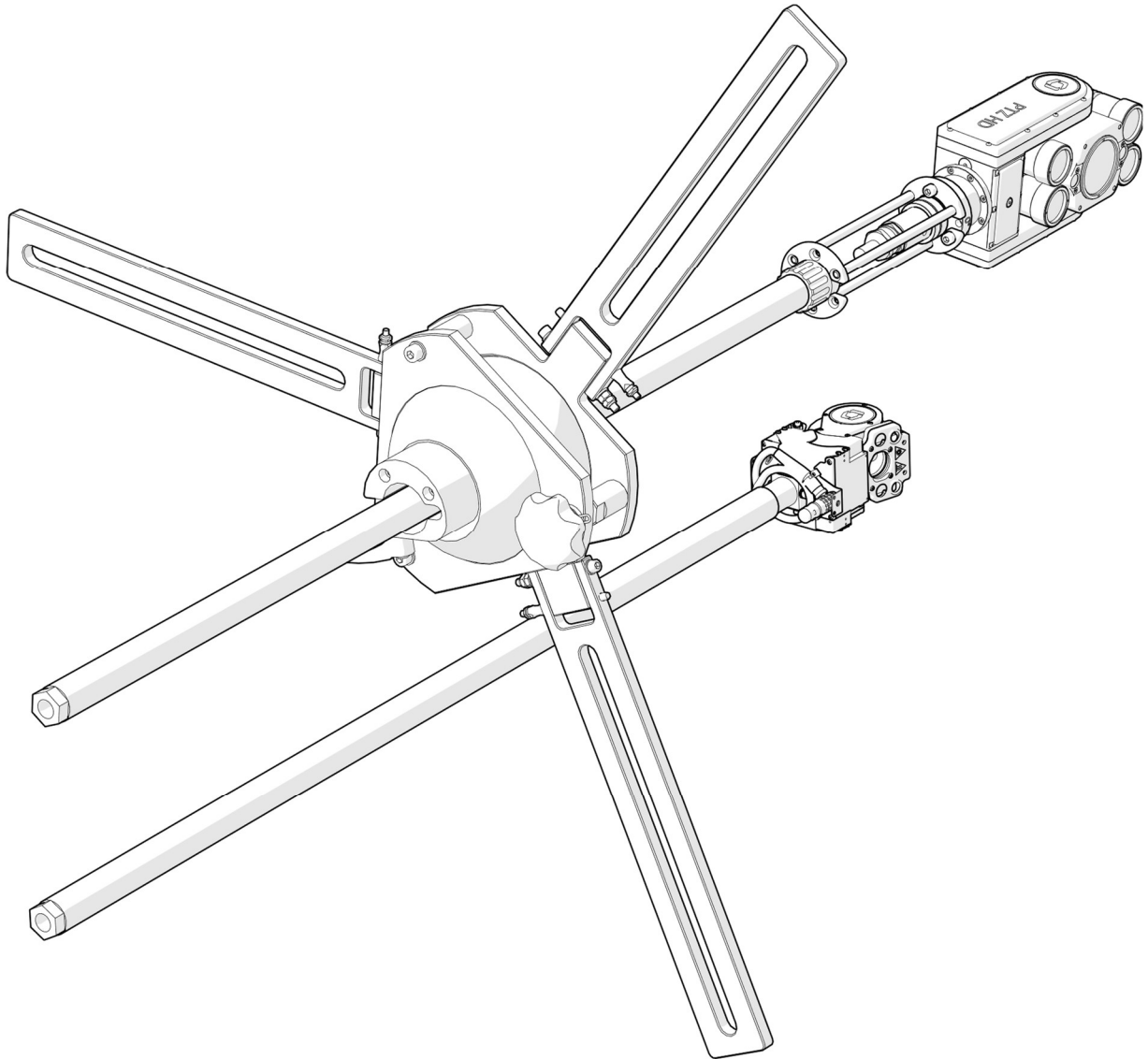




**Waygate  
Technologies**

a Baker Hughes business



**Everest Ca-Zoom HD  
Operating Instructions**



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# 1 Safety

This chapter provides an overview of all the important safety aspects for optimum protection of the personnel as well as safe and trouble-free operation.

Failure to observe the operating and safety instructions contained in this operating manual can lead to accidents with damage of equipment or injuries with severe consequences.

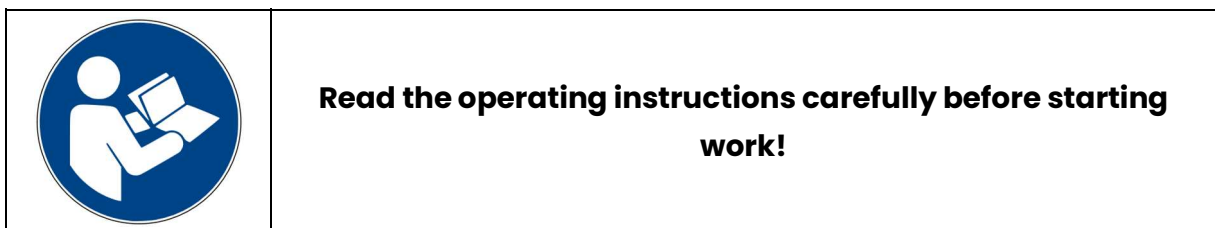
If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

## 1.1 Safety references

It is the user's responsibility to apply safe work site practices as per local and general safety regulations in the area where the system is located and used.

Safe work site practices and regulations include techniques, equipment, procedures related to: transport, lifting, work at height, confined areas, lockout/tagout of energy sources, or any other specific hazard from the site, in addition to the instructions given in this manual.

Operating instructions provide important information on the operation of the system.



The operating instructions are a component of the product and must be kept accessible to the personnel in the immediate vicinity of the system.


When transferring the equipment to third parties, provide the operating instructions.

## 1.2 Symbols used


The following explanations are intended for personal safety and security against damage to the described system or connected devices.

Safety instructions and warnings for the prevention of hazards to life and health of users or maintenance personnel or to prevent damage to property are highlighted in this manual according to the following categories:


- **DANGER:** means that death, serious personal injury or material damage **will** occur if the appropriate precautions are not taken.

Safety pictogram(s) aligned to relevant text	 <b>DANGER</b>
	Hazard description, origin, and consequences.
	Measures to be taken to eliminate the hazard.


- **WARNING:** means that death, serious personal injury or material damage can occur if the appropriate precautions are not taken.

Safety pictogram(s) aligned to relevant text	 <b>WARNING</b>
	Hazard description, origin, and consequences.
	Measures to be taken for risk mitigation or elimination.

- **CAUTION:** means that minor personal injury or material damage may occur if the appropriate precautions are not taken.

Safety pictogram(s) aligned to relevant text	 <b>CAUTION</b>
	Hazard description, origin, and consequences.
	Measures to be taken for risk mitigation or elimination.



- **TIP:**



	<b>TIP / NOTICE</b>
	This symbol indicates application tips or notices for efficient and trouble-free operation of the equipment that do not affect the safety and health of the personnel.







### 1.3 General safety instructions related to the present device

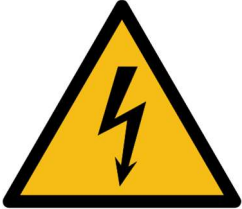



These operating instructions are intended for the safe operation of this device only. For operation of additional cameras or NDT instruments not described in this manual, please refer to the respective operating manuals.




	 <b>DANGER</b>
	POTENTIAL EXPLOSIVE ATMOSPHERE
	<p>Everest Ca-Zoom HD is <b>NOT</b> ATEX compliant or explosion proof.</p> <p>Do not use in potential explosive atmosphere.</p>

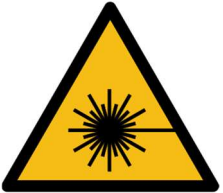


	 <b>DANGER</b>
	Injuries caused due to wrong manipulations by non-trained persons.
	The operator shall restrict access to non-authorized persons

	 <b>DANGER</b>
	Serious injuries or equipment damages due to falling or breaking equipment.
	<p>The operator shall regularly* ensure that:</p> <ul style="list-style-type: none"> <li>– all screws are correctly tightened and not deformed,</li> <li>– no element is subject to torsion or bending.</li> <li>– all the equipment is stored safely and/or tethered to prevent falling down</li> </ul>

	 <b>CAUTION</b>
	<p>Tripping hazards.</p> <p>The operator must ensure there is enough space in the working area to manipulate and install the camera, the telescopic poles and cables. The operator must secure the equipment with safety lines if required.</p>

    	 <b>DANGER</b>
	<p><b>ELECTRICAL SHOCK (AC / 48V DC Power adapter to camera controller)</b></p> <p>The use of 100-240VAC power cord with standard C13 power plug must comply with local and general safety regulations.</p> <p>Use the supplied power adapter with a proper earth ground connection.</p> <p>Disconnect the power when the equipment is not used.</p> <p>Connect power after all devices are connected (camera to interface box).</p> <p>The equipment is intended for indoor use: protect it from water ingress risks, rain or dust.</p> <p>Do not open the housings of the devices.</p>

 	 <b>CAUTION</b>
	<p>Cameras comprise <b>STRONG LIGHTS</b> for illumination.</p>
	<p>Do not look directly into the lights when switched on:  <b>temporary blinding might occur.</b></p>
	<p>Check nobody can stare at the cameras when the lights are switched on.</p> <p>It is only permitted to activate lights in an environment where <b>no personnel can stay in the camera field of view.</b>                  Access must be <b>restricted to non-authorized personnel</b></p>

  IEC 60825-1	 <b>WARNING</b>
	<p>Cameras integrate two class 1 lasers as per IEC 60285-1:2014 applicable to safety of laser products.</p>
	<p>PTZ HD30 laser types: 2 red parallel lines, dist. 22 mm (0.87')</p> <p>TZ1 HD laser types: 2 red dots, dist. 27.5 mm (1.08').</p>
	<p>Glare if operators stare into laser beam or laser beam reflections.</p> <p>Under normal operation conditions (operations which can be foreseen rationally) it is guaranteed as a safety laser.</p> <p>No maintenance is authorized on the laser.</p> <p>Do not power the device if it appears to be damaged (no signal or housing broken).</p> <p>Additional measures are not necessary to maintain laser safety.</p> <p><b>Do not stare into the laser beam, even to reflected beam.</b></p> <p><b>Always observe laser dot reflections on objects of interest on the screen of the Control Station</b></p>

## **1.4 Basic safety instructions**

- Take the required measures before installing the equipment and during the operation.
- Avoid any risk of cable interference with persons or objects that can potentially move.
- Never tension the cable(s).
- Roll up and attach cables with a binder when they are not used.
- Do not lay cables in walking areas, if this is not possible, use cable bridges.
- Safely attach cables at height with binders on vertical supports or guardrails when possible.

## **1.5 Operator responsibilities**

As the Everest Ca-Zoom HD System is used in the industrial field, the operator is subject to the statutory obligations to work safety. In addition to the work safety instructions in this operating manual, the safety, accident prevention and environmental protection regulations applicable to the system must be complied with.

The operator:

- makes a risk assessment, where the additional hazards that result from the specific working conditions at the place of use of the system are determined.
- takes the required measures to eliminate or mitigate risks and applies safe work site practices.
- provides appropriate Personal Protective Equipment for the personnel (see chapter 1.8) and checks the correct use of the required PPE during all the work.
- regularly informs the staff of the possible dangers and the applicable safety and health measures.
- informs the staff about the applicable occupational health and safety regulations.
- ensures that personnel and equipment transport (access to worksite, egress from worksite) is organized as per safety general and local regulations.

- 
- ensures that the personnel handle the system properly, as defined in the manual (take care with magnets, use integrated handles) and apply ergonomic postures.
  - defines the necessary behavioral requirements for the operation of the system at the site of operation.
  - regularly checks during the entire period of use of the system whether the specific instructions which they have produced correspond to the current state of the regulations.
  - adapts the operating instructions - if necessary - to new regulations, standards and conditions of use.
  - unambiguously regulates the responsibilities for the installation, operation, maintenance and cleaning of the system.
  - ensures that all employees who are working on or with the system have read and understood this operating manual. In addition, the operator must train the personnel at regular intervals in the handling of the system and the possible dangers.
  - only allows persons who are expected to perform their work reliably (persons whose reactivity is affected, for example by alcohol or drugs, are not permitted).
  - when selecting the personnel, observes the age- and occupation-specific regulations applicable at the place of employment.
  - ensures orderliness and cleanliness in the work area.
  - prohibits access to the work area of the system for unauthorized persons by means of a clearly visible prohibited sign (pictogram).
  - avoids stressful situations through technological and organizational work preparation.
  - uses only tools and accessories approved by the machine manufacturer.
  - ensures adequate workplace lighting as per local safety regulations, but at least 750 lx, and regularly checks the lighting is maintained to the same level.
  - in the case of demonstrations, the system is restricted to an area with sufficient safety distance to third parties and effectively prevents ingress of unauthorized persons

- Exposure to hazardous materials such as radiation sources must be disclosed to Waygate with each re-quest for maintenance, service or support.
- Contaminated materials cannot be returned to the manufacturer for disposal.
- Operator is responsible to implement appropriate procedure to handle, maintain and dispose irradiated equipment.

Furthermore, the operator must ensure that the system is:

- always in technically perfect condition.
- subjected to a regular functional check.
- maintained as per specified maintenance intervals (see chapter 12.2).
- used and stored in the correct environment (see chapter 11.2 and Appendix A).

For this purpose:

- all safety devices must be regularly checked for completeness and functionality.
- all safety instructions and hazard warnings on the system are in readable condition.
- electrical interfaces and connections are used as per specifications provided in this manual.

---

## 1.6 Reasonably foreseeable misuse

Reasonably foreseeable misuse means:

- Failure to observe all information and directives in the Instruction Manual.
- Use for components other than those specified in the contract.
- Operating, maintaining and repairing of the machine by non-authorized and non-instructed persons.
- Failing to observe the prescribed intervals for inspection and maintenance work as found in the Instruction Manual or as prescribed by regulation.
- Operating the system in an explosive atmosphere.
- The camera is returned for service or disposal after exposure to hazardous materials.

