

Manual
HD-Pushrod Camera

US

Wohler VIS 700



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The Measure of Technology

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1 General Information

1.1 Operation Manual Information

This operation manual allows you to work safely with the Wohler VIS 700. Please keep this manual for your information.

The Wohler VIS 700 should be employed by professionals for its intended use only.

Liability is void for any damages caused by not following this manual.

1.2 Copyright

Without previous authorization of Wohler it is not allowed to reproduce, copy or translate this manual or part of this manual.

1.3 Notes



WARNING!

Not following this warning can cause injury or death.



CAUTION!

Highlights risks that can lead to damage occurring to the device.



NOTE!

Highlights tips and other useful information.

1.4 Proper use

The Camera is designed to visually inspect and document the condition of pipes and shafts, for example in flue gas systems, ventilation systems as well as for inspecting underground pipes etc.

The Camera is designed to be used by trained specialists only.

Any other use is considered improper use.

1.5 Scope of supply

Device	Scope of supply
Wohler VIS 700 HD Pushrod Camera	Monitor
	Ø 1.5 inch pan and tilt color camera head, pluggable (option)
	Ø 1 inch miniature camera head, pluggable (option)
	SD card 32 GB
	Viper with 100 ft camera rod and monitor cable (5 ft)
	3 replacement plastic domes
	1 anti-slide mat
	1 USB power supply with USN-C-cable
	Twinwall hard case

1.6 Storage and transport

To avoid damage occurring during transport it is imperative that the complete system is transported in the original case designed for the purpose.

1.7 Information on disposal



Electronic equipment does not belong into domestic waste, but must be disposed in accordance with the applicable statutory provisions.

You may hand in any defective batteries taken out of the unit to our company as well as to recycling places of public disposal systems or to selling points of new batteries or storage batteries.



1.8 Manufacturer

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2 Important information

Body Protection



WARNING!

Never point a connected camera head at your own or somebody else's eyes when the monitor is switched on. The LEDs are extremely bright and can dazzle.



WARNING!

Guide the rod with due care and attention. As the rod is made of flexible material, it can make whipping movements if it slips. Protect your eyes in particular.



WARNING!

In order to limit the exposure of persons to electromagnetic fields, a safety distance of 5 cm must be maintained when the locating transmitter is switched on and when the user is temporarily or permanently near the camera head.

Working environment



WARNING!

Only place the camera on firm level ground and ensure a secure position of camera and user, especially when working in high altitude, e.g. when working on the roof.



WARNING!

Make sure that the parts that you are going to inspect are no live parts.



CAUTION!

Protect the camera head against oil and acid. Never use the camera head and rod to push obstructions.

Operating Temperature



CAUTION!

Do not use the camera in temperatures above 40°C. High temperatures can damage the camera.

Resistance to water



CAUTION!

Only the camera head and the rod are waterproof. Keep the camera system dry and protect it from water!

Resistance to impacts



CAUTION!

The camera system is not impact resistant. Do not throw or allow the case to fall!

Accessories



CAUTION!

Use only original Wöhler accessories and spare parts!

Bending the camera rod



bending possible



bending not possible



Attention!

Never bend the camera rod over the narrow side but only over the wide side. The minimum bending radius must always be 0.8 ft. or more.

Strong magnetic or electric fields



NOTE!

Do not use the camera near television towers, mobile radio equipment or other sources of magnetic or electric fields, as these may impair the quality of the displayed image.

Important information

Extraneous influences



NOTE!

Extraneous influences such as static discharges can cause the device to malfunction. If a malfunction occurs, switch the monitor off and on again.

3 Technical data

3.1 Monitor



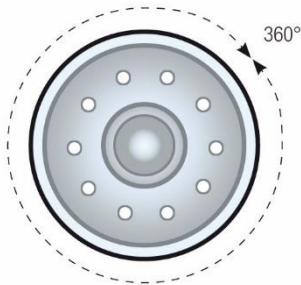
Fig. 1: Monitor

Description	Data
Dimensions housing	0.3 x 0.2 x 0.1 inch
Weight	1.9 lb
TFT display	7"/ 16:9 format 1280 x 800 pixel
Charging cable	USB-C 5 V/3 A
Power supply	3.7 V, 11400 mAh rechargeable Li-Ion battery
Battery operating time	Up to 4 h (battery status in display)
Operating Temperature	32 - 104 °F
Storage Temperature	- 4 – 122°F
WLAN function	Wireless LAN IEEE 802.11 b/g/n network standard 2412-2472 MHz, < 10dBm

3.2 Wöhler pan & tilt camera head

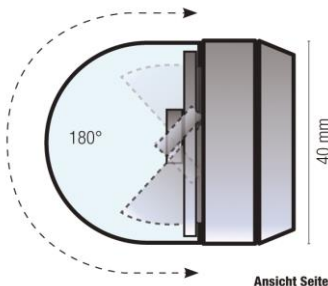


Fig. 2: Pan & tilt camera head



Ansicht Front

Fig. 3: Pans through 360°



Ansicht Seite

Fig. 4: Tilts 180°

Description	Data
Classification Type	½.7" COLOR CMOS
Focus distance	1 inch ... ∞
Light source	10 white LEDs
Protection	Waterproof to IP 67 (up to 1 m depth for 30 mins.)
Dimensions	
Diameter	Ø 1.5 inch
Shell length	2.2 inch
Total length	ca. 4 inch
Frequency of the integrated emitter	8.9 kHz
Angle of detection	70°

3.3 HD – Mini Camera Head



Fig. 5: HD Mini Camera Head

Description	Data
Classification Type	1/2,7" COLOR CMOS
Light source	10 white LEDs
Protection	Waterproof to IP 68 (up to 30 m depth for 30 mins.)
Dimensions	
Diameter	Ø 1 inch
Shell length	1.3 inch
Total length	ca. 3.2 inch
Frequency of the integrated emitter	8.9 kHz
Angle of detection	150°
Operation temperature	0 ... 40 °C
Storage temperature	- 20 ... 50 °C

3.4 Camera Rod

Description	Data
Length	100 ft.
Minimum bending radius	0.8 ft.
Connection cable to the monitor	4.92 ft

3.5 Electronic meter counter

Description	Data
Resolution	1 inch
Max. deviation	5 % of reading

3.6 Storage

Description	Data
Memory	If you are using a memory card other than the one included in the scope of supply, you must format it on a PC before using it with the camera. FAT 32
Max.	32 GB
Technology	SD or SDHC, maximum speed 10
Record Capacity	Approx. 3 GB/h
Video Resolution	1280 x 720 HD, max. 25 fps.
Video format	AVI (H264)

