



Borehole
camera
Well-Camera.3

Instruction
manual



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1.Important Notice

P.A.S.I. software and programs are delivered “as is”. The manufacturer does not grant any kind of warranty including guarantees on suitability and applicability to a certain application. Under no circumstances is the manufacturer or the developer of a program responsible for any possible damage caused by the use of a program.

P.A.S.I. products have not been designed to be used in any way or applications other than those mentioned.

P.A.S.I. reserves the right to change the technical specifications or functions of its products, or to discontinue the manufacture of any of its products or to discontinue the support of any of its products, without any written announcement and urges its customers to ensure, that the information at their disposal is valid.

The WellCamera.3 product must not be treated as household waste. It is to be handed over to the applicable collection point for the recycling of electrical and electronic equipment.

This guide refers to “WellCamera.3” HW version 1.0 , SW version 2.X

Torino, ITALIA 2026

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2. Warranty and safety instructions

Read these instructions carefully before using the product:

- Warranty will be void, if the product is used in any way that does not follow the instructions given in this manual.
- Warranty will be void if any part of Well-camera.3 has been tampered with.
- The device must be used only according to the instructions described in this manual. Faultless and safe operation of the device can be guaranteed only if the transport, storage, handling and operation of the device is appropriate.
- To prevent damage, use only original accessories or those approved by PASI srl.
- The box is waterproof only if all connectors are closed with their own caps. When a suitable location has been selected for the Well-camera.3, it must be ensured that no water can get into the device under any conditions. Direct sunlight is also to be avoided. It is not recommended that the Well-camera.3 is installed on a strongly vibrating surface.

3. Introduction

The Well-camera.3 is a device designed and assembled by P.A.S.I. srl, a leading Italian company in the production of instruments for inspection, geology and geophysics.

Taking advantage of our wide experience in designing and manufacturing camera systems for borehole and well applications, PASI has created the innovative WELL-CAMERA.3;

Well-Camera3 brings significant improvements and greater handling in the world of visual inspections in wells and pipes: all the camera electronics have been miniaturized and incorporated on the cable reel. This compact and lightweight device is the answer for anybody who is looking for an easy-to-use, reliable and affordable tool for quick in-field video inspections.

A complete WELL-CAMERA.3 system consists of:

- Cable reel with camera head and control electronics;
- USB 2.0 cable for connection to external PC (PC not included) for audio/video viewing and recording;
- Power cable for external USB/USB-C Powerbank (powerbank not included, available as accessory);
- Power cable for external 12V battery (**battery not included**)
- Management software PASI WellCamera Recorder (for the control of all the functions of the camera and the visualization/recording audio/video to customer's laptop PC)
- Encoder (**not included, sold separately**)

Main technical features are:

- camera head waterproof up to 35 bar (approx. 350m of freshwater column);
- wide angle lens 120° - available 90° view option;
- Windows 10/11 recording software compatible;
- 16x high intensity LED, with regulation directly from the software user interface;
- available lengths: **100m, 200m, 300m, 400m, 500m.**
- wide range of power supply compatibility (Standard 5V @ 2A powerbank – External 12V battery)

This guide details the technical specifications and how to use the device. Please follow these guidelines.

4. Technical specifications

Camera Head Specifications

Diameter	40mm
Length	150mm
Sensor Type	CCD 1/3"
Resolution	700 lines
Lens	2.9mm fixed lens
Minimum intensity required	0.005 lux @ F1.2
Light type	16X high intensity LEDs
Waterproof protection	IP68, submergible to 350m (35bars)

Reel & Control Unit Specifications

Power Supply	Standard 5V @ 2A powerbank – External 12V battery
Digital Output	Integrated electronics for video digitization and user control through “WellCamera Recorder” software
Interfaces	USB, Power supply, Encoder connector
Weight	8.2 – 20.2Kg (Depending on the model)
Size	(26 – 46)cm X 28 cm X 31cm (Depending on the model)

5. Main panel Description



FIGURE 1 - MAIN PANEL

Connectors on the panel

In Figure 1 the top panel of the Well-camera.3 is shown. Starting from the top right:

- USB: USB connector to connect the Well-camera.3 to an external PC.
- ENCODER: 4 poles male connector to connect the external encoder for measuring depth;
- POWER: 3 poles male connector for external power supply.

