



OPERATION AND INSTALLATION MANUAL

DETAILS OF THE EQUIPMENT

PART NUMBER:	5249-10-0001
DESCRIPTION:	HAWKEYE UNDERWATER CAMERA MODEL 32CS AND 32CS-L

APPROVALS

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ISS	DATE	DESCRIPTION	BY	CHK
0	20/08/08	DRAFT FOR APPROVAL	BW	
1	29/03/10	RELEASE FOR PRODUCTION	RH	
2				

3				
4				
5				

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AUGUST 2008

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SAFETY AND ENVIRONMENTAL STATEMENT

1. Lethal voltages are exposed within the control unit when the top cover is removed. The unit should always be disconnected from the mains supply before removing or operating any internal components.
2. The unit should be earthed at all times.
3. The unit contains electrostatically sensitive devices (ESSD). Appropriate static protection should be used when handling subassemblies.

RELATED DOCUMENTS

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SPECIFICATIONS

INTRODUCTION AND DESCRIPTION

This manual applies to the HAWKEYE 32CS and 32CS-L Underwater Camera System. It contains information on operation and maintenance of the camera unit and provides the user with a manufacturer's recommended spares package.

The HAWKEYE contains a high performance colour TV camera fitted into a waterproof housing. The unit is constructed from stainless steel, acrylic and acetal and is designed for operation up to 300m water depth.

The unit is also fitted with a ring of 20 LED's (light emitting diodes) surrounding the camera lens. This light source is optically isolated from the camera lens to avoid light leakage and smearing. The LED's are high brightness white units with wide angle lenses. The intensity is fixed in the 32CS camera module whilst the 32CS-L illumination level can be adjusted by varying the supply voltage at the connector.

The front face of the camera can be removed to allow access to the camera lens for focus adjustment. A special tool is available as an option to allow removal in the field.

The camera connects to the underwater cable by means of an underwater mate-able connector with locking sleeve.

The unit provides a standard PAL (UK) compatible single ended composite TV signal output. This signal is suitable for transmission along high quality 75 ohm coaxial cable.

INSTALLATION INSTRUCTIONS

The camera unit is designed to operate from a 12VDC supply only. **DO NOT CONNECT TO ANY OTHER SUPPLY VOLTAGE OTHERWISE DAMAGE WILL OCCUR.**

The unit is not reverse polarity protected. **DO NOT CONNECT THE SUPPLY WITH THE WRONG POLARITY.**

The camera can be mounted on any robust structure using clips or brackets around either the black acetal connector housing or the outer diameter of the stainless steel camera housing. In either case, do not over-tighten the fasteners.

The camera is provided with a compatible cable whip. This will be a 3 way unit for the 32CS and a 4 way unit for the 32CS-L. Use an in-line splice to connect this cable whip to the source of power and coaxial connection to the TV monitor. This splice must be fully waterproof.

The connector should be thoroughly cleaned around the pins and mating rubber areas before use. Apply a very light coating of silicone oil (recommended) or grease to the cleaned pins and surrounding mating rubber areas. Do not use excess quantities of grease since this may lead to water leakage. Push the mating cable whip fully onto the fixed bulkhead component and then tighten the locking ring.

During installation and subsequent use, do not bend the cable too close to the mating connector as this may lead to water ingress.

The TV output from the unit is suitable for 75 ohm coaxial cable. The length over which good quality colour signals can be transmitted is dependant on the quality and condition of the cable. A good quality cable should be able to provide signals over 100m without noticeable deterioration in picture quality.

OPERATING INSTRUCTIONS

There are no specific operating instructions for the 32CS camera unit. Simply switch on and use!

The 32CS-L has adjustable lighting and the illumination level can be adjusted to best suit the scene.

It is recommended that the camera, with lights at full intensity, is not operated in air for more than 15 minutes to avoid overheating.

MAINTENANCE INSTRUCTIONS

The camera unit requires no regular maintenance other than keeping in a clean condition. It is recommended that the unit be washed in fresh water after use.

