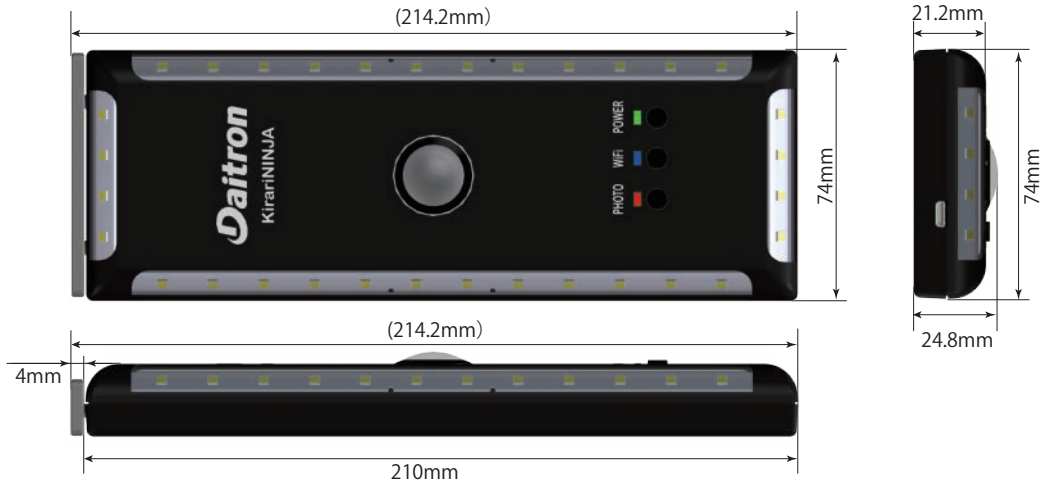




Applicable to cylinder with bore of 50 or less also

# Kirari NINJA-DS

Automatic Photographic Device for Marine Engine Cylinder



- ◆ **Thin (approx. 25mm)**
- ◆ **No cooling gel pack required**
- ◆ **No controller required**
- ◆ **Much less power consumption**
- ◆ **Direct image transfer**
- ◆ **Magnet handling jig for loading/unloading**
- ◆ **Budget-friendly price**

Insertable from smaller scavenging ports.  
 Usable up to the ambient temperature of 70°C.  
 Easy operation using only the buttons on the body  
 LED lights up only in photographing.  
 Directly connected to a PC via USB port  
 Easily and securely set.



Selection of the parts and production cost have been reviewed.

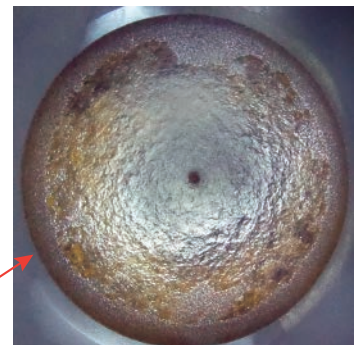
## Objective and Benefits

In conventional methods for inspecting inside of cylinders, the cover is removed and a worker must go inside (open-up inspection), or the inside condition is checked by viewing from a scavenging port (non-open-up inspection). Open-up inspection takes long time, and it is a large burden for workers. Additionally, a test run (or overhauling in some cases) may be required after the re-assembly.

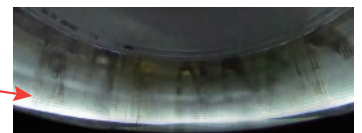
**Kirari NINJA** system, set on top of a piston, can photograph all directions in the cylinder automatically in one round of the piston movement. Images in all cylinders can be captured after the engines are stopped. By using the Kirari NINJA, workload and time can be drastically reduced. Captured images make it possible to see the condition of the combustion chamber in detail and analyze the condition.

- No need to open up the engines
  - Reduces the burden on workers
  - Removes the risk of reassembling
- Photographing is available when a ship is entering a port.
  - Data of changes over time for each cylinder can be acquired.
  - Detects a sign of a failure and facilitate the preventive maintenance.