6. Software "Well Camera Recorder"

Introduction

"Well Camera Recorder" is the official software provided by PASI srl to use the WellCamera.3. The main functionalities include the viewing and recording of the video and the management of the connected unit. You cannot use this software to play a previously recorded video, we recommend using software such as Windows Media Player or VLC media player.

This manual refers to Version V2.1.x and it is compatible with all the WellCamera.3 models and accessories.

The Well Camera Recorder software is compatible with Windows 10/11 operating system.

Software installation

A USB stick containing the installer "WellCameraRecorder.exe" is delivered together with the instrument.

If you are installing an update, before launching the installer, please uninstall the previous version following these steps: *Control Panel > Programs > Programs and features* select the old *Well Camera Recorder* version, press *Uninstall* and follow the software disinstallation procedure .

The software is ready to be used right after installation and you will find a Link on the desktop, double click and get started!

Dive into the software

Main Window graphical interface

The main windows graphical interface is built to contain everything you need to use the WellCamera.3.



FIGURE 2 - MAIN WINDOW GUI






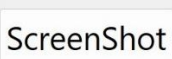
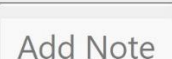
It is divided into three main parts:

- *Multimedia*: In this section on the left of the window you can find actions related to audio and video;
- *Camera View*: In the central area there is the camera view where you can see the video grabbed from the camera head;
- *WC3 – Dashboard*: in this section on the right you can find information and controls for the WellCamera.3 instrument

In the following paragraph, the actions possible via the main window will be examined in detail.

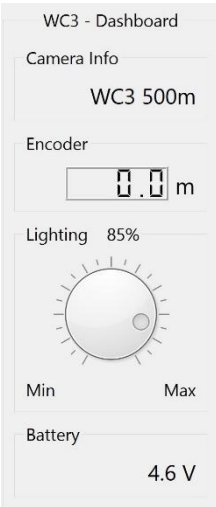
Multimedia

The *Multimedia* panel contains the actions that concern video recording. From top to bottom there are:

	<i>Recording time</i> : View the elapsed recording time in real time
	<i>REC</i> : start video recording
	<i>PAUSE</i> : pause the video recording
	<i>STOP</i> : stop the video recording
	<i>MUTE</i> : mute the microphone while recording
	<i>ScreenShot</i> : save a picture of the camera view
	<i>Add Note</i> : add note to the video recording visible for 5secs while playing the recorded video.

Dashboard

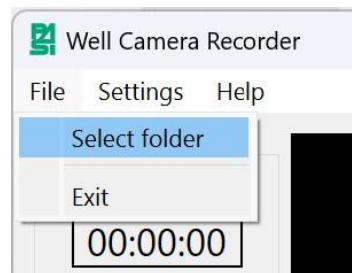
When the instrument is connected to the computer, the software automatically recognizes the model and after allowing a few seconds to start, the video will be displayed on the Camera view. All the information regarding the connected instrument will be displayed in the Dashboard panel and you will be able to interact with it.

	<i>Encoder</i> : Measures the depth read by the encoder (if connected to the instrument). You can manually edit the depth by right clicking directly on the displayed number > set Encoder.
	<i>Lighting</i> : This knob allows you to adjust the lighting of the LEDs on the camera head.
	<i>Battery</i> : Displays the voltage of the power source connected to the instrument. If no power supply is connected or the voltage is too low, the word: LOW will be displayed.

Menu Bar

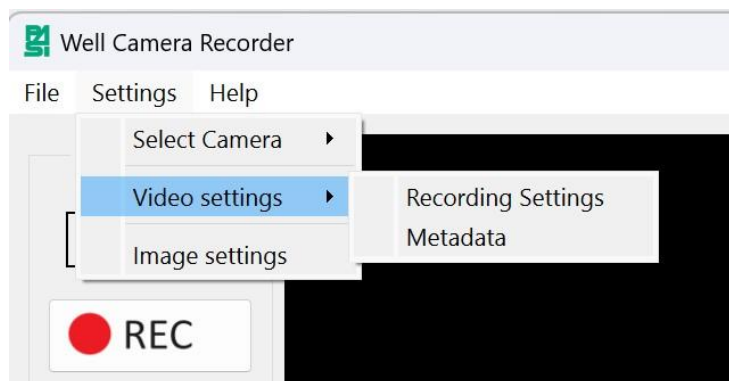
At the top left of the main screen there is a menu bar with the following functions:

File



From the File menu you can choose the destination folder for saving videos and screenshots using the *Select folder* option. Or close the software using the *Exit* option.

