This training course provides service technician training for the Sargas-PJ1 series.

Product Overview

This section provides an overview of the machine, and the options that can be installed.

■ **What Models are there in the Series?** RICOH imagine. change.

- Sargas-PJ1wu (Y095, Y097): PJ WUL6280, PJ LU6000
  - 6000 lumens, WUXGA resolution
- Sargas-PJ1w (Y096, Y098): PJ WXL6280, PJ LW6000
  - 6000 lumens, WXGA resolution
- The models in red are for the China market.
- These are high end laser beam projectors for large conference rooms and convention halls (100 people or more).
- These models can be used over a network.
  - HDBaseT is a standard feature, and Wireless LAN is an option (will be released in 2016).

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No additional notes

Main Specifications

RICOH imagine. change.

	Sargas-PJ1 w	Sargas-PJ1 wu
Type	0.65DMD	0.67DMD
Brightness	6000 lm	6000 lm
Lamp type	Laser diode banks x 2	
Resolution	WXGA (1200 x 800)	WUXGA (1920 x 1200)
Projection distance	0.75m-5.78m	
Projection screen size	50-300 depending on the lens	
Contrast	1100:1	1200:1
Throw Ratio	Depends on the lens (see the service manual for details)	
Dimensions (W × D × H, mm)	484 x 509 x 186	
Weight	18 kg (excluding lens)	
Power Consumption	< 560W (normal), <340 (eco)	
Keystone	Vertical and Horizontal	
Speaker	No speakers	
Wireless LAN	Option	
Wired LAN	HDBaseT	
USB	USB A (for Wi-Fi dongle), Mini USB (for Firmware Update)	

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See the specifications table in the service manual for more details.

Service Features

- This product can be installed by users, except when mounted on a ceiling or wall.
- This product is designed for user maintenance. Regular on-site maintenance is not needed.
- LEDs show the machine status and symptoms for troubleshooting.
- A service mode is available.

No additional notes

No additional notes

Energy Consumption

- Normal mode: 560W+/-20%@ 110VAC
- Eco mode: 340W+/-10%@ 110VAC
- Standby mode (LAN off) < 0.5W

No additional notes

Lenses

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- There are interchangeable lenses for short throw, long throw, and standard throw.
  - Replacement Lens Type A01 (short throw)
  - Standard Lens Type A02 (normal throw)
  - Replacement Lens Type A03 (long throw)
  - Replacement Lens Type A13 (very long throw)
  - Replacement Lens Type A15 (very short throw)

No additional notes

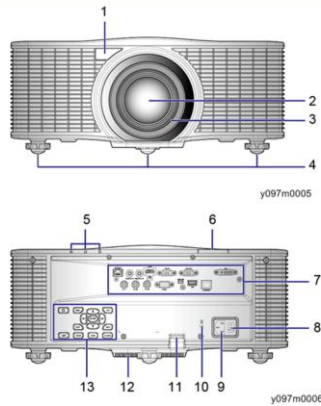## Reliability Information

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- Average monthly projection time: 66 hrs/month
  - 3 hrs/day x 22 working days/month
- Failure Rate
  - 1st year: 0.0024 cases/unit/month
  - 2nd year: 0.0029 cases/unit/month
  - 3rd year: 0.0036 cases/unit/month
  - 4th year: 0.0044 cases/unit/month
  - 5th year: 0.0044 cases/unit/month
- Laser Diode Life
  - 20,000 hrs

