



# Operator's Manual

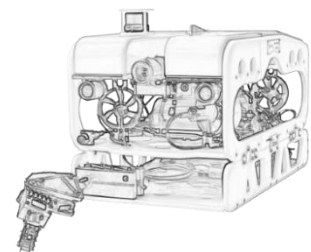
*Underwater Camera - HD camera*

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# **1 Introduction**

## **1.1 General**

The HD Camera housing is constructed from hard anodized Aluminum-6061 T6 and is designed to operate at depth of 2000M. The front port is manufactured from optical quality high strength Acrylic.

## 1.2 Precautions

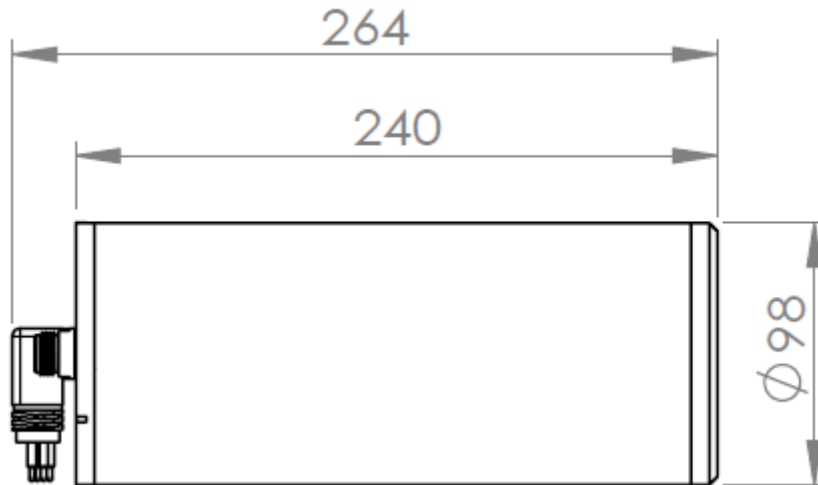
	<p>The “DANGER” symbol indicates a hazardous situation which, if not avoided, will result in death or serious injury. Carefully read the message that follows to prevent serious injury or death.</p>
	<p>The “WARNING” symbol indicates a hazardous situation which, if not avoided, could result in death or serious injury. Carefully read the message that follows to prevent serious injury or death.</p>
	<p>The “CAUTION” symbol indicates a hazardous situation which, if not avoided, could result in minor or moderate injury, or equipment damage. Carefully read the message that follows to prevent minor or moderate injury.</p>
	<p>The “NOTICE” symbol alerts to a situation that is not related to personal injury but may cause equipment damage</p>
	<p>Do not put hands near it when machine operating.</p>
	<p>Do not wear electrically conductive jewelry, clothing, or other items while working on the electrical system.</p>
	<p>An electric shock could be fatal. Ensure power to the Thruster is OFF” before opening electrical panels.</p>



## 2 Specifications

### 2.1 Underwater Camera ( HD Camera )

#### 2.1.1 Standard



<b>DWTEK- HD Camera</b>	
ELECTRICAL	
Image Sensor	1/2.8" Type CMOS
WDR	Digital
DNR	YES
White Balance	Auto / ATW / Manual
Auto Gain Control (AGC)	Automatic
Day & Night	True D/N ICR
Back Light Compensation	YES
Motion Detection	YES
Privacy Masking	YES
Gamma	Standard / Straight
Power Input	12~30 VDC ; 7.2 W
Video Output	Fiber / Coaxial
Resolution	1080P/30
Communication	Sony VISCA
S/N Ratio	50 dB
Electronic Shutter	1/1 ~ 1/10,000 S
Mini Illumination	0.01 lx



OPTICS

Lens	F1.6 ~ 4.7, f4.3 ~ 129 mm, 30X Optical Zoom
Iris Control	Auto
Focus	Auto / Manual
Angle Of View	63.7°~ 2.3°
Digital Zoom	12X (360X with Optical Zoom)