3.7 Twinwall hard case

Description	Data
Dimensions	7 x 17 x 20 in.
Total weight with monitor, camera head and rod	22 lb

4 Design and function

4.1 Video Inspection System



Fig. 6: Wöhler VIS 700 HD Pushrod Camera

Legend:

- 1 Monitor
- 2 Anti-glare protection (stored in the case)
- 3 Space for accessories, charging cable, camera head etc.
- 4 Opening for the camera head
- 5 Camera head
- 6 Lower shell with viper and rod (inside)
- 7 Locks of the camera case
- 8 Locks of the lower shell
- 9 Monitor support

4.2 Monitor



Fig. 7: Monitor



Fig. 8: Bottom side of the monitor with USB and SD card slot

Legend:

- 1 Fixing holes for glare protection
- 2 Handle, in the picture inserted in the slot of the housing
- 3 Bottom side of the monitor with terminal strip
- 4 Loudspeaker
- 5 Microphone
- 6 CTIA standard connection for headset with headphone and microphone
- 7 SD Card slot
- 8 USB port for stick
- 9 USB port for charging cable
- 10 Notch for placing the monitor on the connecting rail of the case



Fig. 9: Insert SD card correctly



ATTENTION!

When inserting the SD card, make sure that the labelling is facing downwards. Never insert the card with force!

5 Starting to use your camera system

5.1 Activating the battery

If the camera system cannot be switched on during initial operation, you have two options for activating the battery:

- Connect the monitor to the mains via the power supply unit. Switch on the camera system.
- Afterwards, the camera can also be switched on without being connected to the power supply.
- or
- Carry out a reset 1, see chapter 16.1.

5.2 Attaching the camera head

- Open the cover of the camera head opening (Fig 5, part 4).
- Carefully pull the rod out of the case.
- If it is not already connected to the rod, connect the camera head to the rod as follows: Insert the five-pin connector of the camera rod into the socket of the camera head. Then screw together the threaded parts of the camera head and camera rod.



CAUTION!

The connection is only waterproof when the connectors are joined together properly.

5.3 Using the monitor



NOTE!

When the monitor is stored in the case the joystick is located at the bottom left. This position makes it possible to operate the joystick with the left hand and guide the camera rod with the right hand. If the monitor is removed from the case, it is recommended that right-handed users turn the monitor around so that they can operate the joystick with their right hand.

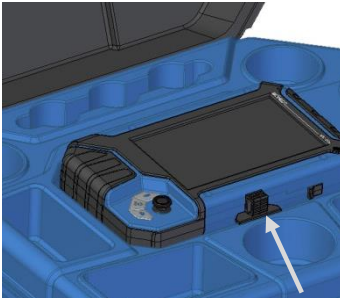


Fig. 10: Press the catch from the front to release the monitor from its secured position in the case

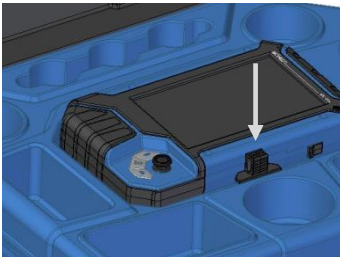


Fig. 11: Press down on the catch from above to lower the monitor into the case.



Fig. 12: You can turn and tilt the monitor

- To release the monitor from its secured position in the case, press the catch from the front.

- To return the monitor to its transport position, press on all four corners of the monitor or press down vertically on the catch.



CAUTION!

If there is any resistance when pushing down on the monitor, check the connection cable has been placed under the monitor properly rolled up.

When released from the case you can tilt the monitor up and down and turn it around its longitudinal axis. Locking points ensure the camera is held in a stable position.



Fig. 13: Monitor removed from the case

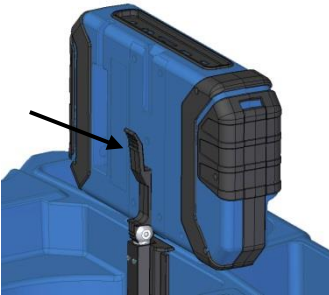


Fig. 14: Press the lever to release the monitor from the holder

Handle



Fig. 15: With the handle pulled out it is possible to hold and operate the monitor with one hand.

It is also possible to take the monitor from the case and hold it in your hands.

Proceed as follows to release the monitor from the holder:

- Position the monitor upright in the holder.
- Press against the lever on the rear of the monitor.
- At the same time pull the monitor out of the holder.

It is possible to pull out a handle to allow you to hold the monitor in your right hand and operate the joystick with your right hand at the same time.



Fig. 16: Push button for pulling out the handle marked with arrow

Glare Protection

- To pull out the handle press the black pushbutton on the top of the monitor and slide the handle to the right at the same time.
- Remove the Glare Protection from of the case lid. It is located in the compartment behind the lower part of the Short Guide.
- Insert both pins of the Glare Protection into the corresponding fixing holes immediately above or below the display to suit your working position. Magnets at the ends of the pins ensure a stable hold.

5.4 Charging the rechargeable battery



Fig. 17: Battery charge icon 60%



Fig. 18: USB port indicated by an arrow

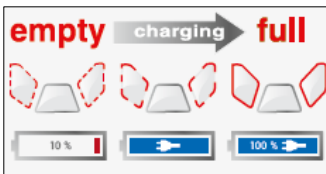


Fig. 19: Keys and charge level indicated when charging



WARNING!

Danger of death by electrocution!

Never touch a mains plug with wet hands!

Do not expose the power pack to moisture!

Never pull the cable to remove the power pack from the socket outlet - it could rip out the cable!

Operate the power pack only when the mains power supply is the same as the voltage stated on the rating plate!

A battery charge icon is on the right of the icon ribbon. The charge level is displayed in either blue or orange ($\leq 20\%$).

Recharge the rechargeable battery if the charge level is displayed in red ($\leq 10\%$).

- To charge the battery, connect the monitor to the mains using the USB power pack included in the scope of supply.
- To do so, insert the USB C connector into the USB port on the bottom of the monitor.

When the camera system is switched off the image and video keys flash red during the charging process.

The image and video keys light up red when the battery is fully charged.

The camera system remains fully functional during the battery charging process.



NOTE!

If possible, recharge the battery when the camera system is switched off. This increases the operational lifetime of the rechargeable battery.

The keys will not flash if the battery is recharged with the camera system switched on. A connector symbol is displayed in the rechargeable battery display.

