</b>	Ethernet 10/100 Base-T; alarm I/O, RS-232, power, lens control, & low pressure contacts
<b>Power</b>	24 V ac, 24 V dc Optional 115 V ac
<b>MECHANICAL</b>	
<b>Dimensions</b>	See dimensional drawings (figure 2 and figure 3)
<b>Weight</b>	12 pounds (5.4 kg), approximate
<b>Mounting</b>	1/2-20 threaded, 5 in-line places on base
<b>Connectors</b>	39-pin Bendix Schrader pressure charge valve (for dry nitrogen) Pressure relief valve
<i>Environmental specifications appear on next page</i>	

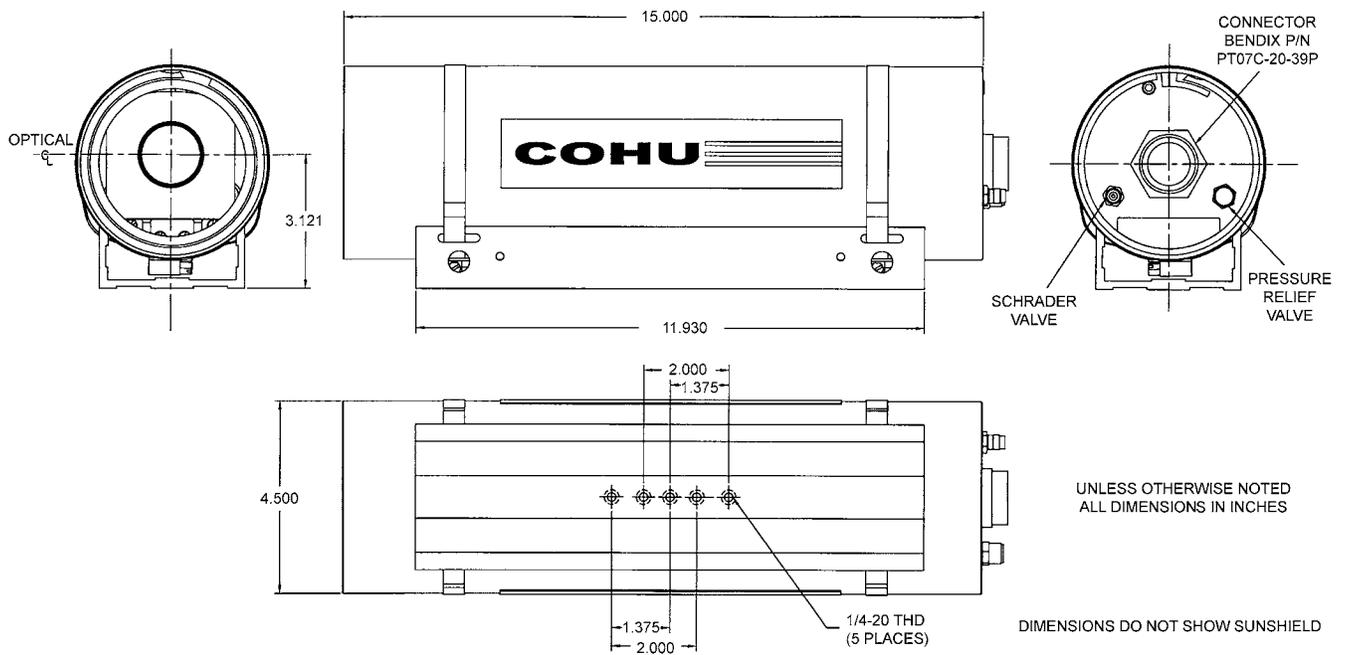
Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment 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.

Changes or modifications to this equipment not expressly approved by Cohu Electronics could void the users authority to operate the equipment

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.

**Table 1. Specifications (continued)**

<b>ENVIRONMENTAL</b>	
<b>Ambient Temperature Limits</b>	
<b>Operating</b>	-20 to 40 °C (-4 to 104 °F) -40 to 40 °C (-40 to 104 °F) with standard heaters -55 to 40 °C (-67 to 104 °F) with optional heater and heated glass
<b>Storage</b>	-30 to 50 °C (-22 to 158 °F)
<b>Humidity</b>	Up to 100 percent relative humidity
<b>Altitude</b>	Sea Level to equivalent of 10,000 feet (508 mm / 20 inches of mercury)
<b>Air Contaminants</b>	Withstands exposure to sand, dust, fungus, and salt atmosphere per MIL-E-5400T, paragraph 3.2.24.7, 3.2.24.8, and 3.2.24.9
<b>EMI</b>	FCC Rules, part 15, subpart J, for class A digital devices



**Figure 2. Dimensions, Camera (without sunshield)**

**1.0 GENERAL DESCRIPTION**

This manual pertains to installation of an environmental housing. Depending on the model it may or may not contain an Ethernet camera module. This manual does not cover the camera module in any detail since that version of the 7100 series is documented in two other manuals.

Reference should be made to technical manuals 6X-1043 (user manual) and 6X-1044 (reference manual) for documentation of the Ethernet camera modules.

**1.1 Electrical Characteristics**

This manual describes characteristics of the sealed and pressurized housing.

Electrical characteristics for the environmental housing primarily relate to the 39 pin interface connector on the rear panel. Table 4 lists each pin function on this connector.

A model number interpretation diagram is shown in figure 4.

**1.2 Mechanical Characteristics**

This environmental (barrel enclosure) version of this series is available in two configurations. The 710x consists of an environmental barrel without the accompanying Ethernet camera module. This version

is shipped from the factory without being pressurized with dry nitrogen since it is assumed that disassembly will be required to install a Camera module in the field.

A model 714x consists of the environmental barrel containing one of the Ethernet Camera modules. This version is sealed and pressurized with 5 psi (34.5 kPa) of dry nitrogen before shipping from the factory.

**2.0 INSTALLATION**

Section 4 provides instructions related to shipping and handling of this environmentally camera housing.