No additional notes

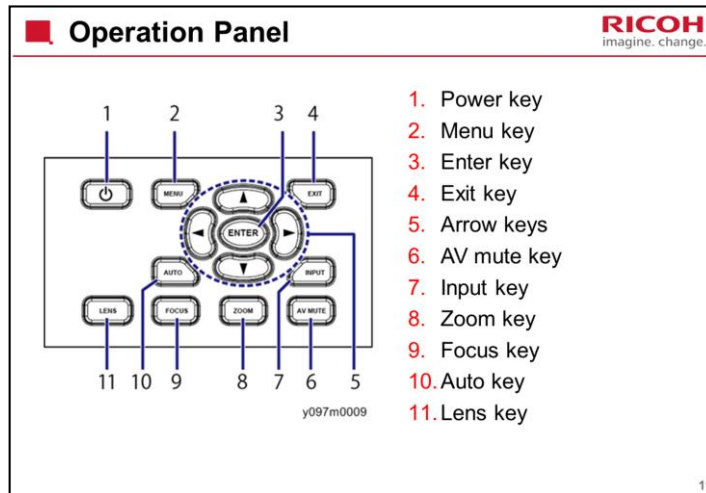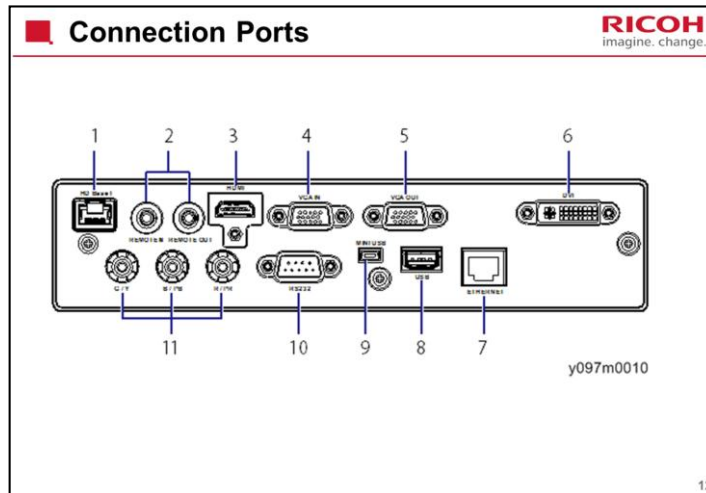No additional notes

Operation Panel

1. Power key
2. Menu key
3. Enter key
4. Exit key
5. Arrow keys
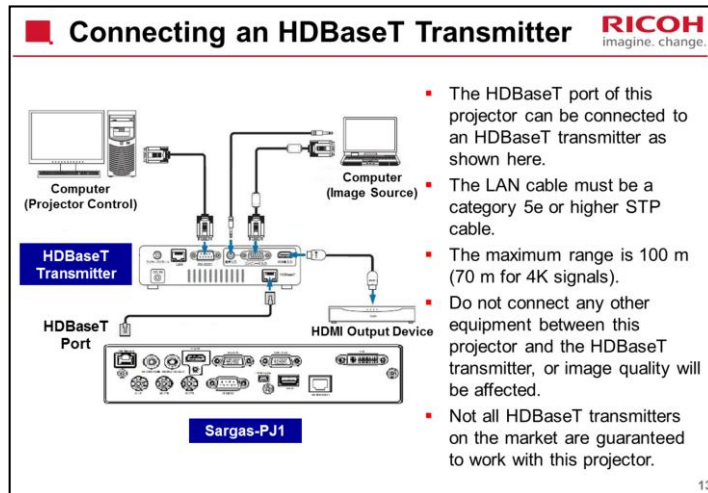6. AV mute key
7. Input key
8. Zoom key
9. Focus key
10. Auto key
11. Lens key

No additional notes

1. HDBaseT connector
2. Remote In/Out connectors
3. HDMI connector
4. VGA IN connector
5. VGA OUT connector
6. DVI-D connector
7. Ethernet connector
8. USB Type A connector
9. Mini USB connector (for firmware update)
10. RS232 connector
11. Component IN connectors

Connecting an HDBaseT Transmitter

- The HDBaseT port of this projector can be connected to an HDBaseT transmitter as shown here.
- The LAN cable must be a category 5e or higher STP cable.
- The maximum range is 100 m (70 m for 4K signals).
- Do not connect any other equipment between this projector and the HDBaseT transmitter, or image quality will be affected.
- Not all HDBaseT transmitters on the market are guaranteed to work with this projector.

HDBaseT is a standard method for connecting consumer electronics. It is promoted by the HDBaseT Alliance.

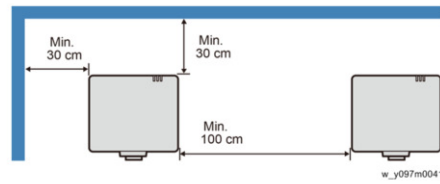STP: Shielded Twisted Pair

No additional notes

Installation

This projector is installed by the customer. However, please study the installation procedure in the user's guide to be familiar with the procedure, because some customers may need help.