6 Keys and their functions

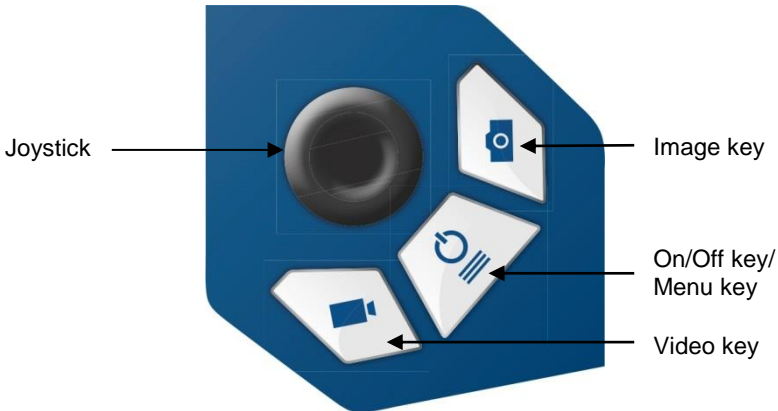


Fig. 20: Monitor keys

6.1 On/Off key



NOTE!

The ventilation fan works at irregular intervals when the camera is in operation.

Switching on the system

- When the system is switched off, press and hold the ON/Off key for approx. one second. The ON/Off key then lights up green, the image and video keys light up blue.

After approx. five seconds the LEDs light up on the camera. The Home screen is displayed followed by the camera image.



NOTE!

It is possible to turn the monitor through 180°. The icon and information ribbons in the monitor are automatically aligned according to the monitor position. It is also possible to turn the viewing position of the screen by slightly turning the monitor.

Switching the system off

- Press and hold the On/Off key for approx. two seconds until the system switches off.

Calling up the menu

- When the system is switched on briefly press the ON/Off key to display the menu.
- Briefly press the ON/Off key again to hide the menu.

6.2 Video key

- To begin recording a video, briefly press the video key.
- To stop recording the video, briefly press the video key again.

A red dot is displayed in the information ribbon of the display when a video is being recorded. In addition, the video recording time is also displayed in the information ribbon.



NOTE!

The camera will only record a video when a memory card is installed. The camera will automatically stop recording, if the memory card is removed.



NOTE!

It is not possible to save the position indicator when recording a video.

If you require this information, it is recommended that you capture an image while recording the video. In the photo all information is shown as graphical elements.

Record time



NOTE!

After 30 minutes the camera will automatically stop recording a video. If the video has to be recorded over a longer period of time, the user has to start recording again by pressing the video key after 30 minutes.



NOTE!

The minimum record time is 10 seconds. Even if the user tries to stop the record before, the camera will stop recording after 10 s only.

6.3 Image key

- Press the image key briefly to capture an image.

It is possible to capture an image while recording a video.



NOTE!

The camera will only capture an image when a memory card is installed.



NOTE!

The photo contains all the information that is shown in the camera display (comments etc.). In the settings menu you can set the photo to be saved without this information, see chapter 12.4.4

6.4 Joystick

Tilts through 180°

- To tilt the camera head move the joystick back and forth.

Pans through 360°

- To pan the camera head move the joystick left or right.

7 Display elements



Legend:

- 1 Brightness control
- 2 Focus control
- 3 Comment function
- 4 System menu
- 5 "Horizon" with tilt and pan angle display / Home function
- 6 "Brightness" slider (the "Focus" slider can also be displayed here)
- 7 Video recording time
- 8 Reset meter counter
- 9 Meter counter
- 10 Microphone on/off
- 11 WLAN active
- 12 Locator
- 13 Number of possible images remaining
- 14 Remaining video recording time
- 15 Date
- 16 Time
- 17 Remaining battery charge

8 Displayed position of the camera head

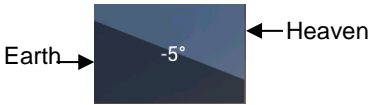


Fig. 21: Horizon icon including degree display

9 Home function

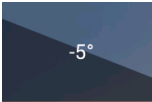


Fig. 22: Tap the horizon icon to level the camera head

10 Digital meter counter



Fig. 23: Reset icon (left) and position of the camera head (right)

The horizon icon indicates the downward gradient of the pipe.

Example:

- 5° corresponds to a downward gradient of 5°
(+ 5° corresponds to an upward gradient of 5°)

The Home function makes it possible to align the camera head in a straight position, so that the camera faces “straight ahead” and the tilt and pan angle display is depicted parallel to the ground below.

- To activate the Home function tap the horizon symbol in the display.

The meter counter display information tells you how far the camera head has been pulled out of the case. To precisely determine the position of the camera head in the pipe, proceed as follows:

- Insert the camera head into the beginning of the pipe and tap the reset icon.

The position indicator is now set to 0.

11 Voice recording



Fig. 24: Microphone icon

The Wöhler VIS 700 can record a voice recording for each video. The microphone must be activated before recording.

- Tap the microphone icon to activate the microphone.

The microphone is located at the bottom left of the monitor, see Fig. 7, part 5.

- Tap the microphone icon again to deactivate the microphone if you do not want the sound to be recorded during video recording.

12 Live menu



Via the live menu, settings can be made on the camera system.

- To display the live menu, briefly tap the On/Off/Menu key when the system is switched on.
- To hide the menu, briefly tap the On/Off/Menu key again.

All menu settings are made using the touchscreen. As soon as a slider appears in the display it is possible to configure the settings via the touchscreen or using the joystick. That is the case with the Focus menu and the Brightness menu.

12.1 Brightness menu



Fig. 25: Brightness menu icon



Fig. 26: Brightness slider

In the Brightness menu it is possible to regulate the light intensity of the camera head LEDs.

- Tap the menu icon “Brightness”.
- To increase or decrease the brightness
 - slide the dot on the slider using the joystick in desired direction
 - or
 - tap the sun symbol on the corresponding side next to the slider or slide the dot on the slider in the desired direction.
- To exit the Brightness menu press the joystick or tap another menu in the display.

12.2 Focus menu



Fig. 27: Focus menu icon



NOTE!

The focus function of the Wöhler VIS 700 HD camera system is only active when the HD pan and tilt camera head Ø 40 mm is connected, not when the HD miniature camera head Ø 26 mm is connected. The miniature camera head has a fixed focus.

In the focus menu, you can set the sharpness of the image area you are interested in. You can adjust the focus using the touch screen or the joystick.

12.2.1 Adjusting the focus by Focus slider



Fig. 28: Focus slider

- Tap the menu icon “Focus” in the display to call up the slider.

12.2.2 Adjusting the focus per joystick

12.2.3 Adjusting the focus by fingertip



Fig. 29: Focus adjustment, distance is displayed

- To adjust the focus slide the dot on the slider or tap the flower or mountain icon.
- To activate the focus function, briefly press the joystick.
- Move the joystick left or right to adjust the focus setting.
- Briefly tap the image area that you want to focus on on the screen.