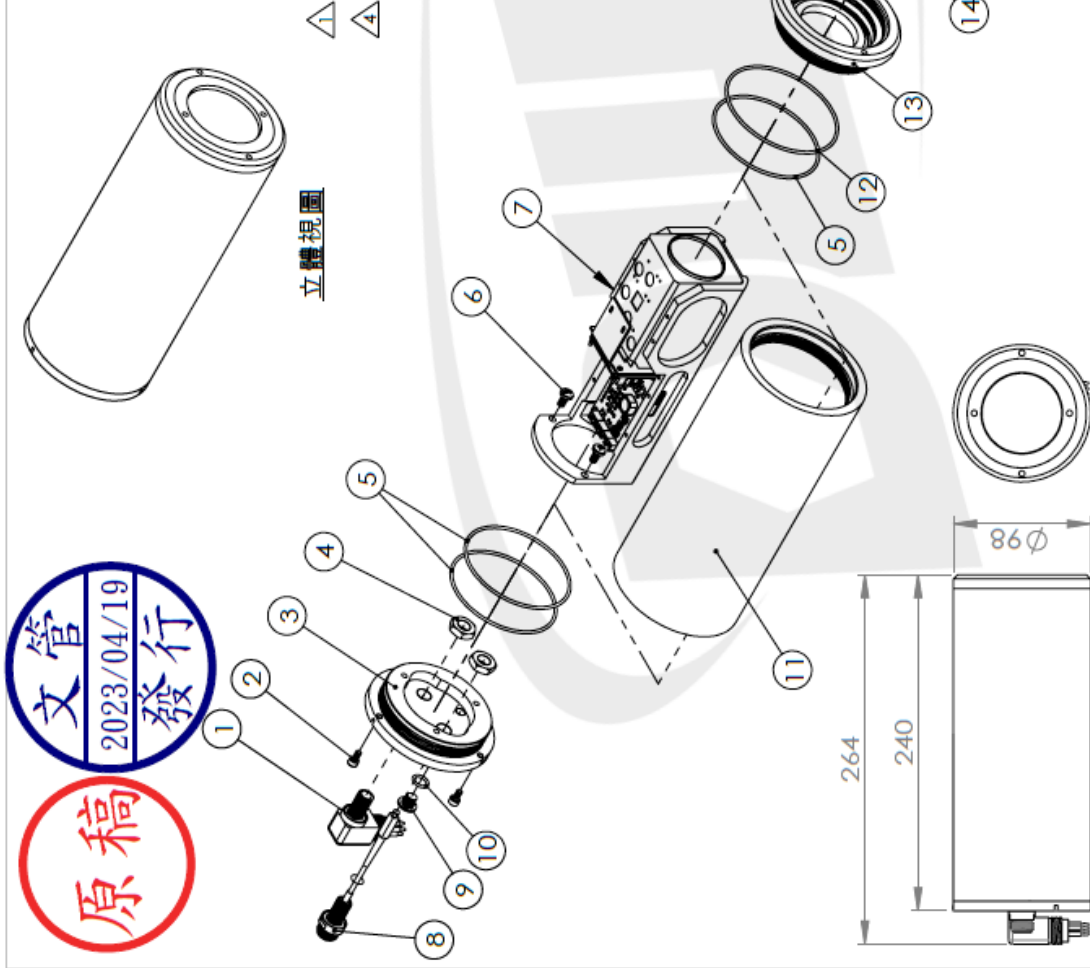
MECHANICAL

Dimension	240 mm (L) / 98 mm (D)
Weight in Air	2.7 kg
Weight in Water	1.3 kg
Standard Housing	Hard Anodized 6061-T6 Aluminum
Window Material	Acrylic
Pan/ Tilt	N/A
Connector	Optic: MCBHRA6M+MSS-OP-BCR/LC Coaxial: MSL-BCR-6M (or option)

ENVIRONMENTAL

Depth Rating	2,000 M
Testing Depth	200 Bar
Operation Temp.	10°C ~ 50°C

ITEM No.	PART No.	TITLE	DESCRIPTION	QTY.
1	2GW100706M-00001	Mini Bulkhead Right Angle Connector	Male 6 Pin	1
2	2P001-D1B2M4-0708	Socket Head CAP Screw	SUS316 M4xP0.7x8	3
3	2D002-00013	End Cap	D002 HD Camera	1
4	2P001-N122U716A-T20	Hex Nut	SUS304 7/16"-T20	2
5	2P002-SOR-S80N70	S-80	ID79.5 x W2	3
6	2P001-PB22M5-08010	SS Round Head Cross Recess Screw	SUS304 M5xP0.8x10	3
7	2C002-00002	HD Camera Module	HD Camera	1
8	2GFP80101M-LC-00004	MSS-OP-BCR/LC雙端接頭	MSS-OP-BCR/LC雙端接頭 x 60cm	1
9	2D003-00016	Pressure relief valve	5/16" x T24	1
10	2P002-SOR-AS012N70	AS-012	ID9.25 x W1.78	1
11	2D002-00011	Housing	OD100xID62x225.5L	1
12	2P002-SOR-S85N70	S-85	ID84.5 x W2	1
13	2D002-00008	Front Window Cap	Ø101.6x29.5L	1
14	2P002-SOR-S56N70	S-56	ID55.5 x W2	1
15	2P002-SOR-S65N70	S-65	ID64.5 x W2	1
16	2D002-00012	PC Len	Ø65x16L	1
17	2D002-00010	POM Fixer	Ø80x10L	1