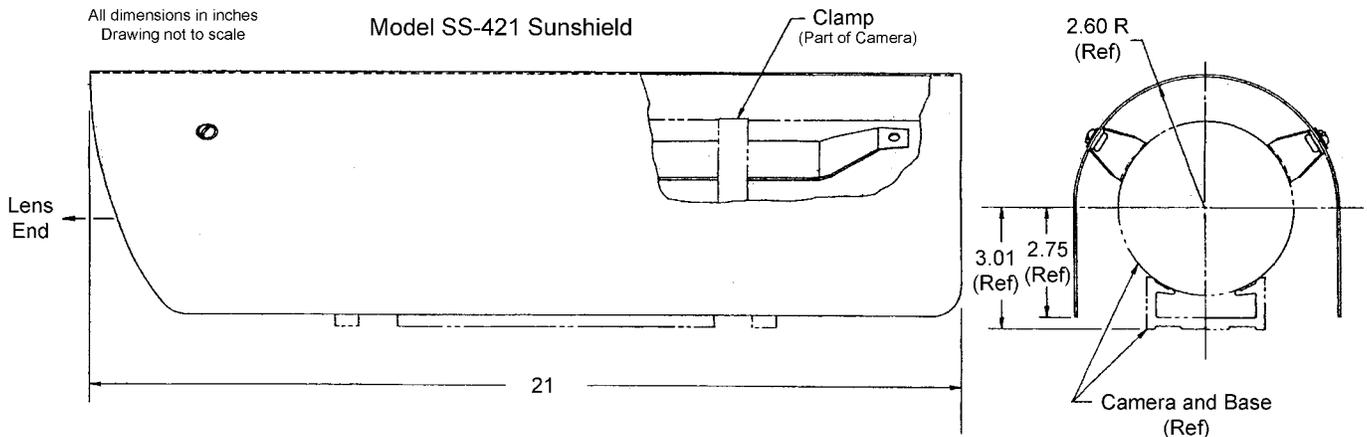
**2.1 Equipment Supplied**

The equipment supplied depends on what has been ordered. In its most basic form only the Camera itself is supplied. Item 1 is basic Camera configuration.

1. Environmental barrel housing with attached mounting base
2. Mating connector for rear panel connector ( see table 2)

Optional items that are supplied if ordered

- 3 115 V ac to 24 V ac power supply



**Figure 3. Dimensions, Optional Sunshield**

**2.2 Equipment Required but Not Supplied**

If the following items were not ordered with the Camera they will be required to make it operational.

1. Power supply. Either 115 V ac or 24 V ac/dc, depending on the version of the Camera.
2. Interconnection cable (figures 10 and 11)
3. Mounting hardware. At least two 1/4-20 threaded bolts of proper length

These following additional items may be required depending on the intended application:

4. Controls for zoom lens
5. Ethernet interface
6. Controls for serial programming of Camera functions
7. Monitoring device for external low pressure indication from Camera
8. Model SS-421 Sunshield
9. Technical manual 6X-1043 (camera module operation)
10. Technical manual 6X-1044 (camera module technical reference)

**2.3 Cabling Requirements**

The model 710x and model 714x uses a 39-pin Bendix type connector for all interconnections with the Camera (table 2). Only 32 pins are assigned functions for use with various versions of this Camera. Fewer than 32 pins are used in typical applications. All electrical interconnections for the Camera pass through this connector.

**Table 2. Interface Connectors**

<b>Connector Location</b>	<b>Cohu P.N.</b>	<b>MS Equivalent Part No.</b>
Rear Panel	1310225-004	PT07C-20-39P
Mating Cable Plug	1310230-005	PT06A-20-39S (SR)
<i>Note: Cable plug connector has an integral back shell/clamp and does not require a separate part to supply this function</i>		

**2.3.1 Connector Sealing**

Even though the Bendix type connector used on this camera is designed to maintain a weather-tight seal with its mating cable plug, it is recommended that for additional protection against moisture in severe conditions a sealing wrap be used on the cable and connector at the rear panel of the camera.

*Coax-Seal* is the recommended product:

**www.coaxseal.com**

**sales@coaxseal.com**

**Unites States 1-800-241-8171**

**or international 1-828-293-2222**

This product is available from a variety of commercial supply houses, consumer stores, and in the U.S. Government supply channels as GSA Schedule GS-07F-5739R.

This material is a thick tape-like material separated by a paper divider in its roll to prevent bonding to itself before use. After this material is wrapped around a connector it forms a permanent weather-tight seal.

The cable and connector should be clean and dry before wrapping with coaxseal.

Use a full wrap of the tape on the cable at the beginning, then continue with a diagonal half-overlap wrap up to the rear panel of the camera and finally another full wrap at the end of the coverage.

The wrap then should be squeezed slightly together by hand to remove air gaps and ensure it has moulded itself to the cable and connector.

This sealer will fuse itself together after a while and removal will require cutting it off.

Refer to the Coax-seal web site and to the instructions accompanying this product for more information .

**2.4 Power Requirements**

The 710x and 714x series Cameras have two basic power input configurations depending on the version:

1. 24 V ac / dc (model 71x4)
2. 115 V ac (model 71x5)

The major difference between these two versions is the addition of a 115 V ac to 24 V ac power