Installation by the Customer

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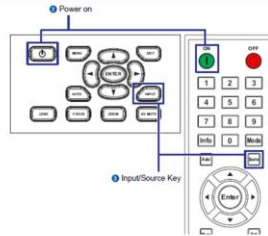No additional notes

Installing Projectors Side-by-side

- There must be a space of 100 cm or more between the projectors if they are installed side by side.

No additional notes

Turning the Power On

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1. Plug in the power cable and turn on the power switch next to the cable inlet.
2. Turn on the lamp by pressing the power button on the operation panel or on the remote control.
   - The Power LED will light up.
   - The Status LED will blink Orange.
3. Turn on the source. Press the Input key on the operation panel (or the Source key on the remote control) to select an input source (VGA, HDMI, or Component).

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No additional notes

Turning the Power Off

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1. Press the "OFF" button on the remote control or the power button on the operation panel.
2. A message will be displayed. Press the button again within 10 seconds and the projector power will turn off.

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No additional notes

Basic Points about Service

No additional notes

Swap and Repair

- This product is intended for 'swap-and-repair'.
- If the projector needs repairs, it is taken away from the customer site and a temporary replacement is provided to the customer.

No additional notes

Special Tools Needed

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- RS-232C cable (cross)
- USB cable (Type A to Mini B)
- Laptop (with terminal emulation software, which is required for collecting error logs and updating firmware)

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An example of terminal emulation software is Tera Term.

Antistatic Clothing

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- To protect the components from damage, wear anti-static clothing when you disassemble the machine.
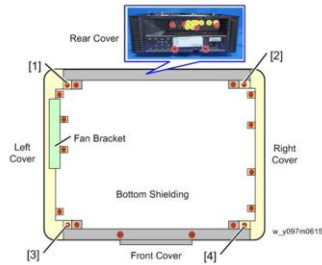
No additional notes

Parts Replacement

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- After replacing parts, some adjustments may be needed. See the table in the following section of the service manual: Replacement and Adjustment - Required Action After Replacing Parts
  - Whenever you replace a component, check this table to see if you have to do any of these procedures.

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No additional notes

Removing Covers

- Each of screws [1], [2], [3] and [4] fastens two adjoining covers.
  - For example, screw [1] fastens the left and rear covers.
- If a cover is difficult to remove, removing the screws of its adjoining cover will make it easier to remove the cover.

No additional notes

Front Cover

- The front IR sensor is built into the front cover. Make sure to connect this up when you replace the cover.
  - 'IR' is printed on the circuit board by the correct connector.

No additional notes

Left Cover

- Two fans are built into the left cover. Make sure to connect them up when you replace the cover.
  - 'R-Fan1' and 'R-Fan2' are printed on the circuit board by the correct connectors.
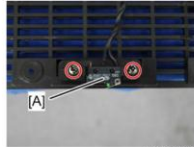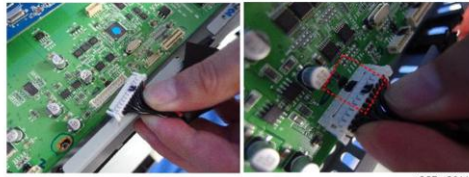
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No additional notes

Right Cover

- One fan is built into the right cover. Make sure to connect it up when you replace the cover.
  - 'F-Fan5' is printed on the circuit board by the correct connector.
- Also, don't forget to reattach the interlock switch [A].

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[A]

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No additional notes

LVPS – PSU Harness

- The connector at each end of the harness linking the LVPS and PSU must be connected to the matching board.
- If you remove the harness, be careful of this. If you connect the LVPS end to the PSU, the power will fail to turn on.
- Mark the connectors and boards as shown in the red frame so as to indicate the matching pairs of connectors and boards

No additional notes

Replacing the Filter Wheel

- Do not touch the wheel part [B]. Be careful not to bump the wheel against anything, because it breaks easily.