The camera will now automatically focus on this area. As additional information, the distance between the camera and the selected image area is displayed for a short time. So the distance between a damaged area and the camera can be determined and documented.

12.3 Comment function

Using the comment function it is possible to add a written comment to an image or video. The comments appear in the upper right corner of the image or video.



NOTE!

A comment can also be activated and deactivated in real time during the video.

It is not possible to add a comment to an image after it has been saved.

Add a comment



Add a comment to the list of comments



Fig. 30: List of comments

Edit a comment

- Tap the menu icon “Comment” in the display. The comment list appears with ready-made comments.

- To create a new comment tap the text icon **T**.
- Enter the new comment using the keypad.
- Tap **OK** to add the new comment to the list of comments. The new comment is displayed when the list of comments is called up again.

- Tap on the comment you want to change so that it is highlighted in blue.
- Tap **T** to edit the selected comment using the keypad.



NOTE!

*To cancel the selection again, tap on **X**.*

Add a comment to an image or a video

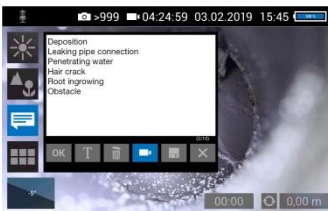


Fig. 31: Video button activated

- To add a comment to an image or video, tap the comment in the list so that it is highlighted in blue.
- Now tap **OK** to select it.



NOTE!

You can select up to 10 comment lines to save them in the image or video.

The selected comment lines now appear in the upper right corner of the image.

- The selected comment lines now appear in the top right-hand corner of the image.

Delete a comment from the list of comments



Store the list of comments



Delete a comment from the image



Exit the Comment menu

- If the Video button is activated, the selected comments can be saved together with a video.
- If the Video button is not activated, the selected comments can be saved with an image.
- To delete a comment from the list of comments, select the comment in the list of comments and then tap the Recycle Bin icon. The comment is no longer displayed when the comment function is called up again.
- To delete a comment previously added to an image, tap the comment to be deleted and then tap the Recycle Bin symbol in the Comment menu.
- Tap the save icon if you want to save the current comment list permanently.

The save icon will be colored blue for 2 seconds.

- If you exit the Comment menu without saving your new comment, the new comment will no longer appear in the list.
- Select the comment in the image (not in the comments list), and then tap the Recycle Bin icon to delete the comment from the image.
- Tap the **X** icon to exit the Comment menu.

12.4 System menu

You can access the System menu via the following submenus:

WLAN, Location detection, Image and video gallery, Settings.

The active functions are highlighted blue, inactive functions are grey.



Fig. 32: System menu with submenus WLAN (1), Locator detection (2), Image and video gallery (3) and settings (4)

Activate WLAN



Fig. 33: WLAN icon

This function is described in chapter 13.

12.4.1 Locator



Fig. 34: Locator icon



Fig. 35: Selecting the frequency

- Tap the Locator icon to activate the locator transmitter.

It is now possible to detect the camera head with the Wöhler Locator 200.

 **NOTE!**

The camera consumes less power when the transmitter is switched off. However, in this case it will not be possible to locate the camera head.

The transmission frequency of the connected camera head is displayed below the locator icon.

- It is possible to change between 9.2 kHz, 8,9 kHz and 512 Hz .
- After selecting the transmission frequency, activate the locating transmitter to save the new selection.

When the camera is rebooted, the last selected transmit frequency is retained.

 **NOTE!**

The camera consumes less power when the transmitter is switched off. However, in this case it will not be possible to locate the camera head.

12.4.2 Saving and deleting images and videos



Fig. 36: Image and video gallery icon



Fig. 37: Image and video gallery

Mark all files



Fig. 38: Lists icon

Save files to USB drive

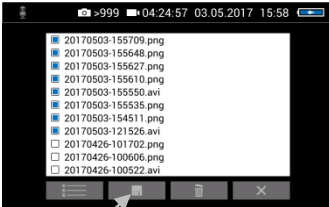


Fig. 39: Image gallery with highlighted files; the Save icon is indicated by an arrow.

Delete files



Fig. 40: Recycle Bin icon

The Picture and Video Gallery displays all the pictures and videos you have taken. The respective file name consists of the date and time of the recording.

- Tap the Lists icon to highlight or deselect all files.
- Insert the USB drive into the monitor.
- Select the check boxes next to the files to be saved. The check boxes will then be highlighted blue.
- Then tap the Save icon.

A dialog box opens to save the files to the USB drive.

- Select the check boxes next to the files to be deleted. The check box next to a selected file is highlighted blue.
- Then tap the Recycle Bin icon.

12.4.3 Display images and videos

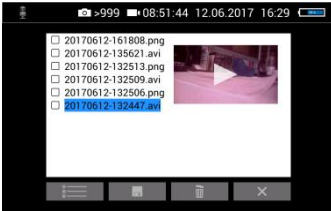


Fig. 41: Preview selected video

How to playback videos on a PC

- Tap a file name in the Image and Video Gallery.

An image or video preview is displayed next to the file list.

- Tap Preview. The image or video is displayed.



NOTE!

Depending on the size of the video file it can take several seconds for the video to load before it is ready to play.

To return to the gallery, tap the image icon again or tap the Close icon in the video.

NOTE!

During video playback, the date, time and meter count are always displayed in the video, regardless of which media player is used.

There are two options to transmit images and videos from the camera to a PC.

- Save the image and video files to a USB drive (see Fig. 39) and then load them onto the PC.
- Remove the SD memory card from the monitor.
- Insert the memory card into the card slot of the PC and copy the image and video files onto the PC.

You can playback a video on the PC using the Windows Media Player or VLC Player once you have saved the respective video file to the PC. If you work with a Windows PC, the Media Player will already be installed on the PC. The VLC Player is available to download free of charge from the website www.vlc.de.



NOTE!

Depending on the size of the video file it can take several seconds for the video to load before it is ready to play.

Exit the Image and Video Gallery

Tap the **X** icon to exit the Image and Video Gallery.

12.4.4 Settings



Note!

The settings made here are automatically saved and remain stored after the camera system has been switched off and switched on again.