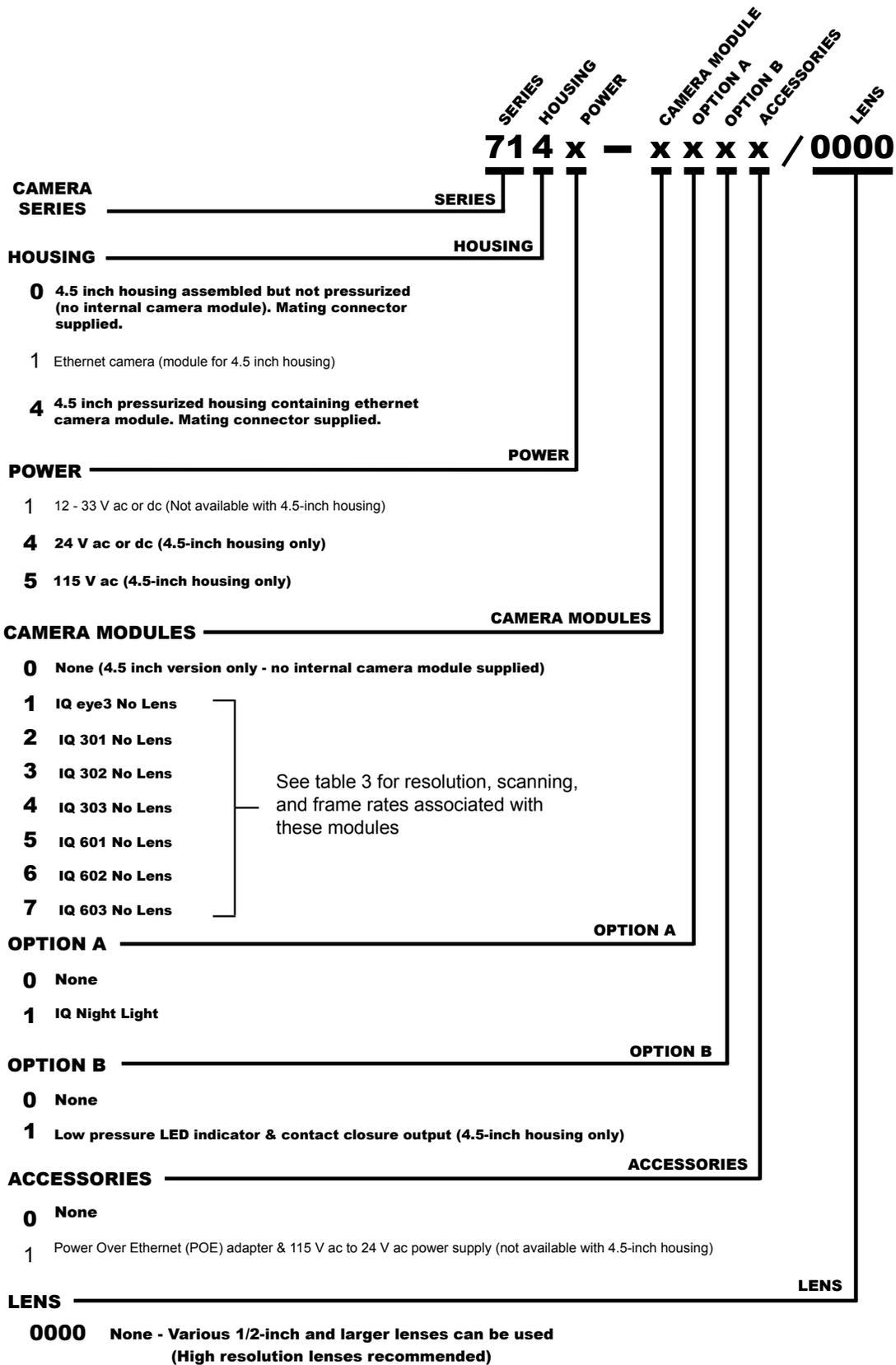


Figure 4. Model Number Interpretation Diagram

**Table 3. Camera Module Characteristics**

Imager Model	Resolution Max Image Size H & V	Frame Rate at 704 x 480 V Resolution	Frame Rate at Max Resolution (H & V)	
301	1280 x 1024	6 ips	1.5	1280 x 1024
302	1600 x 1200	6	1.0	1600 x 1200
303	2048 x 1536	6	0.5	2048 x 1536
601	1280 x 1024	100 + ips	30	1280 x 1024
602	1600 x 1200	100 + ips	20	1600 x 1200
603	2048 x 1536	100 + ips	12	2048 x 1536

Refer to figure 12 for a schematic diagram of the housing. This diagram shows the internal power wiring of the housing and also the inter-connections with the camera module.

In sum, then:

1. 115 V ac line (high/hot) applied to pin W and the neutral applied to pin V. Pin X is the ac power ground. When this version of the camera is to be operated from 115 V ac power, pins A and M must be externally jumpered together.

transformer in the model 71x5. When this transformer is installed at pins A and M on the rear panel Bendix connector must be jumpered together. This can be done either within the cable plug mating with the Bendix connector or at the other end of the cable in the control box assembly, junction box, or other device that may be used.

Figure 10 shows a cable wiring diagram where all connector pins associated with power inputs are carried through the cable to a control panel, junction box, or similar housing or device. This cable can be wired at that end for use with either the 24 V ac/dc or 115 V ac versions of the housing.

2. 24 V ac or 24 V dc applied to pins A and d. When 24 volts is to power the camera ensure that pins A and M are not jumpered together — especially when the optional 115 V ac power transformer has been installed in the housing.

**WARNING**

**If 24 V ac is applied to a Cable wired for 115 V ac operation (having the jumper across pins A and M) 115 V ac will be back-fed out of pins W and V. This jumper must be removed if a 115 V ac Camera is to be operated from 24 V ac.**

Note that while a 115 V ac housing can be operated from 24 V ac/dc this results in a condition where 115 V ac is back fed out of the housing onto pins W and V. To prevent this, the jumper across pins A and M must first be removed so that this condition does not exist.

Figure 11 shows a cable wiring diagram for a 115 V ac version of the cable in which pins A and M are jumpered together within the cable plug attached to the rear panel Bendix connector. This wiring arrangement should be used when the housing is optioned with the 115 Vac transformer. This cable cannot be used to power the housing from 24 V ac/dc because one required 24 volt wire is not carried through the cable.

**2.5 Mounting Requirements**

Five 1/4-20 threaded holes are available on the base for mounting a Camera. See figure 2. At least two of these holes should be used. If the camera is to be mounted outdoors it is likely the sun shield (figure 3) will be required. This must be attached to the camera before it is mounted to a pole, wall, or other type device.

**2.6 Camera Module Characteristics**

Any one of seven different versions of an internal camera modules may be installed in the housing (table 3). These modules have different operating characteristics as listed in the table.

**2.7 Low Pressure Indicator (Option)**

The housing is initially pressurized to about 5 psig (pounds square inch gage) (34.5 kPa) of dry nitrogen. It is possible that this pressure may dissipate over time, but so long as even a minimal amount of the dry nitrogen pressure remains in the housing the camera can be considered operational. When pressure drops to about 1 psig, though, it may be best to reapply dry nitrogen to bring pressure up to about 5 psig again.

To provide an indication of low pressure, the housing can be optioned with a low pressure sensor that provides two indications when pressure drops

**Table 4. Connector Pin Functions**

PIN	NAME	FUNCTIONAL GROUP
A	24 V ac IN / OR 24 V dc in Select Jumper	Pins A and M must be jumpered together when 115 V ac power input pins (V and W) are used to supply operating power to the camera. See section 2.6 in this manual. (Pins A and d are used to apply either 24 V ac or 24 V dc operating power to the camera when this choice is made.
M	115 V ac Select Jumper	
X	Ac Ground	115 V ac input. <b>(WARNING: 115 V ac may be backfed out on these pins when camera is operated from 24 V ac input power)</b> . Remove the jumper between pins A and M if a camera optioned for 115 V ac operation is to be operated from 24 V ac.
W	115 V ac Line in or out	
V	115 V ac Neutral in or out	
d	24 V ac in or 24 V dc in	Pins d and A are used to apply either 24 V ac or 24 V dc operating power to the camera when this choice is made
P	Lens Zoom + (Tele +)	Zoom Lens Function Inputs (optional)
C	Lens Zoom - (Wide +)	
R	Lens Focus + (Near +)	
J	Lens Focus - (Far +)	
S	Lens Iris + (Iris +)	
K	Lens Iris + (Close +)	
i	TD +	Ethernet Interface
h	TD -	
E	RD +	
b	POE +	
B	POE -	
a	RD -	
D	POE +	
Y	POE -	
k	LP1	Contact Closure Low Pressure Indicator Output
j	LP2	
L	Shield Ground	Ground for cable shield
n	RXD	RS-232 Serial Interface for Camera Setup
p	TXD	
q	GND	
F	+12 V dc Out	Power Output for Optional Applications (current limited)
f	12 V dc Return	
G	Trigger in -	Trigger input from external contacts
g	Trigger in +	
H	Trigger Out -	Relay contacts (NO)
c	Trigger Out +	