Settings



In the settings menu there are actions that allow you to select, modify and customize the video and photo recording settings as well as enabling manual selection of the video input source.

Select Camera

This menu item allows you to manually select the source of the video to record. In normal operating conditions it is not necessary as the software automatically recognizes the video source of the WellCamera.3, however on rare occasions the manual function may be needed.

Video Settings

From the video settings menu you can customize the video recording settings and the metadata associated with the recorded video.

In Figure 3 you can see which video recording settings you can customize. In *camera formats* you find a list of the various video formats with resolution and fps. The video codec section offers a list of available codecs (H.264 or WMV). The following sections are related to the audio that is captured from the built-in microphone of the PC you are using. Use of the default options should ensure

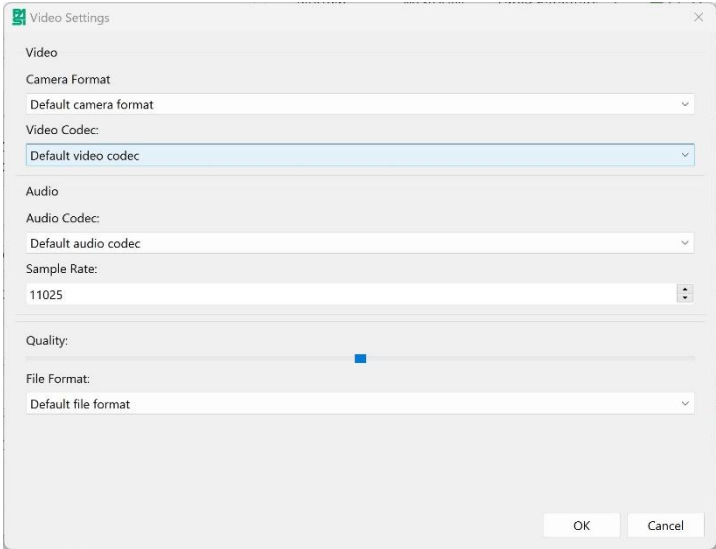


FIGURE 3 – RECORDING SETTINGS

problem-free operation.

The metadata section allows you to customize all metadata fields recorded with the video file. An example is shown in the figure.

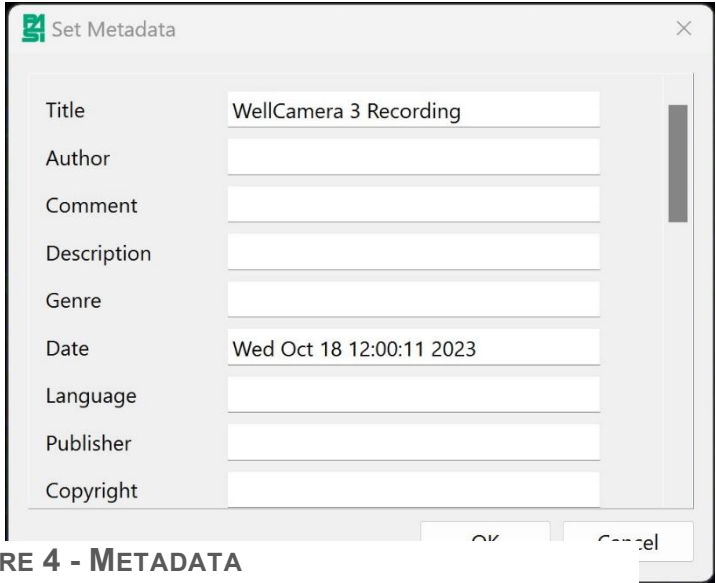


FIGURE 4 - METADATA

Image settings

The *Image Settings* window allows you to customize the resolution and file format of the screen shot taken with ScreenShot button on the main window.

