



Design and Manufacture of Video Pipeline Inspection Systems  
A Full Service Company  
[www.rstechserv.com](http://www.rstechserv.com)

# Controller Power Supply Standard Voltage

**Model 20-2000**

## INSTALLATION MANUAL



Made in USA

# IMPORTANT SAFETY NOTICE

## Fire Safety Conditional Approvals

A fire safety conditional approval must be issued by an appropriate licensed electrical engineer for use of this sewer camera in areas of a sewer that have been demonstrated by testing and monitoring not to fall under the “Fire Safety Approval” requirement in Section 2540.2 of Title 8 of the California Code of Regulations. Testing and monitoring will be considered by the California Division of Occupational Safety and Health, to be sufficient for this purpose if all measurements indicate that the sewer atmosphere is below 10% of the lower explosive limit (LEL) and if the user meets all of the following additional conditions:

- (1) Before each use, inspects cable and electrical equipment for damage or wear that could compromise safety;
- (2) Test operates the sewer camera and associated electrical equipment in a dry location away from any potential exposure to hazardous conditions to determine whether the equipment functions normally and without any problems, such as sparking, loose connections, or other similar safety problems;
- (3) Tests for the existence of a hazardous atmosphere prior to opening any sewer access point using a multi-gas tester, and before energizing the equipment, conducts a test of the sewer atmosphere at the access point estimated to be closest to the end point of the camera work;
- (4) Provides continuous monitoring in the alarm mode at the access point from which the work is performed at all times while the sewer inspection camera is energized in the sewer;
- (5) De-energizes all electrical equipment and uses mechanical ventilation of a measurement exceeding 10% of the LEL is obtained; and Discontinues use of all electrical equipment if the sewer environment cannot be maintained below 10%.

**This piece of equipment is tested by Intertech Test Services and carries the ETL mark.**

## **Table of Contents:**

<i><b>PAGE 4</b></i>	<b>Product Overview</b>
<i><b>PAGE 5</b></i>	<b>Operator and Equipment Safety</b>
<i><b>PAGE 6</b></i>	<b>System Power</b>
<i><b>PAGE 7</b></i>	<b>Installation of Controller</b>
<i><b>PAGE 10</b></i>	<b>Maintenance</b>

# Product Overview



The Model 20-2000 Controller Power Supply is a component of a vehicle mounted or transportable video inspection system. The components of a vehicle system are mounted in a 19-inch standard relay rack, which is part of the operator's control console. The components of a transportable video inspection system are mounted in a 19-inch standard relay rack, which is mounted inside a 1/8" aluminum container. This container provides protection while being transported.

# Operator and Equipment Safety

It is important to be familiar with operations, maintenance, and safety issues when working with RST equipment.



**Read the entire manual before operating the equipment.**

To prevent personal injury or damage to equipment, **turn off Camera power**. When making electrical connections, width adjustments and when maintaining the tractor or camera, disconnect all power to the control station before servicing.

Inspect all transport, camera, lighting cables, and bridles before and after each use. Replace any broken, worn or frayed bridles or cables.



Always use care when near an open manhole, and when climbing in or out of a TV inspection vehicle. The tractor and camera assembly can be placed into the pipeline **without** personnel entering the manhole. Use proper lifting ropes, cranes and winches for lifting equipment in/out of pipes.

# System Power



**CAUTION: NEVER HOOK UP OR DISCONNECT ANY EQUIPMENT WITH POWER TURNED ON!**

The Inspection System requires a steady supply of 120VAC to operate properly. Before starting of the generator or connecting shore power, make sure that ALL equipment inside the vehicle has been turned **OFF**. Turn down the controls for camera power and cable reel speed. After all equipment has been checked, connect the shore power cord.

If a generator is to be used, allow the generator to warm up for a few minutes. Note: Diesel generators use a different control panel that is separate from the controller power supply. Refer to the appropriate generator operators manual for starting. Verify that the voltage and frequency indicators on the controller power supply are in the green normal zone.



**Caution: Before turning on any equipment, plug the keyboard into the data collection system. Plug the Auxiliary Control Box into the Auxiliary Control jack on the controller power supply.**



**Caution: If the voltage or frequency fluctuates into the red zones on the controller power supply, DO NOT turn on any of the equipment in the truck. Check shore power or the generator for proper operation, or have them checked by a qualified technician.**



**Caution: Route cords away from traffic or wet areas to avoid tripping on power cords.**

# 1. Model 20-2000 Controller Power Supply mounting in a vehicle

1.1 The Model 20-2000 Controller Power Supply 7-inch high front panel conforms to the criteria of the EIA standard for universal 19-inch relay rack spacing. Using this method allows components with different panel widths to be placed at different positions in the rack. Figure 1 shows the spacing of an EIA relay rack.