**Table 5. Housing Disassembly Items Required**

<b>ITEM</b>	<b>DESCRIPTION</b>	<b>PURPOSE</b>
1	Tank of dry nitrogen	Dry nitrogen to purge and pressurize camera housing
2	Regulator/Gauge Set for the tank	Required to obtain low pressure nitrogen from a high pressure tank
3	Pressure Reading Gauge — 0 to 20 psi or similar to fit Schrader valve	Establish 5 psig pressure in housing after purging
4	Dow Corning No. 111 Silicon Grease	Lubricate O-rings
5	Desiccant pack (2) — dry, or else item 6 is required	Removes residual humidity from inside the housing
6	Convection oven with accurate temperature control valve	To dry desiccant packs
7	Tie wraps (2)	To hold the desiccant packs in place
8	Diagonal Cutters	To snip off loose ends of the tie wraps holding the desiccant packs in place
9	Heat Gun	To completely dry humidity indicators to obtain complete color change from pink to blue
10	Hex/Allen Wrench, 5/32-inch	To remove & install hex head screw on rear panel
11	Flat Bladed Screwdriver - No. 2	To help remove snap ring from groove in housing
12	O-ring, nominal 4-inch ID	For sealing between rear plate and barrel
13	O-ring, nominal 0.190 inch ID	For sealing hex screw in rear plate
14	Tank of water sufficiently large to hold housing	To check for leaks as indicated by bubbles at sealing areas

Note: Item 6 is not required if dry desiccant packs are available. (New packs must be dried before use.) Items 12 and 13, O-rings, are not required if the existing O-rings on the housing are in good condition. Item 14 is not required if the housing is left pressurized for at least 12 hours and it does not lose more than about 1 psi pressure during that interval. If the housing does lose pressure, a tank of water will likely be required to find the leak.

**CAUTION**

to about 1 psig [6.9 kPa]: (1) This circuit initiates relay contact closure that appears on pins j and k of the rear panel connector and (2) it also causes a red LED to turn on behind the window at the front of the housing.

**2.7.1 Relay Contacts**

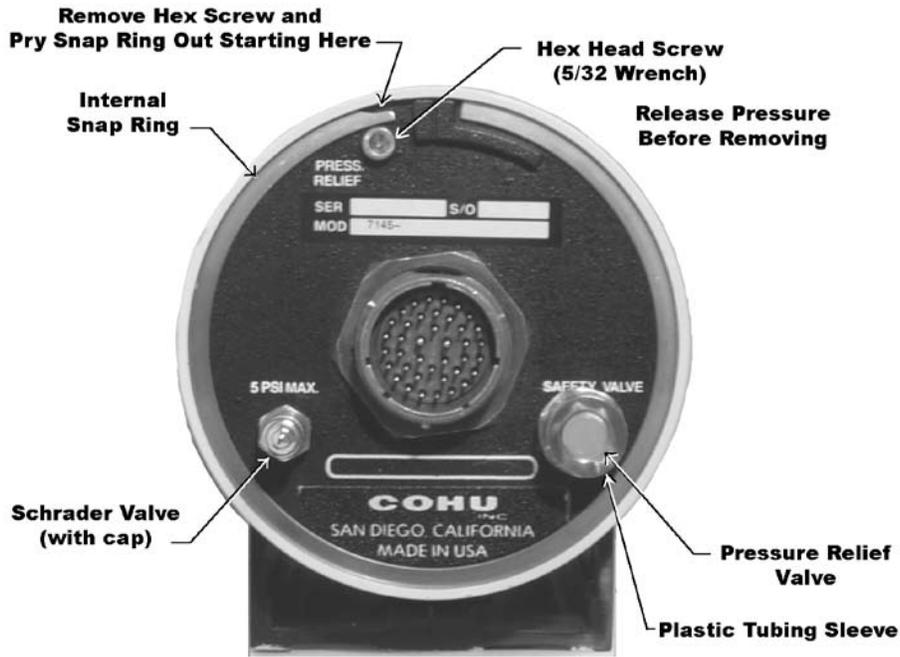
A reed relay is used to provide the contact closure when low pressure is detected. These contacts should not be used to switch more than 250 mA. Maximum switching voltage should not exceed 100 V dc. Steady state (unswitched) current should be limited to 600 mA.

Capacitive loads and incandescent lamp loads draw very heavy currents when switched on. Do not apply a load of either of these types without being sure that they do not exceed the 250 mA switching limit specified for the relay.

A typical incandescent lamp can draw 10 times its rated current when power is first applied. In situations where capacitive loads or incandescent lamp loads are to be applied, be sure to carefully investigate the switching currents involved.

**2.8 Opening and Closing Housing**

The model 710x is shipped without a camera module installed inside the housing. Installing such



**Figure 5. Rear Panel Sealing and Pressurization Features**

a module requires that the housing be accessed through the rear panel and then reassembled after the camera module has been installed.

Refer to figure 12, the housing schematic diagram, for internal connections to a camera module.

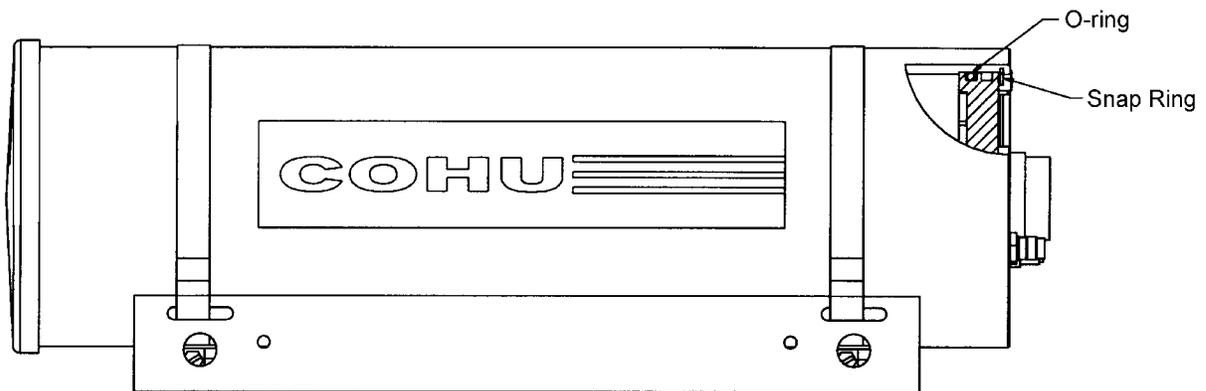
**2.8.1 Opening the Housing**

Always depressurize the housing before proceeding with disassembly. The housing should be opened only from the rear. Proceed as follows:

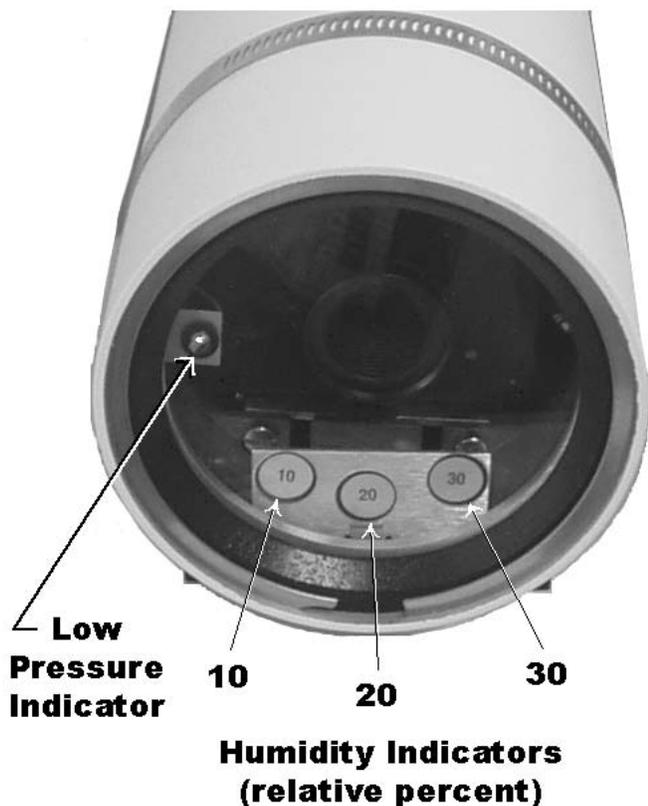
1. Release nitrogen pressure from the housing either by lifting the pressure relief valve pop-up cap or by removing the cap from the Schrader valve and depressing the valve stem. Accessing the pop-up cap will

require removal of the clear tubing sleeve over it. This sleeve protects it from accidental release of pressure.

2. Remove the Snap Ring Locking Screw (figure 5) using a 5/32 inch Allen/hex wrench.
3. Note the O-ring on this hex screw. Place this screw in a safe location so that the O-ring does not get damaged unless it is to be replaced.
4. Use a flat blade screw driver to begin prying the internal snap ring out of its groove in the barrel.
5. Continue to slide the screw driver around the circumference of the housing until the snap ring has been removed.



**Figure 6 . Sealing O-ring and Snap Ring**



Blue Designates Humidity is Lower than the Number.  
Pink designates Humidity is Higher than the Number.

**Figure 7 . Front Window Features  
(all humidity indicators should be blue for a newly sealed and pressurized housing)**

6. Hold the housing firmly while pulling back on the rear panel until the assembly slides out of the housing.
7. Note that at the rear of the removed assembly there is an O-ring pressure seal. It should be protected from accidental damage unless a new O-ring is to be installed. (The O-ring under the finger stock at the front of the removed assembly is not a pressure seal.)
8. Place the external housing and the interior assembly on the workbench making sure that they cannot roll off on the floor and be damaged.

**2.8.2 Desiccant Packs**

The housing should not be reassembled without fresh desiccant packs being installed. This can either be fresh, dry packs from a sealed container or the existing packs that have been removed and properly dried in a convection oven and then stored in a small closed container if not immediately used.



**Figure 8. Rear Double O-ring Grooves  
(install O-ring in groove toward interior of camera)**

**2.8.2.1 Drying Desiccant Packs**

New desiccant packs or packs that have absorbed moisture can be reactivated by baking for a minimum of 16 hours at  $105 \pm 5$  °C ( $221 \pm 41$  °F).

Allow to cool for 5 to 10 minutes and then place in a tightly sealed container for storage. This container should not be too much larger that required to hold the number of packs that have been dried otherwise the packs may absorb moisture from air in the container.

A pack can be left in open ambient air for an hour or so during installation procedures if necessary.

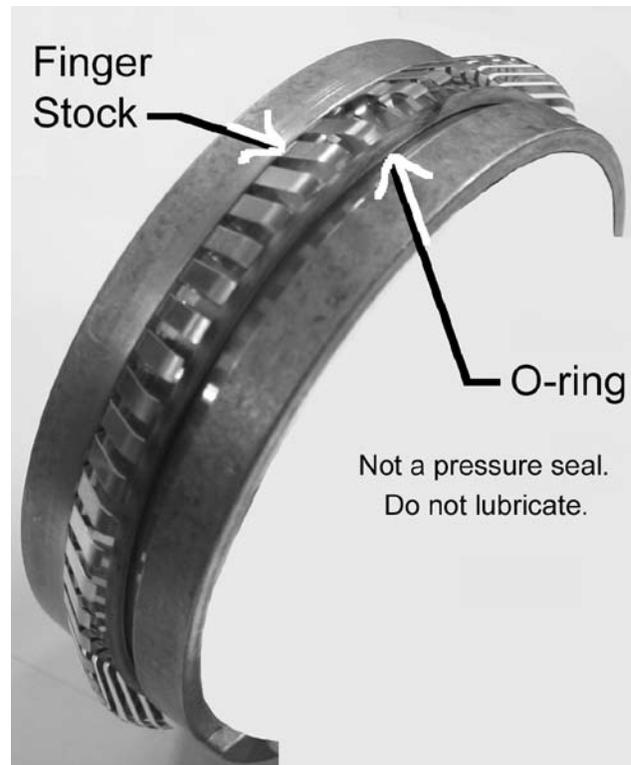
**2.8.3 Closing the Housing**

Before the housing can be reassembled several preparatory steps must be completed:

1. Fresh, dry desiccant packs must be available
2. The humidity indicators at the front of the assembly



**Finger Stock and O-ring Removed**



**Finger Stock with O-ring Below**

**Figure 9. Assembly Housing Wide Front Groove**

must all be blue and not have a pink tint. Gently warm them with a heat gun until they all change to blue. Do not overheat these indicators.

3. The rear plate O-ring must be cleaned, inspected, and lightly recoated with Dow Corning No. 111 silicon grease.

4. The rear plate innermost O-ring groove and mating surface on the interior of the barrel housing must be cleaned and then inspected for any scratches, dents, or other damage.

After any required installation or maintenance procedures have been completed and bench testing done, the housing is ready for ready for reassembly. Proceed as follows:

1. Clean and inspect the interior surface of the barrel housing where the O-ring will rest when assembled for any scratches, dents, or other deformities that may prevent a good seal with the O-ring.

2. Lightly coat the O-ring with Dow Corning No. 111 silicon grease

3. Install the O-ring into the forward most O-ring groove on the rear panel. See figure 6. This is the groove toward the inside of the housing.

5. Verify that the grounding finger stock at the front of the assembly (figure 9) is in place around the large groove. An O-ring should be under the fingerstock. This O-ring is not a pressure seal. It should not be coated with the silicon grease.

5. Install two fresh, dry desiccant packs onto the rail assembly — being sure they will not interfere with operation of the camera and lens or the reinstallation procedure back into the barrel housing. Use tie wraps if necessary.

6. Insert the front of the assembly (with the finger stock) into the barrel — being sure that the assembly is vertically aligned with the base of the housing to the greatest extent possible. Final alignment to the base can be done when the camera is operational.