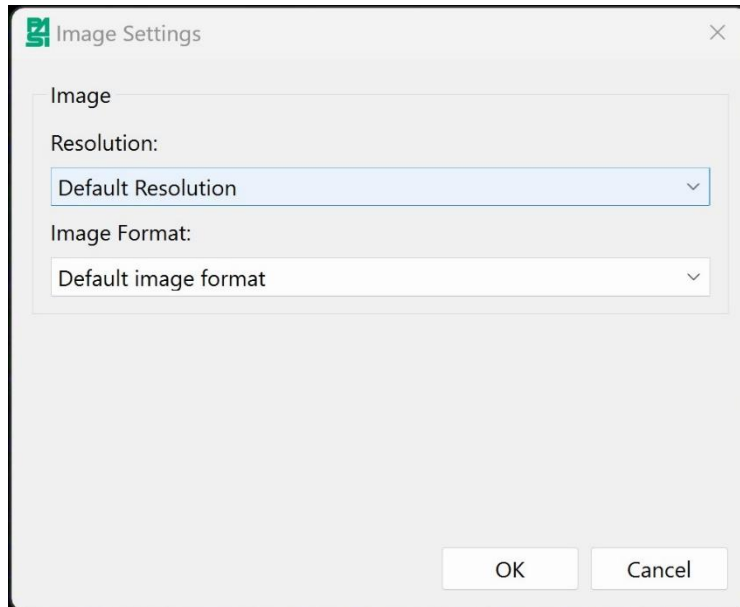


FIGURE 5 - IMAGE SETTINGS

Help

From the *Help* Menu it is possible to find information regarding the software version, serial number, model and firmware version of the instrument currently



FIGURE 6 - ABOUT WC3

connected.

All about recorded files

Screen shots naming and formats

The default recording format is .jpg, you can also choose either PNG or Tiff in the *Image settings* section. File naming is based on the following logic:

- “Image_” + progressive number

Video file and subtitles naming and formats

The recorded video format is MPEG-4 (.mp4). File naming is based on the following logic:

- *ddmmyy* + “_” + *hhmmss*: therefore the name contains the date (day month year) and time (hour minutes seconds) when the recording started, eg: 18102023_124727.mp4 is the video recorded on 18/10/2023 at 12:47:27.

A subtitle file is also generated at the same time as the video is recorded. The format of this file is SubRip (.srt). This file contains the depth indications recorded by the Encoder and the notes made when using the Add Note function (see *Multimedia*). The name of the file is the same as the video recorded.

These files are widely supported by video playing software such as VLC or Windows Media Player. If you use VLC to play the video, the subtitles are added automatically, otherwise you can use the *Subtitles > Add SUBtitle file...* menu and choose the one corresponding to the recorded video.

7. Step by step guide

What's inside

- Cable reel with camera head and control electronics;
- Power source (Standard 5V @ 2A powerbank – External 12V battery)
- 1 cable for power supply (depending on what you are using as power source);
- 1 USB cable to connect the Control Unit to an external PC;
- Encoder (Optional, sold separately)
- Cable for connecting the Encoder (Optional, sold separately).



FIGURE 7- WELL-CAMERA.3 SYSTEM SETUP

Check List

The following points must be considered when installing the Well-camera.3.

1. After placing the components of the Well-camera.3 in the inspection site, turn on the laptop with the “Well Camera Recorder” software installed and launch the software;
2. Connect the USB cable from PC to the WellCamera.3 reel. At this point the software should automatically recognize the connected instrument and show its details. (It may take a few seconds for the information to appear on the screen);
3. Connect the power supply cable from the power source to the WellCamera.3 (See Figure 8). The voltage of the power source should be indicated on the dashboard on the right. If the power supply is compliant the camera system automatically switches on;
4. At this point you should be able to see the video from camera on the screen of the software (It may take a few seconds for the video signal to appear on the screen);
5. Connect one end of the 4-pin black cable female connectors to the Encoder connector and then the other end on the “Encoder” connector to the WellCamera.3 to see the depth indication on the dashboard (Optional);

The video inspection system is now ready to be used. Use multimedia push buttons on the left to record video, images and add notes. During use, adjust the lighting using the knob on the dashboard.