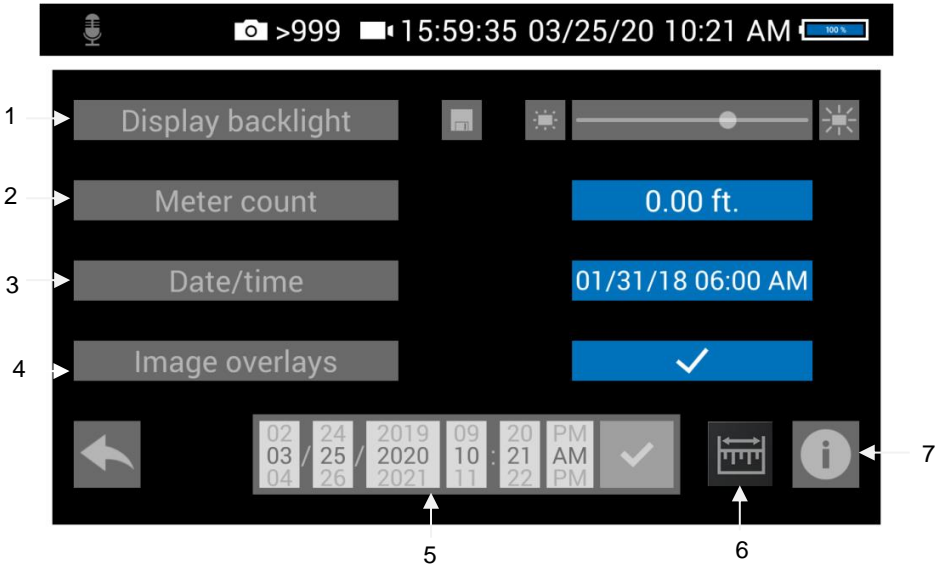


Fig. 42: Settings menu

1 Display Backlight



Here the display backlight can be adjusted. (To adjust the illumination of the camera head, see chapter 7.)

When the camera is turned on, the display brightness is always set to 70%.

- To change the display brightness, tap on the light icons next to the slide bar

or

- move the point on the slide bar.

It is possible to adjust the display brightness in 10 levels from 10% to 100%.

If you want to retain the setting of the display brightness even after switching on again, tap the memory icon next to the slid bar.



NOTE!

To reduce power consumption when the battery is low, it is advisable to choose a low backlight.

2 Meter Count

There are 2 possibilities to display the meter count:

0.00 m (Meter)

0.0 ft. (feet)

- Tap on the blue unit field to change the unit.

3 Date/Time

Here you can change the display of date and time. The following possibilities exist:

GERMAN:

Day.Month.Year

00.00 – 24.00

INTERNATIONAL:

Year-Month-Day

00:00 – 12:00 AM and 00:00 – 12:00 PM

USA:

Month/Day/Year

00:00 – 12:00 AM and 00:00 – 12:00 PM

4 Save fotos without display information

The photos taken with the Wöhler VIS 700 contain all the information shown in the camera display (status display, comments, meter count etc.)

- To deactivate the displays, tap on the check mark .

An x appears instead of the check mark. Photos are now saved without this information.

The settings are saved automatically and are retained after switching the camera off and switching on again.

5 Updating the date and the time

Here you can change the date and time. They appear in the header of the display and as file names of stored photos and videos.

- Select the correct number and confirm with the hook.

The settings are saved automatically and are retained after switching the camera off and switching on again.

6 Distance measurement

See chapter 13.

7 Info Button

- Tap on the Info Button to enter the info menu.

12.4.5 Info menu



Fig. 43: Info menu

Service button

In the info menu under "Hostname" you will find the serial number which is required for displaying the images in a browser, see chapter 13 (transmission of the image files via WLAN), the language version, the wlanO-IP as well as software and hardware versions for the service.

The user does not have to operated the service button.

13 Distance measurement

The Wöhler VIS 700 can measure the distance between two points in the field of view of the camera head. This provides the user with information about the diameter, distance and size of the inspected objects.



NOTE!

The distance measurement can only be carried out if the camera head Ø 1.5 " is connected.



NOTE!

For a precise measurement result, use a plastic dome on the camera head when measuring distance.



NOTE!

For an exact measurement result ensure that the camera dome is clean.

The most precise results for distance measurement are obtained in the centre of the image.

For an accurate measurement, move the camera head as close as possible to the object to be measured, see Measuring accuracy..

13.1 Accuracy “distance measurement”

Distance lens /measured object	Precision
0 – 3.9 inch	± 0.4 inch
3.9 – 11.8 inch	± 0.8 inch
> 11.8 inch	inaccurate

13.2 Open and close the menu „distance measurement“



Fig. 44: Icon: „distance measurement“

13.3 Set Measuring points



Fig. 45: Distance between 2 measuring points



Fig. 46: Warning triangle under distance indicator

To measure an object or distance, proceed as follows:

- Tap the display **for 1s**

The "Distance measurement" icon appears at the top right of the display.

- To exit the "Distance measurement" menu, briefly tap on the icon.

- When the "Distance measurement" icon is displayed, tap the starting point of the distance to be measured.
- As soon as the camera has focused on the point and the distance to the camera lens is displayed, tap on the end point of the distance to be measured.

The distance between the two points is then displayed.



NOTE!

A warning triangle under the measured distance means that the camera head has not been recalibrated after the last reset of the calibration value. In this case, first calibrate the camera head, cf. chapter 13.6.



Fig. 47: The measuring points can be moved by dragging them

 **NOTE!**

The start and end points of the measurement can be moved at any time by dragging and dropping in the screen. The camera then recalculates the points.

- If the displayed distance is not plausible, you can move the start and end points again. To do this, simply tap the end point again.

 **NOTE!**

Only 2 points can be marked at the same time.

13.4 Saving the measurement results

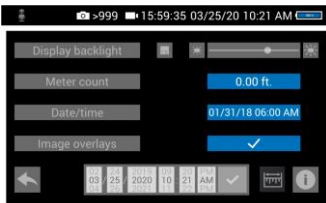


Fig. 48: Settings menu, menu point „Image overlays“ is activated

- Save your measured distance by taking a photo of it.
- Make sure that the menu item "Image overlays" is activated in the settings menu.

13.5 Calibration of the camera head

Since the different camera heads as well as the glass and plastic domes have different optical properties, for an optical distance measurement it is necessary to calibrate the camera head after a change. The camera stores this calibration until the user resets or overwrites it.

For calibration, measure a reference value as accurately as possible. A distance of about 4 inch from the camera lens to the object is suitable for the calibration measurement. The object should be visible in the centre of the camera display. The measuring points should not be on the edge of the display.






Fig. 49: Calibration with calibration template



NOTE!

Calibration is easy to perform using the calibration template stored on the camera's memory card.