7. Fully insert the assembly into the housing so that the internal snap ring groove is accessible.
8. Insert the snap ring into its groove starting at the top right and working around to the top left.
9. Press the snap ring fully into the groove all around the groove.
10. Do not install the hex head screw to secure the snap ring in place yet. It will be installed after the housing is purged of moisture laden room air.
11. Proceed to the Purging and Pressurization procedure.

### **2.8.4 Purging and Pressurization**

After reassembly, the housing can be tested for leaks either by observing for escaping bubbles in a tank of water or by checking pressure with a gauge after 12 hours. This procedure offers both alternatives.

1. Apply dry nitrogen to the Schrader valve for about one to two minutes — allowing it to flow freely out the open hole in the rear plate from where the hex head screw was removed.
2. Verify that the O-ring on the hex head screw is in good condition or install a new O-ring on the screw. Lightly coat the O-ring with Dow Corning No. 111 grease.
3. Install the hex head screw into the rear plate. Do not overtighten.
4. Apply dry nitrogen to the Schrader valve to obtain 5 psig (34.5 kPa) to 6 psig (41.4 kPa) pressure. Record the exact pressure noted with an accurate low-pressure gauge.
5. Perform step 6 and 7— or alternatively steps 8 and 9. Then continue to step 10.
6. Submerge the housing into a tank of water for a minute or two and observe for any signs of leakage from the housing as would be noted by bubbles from sealed areas at the front and rear of the housing.
7. After verifying that the housing does not have any pressure leaks remove it from the water tank and continue to step 8.
8. Dry the Bendix connector pins and interior of the connector with either gentle compressed air or cotton

tipped sticks. Then continue to step 10.

9. Allow the housing to sit for at least 12 hours then check pressure again and verify that it is within a pound of the pressure previously recorded in step 4.
10. Verify that the humidity indicators inside the front window of the housing are all blue — indicating that humidity inside the housing is below 10 percent.
11. Perform an operational test on the camera to verify that it is ready to be released for service.
12. Correct any misalignment of the camera related to the base by loosening the stainless steel straps and rotating the housing slightly as required. Then retighten the straps.
13. Release the housing for service.

## **3.0 OPERATION**

Nearly all operating functions of the Camera relate to the internal Ethernet Camera module. Refer to the user technical manual (6X-1043) and reference technical manual (6X-1044).

The only operating function of the Environmental housing version of the Camera not covered in those manuals is the low pressure indicator.

The LED behind the front window will illuminate red if the barrel loses pressure. Also, a contact closure (pins j and k) will be available through the rear panel connector.

Once the barrel has been recharged to 5 psi (34.5 kPa) with dry nitrogen the LED will turn off and the contacts will open.

## **4.0 Shipping and Handling Instructions**

Refer to this section for inspection upon receiving the equipment, shipping back to the factory, and static discharge handling instructions.

### **4.1 Unpacking and Receiving Inspection**

Should you receive this item in a damaged condition, apparent or concealed, a claim for damage must be made to the carrier.

To return the product to the factory for service, please contact the Customer Service Department for a Return Authorization Number. If a visual inspection

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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.

Since shipping damage is the carrier's responsibility, the carrier will furnish you with an inspection report and the necessary forms for filing the concealed-damage claim

### 4.2 Static Discharge Protection

Procedures in this manual do not require entry into the housing of the Camera. However in the event that an open unit were available, the following precautions should be followed:

#### **CAUTION**

This Camera contains sensitive devices that can be damaged by static discharge. Use appropriate static control methods when working inside the Camera.

Components used in modern electronic equipment, especially solid state devices, are susceptible to damage from static discharge. The relative susceptibility to damage for semiconductors varies from low with TTL to high with CMOS. Most other semiconductors fall between TTL and CMOS in susceptibility to static discharge. As a minimum, therefore, observe the following practices when working inside this or any other electronic equipment:

1. Use conductive sheet stock on the work bench surface.
2. Connect the sheet stock to ground through an 1 megohm or greater value resistor.
3. Use a wrist strap connected to ground through an 1 megohm or greater value resistor when working at the bench.
4. Maintain relative humidity of the room above 30 percent. This may require a room humidifier. Working on circuits with relative humidity below 30 percent requires extraordinary procedures not listed here.

## INSTALLATION AND OPERATION

5. Use antistatic bags to store and transport an exposes chassis, circuit boards, and components. Use new antistatic bags. Old, used bags lose their static protection properties.

This list serves as a reminder of the minimum acceptable practices. Be sure that all static discharge devices at the work bench are properly installed and maintained. Standard grounding mats and wrist straps purchased for use at work benches are supplied with leads having current limiting resistors for safety. Never substitute with a grounding lead not having the resistor.

### 4.3 Preparation for Shipment and Storage

For storage periods exceeding about one month, seal the unit in a vapor-proof bag containing a fresh desiccant pack.

Maintain the Camera storage environment within a range of -30 to 70 °C (-22 to 158 °F).

For shipment, package with enough foam padding or other packing material to prevent damage that can occur during shipping. The original shipping carton is a good container if it has not been damaged or subjected to excessive moisture. For shipping to the factory by Common Carrier, use the following address:

**Cohu Electronics  
3912 Calle Fortunada  
San Diego, CA 92123-1827**

Please contact the Customer Service Department for a Return Authorization (RA) number before sending any shipments to the factory:

**cst@cohu.com**

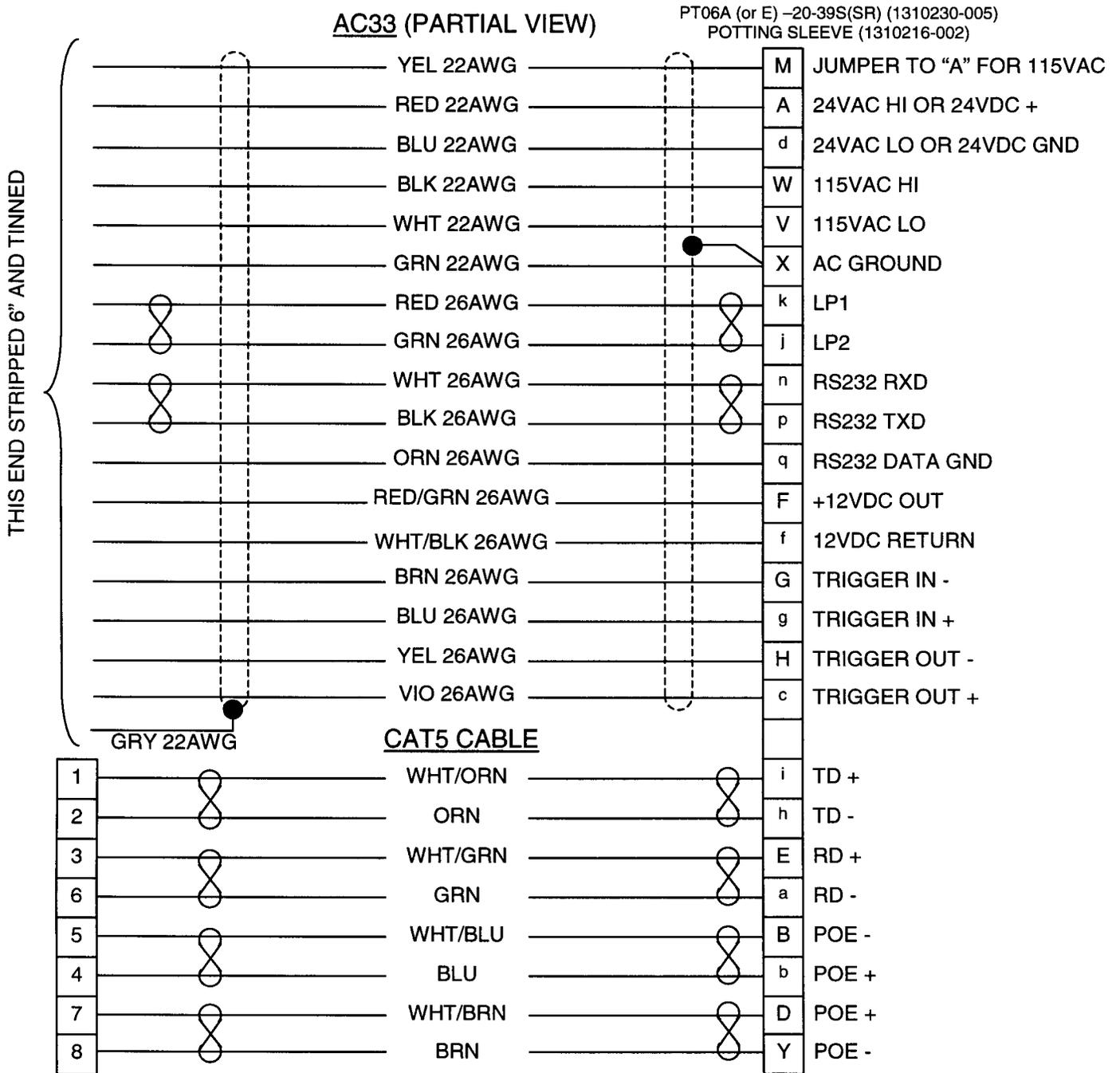
Prominently display the RA number on the outside of the shipping container(s) and on paperwork contained inside. Give a brief description of why the equipment is being returned and list the symptoms of any problems being experienced with the equipment.

-end text

ER8671F1 7140 INTERFACE CABLE

This ER provides an interface cable assembly for a 7140 series camera, providing 24VAC, 24VDC OR 115VAC input power, Ethernet interface via CAT5 cable, low pressure contact closure output, RS232 serial communication, and trigger control. A potting sleeve is installed on the connector and potted.

**NOTE:** When using the 115VAC input, pin “M” (Yellow 22AWG wire) must be connected to pin “A” (Red 22 AWG wire). **CAUTION: DO NOT** connect these two wires together when using 24VAC or 24VDC input power.

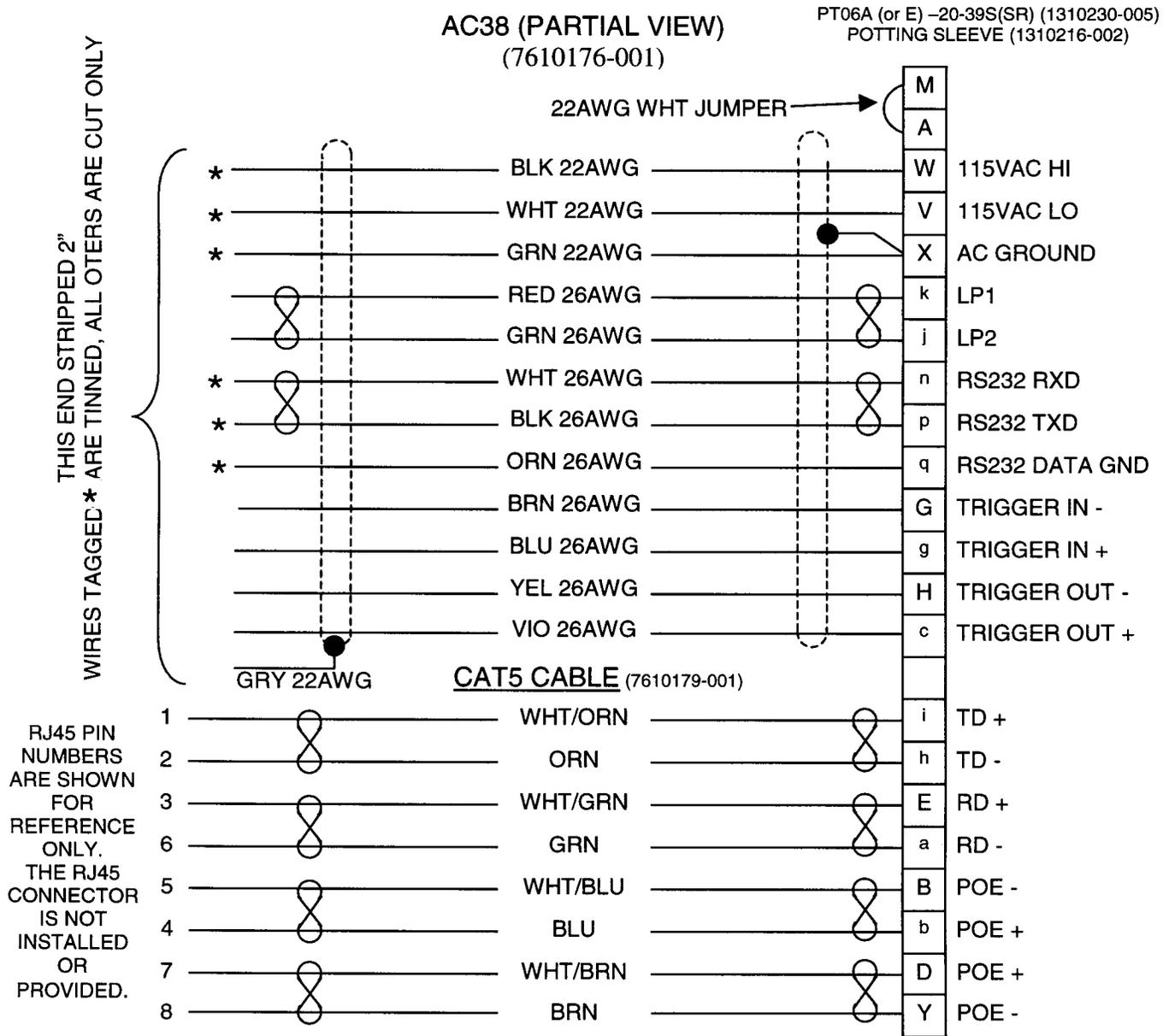


DD August 10, 2004

Figure 10. Cable ER8671 F1, 24 V ac/dc or 115 V ac

### ER8671F2 7140 INTERFACE CABLE

This ER provides an interface cable assembly for a 7140 series camera, providing 115VAC input power, Ethernet interface via CAT5 cable, low pressure contact closure output, RS232 serial communication, and trigger control. A potting sleeve is installed on the connector and potted. The outer jacket on the opposite ends of the cables are stripped 2" (± .5"). All wires tagged \* are tinned, the ends of all other wires are cut off.