原稿

 文管  
 2023/04/19  
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**CATEGORY : HD Camera**

**TITLE : Sea Observer HD Camera**

**PART No. : 2B0020001-00001**

**DWG No. : B00008**

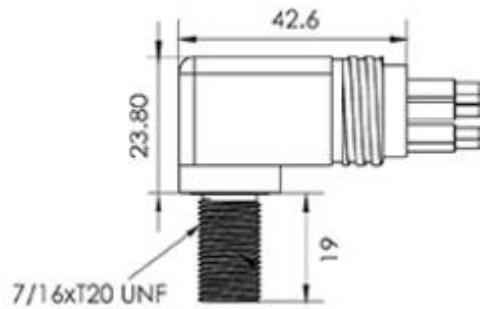
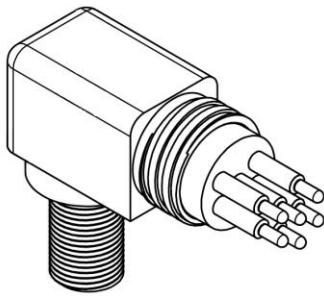
**SIZE : A4 ISSUE : 4 PAGE 1 OF 1**

Revisions	Issue	Date	DESIGN	DS	Date
210602 變更搭配新HD光纖模組(TX)	△1	2022/11/11	DRAWING	Tsui Hwa	2022/10/18
210901 新舊碼變更。	△2	2022/11/11	CHECKED	CJH	2022/10/18
221012 圖面格式更新為v3.0	△3	2022/10/18	APPRV.	DS	2022/10/18
230320 接頭修正	△4	2023/3/30			
2GFP80101M-00004→2GFP80101M-LC-00004					

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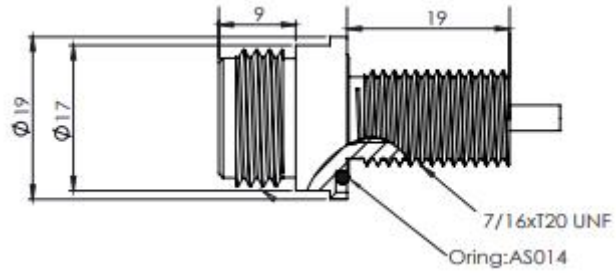
## 2.2 Connector

### 2.2.1 Micro Circular



<b>2GW100706M-00001 (MCBHRA6M)</b>	
<b>Operation Specification</b>	
<b>Max. voltage</b>	300 VDC
<b>Current rating @contact</b>	Contact 2,3,4: 10A
	Contact 5,6,8: 5A
	Contact 10,12,16: 5A
<b>Max. current @connector</b>	Contact 2,3,4,5,6,8: 20A
	Contact 10,12,16: 30A
<b>Insulation resistance</b>	> 200 Mohm
<b>Contact resistance</b>	< 0.01 ohm
<b>Wet matings</b>	> 500 times
<b>Depth rating</b>	600 bar (300 bar for peek)
<b>Temperature rating</b>	- 40 to 60°C
<b>Material Specification</b>	
<b>Connector body</b>	Chloroprene rubber
<b>Bulkhead body</b>	Brass (BR), stainless steel 316 (SS), anodized aluminum (AL), titanium (TI)
<b>Contact</b>	Gold plated brass
<b>Socket</b>	Beryllium copper
<b>Location pin</b>	Stainless steel 316
<b>Bulkhead leads</b>	Contact 2,3,4: AWG 18 PTFE, 30cm (AWG 20 PTFE optional)
	Contact 5,6,8: AWG 20 PTFE, 30cm (AWG 22 PTFE optional)
	Contact 10,12,16: AWG 20 PTFE, 30cm
<b>O - rings</b>	NBR 2-014