- Print out the template on a white paper (original size).
- Bend the paper upwards by 90° at the fold.
- Place the camera head on the marked spot and align the black calibration bar in the center of the picture.
-
- Calibrate the camera head as follows:
- Tap the icons "System menu"  > "Settings menu"  > Distance measurement 

The calibration procedure is now shown in the display.

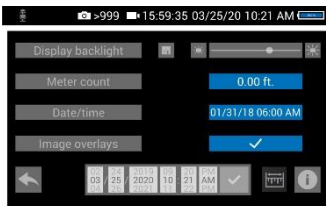


Fig. 50: Icon „distance measurement“ in the settings menu

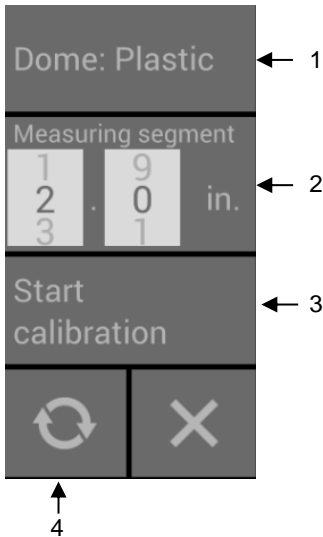


Fig. 51: Calibration Menu



Fig. 52: Set the start and end point of the measuring segment.

The calibration menu for the camera head opens in the display.

- Select the material of the dome (plastic or glass) (1).
- If you do not want to work with the calibration template but with a reference object, set the measuring segment (2).

(Measuring distance: defined distance that is measured as a reference value during calibration).



NOTE!

The reference object can be an object that you always have with you, for example a rule, a USB stick, etc.

When using the calibration template, the preset measuring segment can remain 2 in..

- Tap on „Start calibration“ (3).
- Touch the start and end points of the measuring distance in the screen and correct the position of the point by drag & drop if necessary.

- Tap on "Start calibration" when the end points are positioned (3).

After calibration, the normal video image reappears on screen.

13.6 Reset calibration

- Tap the reset icon (4) to reset the calibration to the default value.

14 Working with the Light Ring



Fig. 53: Digital Light Ring for camera heads \varnothing 26 mm and 40 mm

14.1 System requirements

The Light Ring can be controlled via the camera.



NOTE!

It is not possible to control the Light Ring with an older Version of the camera or the camera head.



Fig. 54: Info menu with SOM (Firmware of the camera) and CAM (Version of the camera head)

The firmware of the camera must be 2.0.2 or higher. The version of the camera head must be 1.4.0 or higher. You can find the version number in the Info menu, see chapter 12.4.5.

If you work with an older camera or camera head the the Light Ring will always be switched on when the camera ist switched on.

14.2 Installing the light ring



Fig. 55: Light Ring plugged on the rod

- Unscrew the camera head from the camera rod.
- Plug the 5-pin plug of the camera rod into the socket of the Wöhler Light Ring.
- Turn the threaded piece of the camera rod to the right to lock it.



Fig. 56: Camera with light ring

- Plug the camera head connector into the auxiliary lighting connector and rotate until the poles snap into place.
- Turn the threaded piece of the camera rod to the right to lock it.

14.3 Dimming the lighting

When the camera system is switched on, the light ring is switched on and the illumination of the camera head is at the highest level.

The additional illumination can be switched off via the brightness menu of the camera. The LEDs of the camera head can be dimmed in 3 levels and then switched off. It is also possible to switch the LEDs of the camera head off and the additional lighting on.

- Press the menu button to display the camera menu.



Fig. 57: Camera menu when the light ring is switched on

Dimming the LEDs and switching off the additional illumination

LEDs off and additional illumination on



NOTE!

If the light ring is installed, a light bulb appears as the icon for the brightness menu instead of the sun. When the light ring is switched on, a + appears next to the light bulb.

- Tap on the bulb icon to select the brightness menu.
- You can now use the slider or joystick to first switch off the light ring and then dim and switch off the LEDs of the camera head in 3 lighting levels.
- Tap and hold the light bulb icon for 1 second to turn off the camera head LEDs and keep the light ring on.

The icon of the light bulb will no longer be filled.

15 Transmission of image files via WLAN

There are 2 ways for a live transmission of images and videos:

1. Access Point: the Wöhler VIS 700 establishes its own WLAN network.
2. Client: You dial into a stationary WLAN network with the Wöhler VIS 700 and your mobile device or laptop.



NOTE

If the wifi function has been enabled on the camera, it will remain enabled even after the camera is switched off and on again.

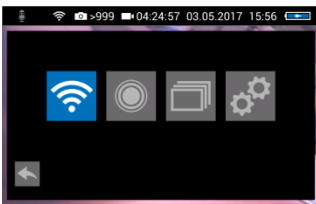


Fig. 58: system menu with activated WLAN icon

- Open the System menu, see chapter 12.3.



Fig. 59: WLAN icon

- Tap on the WLAN Icon, to activate the WLAN function of the camera system.

The camera will now search for the available networks.

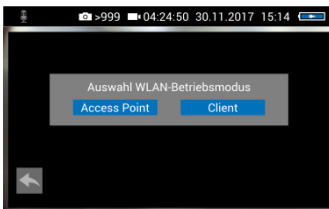


Fig. 60: Selecting the WLAN mode

- You will be prompted to select the WLAN operating mode: "Access Point" or "Client".

15.1 Access Point: Transmission via a VIS 700-WLAN-network

When “Access Point” is selected, the Wöhler VIS 700 builds up its own WLAN network, via which the image data can be transferred directly to a mobile device.

This method allows to view the live images on the Wöhler VIS 700 monitor, while a colleague standing at the other end of the tube, can watch the live videos on his mobile device.

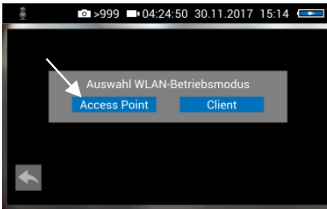


Fig. 61: „AccessPoint“

- Select “Access Point”

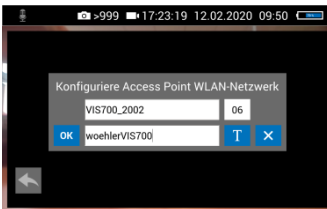


Fig. 62: Network name and password

The display shows the network name of the Wöhler VIS 700 and the password you need to connect your mobile device.

The **network name** is composed as follows:

VIS700_*serial number of the camera*.

The default **password** is:

woehlerVIS700

15.1.1 Select WLAN channel

If necessary, it is possible to select the WLAN channel. 11 WLAN channels can be selected.