< Images of a Combustion Chamber >



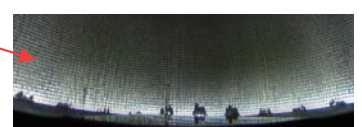
Exhaust Valve (Fire Side)



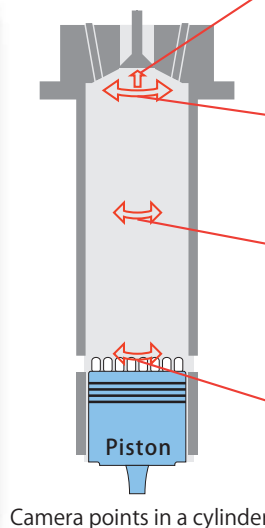
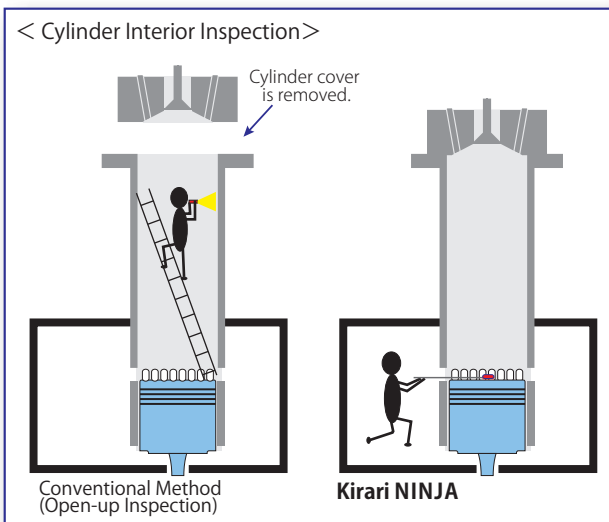
Top Dead Center



Cylinder Oil Groove



Bottom Dead Center



## ■ Operating Requirement

Kirari NINJA can be inserted into the scavenging port of the cylinder.

## ■ Heat Resistance

Max. temperature in cylinder should be 70°C or less.

## ■ Lighting Range

Cylinder I.D. Max. 980mm

## ■ Continuous Running Time

90 min. or longer

## ■ Camera Mode

Still image mode

## ■ Dimensions

H25× W74× D215mm

## ■ Weight

Approx. 350g (with batteries)

## ■ Image

Still image Jpeg (Exif Ver.2.3 DCF 2.0 compliant)

## ■ Internal Memory

Approx. 8GB

Image size: 5376× 2688 (approx. 1600 images)

Image size: 2048× 1024 (approx. 9000 images)

## ■ Accessory

- Handling jig (magnet-type)
- Charger, AA NiMH batteries (4 pcs)
- Album software (in accessory USB memory)
- Manual (in accessory USB memory)
- Dummy box

## ■ Certification

CLASS NK (to be certified)

•Kirari NINJA is the system name.

•"Wi-Fi" is a registered trademark of Wi-Fi Alliance.

•Kirari NINJA used herein is a registered trademark of Daitron Co., Ltd.

•Any other product names are the trademarks or registered trademarks of their respective companies.

## Kirari NINJA Series Comparison Chart

Product Name		Conventional Kirari NINJA	Compact Kirari NINJA-DS
Applicable Cylinder Size		Bore 50 or larger	Bore 35 or larger
Enclosure	Dimensions (mm) <Approx.>	H 35 x W 101 x D 223 ※1	H 25 x W 74 x D 215
	Weight (g) <Approx.> ※with batteries and camera	390 (with cooling gel pack)	350
	Open-up	Required	Not Required
	Heat resistance (ambient temperature)	70°C or less (with cooling gel pack)	70°C or less
360°Camera	Camera	THETA-SC ※2	Integrated camera
	Operation	External controller	Buttons on the body
	Battery	Integrated lithium-ion	NiMH battery in the enclosure
	Charger	Directly to the camera	Accessory AA NiMH batteries
	Image loading	Wi-Fi, USB (camera)	Wi-Fi, USB (enclosure)
Lighting	Light	Always lit	In photographing only
	Battery	AAA NiMH (4 pcs)	AA NiMH (4 pcs)
Accessory	Handling jig	Insertion type	Magnet type
	Cooling gel pack, Cooler bag	○	×
	Controller (iPod Touch/iPad)	○	×
	Case	○	×

※1 Buttons are excluded.

※2 RICOH THETA SC is a registered trademark of Ricoh Company.

## Company Information

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