**2GFP80101M-LC-00004 (MSSBH01M-LC)**

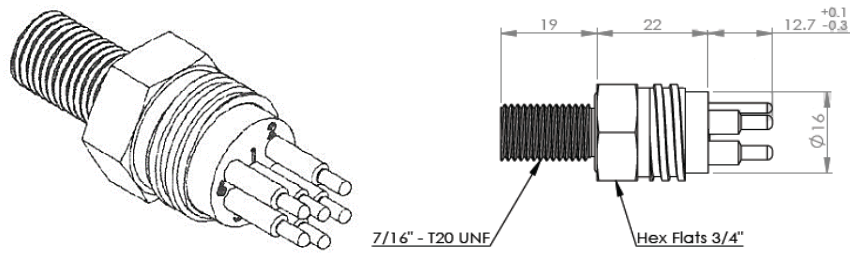
**Operation Specification**

<b>Insertion loss</b>	< 0.3 dB
<b>Typically</b>	< 0.5 dB
<b>Wet mating</b>	N/A
<b>Depth rating</b>	600 bar
<b>Temperature rating</b>	- 40 to 60°C

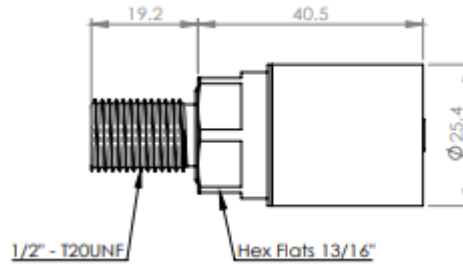
**Material Specification**

<b>Connector body</b>	Stainless steel 316
<b>Bulkhead body</b>	Stainless steel 316
<b>Locking sleeve</b>	Copper
<b>O - rings</b>	NBR

## 2.2.2 Customization (Option)



<b>2GW100606M-00001 (MCBH6MBR)</b>	
<b>Operation Specification</b>	
<b>Max. voltage</b>	300 VDC
<b>Current rating @contact</b>	Contact 2,3,4: 10A
	Contact 5,6,8: 5A
	Contact 10,12,16: 5A
<b>Max. current @connector</b>	Contact 2,3,4,5,6,8: 20A
	Contact 10,12,16: 30A
<b>Insulation resistance</b>	> 200 Mohm
<b>Contact resistance</b>	< 0.01 ohm
<b>Wet matings</b>	> 500 times
<b>Depth rating</b>	600 bar (300 bar for peek)
<b>Temperature rating</b>	- 40 to 60°C
<b>Material Specification</b>	
<b>Connector body</b>	Chloroprene rubber
<b>Bulkhead body</b>	Brass (BR), stainless steel 316 (SS), anodized aluminum (AL), titanium (TI)
<b>Contact</b>	Gold plated brass
<b>Socket</b>	Beryllium copper
<b>Location pin</b>	Stainless steel 316
<b>Bulkhead leads</b>	Contact 2,3,4: AWG 18 PTFE, 30cm (AWG 20 PTFE optional)
	Contact 5,6,8: AWG 20 PTFE, 30cm (AWG 22 PTFE optional)
	Contact 10,12,16: AWG 20 PTFE, 30cm
<b>O - rings</b>	NBR 2-014



**2GW104201M-00001 (CX50IL01M)**

**Operation Specification**

<b>Max. Voltage</b>	300 VDC	
<b>Current Rating @ contact</b>	5A	
<b>Max. Current @ connector</b>	20A	
<b>Video Types</b> <small>Recommend SDI, HD-SDI, 3G-SDI and Composite</small>	<b>Frequency*</b>	0.3GHz 0.5GHz 1.0GHz 1.5GHz 2.0GHz 2.5GHz 3.0GHz
	<b>Attenuation*</b>	4.6dB 6.5dB 10.2dB 12.3dB 16.3dB 18.5dB 20.0dB
<b>Recommended max. Frequency</b>	3.0 GHz	
<b>Insulation Resistance</b>	>200 Mohm	
<b>Contact Resistance</b>	>0.01 ohm	
<b>Depth Rating</b>	600 bar	
<b>Temperature Rating</b>	- 40 to 60°	

**Material Specification**

<b>Connector Body</b>	Chloroprene Rubber
<b>Bulkhead Bod</b>	Brass(BR), Stainless steel 316(SS) or Titanium(TI)
<b>Contact</b>	Gold plated brass
<b>Socket</b>	Beryllium Copper
<b>Coax Bulkhead Leads</b>	RG316 Coax, 100cm
<b>O - rings</b>	NBR 2-015

\*All frequency and attenuation values are based on a 2 bulkhead connectors (50 ohm) with 10m tail.

\*\*The connector cannot take open face pressure.

\*\*\*Locking sleeves are necessary, but grease is NOT required.