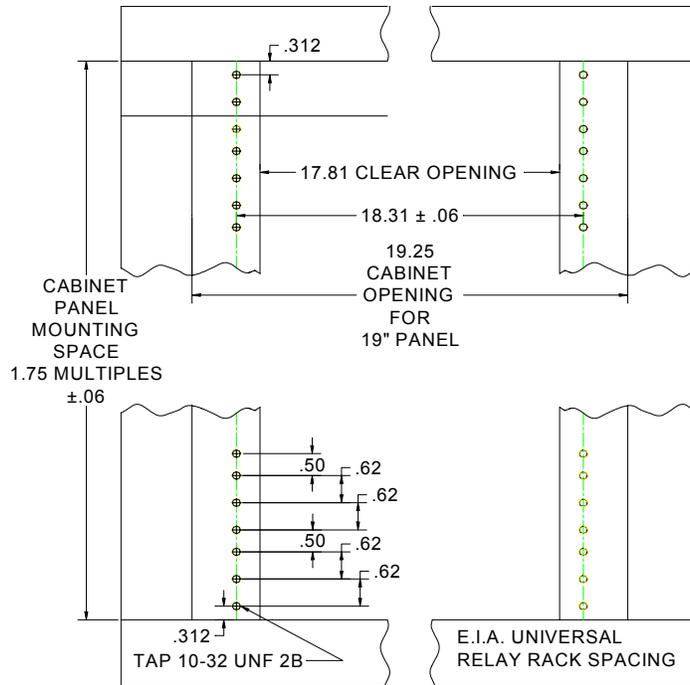


Figure. 1

1.2 In vehicles, the Controller Power Supply is mounted in relay racks that are part of the operator's console. Relay rack rails are mounted to the side supports of the equipment opening. The vehicle environment may subject the equipment to severe shock and vibration.

The Control Power supply unit must have adequate front and rear support. It is recommended that the unit be installed on the bottom of the equipment stack so it will sit on the office counter top. If the power supply is installed in the middle of the stack, use a 2-inch shelf angle, mounted front and rear, to provide additional support.

When installing the relay rack rails, ensure that the equipment-mounting holes follow the pattern in Figure 1.

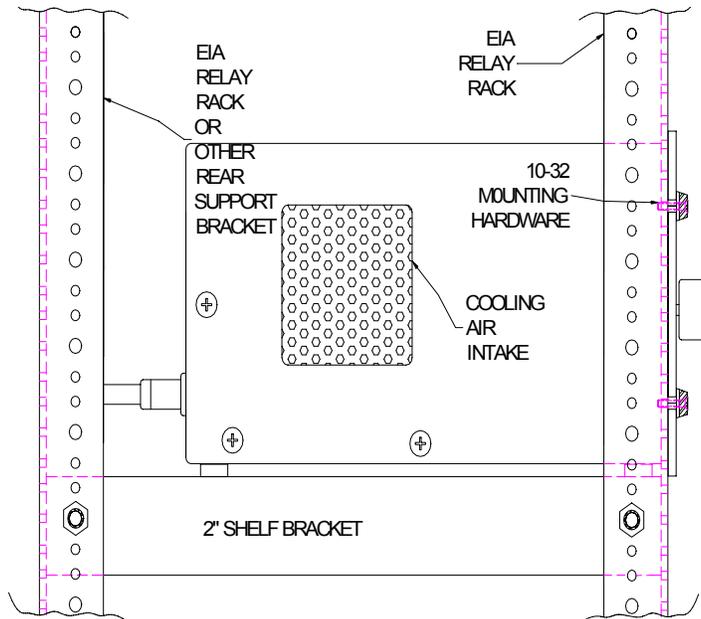


Figure. 2

The area around the cooling air inlet must have access to sufficient cool air from

outside of the console. The sidewall of the operator's console should not be closer than a  $\frac{3}{4}$ " from the cooling air inlet. Allow a 4-inch clearance front and back from the cooling air inlet. The inlet must not be obstructed. (See Figure 2.)