## 1.7 Limits of the machinery

- By nature of the industry and assets to be inspected, the camera might be exposed to hazardous chemicals or radiation sources. It is in the operator's responsibility to assess and mitigate the associated risks both during operation and subsequent maintenance of the equipment.
- Pressure vessels and other assets with manways.
- Ambient atmosphere of temperatures 0 °C to 45 °C and humidity up to 80 %.
- Not intended for use in explosive atmosphere.
- The scope of the equipment covered by this risk analysis is limited to:
  - PTZHD30 camera
  - TZI camera
  - Camera controller
  - Pendant
  - Power supply
  - Transport box
  - Pole

- Manhole bracket
- If additional equipment is used, an extended risk analysis must be created.







## 1.8 Personal protective equipment (PPE)

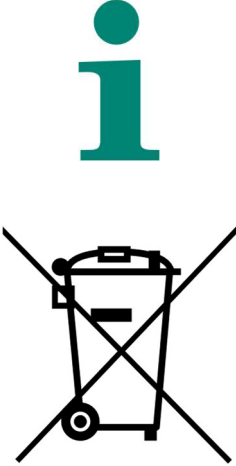
Personal protective equipment is used to protect persons from impairment of safety and health at work. During the various kinds of work on and with the system, the personnel must carry personal protective equipment:

- ✓ as referred to separately in the individual sections of this operating manual
- ✓ when required by the environment where the inspection takes place, defined by site risk assessment, in accordance with local safety authorities.

**Table 1. Non-exhaustive list of PPE**

	<p style="text-align: center;"><b>Protective gloves</b></p> <p>Protective gloves are used to protect the hands from friction, abrasion, puncture or deeper injuries, as well as from contact with hot surfaces.</p>
	<p style="text-align: center;"><b>Safety shoes</b></p> <p>Safety shoes protect the feet from crushing, falling parts and slipping on a slippery surface.</p>
	<p style="text-align: center;"><b>Hardhat</b></p> <p>Industrial protective hardhats protect the head against falling objects, oscillating loads and impacts on fixed objects.</p>
	<p style="text-align: center;"><b>Safety goggles</b></p> <p>The protective goggles are used to protect the eyes from moving parts and liquid sprayers.</p>

**1.9 Environmental aspects**

<b>NOTICE</b>	
	<p style="text-align: center;"><b>Environmental hazard due to incorrect handling of environmentally hazardous substances!</b></p> <p>Incorrect handling of environmentally hazardous substance, especially incorrect waste disposal, can cause considerable environmental damages.</p> <ul style="list-style-type: none"> <li>– The following information regarding the handling of environmentally hazardous substances and the corresponding waste disposal shall always be observed.</li> <li>– In case of doubt, local authorities or specialized waste management companies shall be asked for further details.</li> </ul>

**Electric and electronic components:**

Electric and electronic components may contain toxic materials. These components must be collected separately and delivered to a local collection center or disposed of by a specialized company.

**Batteries:**

Batteries contain toxic heavy metals. They are subject to hazardous waste handling and must be delivered to a local collection center or disposed of by a specialized company.

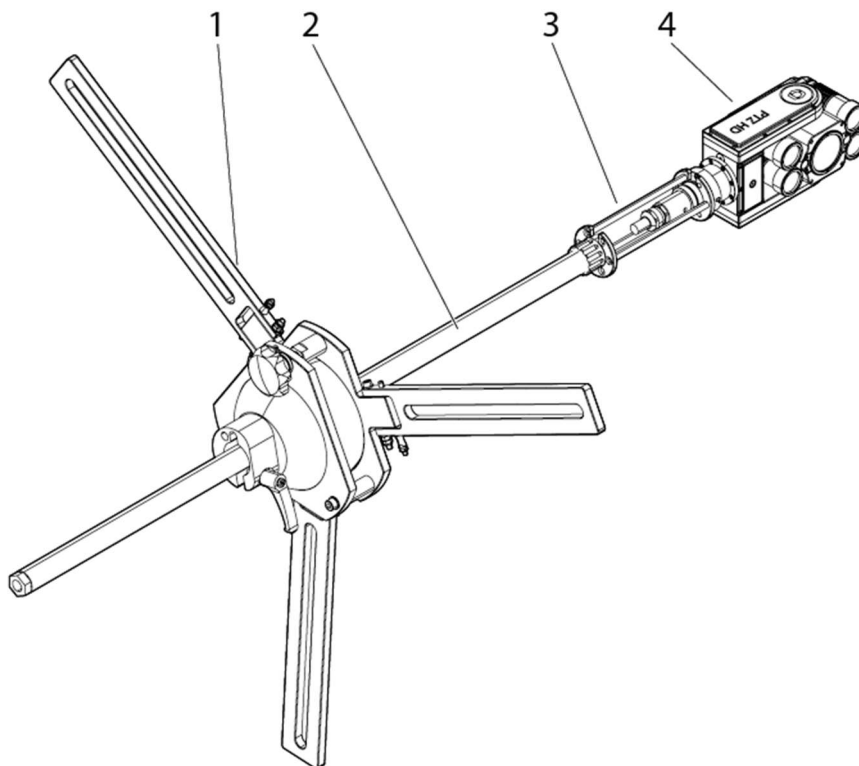
## 2 Product overview and functionalities

### 2.1 Intended use

The Everest Ca-Zoom HD System is used to perform indoor remote visual inspection of pressure vessels and other industrial assets, typically, confined spaces. The cameras are either mounted in a fixed location or manually handled with the use of a pole. The operator can remotely control all functions of the cameras from a handheld tablet.

For stabilization the pole with the camera can be fixed with a manhole bracket attached to the manhole.

### 2.2 Parts description



**Figure 1. Camera PTZHD30 with pole and manhole bracket**

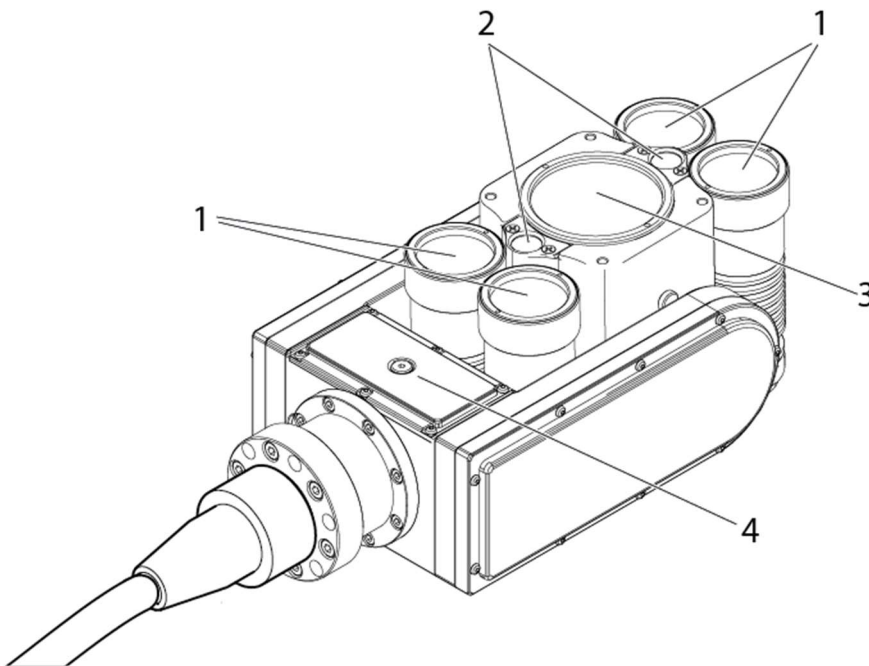
**1** Manhole bracket

**2** Pole

**3** Pole adapter

**4** Camera PTZHD30

2.2.1 PTZHD30 Camera



**Figure 2. PTZHD30 Camera**

- |                                       |                                |
|---------------------------------------|--------------------------------|
| <b>1</b> Light emitters               | <b>3</b> Lens and image sensor |
| <b>2</b> Laser line emitters, class 1 | <b>4</b> Valve seal screw      |

Light emitters (1): The integrated lighting ensures optimum illumination of the immediate surroundings. The current LED technology enables high light output with low heat generation. Therefore, this lighting is also suitable for dry use without restrictions.

The upper and lower LED pairs can be switched on separately.

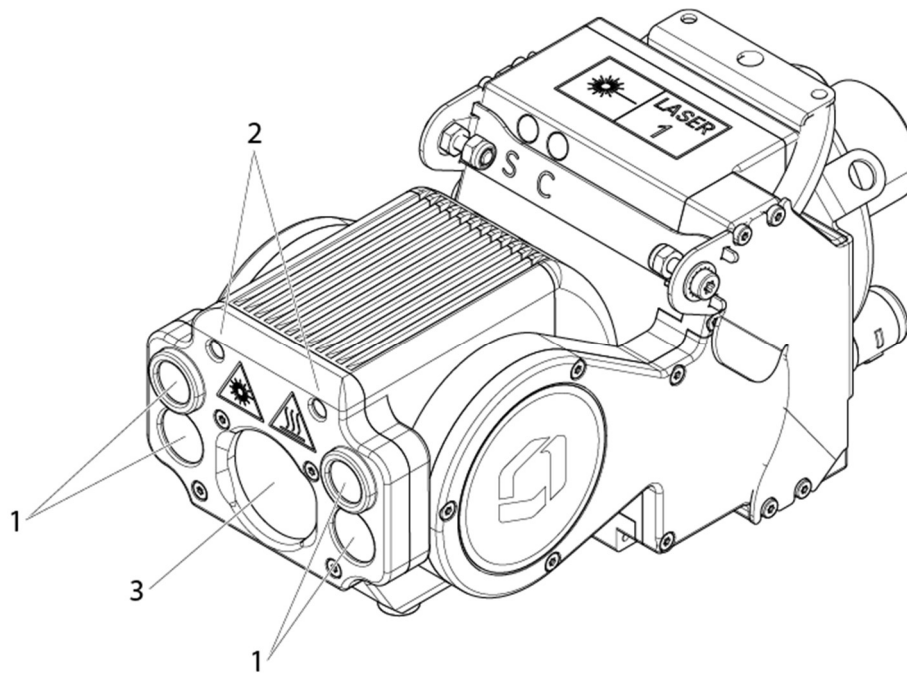
Laser line emitters (2) (optional): When the laser is activated, two parallel lines are projected into the inspection area at a constant distance. Using this reference value, it is possible to measure details in the inspection area.

For details see chapter 9.1.

Lens (3): The lens is protected by a glass pane from external influences. This glass may only be cleaned with a soft wipe.

Valve seal screw (4): This screw protects the compressed air valve and seals it against higher outside pressures. Compressed air must be applied to the camera head for underwater use. This protects the high-quality electronics in the event of leakage.

### 2.2.2 TZI Camera



**Figure 3. TZI Camera**

**1** Light emitters

**3** Lens and image sensor

**2** Laser point emitters, class 1

Light emitters (1): The integrated lighting ensures optimum illumination of the immediate surroundings. The current LED technology enables high light output with low heat generation. Therefore, this lighting is also suitable for dry use without restrictions.

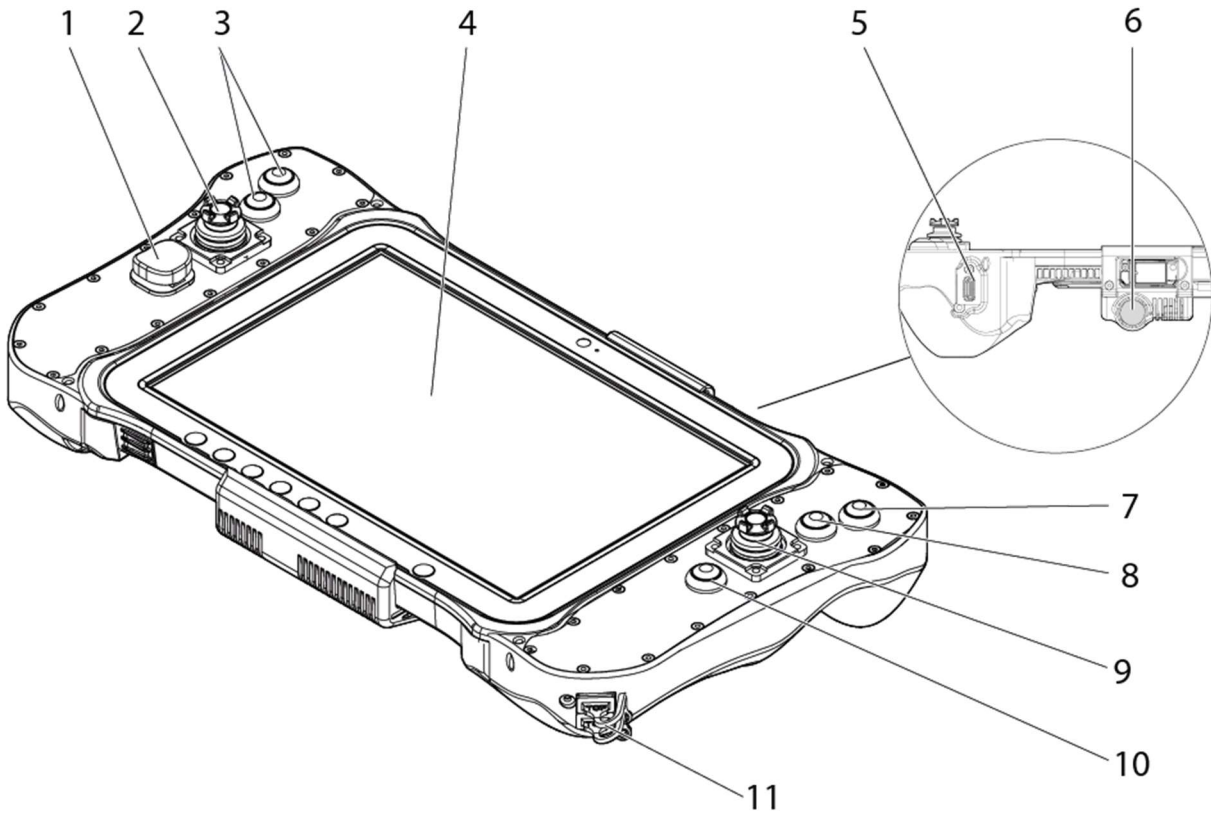
In order to achieve efficient lighting, the upper and lower headlights have different beam angles. The spotlight can be used to lighten up a small area while the flood light covers a large area with smooth light. In addition, both headlight units can be switched on separately.