FIGURE 8 - POWERBANK AS POWER SOURCE WITH USB POWER CABLE

Encoder

The depth readings from the encoder are saved in a special subtitle file together with the video file. Read paragraph *Video file and subtitles naming and formats* for further information.

To obtain the best performance in reading the depth it is essential that the following points are respected:

- The encoder must be properly mounted on a solid support;
- The cable must be placed correctly between pulleys.
- The reading will be reliable only if there is sufficient friction. Therefore the cable should not be wet or dirty otherwise the cable will slide on the pulleys. Also make sure that the cable is tensioned.
- unrolling the cable too quickly may result in read errors;


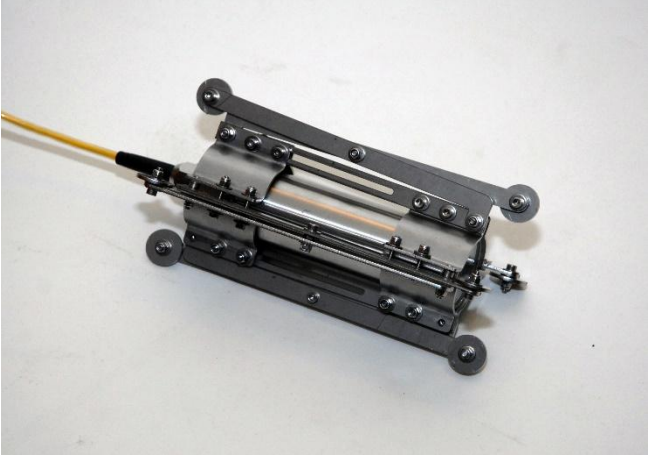
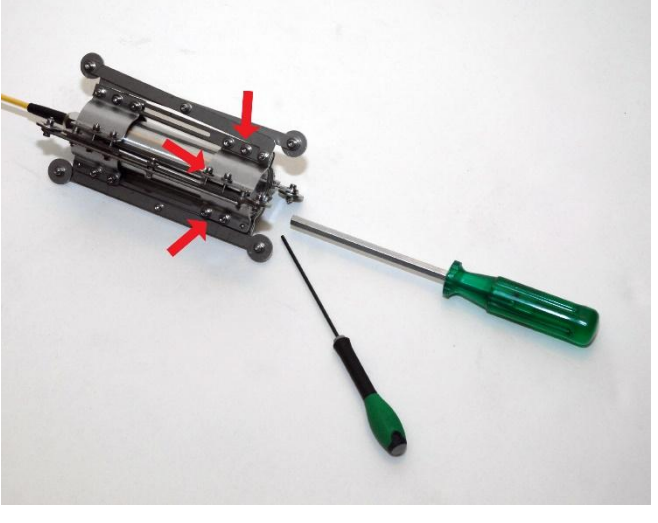
If all recommendations are respected, encoder precision is $\pm 0.05\%$ Figure 9 shows the encoder properly mounted with the camera cable.