Inspect the plastic (acrylic) front face components regularly, looking for deep scratches and cracks. Damage of this type can result in water ingress into the camera and damage to the electronic assemblies.

FAULTFINDING

There are a number of faults which can occur with an underwater camera. The following are some of the more common examples:

Water Ingress

Depending on the severity of the problem, water ingress can be seen as large volumes of water behind the lens, water droplets on the lens or simply as mist or condensation on the lens following removal from service.

The camera will often continue to work but **SHOULD NOT BE USED THEREAFTER**. Continuing to supply power to the camera result can result in damage to the electronics.

In any of the above situations, the reason for failure must be found and the camera must be repaired.

If possible, attempt to recover the unit by disassembling, removing the camera and light module. Remove the lens from the camera by unscrewing from the camera body and then wash all parts thoroughly in fresh water (preferably de-ionised). Do not soak the lens otherwise water may get in between the glass elements and destroy the lens. Dry all components with a lint free cloth and, finally, place in a warm oven (40 to 50 degC) and leave at least 24 hours.

Picture out of Focus

An out of focus picture can be the result of contamination within the camera such as water ingress or can be the result of an incorrectly adjusted lens for the conditions of use.

The camera lens is adjustable by the user by removal of the front lensd assembly. See the disassembly procedure below.

The lens can be rotated in the camera lens body to adjust focus. Screwing the lens out will allow the camera to focus closer to the subject.

Picture Cannot be Synchronised or Has Lost Colour

Assuming that the monitor and cable are in good condition, loss of colour or inability to synchronise the picture (rolling up/down or across the screen) is usually because of attenuation of signal in the cable. This is usually as a result of using a cable length beyond the capabilities of the system.

The solution is either to use a better quality cable, if possible, or to fit a line compensation amplifier to increase the signal level to the monitor.

PROCEDURE FOR DISASSEMBLY

This procedure should only be carried out by experienced personnel.

1. Remove the camera from the underwater cable if fitted.
2. Dry the outer surfaces and then remove stainless steel ring which holds on the lens assemblies using the correct tool.

3. Carefully remove the stainless steel ring (which will also remove the camera lens) and also the outer acrylic lens in front of the lights. This will reveal the camera lens focus ring and the LED assembly.
4. Focus the camera if required without further disassembly.
5. The camera and LED assembly may be removed by extracting the four M2 screws (those at 90 degrees to each other) holding the PCB in place.
6. Carefully pull the internal chassis with the LED PCB out of the stainless steel housing. Take care not to stretch the wires connecting the rear connector pins.
7. If the LED assembly is to be replaced, disconnect the wiring behind the camera and then remove the remaining two M2 screws holding the PCB to the chassis. The LED PCB can now be separated from the chassis.

PROCEDURE FOR REASSEMBLY

1. Assemble the camera and LED unit to the chassis. Note the location of the nylon screws and washers which are intended to isolate the camera wiring from the chassis.
2. Clean and apply a small amount of silicon grease to the o-rings around the lenses. Do not apply large quantities of grease.
3. Insert the light lens into the housing followed by the stainless steel ring containing the camera lens. Ensure that the brass sleeve is correctly located under the camera lens.

RECOMMENDED SPARES

QTY	PART No.	DESCRIPTION
1	5248-01-005	Camera Window
1	5248-01-006	Light Window
1		O-Ring Kit.
1	5248-01-015	Window Ring Assembly Tool
1		Molycote Type MS111 Grease.

SPECIFICATIONS**Mechanical**

Diameter	63mm
Length	78mm (exc. connector)
Depth Rating	300m
In Air Weight	0.5kg (approximate)
In Water Weight	0.2kg (approximate)
Housing Materials	Stainless Steel, Acetal and Acrylic

Optical

Lens	f2.0 3.6mm adjustable focus
Field of view	70 degrees diagonal (in-air)
Focus	Adjustable (after disassembly)
Min Illumination	1.2 lux
Imager	1/4 inch ccd sensor

Lighting

Construction	20 off White, high brightness LED's
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Power Requirements

Camera plus Lights	12vdc +/- 10% at 310mA approximately
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