Laser point emitters (2) (optional): When the laser is activated, two laser points are projected into the inspection area at a certain distance. Using this reference value, it is possible to measure details in the inspection area.

For details see chapter 9.1.

Lens (3): The lens is protected by a glass pane from external influences. This glass may only be cleaned with a soft wipe.

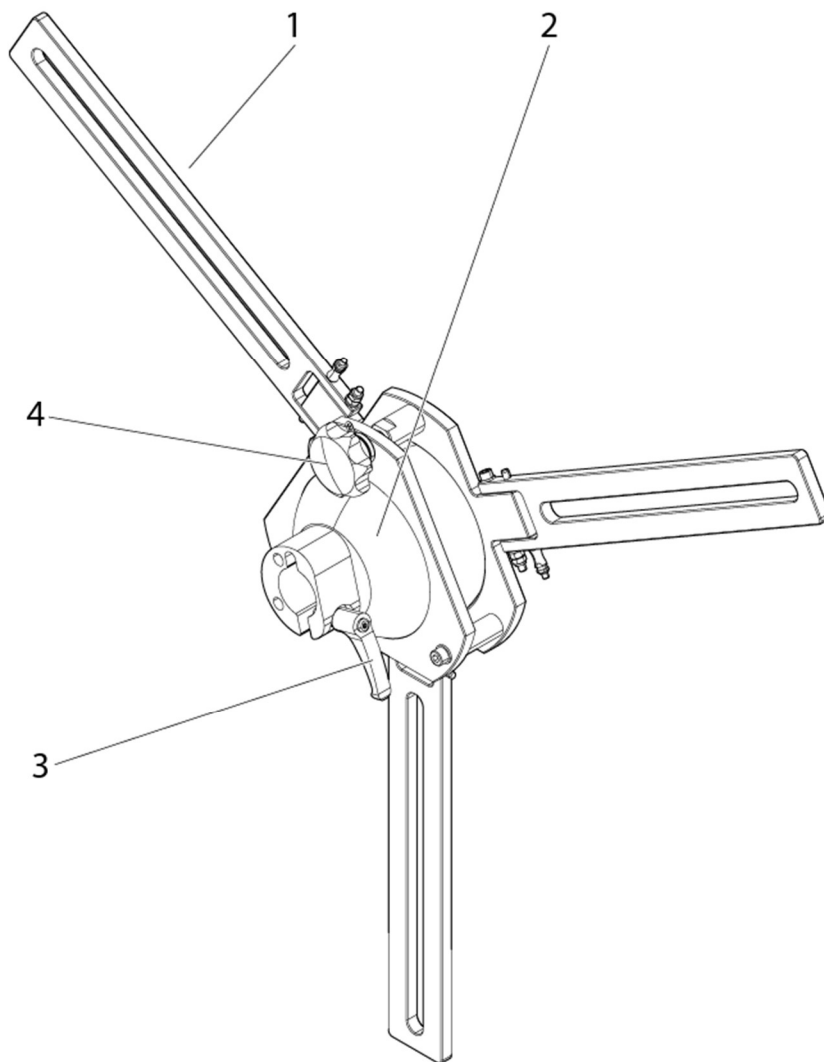
2.2.3 Pendant



**Figure 4. Pendant**

- |          |                                 |           |                      |
|----------|---------------------------------|-----------|----------------------|
| <b>1</b> | Rocker switch to zoom in/out    | <b>7</b>  | Video record button  |
| <b>2</b> | Pan & Tilt joystick             | <b>8</b>  | Freeze image button  |
| <b>3</b> | Light buttons                   | <b>9</b>  | Pan & Tilt joystick  |
| <b>4</b> | Touchscreen                     | <b>10</b> | Capture image button |
| <b>5</b> | HDMI socket                     | <b>11</b> | USB Ports            |
| <b>6</b> | Connection to camera controller |           |                      |

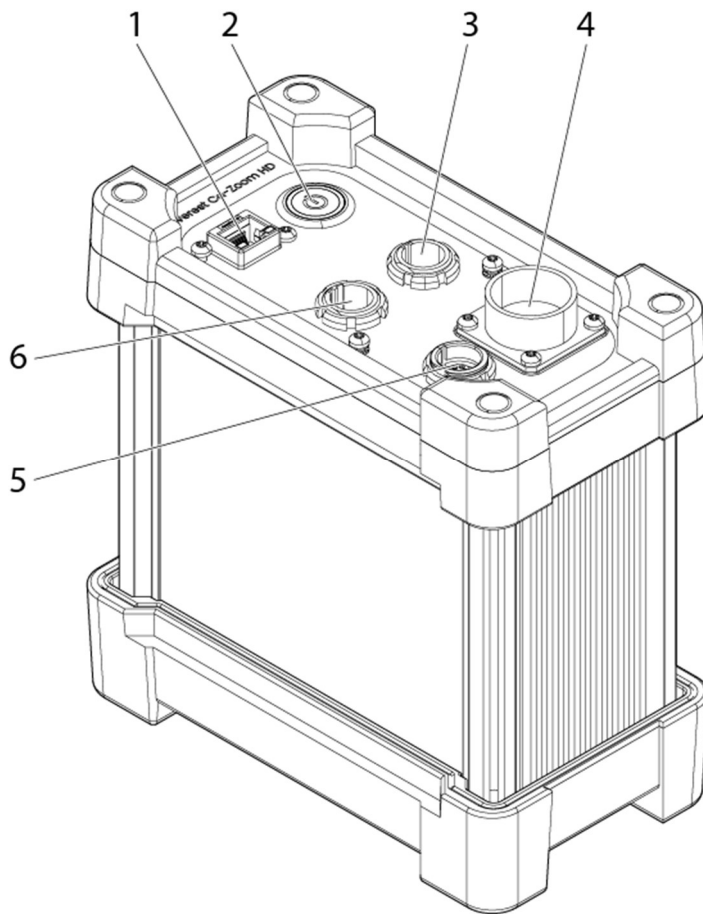
2.2.4 Manhole bracket



**Figure 5. Manhole bracket**

- |          |                          |          |                  |
|----------|--------------------------|----------|------------------|
| <b>1</b> | Manhole mounting bracket | <b>3</b> | Pole clamp       |
| <b>2</b> | Ball joint               | <b>4</b> | Ball joint clamp |

2.2.5 Camera controller



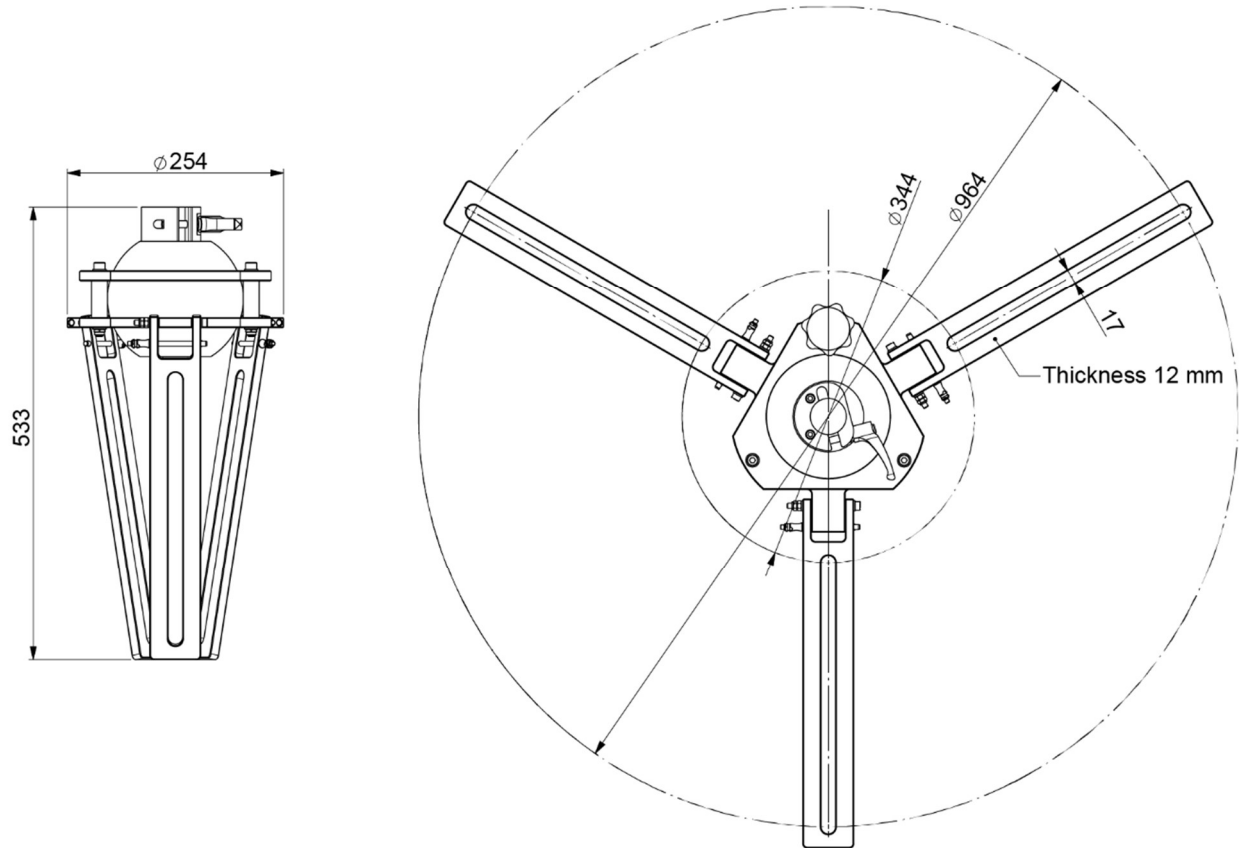
**Figure 6. Camera controller**

- |          |                      |          |                           |
|----------|----------------------|----------|---------------------------|
| <b>1</b> | Ethernet RJ45 jack   | <b>4</b> | PTZHD30 camera connector  |
| <b>2</b> | Power button         | <b>5</b> | DC power supply connector |
| <b>3</b> | TZI camera connector | <b>6</b> | Pendant connector         |



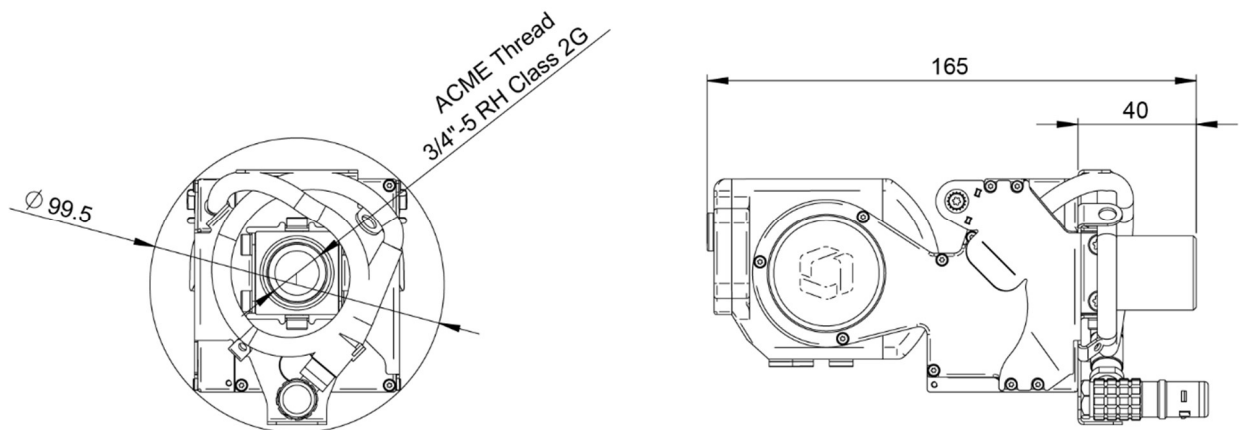
## 2.3 Principal dimensions

### 2.3.1 Manhole bracket



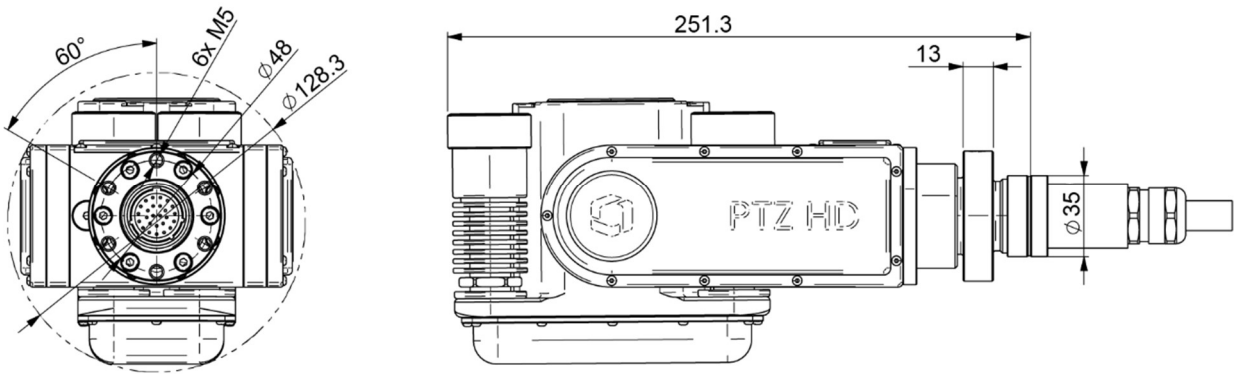
**Figure 7. Dimensions manhole bracket**