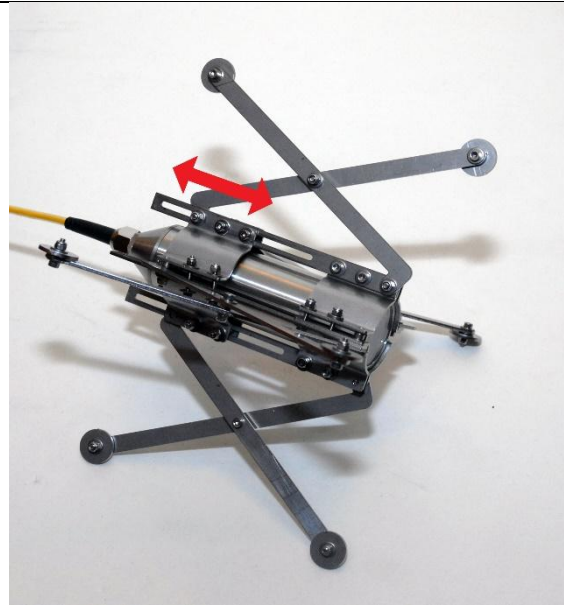
FIGURE 9 - ENCODER PROPERLY INSTALLED

8. Accessories

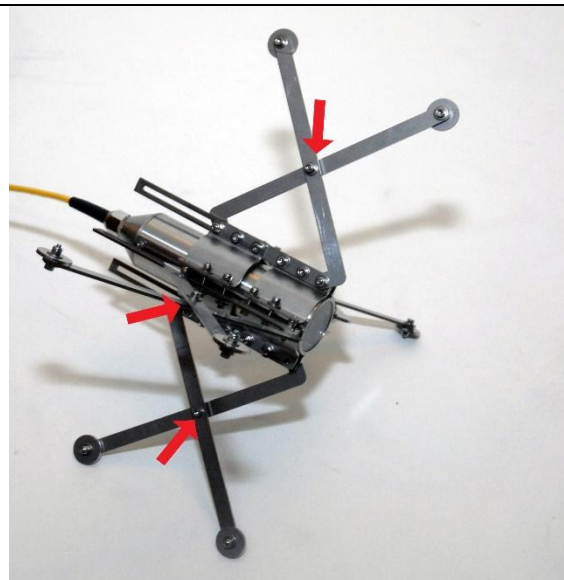
Horizontal centering device (Optional)

<p>1) Well-Camera head.</p>	
<p>2) Insert Well-Camera head in the centering device as shown in the picture.</p> <p>Be sure to mount the Well-Camera head in the right direction: the front side of the camera head fits the narrowest part of the centering device, see image.</p>	
<p>3) Tighten the bolts of the centering device with the special tools as shown in the image.</p>	

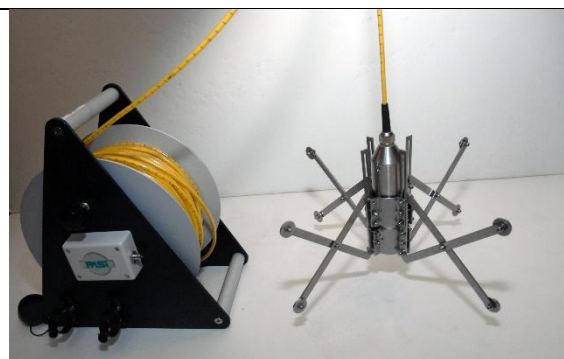
4)The diameter of the centering device can be adjusted as indicated by sliding the two flanges along the device




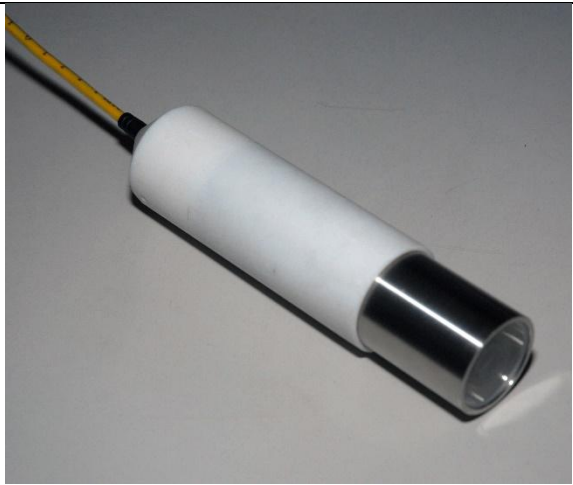
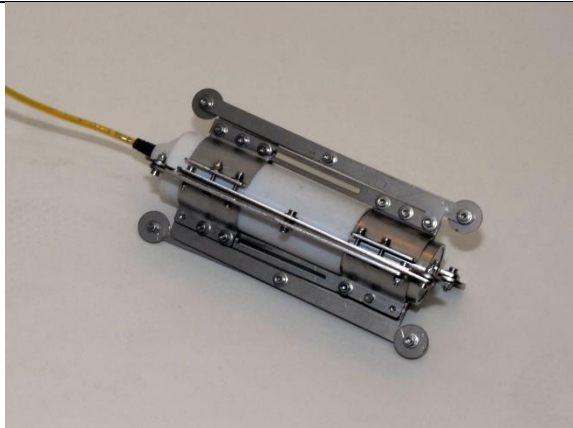
5)Fix into position by tightening the bolts & the screws as shown in the image.