DD March 15, 2005

Figure 11. Cable ER8671 F2, 115 V ac Only

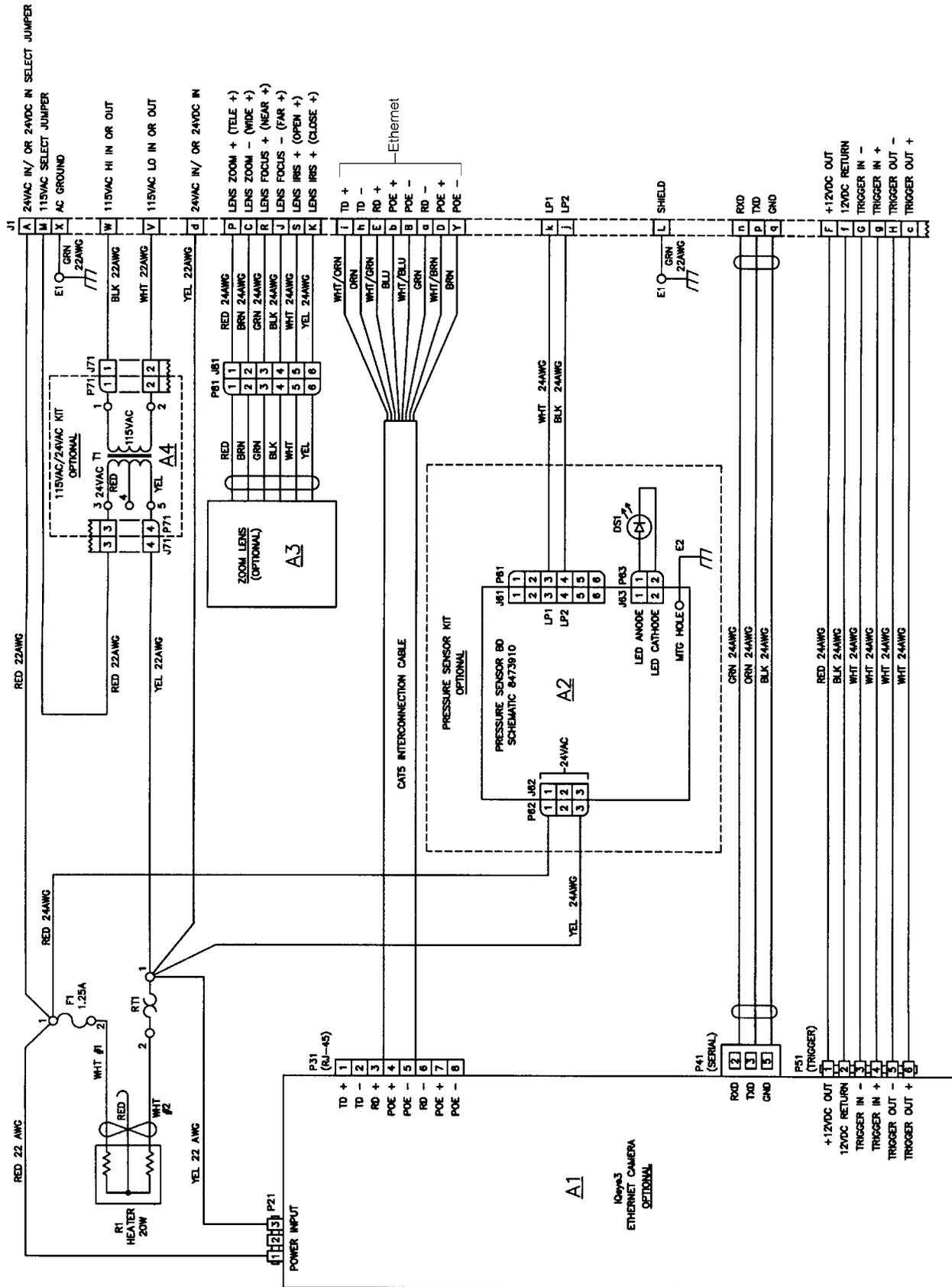


Figure 12. Schematic Diagram, Model 710x and 714x Housings

1. ALL WIRES ARE 24 AWG.  
NOTES: UNLESS OTHERWISE SPECIFIED

## WARRANTY

Cohu, Inc., Electronics Division warrants equipment manufactured to be free from defects of material and workmanship. Any such defective part or parts will be repaired or replaced when confirmed by Cohu examination to have become defective within two years from the date of shipment to the original purchaser for standard CCD, CMOS and uncooled thermal cameras and one year date of shipment to the original purchaser for image intensified cameras, and all other Cohu manufactured products.

**Pressurized Housings:** Pressurized camera products include a lifetime pressurization warranty. Cohu will re-pressurize, at no charge, returned environmental cameras not exhibiting evidence of physical damage due to misuse. All warranty repairs will be performed at the Cohu factory or as otherwise authorized by Cohu in writing. Purchaser shall prepay transportation charges to Cohu.

**Extended IR cameras:** Cameras utilizing extended infrared (extended IR) sensors found to exceed acceptable white blemish specifications within one month of delivery shall be repaired or replaced without charge.

This Warranty does not extend to Cohu equipment subjected to misuse, accident, neglect, improper application, or repaired or altered other than by Cohu, or unless authorized by Cohu in writing. Cameras utilizing extended IR sensors are not warranted for use in areas of elevated levels of cosmic radiation.

Television image pickup tubes, image intensifiers, lenses, and products manufactured by companies other than Cohu are warranted by their original manufacturers. This Warranty is in lieu of all other warranties, expressed, implied, or statutory, including warranties of fitness for a particular purpose and merchantability, and this warranty sets forth the purchaser's sole remedy in connection with such warranties. Whether as a result of breach of contract or warranty, tort, (including negligence) or otherwise, Cohu shall not be liable for any penalties regardless of reason, including but not limited to collateral, consequential, incidental, or exemplary damages, including without limitation, any loss or profit or revenues, loss of use of any equipment or goods, or removal or re-installation of equipment without prior approval.

A Return Authorization (RA) number must be obtained from Cohu prior to returning any item for warranty repair or replacement.

11/06