### 2.3.2 TZI Camera



**Figure 8. Dimensions TZI camera**

2.3.3 PTZHD30 Camera



**Figure 9. Dimensions PTZHD30 camera**

### 3 List of parts and accessories

Depending on the needs of the customer the following items can be implemented in the Ca-Zoom HD System:

<b>Part #</b>	<b>Description</b>
PTZ-ACC-PNDNT	Ca-Zoom HD pendant
PTZ-ACC-CASE	Ca-Zoom HD system case
PTZ-ACC-HD30-HEAD	PTZHD30 - inspection camera head
PTZ-ACC-POLEMNT	PTZHD30 - pole mount for V4010 pole
PTZ-ACC-C30M	PTZHD30 - camera cable 30 m / 100 ft
PTZ-ACC-C10M	PTZHD30 - camera cable 10 m / 30 ft
PTZ-ACC-HD30-C70M	PTZHD30 - camera cable 70 m / 230 ft
PTZ-ACC-CTRLBOX	Ca-Zoom HD camera controller
PTZ-ACC-CO2PUMP	CO <sub>2</sub> pressurization pump
PTZ-ACC-CO2-3PCS	CO <sub>2</sub> gas cartridge 16 g 3 Pcs
BIKE-ACC-TZI-CAM	TZI inspection camera
TZI-ACC-POLEMNT	TZI - pole mount for V4010 pole
TZI-ACC-C10M	TZI - camera cable 10 m / 33 ft
TZI-ACC-C30M	TZI - camera cable 30 m / 100 ft
PTZ-ACC-TOOLBOX	PTZ HD tool box
V4010-1036	Tripod ball joint W/6' POLE(X3)
V4010-1000	Carbon fibre pole - 6' section
V4010-1003	Carbon fiber pole - 3' section
PTZ-ACC-HRNS	Ca-Zoom HD pendant shoulder harness
PTZ-ACC-BKPK	Ca-Zoom HD backpack
PTZ-ACC-PNDNT-C5M	Pendant cable 5 m / 16.5 ft
PTZ-ACC-CORD-EU	Mains power cord C13 EU

PTZ-ACC-CORD-UK	Mains power cord C13 UK
PTZ-ACC-CORD-US	Mains power cord C13 US
PTZ-ACC-CORD-AUS	Mains power cord C13 AUS

A typical Ca-Zoom HD Kit comprises these items:

<b>Quantity</b>	<b>Item</b>
1	Ca-Zoom HD system case
1	Ca-Zoom HD pendant
1	TZ1 inspection camera
1	TZ1 - pole mount for V4010 pole
1	PTZHD30 - inspection camera head
1	PTZHD30 - pole mount for V4010 pole
1	Ca-Zoom HD camera controller
1	Pendant cable 5 m / 16.5 ft
1	CO <sub>2</sub> pressurization pump
1	CO <sub>2</sub> gas cartridge 16 g 3 Pcs
1	Tool box







**Figure 10. Typical Ca-Zoom HD System**



## 4 Handling

### 4.1 Packing / unpacking

 <b>WARNING</b>	
	<p>Squeezing hands while manipulating the mounting bracket and the clamps.</p> <p>Sharp edges causing hand injuries.</p>
	<p>Ensure there is enough room to manipulate the telescopic pole, the camera and the cables.</p>
	<p>Use suitable protective gloves for mounting bracket and telescopic pole manipulation.</p> <p>Always use the pole caps to avoid injuries and to protect the threads against shocks and dirt.</p>

Read the related content in chapter 1.3.

### 4.2 Cleaning

All components should be cleaned after use:

- Clean the cables, the poles and the manhole bracket with a clean cloth and normal water.
- Clean the cameras and the camera controller with a clean cloth and 70 % alcohol.







## 5 Assembly

### 5.1 General safety instructions

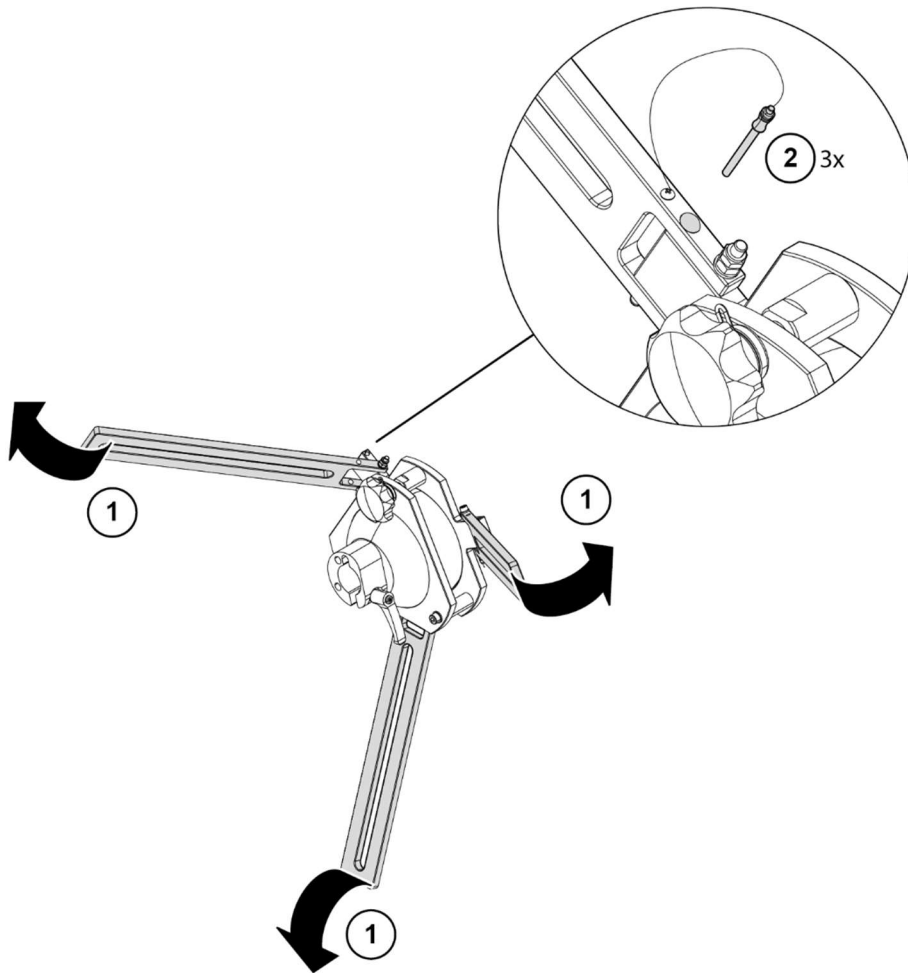
- Take the required measures before installing the equipment and during the operation.
- Avoid any risk of cable interference with persons or objects that can potentially move.
- Never tension the cable(s).
- Roll and attach cables with a binder when they are not used.
- Do not lay cables in walking areas. If this is not possible, use cable bridges.
- Safely attach cables at height with binders on vertical supports or guardrails when possible.

	 <b>CAUTION</b>
	<p>Height from the ground.</p> <p>Falling objects.</p>
	<p>Follow procedure for mounting the equipment to the pole or a fixed bracket.</p>
	<p>Attach a safety cable to the pole and a secure location. Beware that the cable will become taught when under load.</p>

Depending on the installation situation, adjust the sequence of the following actions:

- Mount the camera on the pole.
- Connect the wiring of the camera.
- Insert the pole through the opening of the ball joint and secure it with the ball joint clamp.
- Attach the manhole bracket to the opening of the object to be examined using suitable fastening equipment.

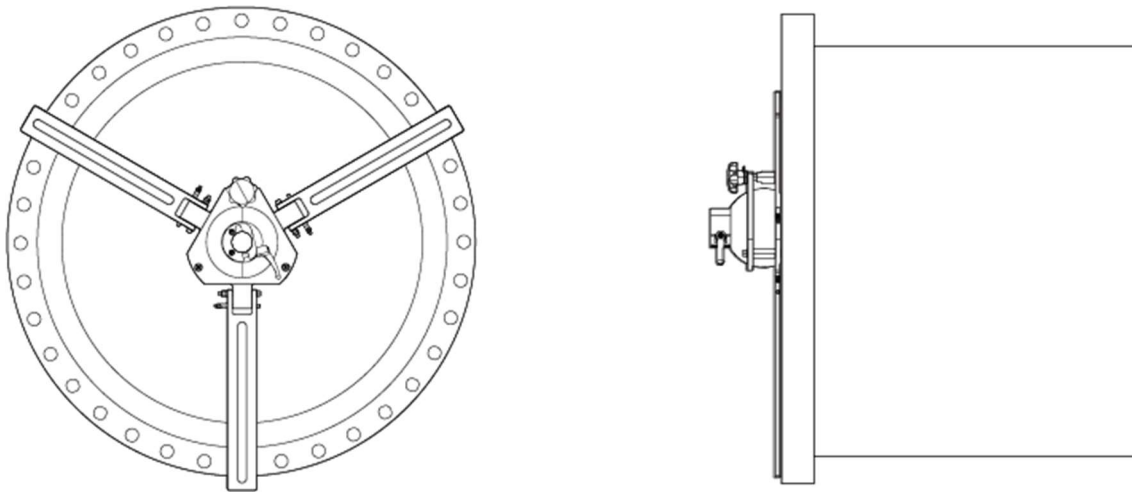
## 5.2 Unfold manhole bracket



**Figure 11. Unfold manhole bracket**

1. Unfold the three fastening arms of the manhole bracket one after the other
2. Secure each arm of the manhole bracket with a cotter pin.

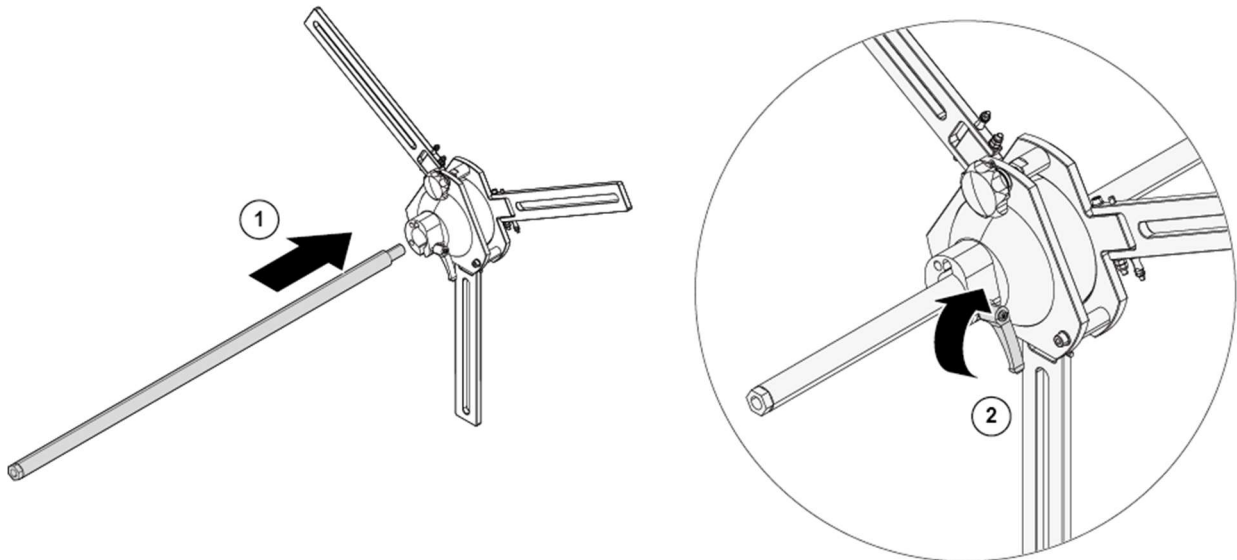
### 5.3 Mount manhole bracket



**Figure 12. Mount manhole bracket**

Attach the manhole bracket to the manhole using suitable fastening material. Make sure that the mounting is able to support the weight of the camera and the pole.

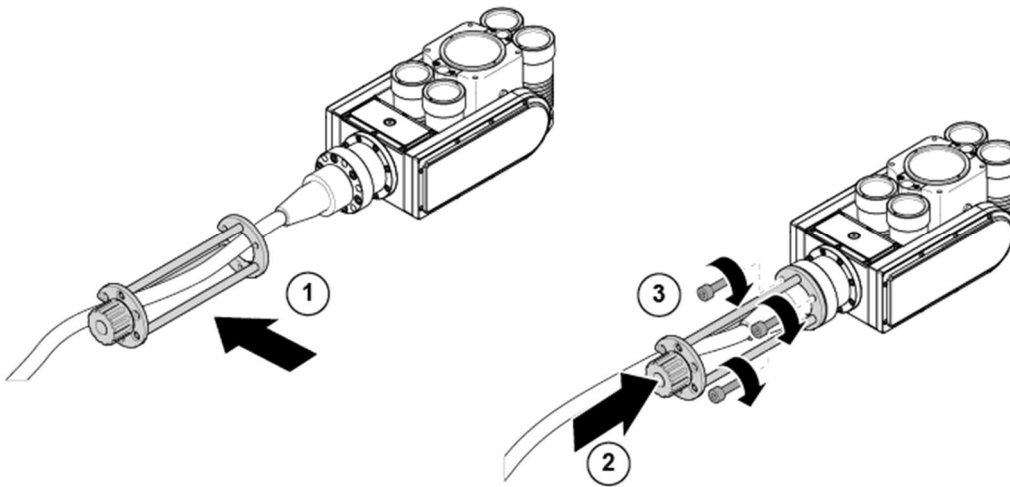
### 5.4 Assemble pole on manhole bracket



**Figure 13. Assemble pole on manhole bracket**

1. Insert the pole with the threaded side first into the opening of the ball joint.
2. Fasten the pole in the ball joint with the screw lever of the pole clamp.