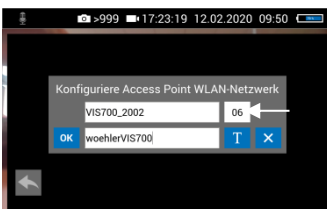


Fig. 63: WLAN-channel marked by arrow



NOTE!

Default setting: Channel 6

Normally it is not necessary to select another WLAN channel.

- To select another WLAN channel, tap the number field in the top row and select the desired channel.

15.1.2 Change password if necessary

It is possible to change the network name and the password.



NOTE

If you change the network name, you can use your

own company name as the network name, for example.

- Please note the following restrictions on the network name and password:

Networkname

Network name:

The input field must not be empty.

The network name must not be longer than 32 characters.

Password

Password:

Valid length: 8 characters - 64 characters .



NOTE!

It is not possible to enter more than 64 characters. If your password has less than 8 characters it will be marked in red.

Permissible characters in each case:

Uppercase and lowercase letters from a to z.

Digits 0 to 9

The following special characters (network name):

`_ - ! # $ % & ' () + , . / : ; < = > ? @ ^ ` { | } ~`

The following special characters (password):

`_ - ! " # $ % & ' () * + , . / : ; < = > ? @ [] ^ ` { | } ~`

All other characters (letters, special characters, etc.) are not permitted.



NOTE!

Invalid characters cannot be typed during password entry. If the user tries to type an invalid character, nothing happens.

Transmission of image files via WLAN

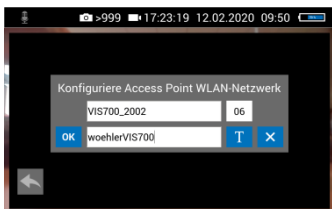


Fig. 64: Changing the password

- To change the network name or password, tap the corresponding field and then tap the text-button T.
- A keyboard will appear on screen.
- Make the appropriate changes. (The password must have at least 8 signs).
- Tap OK to save the changes.



NOTE!

If you tap OK or turn off the camera even though the password is too short or no character is entered for the network name, the password or network name will be reset to the last valid character combination.



Fig. 65: WLAN icon in the icon ribbon

Establishing a connection to a mobile device

The WLAN icon is displayed in the icon ribbon of the display until the WLAN function is deactivated.

- To deactivate the WLAN function, tap the WLAN icon again in the System menu.
- To establish a connection between the camera and the mobile device, proceed as follows.
- Access the WLAN settings of your mobile device.
- Select the network **VIS700_ [serial number, 4 digits]** or the network name that you have chosen
- Enter the password. The password is **woehlerVIS700** or the password that you have chosen. Note the upper and lower case letters.



NOTE!

As long as your mobile device is connected to the VIS700 network, you will not be able to connect it to the Internet. Therefore, the warning message "Internet not available" appears.

- Wait until the Wöhler VIS 700 establishes contact with your mobile device.

You now have the possibility to view the live video in the Wöhler VIS 700 app on your mobile device.

15.2 Client: Using an existing WLAN network

In the “Client” mode, you dial into an existing network both with the Wöhler VIS 700 and with a mobile device or a WLAN-capable PC or Laptop. This way, live image transmission from the camera to the mobile device/laptop is even possible over a certain distance. This possibility can be interesting in industrial plants, for example.



NOTE!

If the Wöhler VIS 700 was connected to an existing network via the client mode, it will connect to this network again after a restart. If the camera is not within range of this network when rebooting, the WLAN is deactivated on the camera.

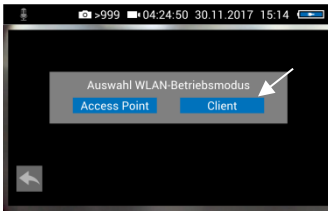


Fig. 66: Client

- Select “Client”.

All available networks will appear in the camera display.

- Select the network.
- Enter the password of your network.
- Confirm with OK.



NOTE

The password will always be saved so that you do not have to enter it the next time you log on to the same network.



Fig. 67: WLAN-Icon in the header

After a successful connection, the WLAN icon will appear in the top bar of the display. The WLAN button in the system menu will be highlighted in blue until the WLAN function is deactivated again.

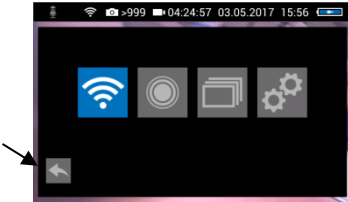


Fig. 68: System menu with activated WLAN button

Connection to a mobile device or laptop

- Tap the arrow button to exit the system menu.

- Proceed as follows to establish the connection between the camera and the mobile device or laptop.
- Open the WLAN settings of your mobile device.
- Select the same network that you dialed into with the camera.
- Enter the password of your network.

You now have the possibility to view the live video in the Wöhler VIS 700 app on your mobile device.

16 Faults

16.1 Reset



Fig. 69: Reset hole indicated by an arrow

It is possible to rectify certain malfunctions by initiating a reset operation. The reset hole is located on the rear of the monitor next to the camera connection port, see Figure opposite.

- Reset 1: Insert a thin object, for example a straightened paper clip, into the reset hole and press for 2-3 seconds. All buttons should then light up.
- Reset 2: If all buttons do not light up after 2-3 seconds, insert a thin object into the reset hole and press for approx. 15 seconds. All buttons should then light up.



NOTE!

Depending on the type of reset operation the reset time (until all buttons light up) is between 2 and 15 seconds. The reset operation is successful when all buttons light up.

16.2 Possible malfunctions

Fault description	Possible cause	Remedy
Image and video keys flash rapidly when the device is turned on.	Rechargeable battery is flat.	Recharge the battery
Monitor and camera head switched on. No image or stuttering image replay.	Rod is broken.	Return the device for repair.
Camera stops video recording	No video signal, e.g. due to a broken rod	If it occurs repeatedly, return the unit for repair.
Blurred images	Plastic dome scratched.	Replace the plastic dome; glass dome optional.
Camera system dead	Rechargeable battery is flat.	Recharge the battery.
	Device is faulty.	Return the device for repair.

17 Maintenance

17.1 Information on maintenance

Proper operation of the Service Camera requires regular maintenance. The following maintenance works can be done by the user himself.

17.2 Replacing the dome of the camera head



Fig. 70: Fitting the camera dome



NOTE!

The camera head is supplied protected by a plastic dome, which can be replaced if necessary, for example, if it becomes scratched. It is optional to fit this camera head with a glass dome for use in dry working environments.

Attention: Only use the glass dome in dry areas. If the glass breaks in the sewage pipe, the camera head would be destroyed immediately.