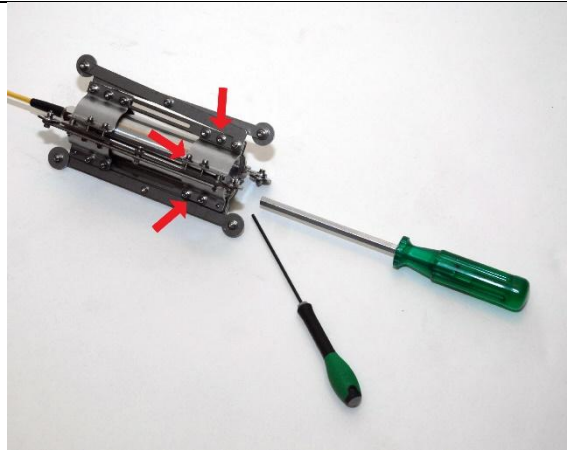
6)The Well Camera with the centering devices is now ready to use



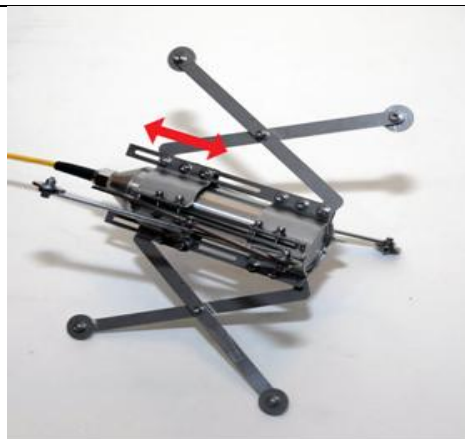
How to mount and use the horizontal centering device with the aspo (optional)

<p>1)Well-Camera head</p>	 A cylindrical, metallic Well-Camera head with a yellow cable attached to its rear end.
<p>2)Insert the Well-Camera head in the Teflon shield.</p>	 The Well-Camera head is inserted into a white, cylindrical Teflon shield.
<p>3)Insert Well-Camera head in the centering device as shown in the picture.</p> <p>Be sure to mount the Well-Camera head in the right direction: the front side of the camera head fits the narrowest part of the centering device, see image).</p>	 The Well-Camera head, mounted in its Teflon shield, is inserted into a complex metal centering device with rollers.

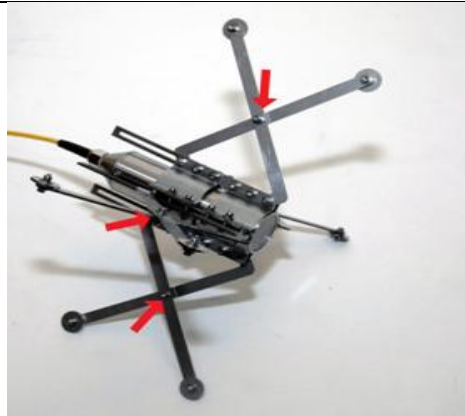
4) Tighten the bolts of the centering device with the special tools as shown in the picture



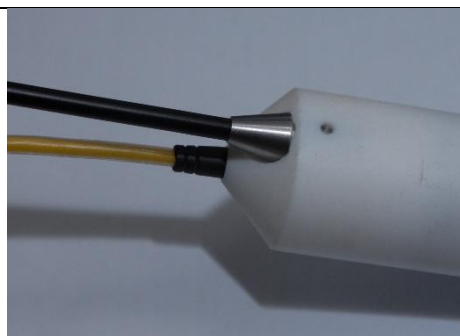
5) The diameter of the centering device can be adjusted as indicated by sliding the two flanges along the device



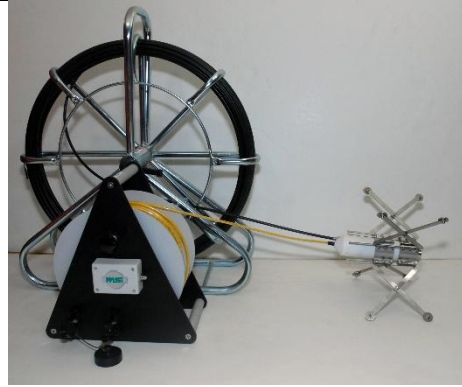
6) Fix into position by tightening the bolts & the screws as shown in the picture



7) Fix the ASPO fiberglass cable to the teflon shield as shown in the picture.