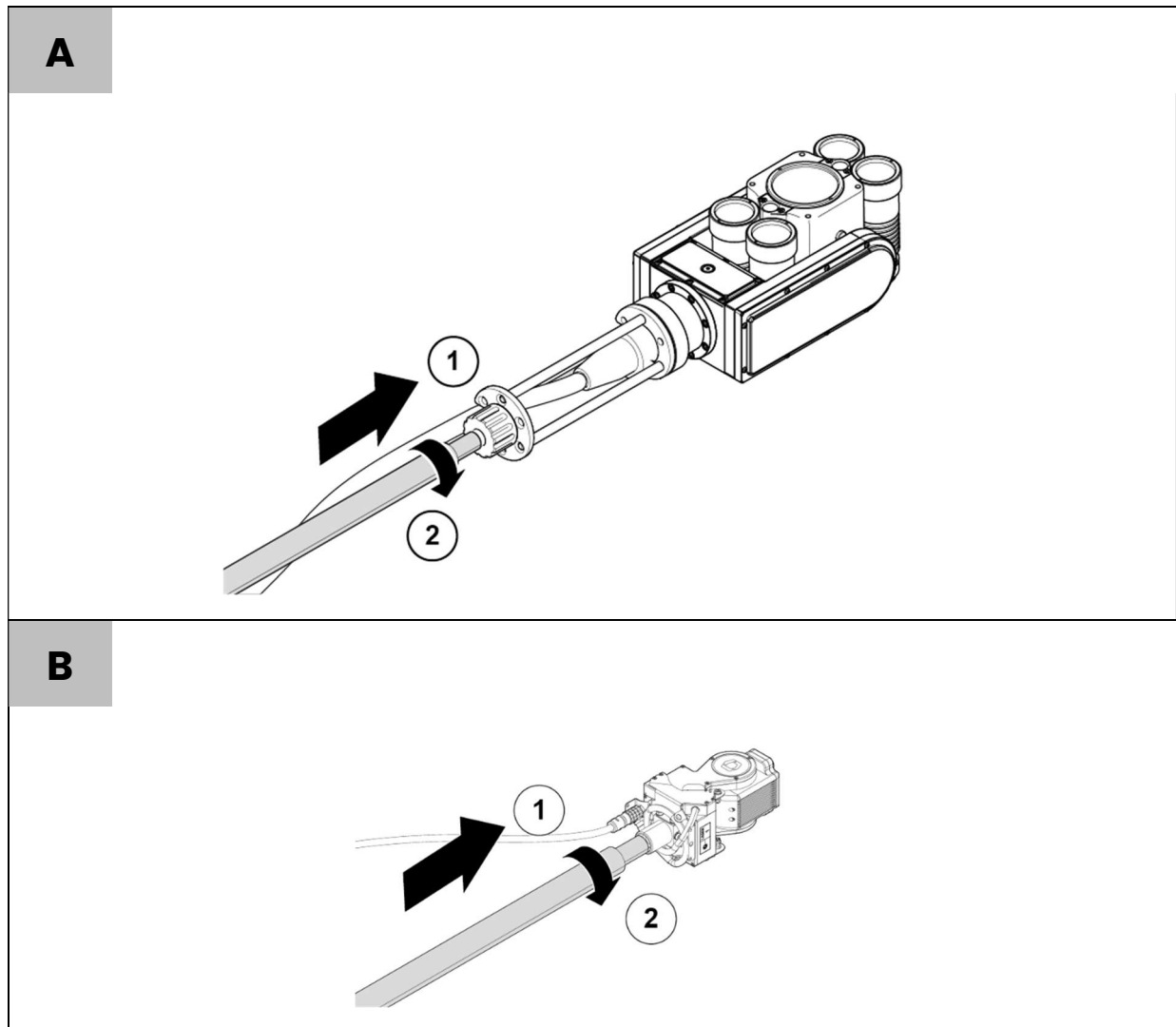
## 5.5 Assemble pole adapter on PTZHD30 camera



**Figure 14. Assemble pole adapter on PTZHD30 camera**

1. Slide the pole adapter over the cable of the camera.
2. Place the pole adapter over the corresponding holes in the connector socket of the camera.
3. Attach the pole adapter to the connector socket of the camera with three screws.

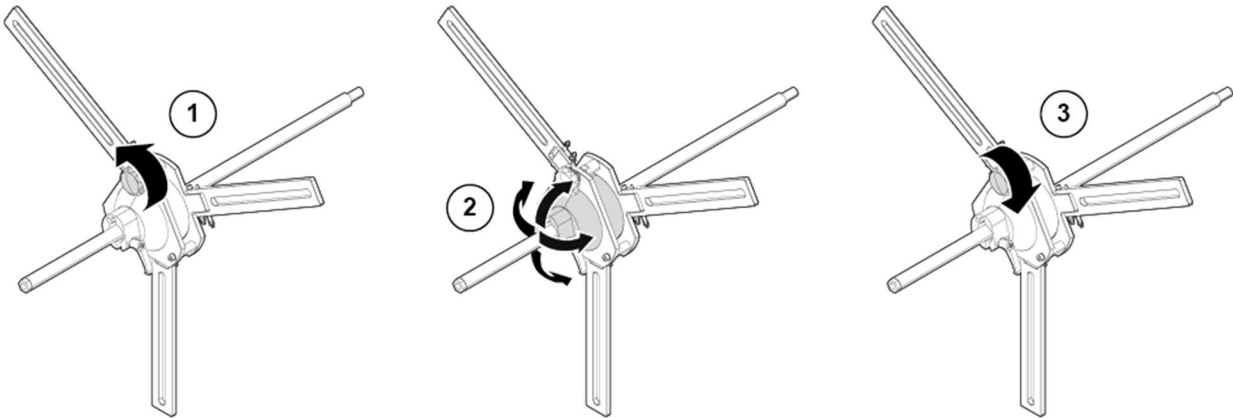
## 5.6 Assemble PTZHD30 camera (A) or TZ1 camera (B) on pole



**Figure 15. Assemble cameras on pole**

1. Place the thread of the pole in the corresponding opening of the pole adapter.
2. Screw the pole to the pole adapter.

## 5.7 Use ball joint to rotate pole



**Figure 16. Use ball joint to rotate pole**

1. Loosen the ball joint clamp by slightly loosening the hand screw. Make sure that the pole does not accidentally slip out of the ball joint.
2. Move the pole with the ball joint in the desired direction.
3. Fasten the ball joint clamp by tightening the hand screw.

## 6 Interconnection



### 6.1 Connectors and fittings

#### Push-pull connectors

The cylindrical push-pull connectors include a self-latching system to ease the mate and unmate of the connectors.



To **connect** the cylindrical push-pull connectors:



- Line up the red dot on the connector shell with the red index mark on the socket
- Push the connector in axial direction to engage the latches.



	 <b>CAUTION</b>
	<p>If a connector does not easily fit into the socket, it can incite the operator to apply too much force. As a result, pins can be seriously damaged (cable might be sent for repair or replaced by a new one).</p>
	<p>If a connector does not engage the latches within the socket, never apply more pressure than usual. Re-check the correct orientation of the shell and the axial alignment of the pins.</p>

To **disconnect** the cylindrical push-pull connectors:

- Pull on the outer shell release sleeve of the connector to disengage the latch.
- Remove the connector from the socket.



	 <b>CAUTION</b>
	<p>Plugged connectors and sockets can be progressively damaged if mechanically stressed.</p> <ul style="list-style-type: none"> <li>– Do not pull the cables when connectors are plugged.</li> <li>– Do not put any load (axial or lateral) on the plugged connectors.</li> <li>– Do not let long cables hang with their own weight.</li> </ul>

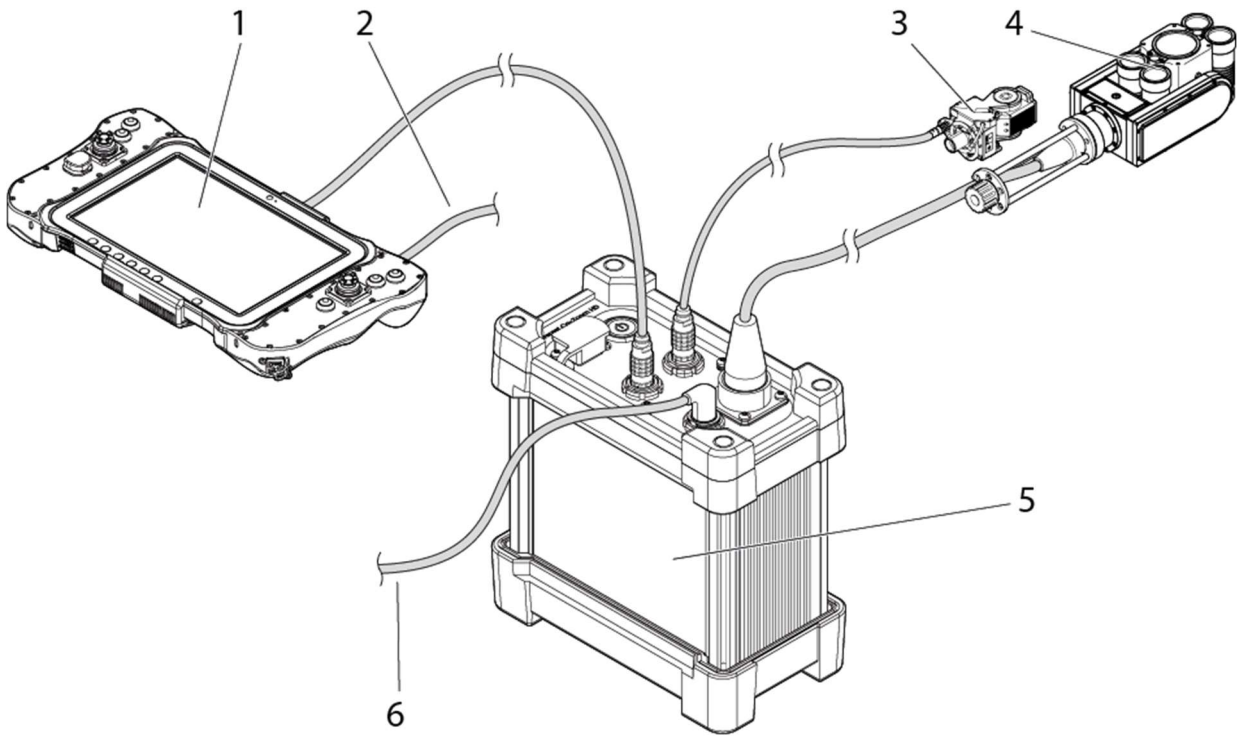
	 <b>CAUTION</b>
	<p>Defective sealing can induce electrical hazards and operational issues.</p> <p>Protect the sockets that are not used with the provided caps (each cap ensures IP65 ingress protection).</p>

	 <b>CAUTION</b>
	<p>Dropping or dragging on uncleaned or soaked floors, platforms or containers can cause malfunctions or short-circuits.</p> <p>Always lay cables and connectors in clean areas.</p> <p>Roll up cables and attach them with a binder when they are not used.</p>



## 6.2 Connection between camera controller and equipment

	 <b>WARNING</b>	
	Squeezing fingers, hands or arms.	
	– Secure boxes with safety rope.	





**Figure 17. Connection of the equipment**

- |          |                            |          |                    |
|----------|----------------------------|----------|--------------------|
| <b>1</b> | Pendant                    | <b>4</b> | PTZHD30 camera     |
| <b>2</b> | To optional display (HDMI) | <b>5</b> | Camera controller  |
| <b>3</b> | TZ1 Camera                 | <b>6</b> | To DC power supply |

### 6.3 Connection to the main power supply

Use the power cord with latched C13 connector provided with the Everest Ca-Zoom HD System to ensure a reasonable protection against dust.



If another power cord is used, it must comply with national and international regulations.




	 <b>DANGER</b>
	<p>The power cord can overheat and burn.</p> <p>The use of 100-240 VAC power cord with standard C13 power plug must comply with local regulations. Power cords and adapters must be compliant to local and general safety regulations.</p>

Connect the camera controller to the local power supply when interconnections are finished.



## 7 System start-up

	 <b>WARNING</b>
	Risk of damage to eyes.
	<ul style="list-style-type: none"> <li>- Do not look directly into the lights when switched on.</li> </ul> <p>Temporary blinding might occur.</p>

 	 <b>WARNING</b>
	Risk of damage to skin.
	<p>The housing of PTZ or TZI cameras becomes hot during operation, in particular, if lights are switched on.</p> <ul style="list-style-type: none"> <li>- Use safety gloves when you intend to handle the camera.</li> </ul>

**IMPORTANT:**

- Before switching on the camera controller, all necessary cables must be connected.
- When the camera controller is switched on, do not connected or disconnected any equipment like cameras or pendant.
- Set everything up according to setup description before powering on the system.
- Only use the pole with the system camera.

Press the power button to start-up the Everest Ca-Zoom HD System.

