



FEATURES

- Wide range
- Easy to fit
- Depths to 200m
- Lighting up to 100W
- Axial and radial viewing

IST-REES R93

Interchangeable Viewing Heads

Designed to enhance the versatility of the IST-Rees R93 Camera, the range of Interchangeable Viewing Heads simply screw on to the forward end of the camera body, without tools, and provide rugged protection for the high performance optics.

Fitting the appropriate viewing head enables the camera to be used underwater and gives additional optional facilities including remotely controlled lighting. The radial viewing R93-03 head also features a rotating mirror remotely driven by a motor in the R93 camera. All lighting supplies up to 100 watts are routed through the camera cable to spring loaded contacts adjacent to the camera lens. These connect to gold plated rings at the rear of the viewing head when the head is installed on the camera body.



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R93 VIEWING HEADS SPECIFICATIONS AND PERFORMANCE

Plain or water corrected windows are supplied depending upon the application. A plain window can be used underwater, however it narrows the viewing angle as follows:

Plain	Air	Water
Horizontal	50°	37°
Vertical	39°	29°
Diagonal	61°	45°

When a water corrected window is used the angle of view in water is the same as the angle of view of a plain window in air.

The 9mm f2.0 lens focusing range is from 30mm to infinity as a stock item, but closer focusing can be provided if required, subject to individual application.

The amount of light that can be provided is governed by a number of factors, the most important being whether the camera is to be used in water or air. In water the heat generated by the lights is dissipated quickly allowing high power to be used. In air lower power may have to be used as heat is dissipated more slowly.

In some instances, lights on a particular head may not be rated for continuous operation in air.

Remote control of the various viewing heads including rotation, Hi and Lo light levels, and light intensity is available from the R90 Mk3 Camera Control Unit (CCU). Lighting power of up to 20 watts is also provided by the R90 Mk3 CCU lighting Module. Heads requiring higher power outputs, use an R905 LPS external lighting power supply. Interconnecting leads to the R90 Mk3 CCU enable the lighting power to be routed via the single camera cable.

SPECIFICATION NOTES FOR ALL VIEWING HEADS

1. The information provided on lighting ranges is approximate only based on tests made in a dark-room viewing scenes with reflectivity of 60% using an R93 camera fitted with a newvicon tube.
2. A “good” picture is defined as one where the illumination available is sufficient for the camera to produce a 1 volt composite video signal with a fully open iris.
3. A “usable” picture can usually be obtained dependent on the scene viewed and environmental factors etc, when the illumination available is only 1/3 that required to achieve a 1 volt composite video signal with a fully open iris.
4. The “length with camera” dimensions given relate to the length from the tip of viewing head to the end of the camera connector.

In applications where there are severe space constraints care should be taken to allow for the size of the camera cable mating connector and if necessary, the bend radius of the connecting camera cable. Please refer to the Rees R90 series cables and connectors data sheets.

R93/00

The R93/00 viewing head protects the lens and enables the R93 camera to be used underwater. Quartz glass and polycarbonate windows are available.

Length with Camera	294mm (11.6")
Diameter	40.5mm (1.6")
Depth Rating	200m (656')
Weight with Camera	1.4 kg (3.0 lb.)



R93/01

The R93/01 head is designed for use in restricted spaces. It has a low power internal lighting system of 1.8 watts provided by a ring of 8 tungsten lamps and can be used continuously in air or water. Quartz glass and polycarbonate windows are available.

Lighting Range (m)	In Air	In Water
For good picture	1.3m	0.3m
For usable picture	3.2m	0.7m

Length with Camera	294mm (11.6")
Diameter	40.5mm (1.6")
Depth Rating	200m (656')
Weight with Camera	1.2 kg (2.6 lb.)



R93/02

The R93/02 heads have either 20 watt or 100 watt tungsten halogen lamps. The 20W version is designed for continuous operation in air or water, and can be powered by the R90 Mk3 Lighting Module. The 100W version is designed for continuous operation in water, and can be used in air for short periods depending upon the prevailing environmental conditions.

Forward viewing is slightly obscured by the lamp housing but this tends to be insignificant for the inspection of tubes and pipes where the extra lighting power available within the same diameter as the R93/01 head is of particular benefit. A water corrected window is fitted as standard.

Lighting Range (m)	In Air	In Water
For good pictures (20 watts)	1.3m	0.75m
For usable pictures (20 watts)	2.7m	1.75m
For good pictures (100 watts)	1.7m	1.0m
For usable pictures (100 watts)	6.0m	1.8m

Length with Camera	(20W) 440mm (17.3") (100W) 457mm (18")
Diameter	40.5mm (1.6")
Depth Rating	200m (656')
Weight with Camera	2.5kg (5.5 lb.)



R93/03

The radial viewing R93/03 views at right angles to the camera by using a stainless steel mirror which can scan through 360°. The head is fitted with either a 20W or 100W forward lamp and two 0.7W lamps — one mounted at each side of the mirror. Light from the forward lamp is back reflected to provide shadow modelling, the 0.7W lamps produce a diffuse light ideal for close-up viewing. The 20W versions can be used continuously in air or water. The 100W version is designed for operation in water, and can be used in air for short periods depending on the prevailing environmental conditions. Acrylic and quartz glass versions are available. The acrylic window should be replaced after 104 Gy due to embrittlement.

Note: During a 360° scan the picture becomes inverted.

Lighting Range (m)	In Air	In Water
Lo position for good picture (1.4W)	0.3m	-
Lo position for usable picture (1.4W)	0.4m	-
Hi position for good picture (100W)	1.5m	0.65m
Hi position for usable picture (100W)	4.0m	1.1m
Hi position for good picture (20W)	1.3m	0.35m
Hi position for usable picture (20W)	3.3m	0.95m

Length with Camera	(20W) 383mm (15") (100W) 415mm (16.3")
Diameter	42mm (1.7")
Depth Rating	200m (656')
Weight with Camera	1.7kg (3.7 lb.)



R93/05

The R93/05 provides good illumination for general purpose viewing from 2 x 10 watt tungsten halogen lamps. It is designed for continuous use underwater and can also be used in air for short periods. After fitting, the head can be rotated manually by up to 180° (without breaking the center waterproof seal), to obtain the optimum lighting alignment, or to fit into specific spaces.

Lighting Range (m)	In Air	In Water
For good picture	3.0m	2.0m
For usable picture	7.0m	4.6m

Length with Camera	300mm (11.8")
Depth Rating	200m (656')
Weight with Camera	2.4kg (5.3 lb.)



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