8) The Well Camera with the ASPO option and centering device is now ready to use.



Installation and use of the adjustable pulley assembly (Optional)

- 1) Unscrew anticlockwise the clamp until it reaches the thickness of the borehole casing, then tighten it by screwing it clockwise until it is secure. The clamping device can be regulated for a thickness from 0 to 9.3 cm.
- 2) Align the blue pulley with the centre of the shaft, unscrew it by using a wrench measure #17 (not supplied with the accessory). Once the desired position is reached, secure the blue pulley by turning the wrench clockwise.
- 3) Insert the camera head in the well, by placing the connecting cable into the groove of the pulley.

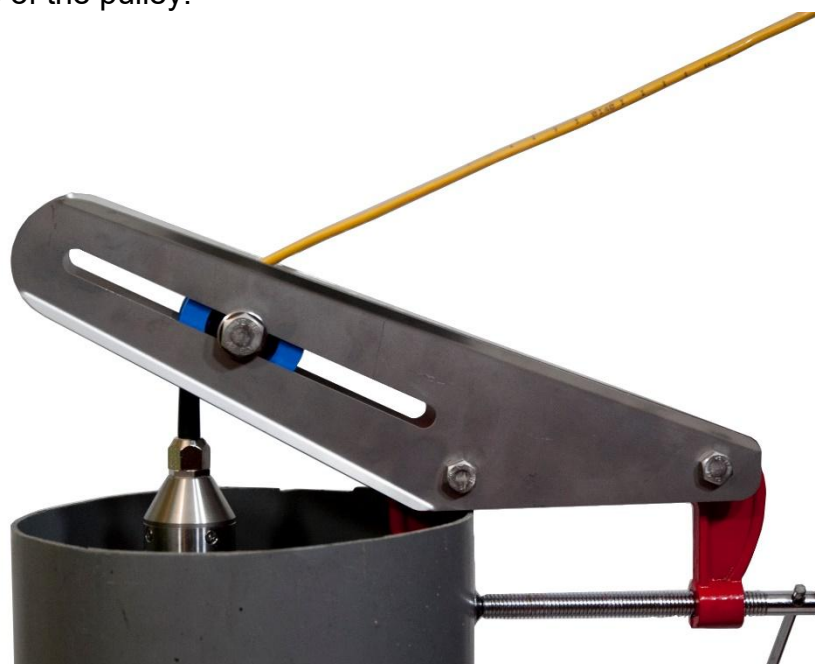


FIGURE 10 - THE POSITION OF THE BLUE PULLEY CAN BE REGULATED

Installation and use of the suspending tripod with pulley (Optional)





FIGURE 11 - SUSPENDING TRIPOD WITH PULLEY

How to adjust the height of the tripod:

- 1) Loosen the three screws at the base of the tripod legs to adjust their length in order to reach the right position to allow the Well-camera.1-N to be lowered vertically and centred in the borehole.
- 2) Pass the camera head and its cable carefully inside the pulley bracket and then slowly lower the camera head inside the well.

- 3) The cable reel has a braking system to optimize the camera head descent speed: turn the knob clockwise to descend faster or turn anticlockwise to slow down.

How to mount and use the centering device for vertical use and the 90° view option (Optional)

<p>1) Well-Camera head</p>	
<p>2) Insert the Well-Camera head in the vertical centering device and mount the elastic band as shown.</p> <p>The centering device can be fixed at different opening diameters by sliding the adjusting ring along the camera head body. The ring can be fixed simply by tightening the screw clockwise.</p> <p>The centering device can be regulated from 80mm to 260mm of diameter.</p>	

3) The 90°view option can be mounted using its own special mounting ring simply by tightening the screw clockwise.

The distance between the mirror and the camera front glass can be regulated by sliding the 90°view option mounting bracket and tightening its screws clockwise.

We recommend you use the 90°view option together with the vertical centering device.