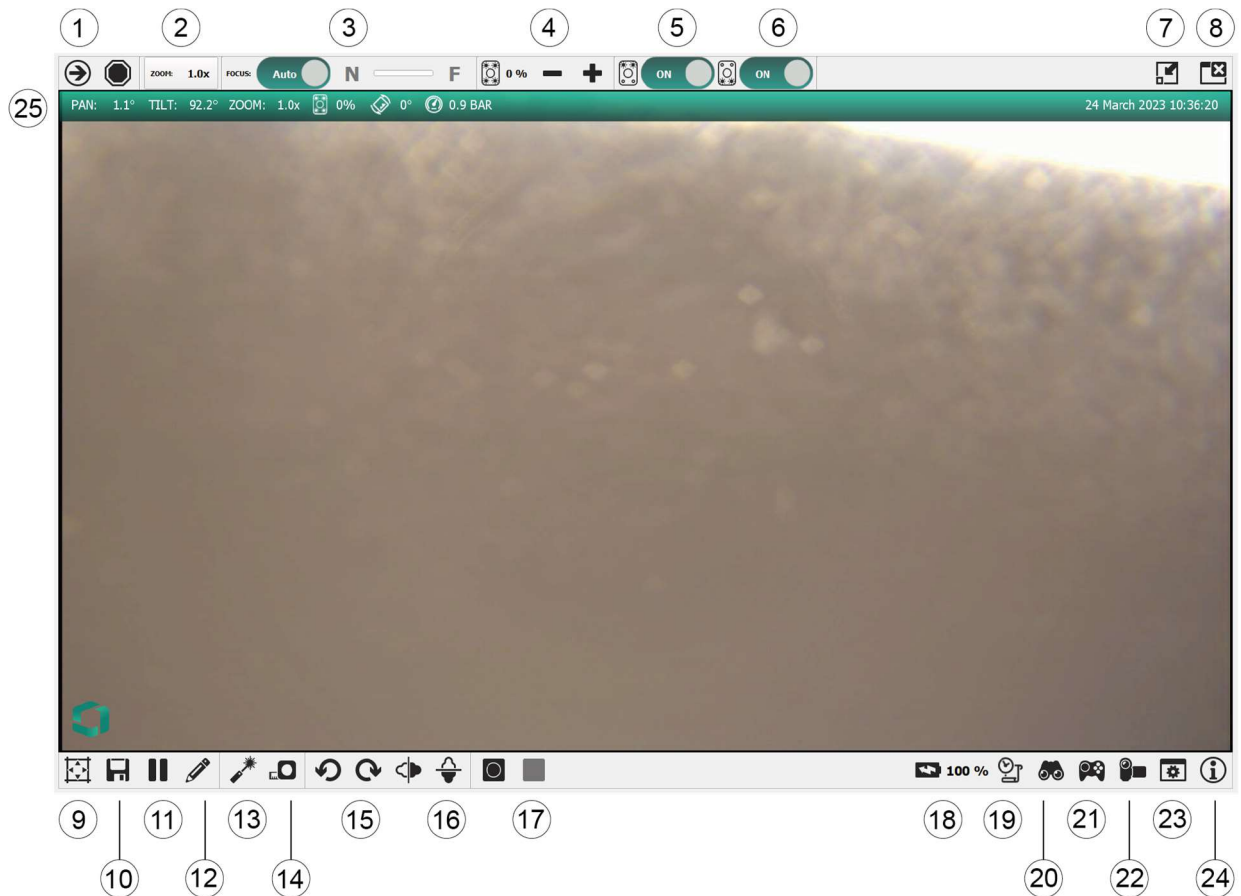
Note: The start-up may take up to a few minutes.



## 8 Ca-Zoom HD software application – camera controls

The Ca-Zoom HD software is explained using PTZHD30 camera as an example. The functionality of the software changes only slightly when switching to TZ1 camera. All important differences are described in (see chapter 8.7).

### 8.1 Main screen of the Ca-Zoom HD software



**Figure 18. Ca-Zoom HD software application**

No.	Button	Function
1	Position / Stop	Open a menu to save and recall individual pan and tilt positions of the camera.  For more details see chapter (8.2).  Halt the movement of the camera with the button "Stop".
2	Zoom	Displays the zoom factor.

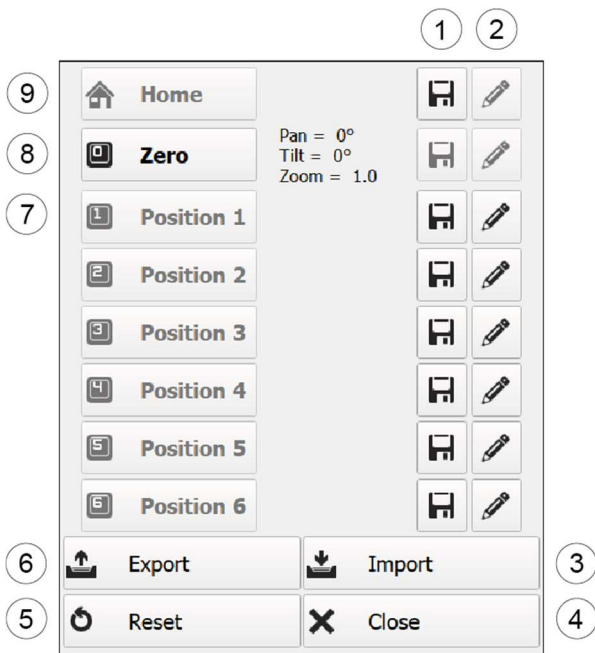
No.	Button	Function
3	Focus	<p>Enable or disable the auto focus of the camera with the button "Auto".</p> <p>Adjust the camera focus manually with the buttons "N / F".</p>
4	Light intensity	Adjust the intensity of the lighting with the buttons "- / +".
5	Top lights	Toggle on /off the top lights of the camera.
6	Bottom lights	Toggle on /off the bottom lights of the camera.
7	Minimize	Minimize the window.
8	Close	Close the window and exit software.
9	Full screen mode	<p>Maximize the screen for full size view.</p> <p>Exit the full screen mode with the "x" in the lower right corner of the screen.</p>
10	Save image	<p>Save a screenshot. The screenshot can be found in the directory which is set in the menu "Settings".</p> <p>For more details see chapter (8.6).</p>
11	Freeze image	Freeze the current camera image for a closer examination. Tap button again to return to the live image of the camera.
12	Annotation mode	<p>Enter the annotation mode to add text and/or graphics to the current (frozen) camera image.</p> <p>For more details see chapter (8.3).</p>
13	Laser	<p>Activate two laser lines. The two laser lines have a fixed distance of 22 mm and are used as reference for measurements.</p> <p>Deactivate the laser lines by tapping the button again.</p>



<b>No.</b>	<b>Button</b>	<b>Function</b>
14	Measure	<p>Open the measure mode with a set of tools to measure distances and/or areas.</p> <p>Leave the measure mode by tapping the button again.</p> <p>For more details see chapter (8.4).</p>
15	Rotate image	<p>Rotate the camera image counterclockwise or clockwise.</p>
16	Mirror image	<p>Mirror the camera image vertically or horizontally.</p>
17	Video recording	<p>Start and stop video recording. The video can be found in the directory which is set in the menu "Settings".</p> <p>For more details see chapter (8.6).</p>
18	Battery	<p>Display the battery level.</p>
19	System log	<p>Open the system log. The system log can be exported and sent to the Waygate support in case of any problems.</p>
20	Device discovery	<p>Discover the device.</p>
21	Controls	<p>Change the input device from internal controls (joysticks) to an external controller.</p>
22	Camera setup	<p>Change the settings of the camera.</p> <p>For more details see chapter (8.5).</p>
23	Settings	<p>Change program settings.</p> <p>For more details see chapter (8.6).</p>
24	About	<p>Display information about the software.</p>

No.	Button	Function
25	Information bar	<p>The information bar displays:</p> <ul style="list-style-type: none"> <li>the current pan, tilt and zoom of the camera.</li> <li>the intensity of the lighting.</li> <li>whether the camera picture is rotated or mirrored.</li> <li>the pressure inside the camera.</li> </ul> <p>the current date and time.</p>

## 8.2 Position



No.	Button	Function
1	Save	Save the current camera position.
2	Edit	Open a dialog to edit the name of the position.
3	Import	Import stored position settings from a json file.
4	Close	Close the dialog.
5	Reset	Reset all settings. This deletes all camera positions without warning.

No.	Button	Function
6	Export	Export current position settings to a json file.
7	Position 1-6	Set up to 6 individual camera positions.
8	Zero	<p>Return to default camera values:</p> <ul style="list-style-type: none"> <li>• Pan = 0°/360°</li> <li>• Tilt = 0°</li> <li>• Zoom = 1.0</li> </ul> <p>The Zero-values can't be edited and will not be deleted after a reset.</p>
9	Persistent Home Position	Can not be changed. Will move the camera to a position with minimal footprint for deployment through small openings.

### 8.3 Annotation mode



No.	Button	Function
1	Rectangle	<p>Add a rectangle to the image. To edit the rectangle:</p> <ul style="list-style-type: none"> <li>• Tap, hold and drag the rectangle to move it.</li> <li>• Drag the moving-point-indicator to resize it.</li> <li>• Drag the rotation-point-indicator to rotate it.</li> <li>• Double tap the text to edit the color and the font.</li> </ul>
2	Ellipse	<p>Add an ellipse to the image. To edit the ellipse:</p> <ul style="list-style-type: none"> <li>• Tap, hold and drag the ellipse to move it.</li> <li>• Drag the moving-point-indicator to resize it.</li> <li>• Drag the rotation-point-indicator to rotate it.</li> <li>• Double tap the text to edit the color and the font.</li> </ul>

No.	Button	Function
3	Contour	Add a contour to the image. To edit the contour: <ul style="list-style-type: none"> <li>• Tap, hold and drag the contour to move it.</li> <li>• Drag the moving-point-indicator to move the edges of the contour.</li> <li>• Add points to create an n-sided polygon.</li> <li>• Double tap the text to edit the color and the font.</li> </ul>
4	Line	Add a line to the image. To edit the line: <ul style="list-style-type: none"> <li>• Tap, hold and drag the line to move it.</li> <li>• Drag the moving-point-indicator to move the endpoints of the line.</li> <li>• Double tap the text to edit the color and the font.</li> </ul>
5	Arrow	Add an arrow to the image. To edit the arrow: <ul style="list-style-type: none"> <li>• Tap, hold and drag the arrow to move it.</li> <li>• Drag the moving-point-indicator to move the endpoints of the arrow.</li> <li>• Double tap the text to edit the color and the font.</li> </ul>
6	Textbox	Add a textbox to the image. To edit the textbox: <ul style="list-style-type: none"> <li>• Tap, hold and drag the textbox to move it.</li> <li>• Double tap the text to edit the color, background color and the font.</li> </ul>
7	Delete	Delete an annotation.  All annotations will show a cross nearby. Tap the cross to delete the annotation.
8	Clear	Delete all annotations at once.

## 8.4 Measure

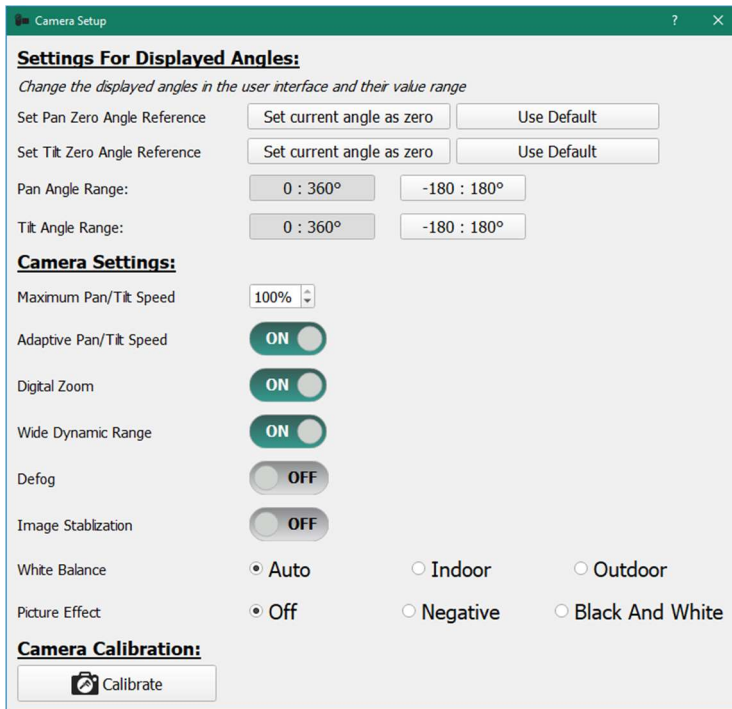


No.	Button	Function
1	Rectangle	<ul style="list-style-type: none"> <li>• Add a rectangle to the image.</li> <li>• Edit the rectangle as described in annotation mode (see chapter 8.3).</li> </ul> <p>→ Length, width and area of the rectangle will be displayed.</p>
2	Ellipse	<ul style="list-style-type: none"> <li>• Add an ellipse to the image.</li> <li>• Edit the ellipse as described in annotation mode (see chapter 8.3).</li> </ul> <p>→ Length, width and area of the ellipse will be displayed.</p>
3	Contour	<ul style="list-style-type: none"> <li>• Add a contour to the image.</li> <li>• Edit the contour as described in annotation mode (see chapter 8.3).</li> </ul> <p>→ Area of the contour will be displayed.</p>
4	Line	<ul style="list-style-type: none"> <li>• Add a line to the image.</li> <li>• Edit the line as described in annotation mode (see chapter 8.3).</li> </ul> <p>→ Length of the line will be displayed.</p>
5	Arrow	<ul style="list-style-type: none"> <li>• Add an arrow to the image.</li> <li>• Edit the arrow as described in annotation mode (see chapter 8.3).</li> </ul> <p>→ Length of the arrow will be displayed.</p>

No.	Button	Function
6	Textbox	<ul style="list-style-type: none"> <li>• Add a textbox to the image.</li> <li>• Edit the textbox as described in annotation mode (see chapter 8.3).</li> </ul>
7	Measuring tape	Toggle display of measurements on or off.
8	Units	Select measurement unit from the dropdown menu.
9	Delete	Delete a measurement annotation.  All measurement annotations will show a cross nearby. Tap the cross to delete the measurement annotation.
10	Clear	Delete all measurement annotations at once.