Before replacing the dome, the thread of the new dome must be sparingly greased with silicone grease. When replacing the dome, make sure that no grease gets into the camera head and especially its mechanical components.

When fitting the replacement dome, make sure you engage all of the thread to ensure it is properly tightened. Otherwise, it cannot be guaranteed that the camera head is properly sealed, and malfunctions can occur as a result of water and dirt ingress.

17.3 Camera head

- Only use soft, damp cloth to clean the lens. Never use any cleanser.

17.4 Monitor

- Clean the monitor using a soft cloth.

17.5 Cleaning the viper and the rod

The viper with the rod is placed in the lower shell of the case. It is possible to take it out and clean it with water. In this case the camera head can remain fixed to the camera rod. If you remove the camera head from the rod, you must seal the rod end with a plug before cleaning.

- To do so proceed as follows:



Fig. 71: Press lever and pull the monitor from the support at the same time.

- First open the upper shell of the case.
- Place the monitor in an upright position and pull it from the support.
- Unscrew the union nut of the monitor cable and remove the monitor cable from the monitor.
- Store the monitor so that it cannot become wet when you are cleaning the viper.



Fig. 72: Upper shell of the case with connection cable (monitor) and without monitor

- Push the monitor support back into the case.



Fig. 73: Case in the correct position for removing the viper

- Open the black locks of the lower shell.
- Place the case in an upright position on the narrow edge.



Fig. 74: Grasping the end of the rod and the viper

- Grasp the rod guide and the viper, so that they cannot twist against each other any more.
- Turn the viper 90° counterclockwise.

The rod can easily be removed from the case now.



Fig. 75: Removing the viper with the connection cable from the case.

- Remove the viper from the case.
- Cautiously pull the monitor cable from the case.
- Close the upper shell of the case.

Cleaning the viper and the rod



Fig. 76: Viper removed from the case, monitor plug covered by a lid

! CAUTION!

Take care that no water comes into the plug connections of the rod.

- Secure the monitor plug against water, e.g. with a foil.
- If the camera head is not connected to the rod during cleaning, secure the rod end against the ingress of water, e.g. with a foil.



NOTE!

The waterproof camera head can remain attached to the camera rod while cleaning. In this case take care that the connection is tight.



Fig. 77: Cleaning the viper and the rod

- Clean the viper and the rod with water.

Cleaning the lower shell of the case.



Fig. 78: Sealing plug placed in the lower shell of the case.

In the upper right corner of the lower shell of the case there is a sealing plug.

- Remove the sealing plug.



Fig. 79: Hole for the connection of the viper, sealed with the sealing plug.

- Plug the sealing plug into the hole for the connection of the viper. Fix the sealing plug by turning it clockwise. Fix it carefully so that no water can come into the upper shell of the case.
- Flush the lower shell of the case with water.
- Dry the case with a cloth.
- Allow the viper and the rod to dry, to avoid humidity in the case.

Assembly of the case



Fig. 80: Rod guide in the end position

- After that mount the case in reverse order.
- Turn the sealing plug counter clockwise, remove it and plug it in its place in the upper right corner of the lower shell of the case.
- Guide the monitor cable through the hole in the middle of the case.
- Place the viper on the hole, so that the rod guide is vertically down.
- Press the viper slightly and turn it 90° clockwise.



Fig. 81: Rod with camera head.

- Guide the end of the rod with the camera head through the opening and push the camera head into the case.
- Close the lower shell of the case.
- Connect the monitor with the monitor cable.
- Replace the monitor into the case again.
- Return the monitor to its transport position by pressing down (see chapter 5.3) and close the case.

18 Guide accessories

This section contains some recommendations based on our experience about the selection of guide accessories for the inspection in tubes and ducts.

As all pipes and chimney systems are different, the user has to decide about the guide accessory in every single case. For the selection of the correct tool it is important to consider that the guide accessory has to facilitate the introduction and the extraction of the camera head, as well as an adequate guidance. The danger of jamming or getting stuck in the tube has to be avoided.

Pipe Ø	Camera Head Ø 26 mm	Camera Head Ø 40 mm
40	Without accessories	Inspection not possible
50	3827	Inspection not possible
60	3634, 3827, 3847	2641, 3682
70	3634, 3827, 3847, 8818	2641, 3682, 8818
100	3634, 3827, 3847, 8818, 3850, 3857	2641, 3682, 8818, 3850, 3857
125	3634, 3827, 3847, 8818, 3850, 3857, 3681	2641, 3682, 8818, 3850, 3857, 3681
150	Every accessory possible	Every accessory possible

Table: Appropriated accessories (article numbers)

19 Guaranty and Service

19.1 Guaranty

Each Wöhler VE 700 HD Service Camera will be tested in all functions and will leave our factory only after extensive quality control testing.

If used properly, the warranty period for the Wöhler VIS 700 will be 12 month from the date of sale. Not covered by the warranty is the plastic dome and SD card.

This warranty does not cover the freight and packing costs when the camera is sent to the factory for repair.

Service by non authorized personnel or making modifications to the analyzer voids any warranty.

19.2 Service

Excellent SERVICE is very important to us. Therefore, of course, we are readily available to assist you after the warranty period ends.

- Send us the Camera and we will repair it and return it to you with our package service.
- Immediate help is provided by our technical staff over the telephone.

20 Declaration of conformity

The manufacturer:

Wöhler Technik GmbH
Wöhler-Platz 1, D-33181 Bad Wünnenberg

declares that the product

product name: HD Pushrod-Camera Camera
model number: Wohler VIS 700

complies with the key safety requirements set down in the guidelines of the Council for the Harmonization of the Legal Requirements of the Member States in relation to the electromagnetic compatibility (2014/53/EU).

The following standards were availed of to evaluate the product in respect of the electromagnetic compatibility:

EN 61326-1:2013 / IEC 61326-1:2012
ETSI EN 301 489-1 V2.1.1 (2017-02)
Draft ETSI EN 301 489-1 V2.2.0 (2017-03)
ETSI EN 301 489-17 V3.1.1 (2017-02)
Draft ETSI EN 301 489-17 V3.2.0 (2017-03)
ETSI EN 300 328 V2.1.1 (2016-11)
ETSI EN 300 330 V2.1.1 (2017-02)
EN 62368-1 :2014+ AC:2015
IEC 62368-1 :2014 (Ed. 2) + Cor.:2015

This device complies with Industry Canada licence-exempt RSS standard(s) and part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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 a commercial environment. This equipment generates, uses, and can radiate radio fre-

Declaration of conformity

quency energy and, if not installed and used in accordance with the instruction manual, 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Points of sale and service

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