## **2. Model 20-2000 Controller Power Supply mounting in a transit case**

**2.1** The Controller Power Supply may be mounted in a transit case that has used relay racks to mount the enclosures.

When installing the relay rack rails, ensure that the equipment-mounting holes follow the pattern in Figure 1.

The Control Power supply unit must have adequate front and rear support. It is recommended that the unit be installed on the bottom of the equipment stack so it will sit on the bottom of the transit case. If the power supply is installed in the middle of the stack, use a 2-inch shelf angle, mounted front and rear, to provide additional support.

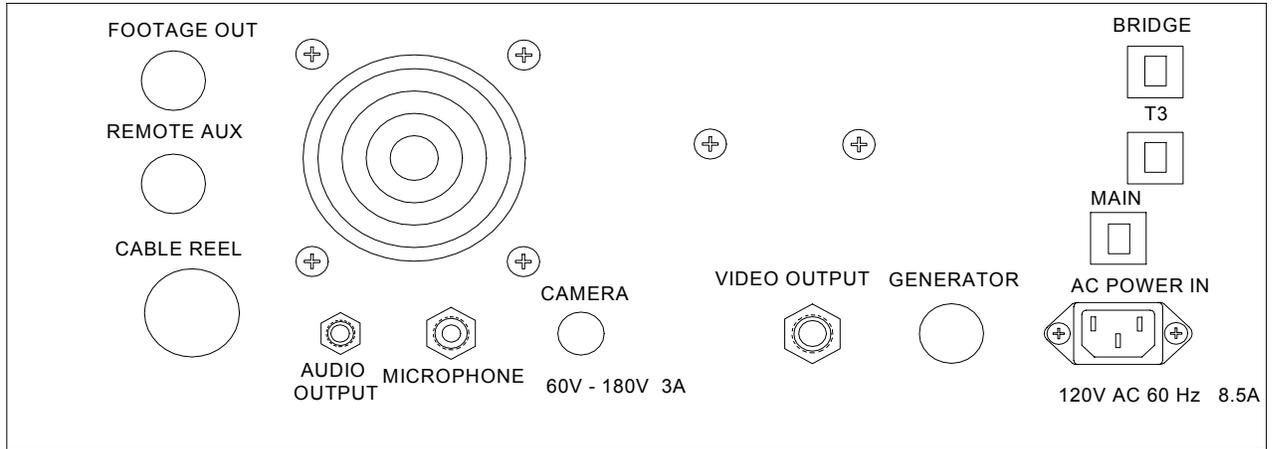
The area around the cooling air inlet must have access to sufficient cool air from outside of the console. The sidewall of the operator's console should not be closer than a  $\frac{3}{4}$ " from the cooling air inlet. Allow a 4-inch clearance front and back from the cooling air inlet. The inlet must not be obstructed. (See Figure 2.)

The transit case needs one or more 3-inch cooling fans to exhaust air from the transit case. It is recommended to use the 3.5-inch filler panel in the top section of the rack mount above the equipment.

When the transit case is being used in a hot climate or at an elevation above 4000 feet. It is recommended that a  $1\frac{3}{4}$ " panel drilled with a number of  $\frac{1}{4}$ " holes be mounted below the controller power supply for proper ventilation. Depending on the power requirement of the other equipment mounted in the transit enclosure, the number of exhaust cooling fans may need to be increased.

Contact the R. S. Technical Services, Inc. for guidance for additional cooling criteria.

### 3. Model 20-2000 Controller Power Supply rear panel connectors.



**Figure 3** Rear Panel

- 3.1 FOOTAGE OUT  
Plug AMP 4 pin male
- 3.2 REMOTE AUX.  
Plug AMP 8 pin male
- 3.3 CABLE REEL  
Plug AMP 28 pin male
- 3.4 AUDIO OUTPUT  
Plug RCA type
- 3.5 MICROPHONE  
Plug 1/4" MONO type
- 3.6 CAMERA  
Plug Type N 50 Ohm
- 3.7 VIDEO OUT  
Plug BNC 75 Ohm
- 3.8 GENERATOR  
Plug AMP 4pin Female
- 3.9 AC POWER IN  
Attachment Cord IEC 60320,insulation type SJT, 13A/125VAC

# Maintenance

1. Keep office clean of dust and dirt.
2. Keep liquids and spills away from controller and equipment.
3. Repair or replace any defective switches and knobs.
4. Inspect plug on auxiliary control box for wear.
5. Make sure power cable and electrical connections are properly connected.