- Laser Lines may now be turned off – measurement is still possible

## 8.5 Camera setup



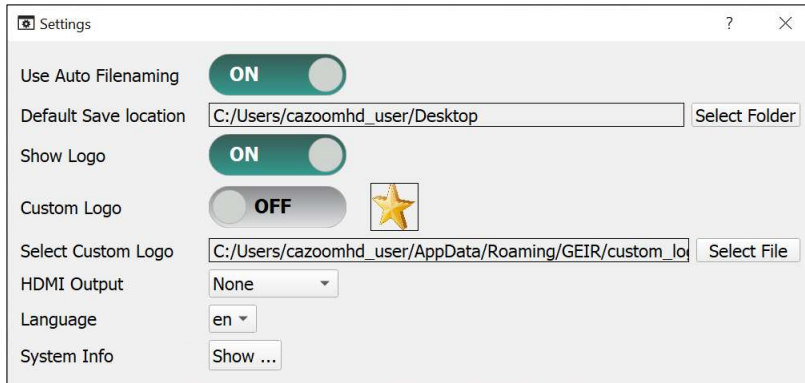
Designation	Function
Set Pan Zero Angle Reference	Add an offset to the pan or tilt value. This can be used to give the camera a new zero point within the object to be examined.
Set Tilt Zero Angle Reference	
Pan Angle Range	Toggle the pan or tilt angle range between [ 0 : 360° ] or [ -180 : 180° ]
Tilt Angle Range	
Maximum Pan/Tilt Speed	Reduce the maximum pan and tilt speed to the desired level.
Adaptive Pan/Tilt Speed	With adaptive pan/tilt speed applied, the rotation speed of the camera correlates with the current zoom factor: the higher the zoom factor, the slower the rotation speed.
Digital Zoom	Toggle on to add a digital zoom to the 30x optical zoom.
Wide Dynamic Range	Toggle on to compensate for strong differences in contrast and brightness.
Defog	Toggle on to enhance contrast and saturation of the image.

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<b>Designation</b>	<b>Function</b>
Image Stabilization	Toggle on to use the built-in image stabilization of the camera.
White Balance	Select the white balance settings to correct colors in correlation to the light source.
Picture Effect	Select a picture effect to make certain defects more visible.
Camera Calibration	Calibrate the camera.



## 8.6 Settings



Designation	Function
Use Auto Filenaming	Toggle on to use automatic naming of the saved files.
Default Save location	Select a folder for the default location of the saved files.
Show Logo	Toggle on to show the logo in the lower left side of the image. The logo will be implemented in screenshots and videos.
Custom Logo	Toggle on to use a custom logo to be show.
Select Custom Logo	Select a custom logo from the tablet.
HDMI Output	Select an additional display.
Language	Select a menu language. The system must be restarted to apply the changes.
System Info	Display additional information for camera debugging.

## 8.7 Differences using TZ1 camera

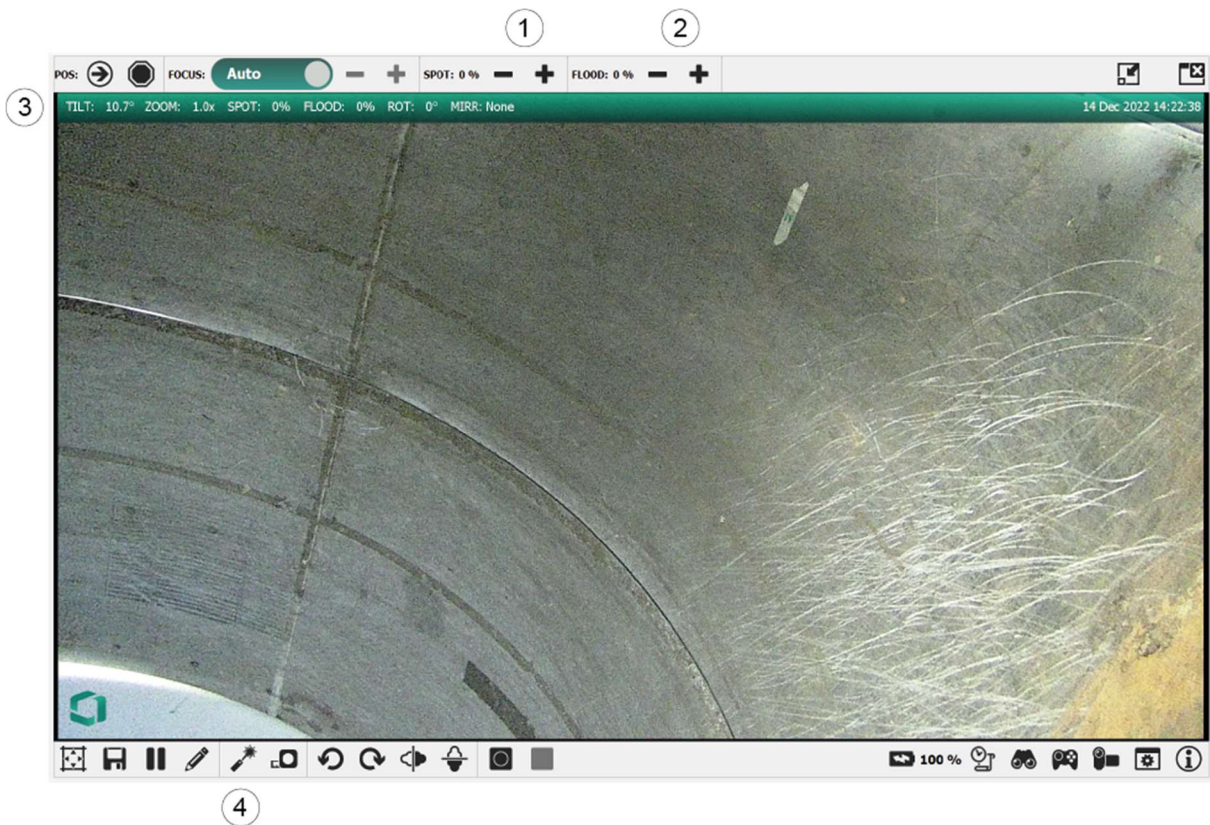


Figure 19. Differences in the TZ1 screen

No.	Button	Function
1	Spot	Adjust the intensity of the spot lighting with the buttons “- / +”.
2	Flood	Adjust the intensity of the flood lighting with the buttons “- / +”.
3	Information bar	The information bar displays: <ul style="list-style-type: none"> <li>• the current tilt and zoom of the camera.</li> <li>• the intensity of the spot lighting.</li> <li>• the intensity of the flood lighting.</li> <li>• whether the camera picture is rotated or mirrored.</li> <li>• the current date and time.</li> </ul>

---

No.	Button	Function
4	Laser	<p>Activate two laser points. The two laser points have a fixed distance of 27,5 mm and are used as reference for measurements.</p> <p>Deactivate the laser points by tapping the button again.</p>



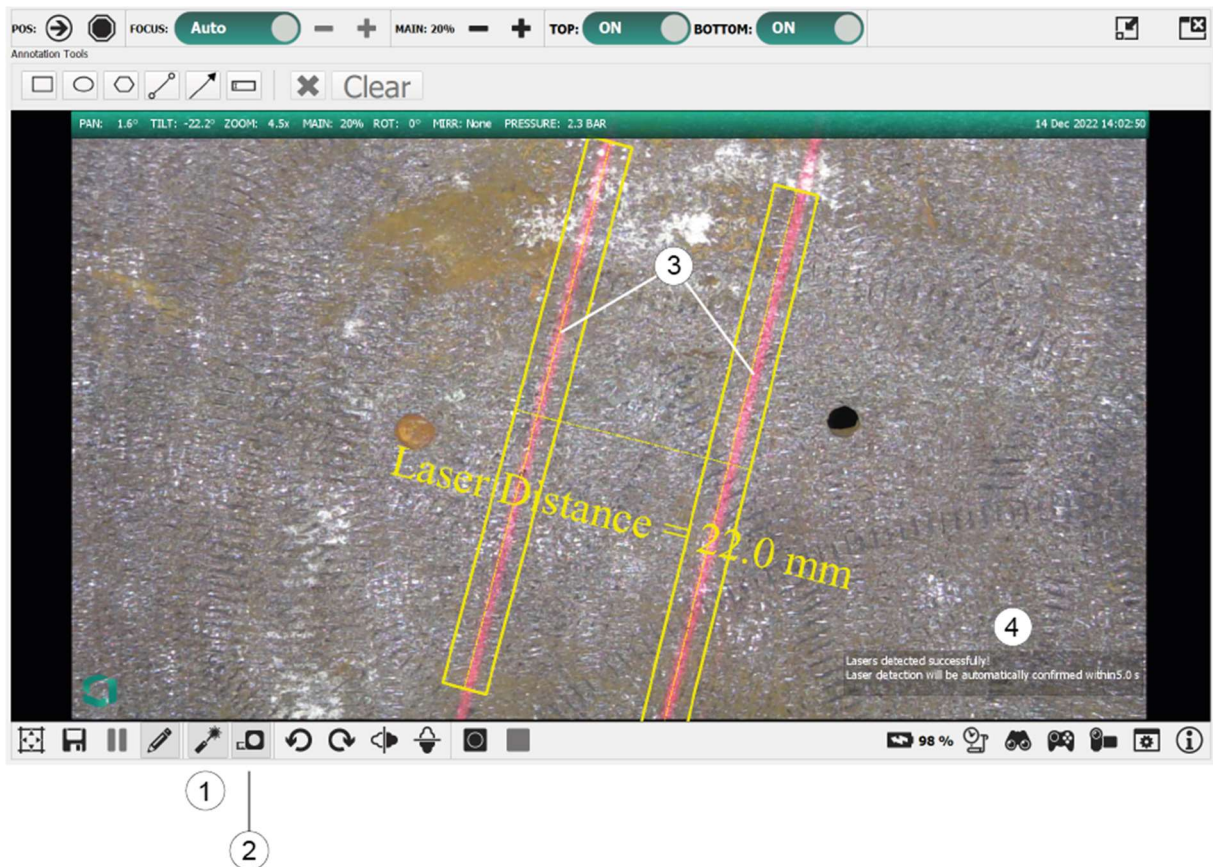
## 9 Measure and document

### 9.1 Measure and make annotations

With the measurement function, points in the observation environment can be marked, documented and measured.

Therefore the Everest Ca-Zoom HD System uses lasers with a fixed distance as reference.

- PTZHD30 camera: two laser lines with a fixed distance of 22,0 mm.
- TZI camera: two laser points with a fixed distance of 27,5 mm.



**Figure 20. Capture laser lines**

1. Switch on the laser using the "Laser" button (1).

Two laser lines appear in the screen.

2. Tap the "Measurement" button (2).

The annotation tools appear, and the laser lines are marked with yellow borders (3).

Check the system information whether the laser lines are detected correctly (4).

If the laser lines are detected correctly, the system will confirm automatically.

To mark, measure and document use the measure tools as described in (8.4)

## **9.2 Take a screenshots**

There are two ways to take a screenshot:

- a) Press the “capture image button” (10) on pendant (see chapter 2.2.3).
- b) Tap “save image” (10) on the touchscreen of the pendant (see chapter 8.1).

The screenshot will be saved automatically to the internal memory. It can be found in the directory which is set in the menu “Settings”.

For more details see chapter (8.6).

## **9.3 Record a video**

There are two ways to record a video:

- a) Press the “video record button” (7) on pendant (see chapter 2.2.3).
- b) Tap “video recording” (10) on the touchscreen of the pendant (see chapter 8.1).

The video will be saved automatically to the internal memory. It can be found in the directory which is set in the menu “Settings”.

For more details see chapter (8.6).

## **10 Shutdown**

Do not turn off the camera controller while the operating system is still running.

To shut down the system:




1. Tap “close” (7) to exit the software application (see chapter 8.1).
2. Shut down Microsoft Windows.
3. Turn off camera controller (see chapter 2.2.5) with power button (2).





## 11 Packing

### 11.1 Disconnection / Disassembly

 <b>CAUTION</b>	
	<p>Attention to equipment handling (electrical shock or short-circuits) and manipulation (dropping or tipping over).</p> <p>Personnel can be injured, and equipment can be seriously damaged.</p>
	<p>Disconnect the power supply before disassembly.</p> <p>Use safety gloves.</p> <p>Ensure sufficient clearance in the working area and keep it clean and tidy.</p> <p>Manipulate and organize in stable and clean locations.</p>

To disconnect / disassemble the Everest Ca-Zoom HD System:

- Place all components on a levelled and clean working space.
- Disconnect the power supply.
- Unplug all cables from the camera controller and all of the components.
- Unmount the pole from the manhole bracket.
- Unmount the camera from the pole.
- Unmount the adapter from the PTZHD30 camera.
- Fold the manhole bracket.

All components should be cleaned before packing: For details see chapter (4.2).

Pack all components except pole and manhole bracket in the Ca-Zoom HD system case.

### 11.2 Storage

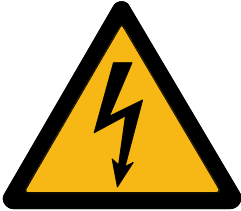

Store the packed Everest Ca-Zoom HD System in a clean and dry location.



Temperature range: 0 °C ... +50 °C.



## 12 Maintenance

### 12.1 Safety instructions

	 <b>DANGER</b>
	<p>Risk of electric shock in case of damage to cables and equipment.</p> <p>Do not open the sealed board panels of the Control Station, no inside parts require maintenance.</p>

	 <b>DANGER</b>
	<p>Risk of injury from nuclear radiation</p> <p>Equipment cannot be returned for service once it has been used in a nuclear facility due to contamination.</p>


Refer to safety instructions in (1.3).

Work related to mechanical or electrical maintenance or repair requires special knowledge and experience. Therefore, it must be performed by personnel who can prove the required qualifications.

The electrical devices must not be opened for regular maintenance.

Please contact the technical support (see chapter 15) for any specific request.

## 12.2 Maintenance work and functional test



	NOTICE
Regular cleaning, care and maintenance within the intervals described below will ensure efficient operational readiness.	

All maintenance work must be performed by trained and authorized staff in compliance with the instruction manual, taking all safety instructions into consideration.