## 2.3 General

Part No.	2GW100706M-00001
Title	Micro Circular Bulkhead
Service Check	Regularly
Tool	None

HD Camera function with MCBH6MBR connector.

## 2.4 Indications for Replacement

Replace if connector is damaged, deformed or no longer watertight.

## 2.5 Installation Procedures

### For greasing and mating above water (dry mate)

1. Connectors must be greased with Molykote 44 Medium before each mating.
2. A layer of grease corresponding to minimum 1/10 of socket depth should be applied to the female connector.
3. The inner edge of all sockets should be completely covered, and a thin transparent layer of grease should be left visible on the face of the connector.
4. After greasing, fully mate the male and female connector in order to secure optimal distribution of grease on pins and in sockets.
5. To confirm that grease has been sufficiently applied, de-mate and check for grease on each male pin, then re-mate the connector.

### For Cleaning

1. General cleaning and removal of any accumulated sand or mud on a connector should be performed with spray based contact cleaner, Isopropyl Alcohol.
2. New grease must be applied again before mating.



### **Caution!!**

**It always recommends applying dummy plug for watertight protection when storage and operation.**



### **Warning!!**

**Only the qualified specialist is allowed to proceed the connector replacement.**

### 3 Installation

#### 3.1 Installation Guide


HD Camera Electrical

	Nominal	Max	Min
Input Voltage	24 VDC	30 VDC	12 VDC
Input Current	0.3 A	0.24 A	0.6 A

Procedure of electronic Connection:

1. Cable Black /Pin1 to GND
2. Cable White /Pin2 to PE
3. Cable Red /Pin3 to +24 VDC
4. Cable Green /Pin4 to TX
5. Cable Orange/Pin5 to RX
6. Cable Bule /Pin6 to Signal GND

#### 3.2 Pin Assignment

Num of Pin	Cable Code	Assignment	Bulkhead Top View (Male)
1	Black	GND	
2	White	PE	
3	Red	+24 VDC	
4	Green	TX	
5	Orange	RX	
6	Blue	Signal GND	

Make sure all the connection is correct, and then follow the instruction listed as below to power the HD Camera

1. Deliver +24 VDC to Red
2. Deliver GND to Black
3. RS232 control signal to Green and Orange



### 3.3 Maintenance and Removal

1. The HD Camera has been designed from the outset with a view towards simple straight forward operation and maintenance. All the HD Camera main parts are replaceable with instruction. Please contact DWTEK for details. If the connector requires for replacement, it is suggested that a thread lock compound be used to hold the connector firm.
2. If any parts of the HD Camera are removed for maintenance, the O-ring seals should have damage check and be lightly greased and cleaned before the HD Camera is reassembled.
3. Care should be taken not to scratch the front window when cleaning it with soft cloth and soapy water.

To remove the HD Camera, please follow below steps.

1. Disconnect the cable.
2. Install the protection dummy on the bulkhead connector.

HD Camera FIELD & DEPOT REPAIR PROCEDURES LISTED BELOW SHALL BE CARED.



**Warning!!**

**Make sure to switch off HD Camera power the system is on the surface.**



**Caution!!**

**The HD Camera is designed as a simple maintenance unit. After each dive, please always wash with fresh water.**



## 4 Trouble shooting

### 4.1 HD Camera Trouble shooting

If HD Camera performed:

I. No video signals.

please proceed the initial detection procedure which mainly caused by one type of case as below:

I. Power output.

### 4.2 Detection Procedure

1. Use a multimeter to confirm that the voltage has a normal output, and the cable Black is connected to GND, and Red is connected to +24 VDC.
2. Make sure that the HD Camera is unobserved and in safe and well-protected condition.
3. It is recommended to use a power supply with a current consumption display to check the power consumption. If there is no power consumption, please contact the original factory and send it back for testing.



**Caution!!**

**If the current goes higher with short circuit, the PCB need to be examined and replaced.**



## 5 Maintenance

### 5.1 Acrylic

#### 5.1.1 General

Part No.	2D002-00012
Title	PC Len
Service Check	Dirty
Tool	Alcohol 、 Clean Paper

1. When cleaning the acrylic, use a soft cloth dampened with water to wipe it. Do not use pickle cloth or coarse cloth to avoid scratching the acrylic. Acrylic can be cleaned with rubbing alcohol and cleaning paper.
2. It is recommended to spray it on a soft cloth before wiping.
3. Do not use high-concentration alcohol to avoid fogging or cracking of the acrylic