No additional notes
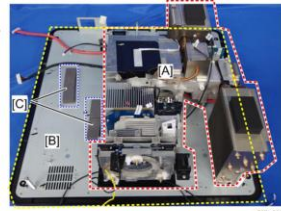
Optics Engine Layout

- [A]: Optics Engine
  - 2 Laser banks, 2 Laser Bank Boards
  - Optical Engine Board
  - DMD Board
  - Phosphor Wheel
  - Fan 7 (inside the Phosphor Wheel)
- [B]: Base Unit
  - Bottom Shielding
  - Bottom Cover
  - Fan 6 (between the Optical Engine and the Bottom Shielding)
- [C]: Thermal Pads
- Individual components of the optics engines cannot be replaced in the field.
  - For example, if the laser banks don't work, replace the entire optics engine and base unit.

No additional notes

Service Mode Menu

- Factory Reset: Use this to reset all the settings in the OSD menu (except for the service mode and network settings).
- Filter Wheel Index: Use this to adjust the filter wheel index.
- Phosphor Wheel Index: Use this to adjust the phosphor wheel index.
- Error Log: Records the times when power failed on the projector.
- Mode Adjustment: Use this to adjust the projected image position and record the coordinates after adjustment. (Up to 19 coordinates can be recorded.)
- Reset Projector Hours: Use this to reset the machine's cumulative operation time.
- Light Sensor Calibration: Use this to calibrate the color balance.
- ADC Calibration: Use this to calibrate the analog-to-digital converter (ADC).
- G Sensor Calibration: Use this to calibrate the sensor that detects the projector's orientation.

For details on how to enter service mode, see the service manual.

The machine contains a light sensor to monitor the brightness. Calibration is needed because laser brightness decays naturally over time.
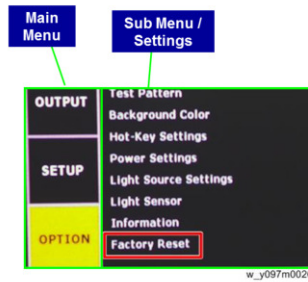
- Adjust if there are yellowish or bluish parts in the image.

No additional notes

Factory Reset: Method 1
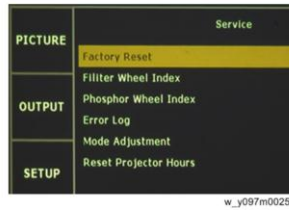
RICOH
imagine. change.

- This erases all OSD menu settings and restores the default setting (except the service mode and network settings).
- Procedure:
  - Press the "Menu" key to enter the OSD menu.
  - Select "Option" -> "Factory Reset".

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No additional notes

Factory Reset: Method 2

- This does the same as method 1 on the previous slide.
- Procedure:
  - Get into service mode, and select factory Reset.

No additional notes

Updating Firmware

This section explains the basic points about updating the firmware.

- PW392
- PIC
- LAN

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No additional notes

- Equipment needed
  - Software
    - Firmware update file
    - Terminal software which can support serial port connections
  - Hardware
    - Projector
    - Power cord
    - Female to female RS232 cable (cross)
    - PC
- The detailed procedure is in the System Maintenance - Firmware Update section of the service manual.
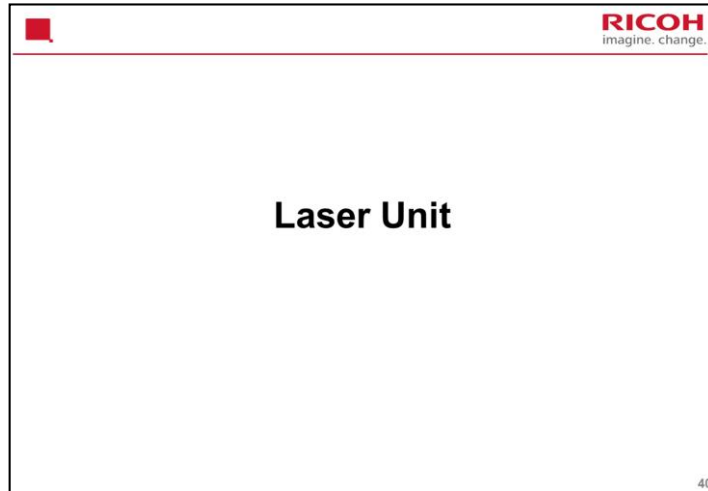
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No additional notes

No additional notes

Laser Unit

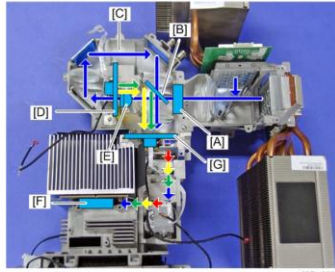This section briefly describes the technology used in the laser diode units.