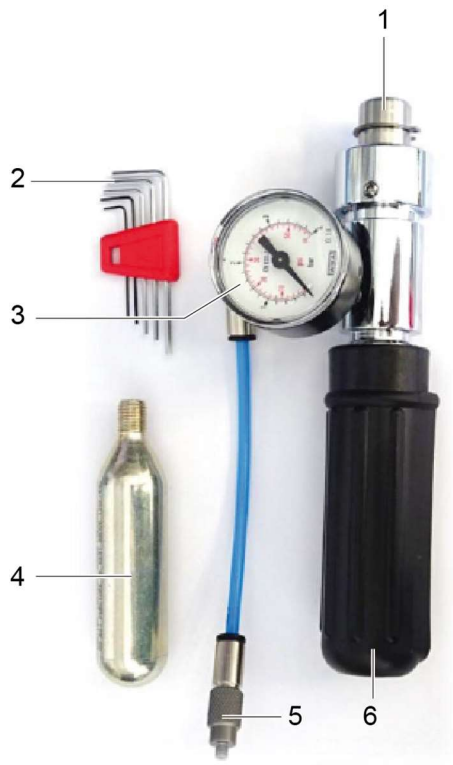
### 12.2.1 Inspections before each use

- Cables: Visually inspect the cables for integrity (connector outlet and outer sheath).
- Assemblies, screws and clamps: Make sure that the mounted parts and screws are not loose or damaged.

### 12.2.2 Apply compressed air to the device

 	⚠ WARNING
<p>Danger from bursting camera head. Camera head explodes when over pressurized.</p> <ul style="list-style-type: none"> <li>• Wear protective goggles when repressurizing camera head.</li> <li>• Only use supplier CO<sub>2</sub> injector to pressurize camera head. Do not pressurize directly from any other source.</li> <li>• Only use pressurization cartridges approved by supplier.</li> <li>• Do not puncture CO<sub>2</sub> cartridge or heat above 49 °C/120 °F.</li> </ul>	





Compressed air or CO<sub>2</sub> must be applied to the camera head for underwater use. This protects the high-quality electronics in the event of leakage. The camera head either indicates the loss of tightness by periodically switching off the lights or by an alert on the control software (newer models).



**Figure 21. Accessories**

- |          |                     |          |                           |
|----------|---------------------|----------|---------------------------|
| <b>1</b> | Pushbutton          | <b>4</b> | CO <sub>2</sub> cartridge |
| <b>2</b> | Allen keys          | <b>5</b> | Valve adapter             |
| <b>3</b> | Pump with manometer | <b>6</b> | Cartridge housing         |

## Changing the CO<sub>2</sub> cartridge

 <b>WARNING</b>	
  	<p>Danger of icing.</p> <p>If the cartridge is screwed in too slowly, CO<sub>2</sub> gas can escape.</p> <p>Never remove the cartridge with pressure inside</p> <p>Danger of icing in this area.</p> <ul style="list-style-type: none"><li>• Wear protective gloves and goggles.</li><li>• Do not inhale.</li><li>• Do not discharge CO<sub>2</sub> injector towards face or body.</li></ul>

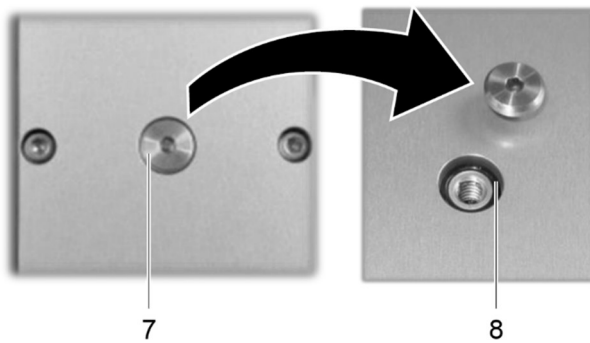
If it is necessary to change the CO<sub>2</sub> cartridge, slowly loosen the cartridge housing and check whether the CO<sub>2</sub> cartridge has been completely emptied. When gas flows out, tighten the cartridge housing again, otherwise there may be danger of icing in this area.

Use the pump until the CO<sub>2</sub> cartridge is completely empty.

**Camera pressurization procedure:**

1. Unscrew the black cartridge housing (6), remove the emptied cartridge if necessary and insert a new CO<sub>2</sub> cartridge into the housing.
2. Screw in the cartridge housing including the cartridge until a small resistance is felt.

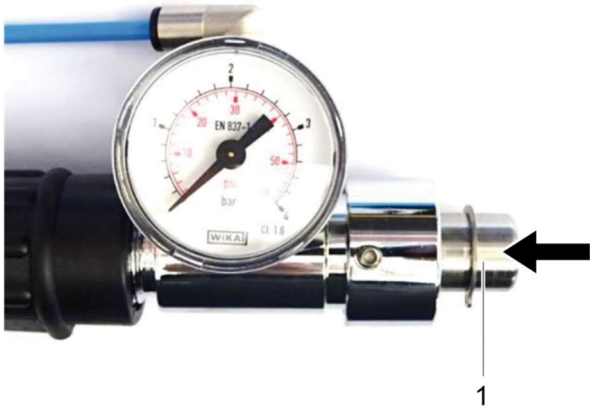
Tighten it in one go, without changing your grip, so that no gas escapes unnecessarily.

**Figure 22. Unscrew valve seal**

3. Unscrew the valve seal screw (7).  
Use the 2 mm Allen key that is supplied with the device.
4. Ensure that the O-ring (8) remains in the device.

**Figure 23. Apply adapter**

5. Screw the adapter (9) into the valve



**Figure 24. Pushbutton**

6. Press the pushbutton into the pump housing.  
At best, take the pump in both hands and grasp the cartridge housing with one hand and press the pushbutton with the other palm of your hand.  
The CO<sub>2</sub> gas flows into the device.
7. The pressure must be constantly checked on the manometer, holding the pushbutton for a few seconds at the desired pressure so that the desired pressure also prevails in the camera.

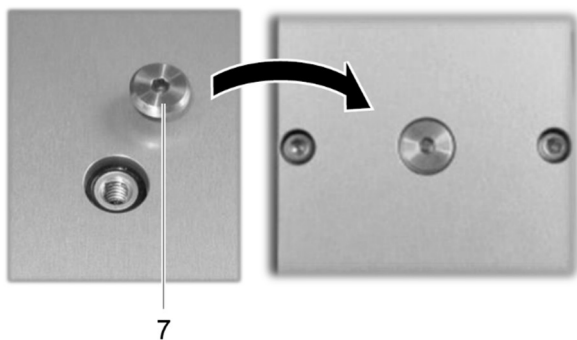
**It must not exceed the maximum pressure of the device.**

The pushbutton is limited by a safety ring. This must not be removed or manipulated.

Maximum achievable pressure (pushbutton pressed in until stop): less than 2.5 bar (36 psi).

When the filling process is finished, the push button is released. The pressure in the pump is reduced. The pressure display decreases.

8. The valve adapter can now be removed.





**Figure 25. Screw in valve seal**



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Before retightening the valve sealing screw, make sure that the O-ring is clean and lightly greased. The area around the O-ring must not be contaminated.

	 <b>CAUTION</b>
	Danger of icing in this area. If the cartridge is screwed in too slowly, CO <sub>2</sub> gas can escape.





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## 13 Troubleshooting

<b>Problem</b>	<b>Cause</b>	<b>Remedy</b>
The application cannot find devices on the network	One or more connectors are not plugged correctly	Check that the connectors are correctly latched.
A connector does not latch correctly	A pin can be damaged or the connector guiding function is altered	Try another cable, call the Technical Support.



## 14 Disposal

	 <b>DANGER</b>
	<p>Risk of injury from nuclear radiation</p> <p>Equipment cannot be returned for service once it has been used in a nuclear facility due to contamination.</p>

	 <b>DANGER</b>
	<p>Risk of injury by toxic vapors or chemicals</p> <p>Equipment cannot be returned for service once used in a contaminated environment.</p>



### Disassembling

Follow the disassembling and cleaning instructions in (11.1) and (4.2).


### Waste disposal

Knocked down components of the Everest Ca-Zoom HD System have to be supplied for recycling:

- Scrap metal residues.
- Plastic parts to be sent to recycling.
- Assort remaining components according to material consistence.

  	<b>CAUTION</b>
	<p><b>Incorrect or faulty disposal can damage environment!</b></p> <p>Electronic waste, electronic components, lubricants and other auxiliaries are:</p> <ul style="list-style-type: none"> <li>– Subject to special waste treatment and may only be disposed of by authorized specialist companies for waste treatment!</li> <li>– Liable to treatment of special refuse and must only be disposed of by authorized specialist companies!</li> </ul>

Local authorities and waste disposal companies provide information on environmentally friendly disposal.

	<b>NOTICE</b>
	<p>All components of the Everest Ca-Zoom HD system can be returned to us.</p> <p>Please contact technical support (see chapter 15) for more details.</p>

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## 15 Technical Support

For technical support, contact the support service.

Mail to: [remoteservice@bakerhughes.com](mailto:remoteservice@bakerhughes.com)

Phone: +1-866-243-2638

### Customer Support Centers

#### USA

Waygate Technologies

LP 721 Visions Drive

Skaneateles, NY 13152

Tel: +1 832-325-4368

E-mail:

[waygate.usa@bakerhughes.com](mailto:waygate.usa@bakerhughes.com)

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Tel: +55 19 2104 6983

E-mail: [mcs.services@bakerhughes.com](mailto:mcs.services@bakerhughes.com)

#### India

GE Oil & Gas India Pvt. Ltd,

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Badhalwadi, MAWAL, Pune,

Maharashtra, 410507

Tel: 02114662277

E-mail: [India.Service@bakerhughes.com](mailto:India.Service@bakerhughes.com)





## Appendix A Specifications

Camera heads		PTZ HD30	TZ1 HD
Camera features	Resolution	1920 x 1080	1920 x 1080
	Image sensor size	2.38 MP	4.08 MP
	Zoom	30 x optical (12 x digital)	10 x optical
	Focal length range	4.3 mm..129 mm	3.3 mm..33 mm
	Field of view (in air)	tele: 2.3° wide end: 63.7°	tele: 6.7° wide end: 59.2°
	Min. focus distance	tele: 1200 mm wide end: 100 mm	tele: 800 mm wide: 50 mm
	Focus	auto and manual	auto and manual
	Iris	auto	auto
	Electronic shutter	auto	auto
	Sensitivity	1.4 lx	0.5 lx
Laser (class 1) & Lights	Lights	2 pairs of lights	2 spot-lights, 2 flood-lights
		each LED: 745 lm total 2980 lm	total 988 lm
	Parallel laser beams $\lambda$ (color)	built-in laser lines 650 nm (red)	built-in laser dots 635 nm (red)
	Optical output power	0.4 mW	2.8 mW
	Distance btw. beams	22 mm (0.87")	27.5 mm (1.08')
Motion	Pan	continuous 360°	not available, tilt-only
	Pan speed	max. 9° / sec	
	Tilt	338° (-169° to +169°)	227° (-104° to +123°)
	Tilt speed	max. 8° / sec	22° / sec
	Clutch protection	yes (pan and tilt)	yes
	Position feedback	magnetic angle encoder feedback	magnetic angle encoder feedback
Dimensions	Construction	anodized aluminum	anodized aluminum
	Weight	3.5 kg	0.74 kg
	Size L x W x H mm (inches)	250 (9.85)x 117 (4.6)x 113 (4.5)	125 (4.92) x 66 (2.6) x 72 (2.84)
	Min. opening $\varnothing$	130 mm (5.11")	98 mm (3.86")
	Cable lengths m (feet)	10 (33'), 30 (98'), 70 (230')	10 (33'), 30 (98')

	Camera heads	PTZ HD30	TZ1 HD
Environm	Operating pressure	IP68, Waterproof to 50 m	IP65
	Pressurization	max 2.5 bar internal	N/A

Camera controller & Pendant	
Weight	
• Camera controller	1.64 kg
• Pendant	2.01 kg
Input rating to AC/48V DC power adapter, Power	100-240 VAC (47-63Hz), 150W
Processor	Intel Core i5-7300U
Memory	8 GB DDR3L SDRAM
Disk Drive	256 GB SSD
Video storage capacity	> 6 hours
Video output	HDMI output on Pendant
Monitor	10.1 inch WUXGA (1920x1200) 10-point gloved multi touch
Screen brightness	800 nits
Hand-held cable	5m (16.4 ft)
Controls	Buttons and joysticks
Soft buttons	On touchscreen user interface


Everest Ca Zoom HD : general and specific environmental ratings	
• Altitude	up to 2000 m
• Conditions of use	Indoor
• Temperature (general)	0° C ... 40°C (32°F ... 104°F)
• Temperature, (specific for PTZ HD30 camera head and cable)	0° C ... 45°C (32°F ... 113°F)
• Pollution category	Pollution degree 2
• Overvoltage category	Overvoltage category II
• Humidity	up to 95%

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## Appendix B Regulatory Compliance

### European Equipment Classification

Group 1, Class A

The  mark on this product indicates it has been tested to and conforms with the provisions noted within the 2014/30/EU Electromagnetic Compatibility Directive. The Everest Ca-Zoom HD system is in conformance with the following standard: EN61326-1.

### Safety Mark

This device complies with the following standards:

UL 61010-1, IEC 61010-1, EN 61010-1 and CSA-C22.2 No. 61010-1.

### FCC Compliance Statement:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference and
- 2) This device must accept any interference received, including interference that may cause undesired operation.

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in industrial environment. This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

### Industry Canada Regulatory Statement:

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

- 1) This device may not cause interferences, and

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2) This device must accept any interferences, including interferences that may cause undesired operation of the device.

Cet appareil est conforme avec Industrie Canada exempts de licence standard RSS (s). L'utilisation de ce dispositif est autorisée seulement aux conditions suivantes:

1) il ne doit pas produire de brouillage et

2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

Complies with the Canadian **ICES-001 Class A** specifications.

Cet appareil numérique de la **classe A** est conforme à la norme **NMB-001** du Canada.

### **Canadian Notice**

This equipment does not exceed the Class A limits for radio noise emissions as described in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

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