- This projector uses blue lasers for a light source.
- A phosphor wheel and an index wheel create the other required colours (yellow, red, green) from the blue light.
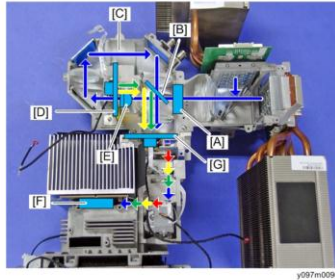
No additional notes

Light Path - 1

- Blue light from the laser diode banks goes through the afocal lens [A] and the dichroic mirror [B].
- The collimator [E] adjusts the beam before it reaches the phosphor wheel [D].

Afocal lens: No convergence, light is transmitted to a distant point as parallel rays.

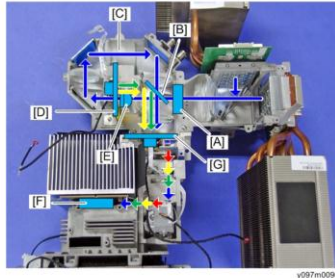Light Path - 2

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imagine. change.

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- The phosphor wheel [D] creates green and yellow light from the blue light.
- The green and yellow light are reflected back to the dichroic mirror [B], but the blue light passes straight through.

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Afocal lens: No convergence, light is transmitted to a distant point as parallel rays.

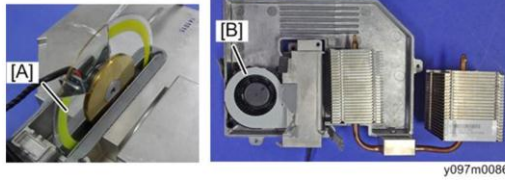**Light Path - 3** — RICOH imagine. change.

- The green, yellow, and blue light reaches the filter wheel [G]. This wheel creates red light from the yellow light.
- The four beams (blue, green, yellow, red) reach the DMD [F] and the image is assembled for projection.

Afocal lens: No convergence, light is transmitted to a distant point as parallel rays.

Phosphor Wheel

- The phosphor wheel has three segments: blue transparency, yellow phosphor, green phosphor.
- A fan on top of the phosphor wheel cools it down during operation.

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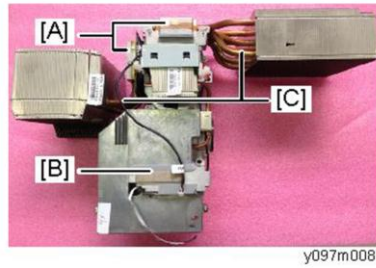No additional notes

Filter Wheel

- The filter wheel has 4 segments: green, blue, red, and yellow.
- The blue segment contains a diffuser to reduce the coherence of the blue laser light, for safety purposes.
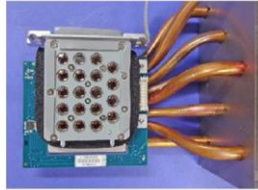
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No additional notes

Combiner Module

- This module contains two banks of laser diodes [A], the phosphor wheel assembly [B], and heat pipes [C] for cooling the laser diodes.

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No additional notes

Laser Banks

y097m0088   y097m0089

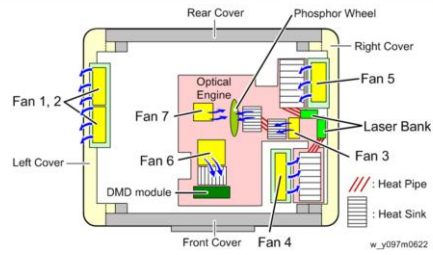- Each bank has 19 laser diodes, cooled by heat pipes.

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No additional notes

Cooling Fans

- Fans 6 and 7 are inside the optics engine/base unit assembly. If either of these fans breaks, the optics engine/base unit must be replaced.

No additional notes

The End