

WÖHLER

Operating manual
Color monitor

USA

Wöhler VIS 400



The measure of technology

1 General Information

1.1 Operation Manual Information

This operation manual allows you to safely work with the Wohler VIS 400 Color Monitor. Please keep this manual for your information.

The Wohler VIS 400 should be used by trained professionals for its intended use only.

Warranty is voided by any damages caused by not following this manual.

1.2 Notes



WARNING!

Not following this warning can cause injury or death.



ATTENTION!

Not following this note can cause permanent damage to the monitor.



NOTE!

Usefull information

1.3 Proper use

The Wöhler VIS 400 color monitor is designed to be used together with a suitable camera cable, camera rod and camera head to visually inspect and document the condition of pipes in shafts, for example in flue gas systems, chimneys, ventilation systems as well as for inspecting underground drain pipes.

The device is designed to be used by trained professionals only. Any other use is considered improper use.

1.4 Basic features

Device	Scope of supply
Wöhler VIS 400 color monitor	Color monitor
	12 V rechargeable battery
	Power pack: 18 V, 1.5 A
	SD memory card 4 GB
	Protective case with anti-glare visor and carry strap

1.5 Transporting

To prevent damage to the Monitor use the original carrying case when transporting.

The carrying case can be purchased separately.

1.6 Information on disposal



Electronic equipment does not belong in 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.

2 Important information

Eye 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 cause eye damage.

**WARNING!**

When connected, 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.

Operating temperature

**CAUTION!**

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

Resistance to water

**CAUTION!**

The color monitor is not waterproof. Keep the monitor dry and away from water!

Resistance to impacts

**CAUTION!**

The color monitor is not impact resistant. Do not throw or allow the case to fall!

Accessories

**CAUTION!**

Use only original Wöhler accessories and spare parts!

Strong magnetic or electric fields

**NOTE!**

Do not use the color monitor 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

Description	Details
TFT display	7" 16:9 format
Recording	2 GB SD card (2.5 h recording capacity)
Optional memory cards	
Max.	32 GB
Technology:	SD or SDHC
Velocity class:	2 - 10
Formatting:	For cards < 4 GB: FAT or FAT32, others: FAT 32
Interface	Mini USB port
Video output	FBAS signal
Power supply	12 V NiMH rechargeable battery 2000 mAh
Battery operating time	Max. 2 h (battery status is displayed)
Distance measurement:	Electronic meter counter
Operating temperature	-4 ... 122 °F
Storage temperature	32 ... 104 °F
Dimensions housing	
Without case	8" x 8" x 2"
With case	9" x 9" x 3"
Weight	
Without case	3 lbs
With case	4 lbs
Standard connection telescopic stand	

4 Design and function

4.1 Monitor

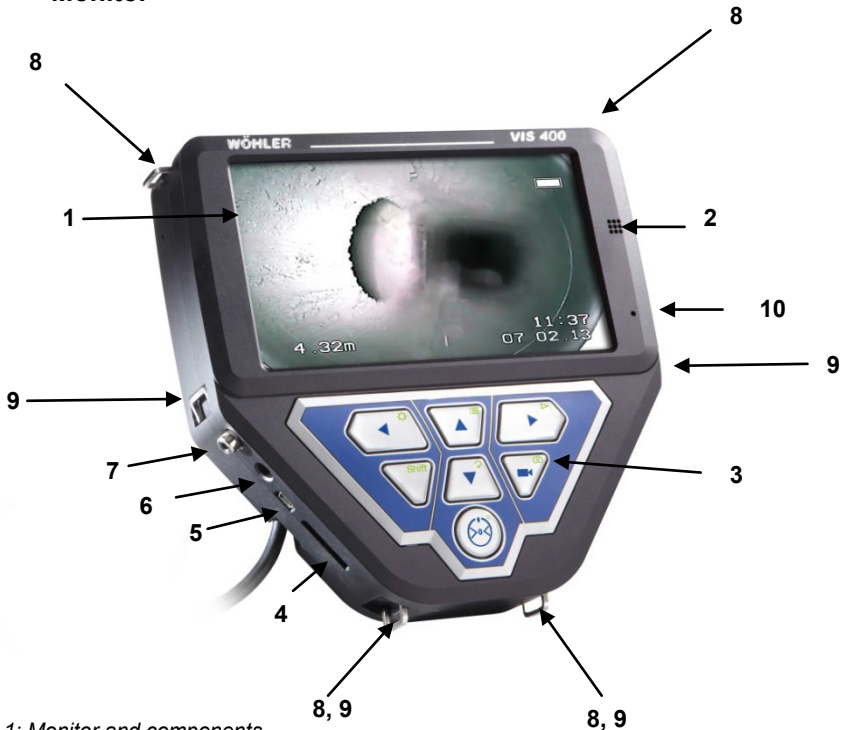


Fig. 1: Monitor and components

Legend

Front and side view:

- 1 Display
- 2 Loudspeaker
- 3 Control panel
- 4 Card slot for memory card
- 5 Mini USB port
- 6 Power pack connection
- 7 Video out
- 8 Eyelet to secure shoulder strap
- 9 Eyelet to secure wrist strap
- 10 Microphone

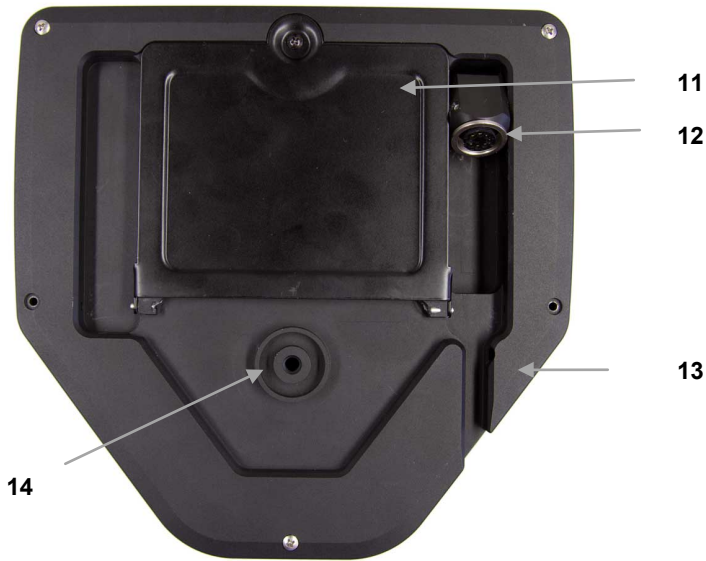


Fig. 2: Monitor - rear view

Legend

Rear:

- 11 Battery compartment
- 12 Connection socket for camera cable or rod
- 13 Cable guide
- 14 Standard telescopic stand connection

4.3 Control panel

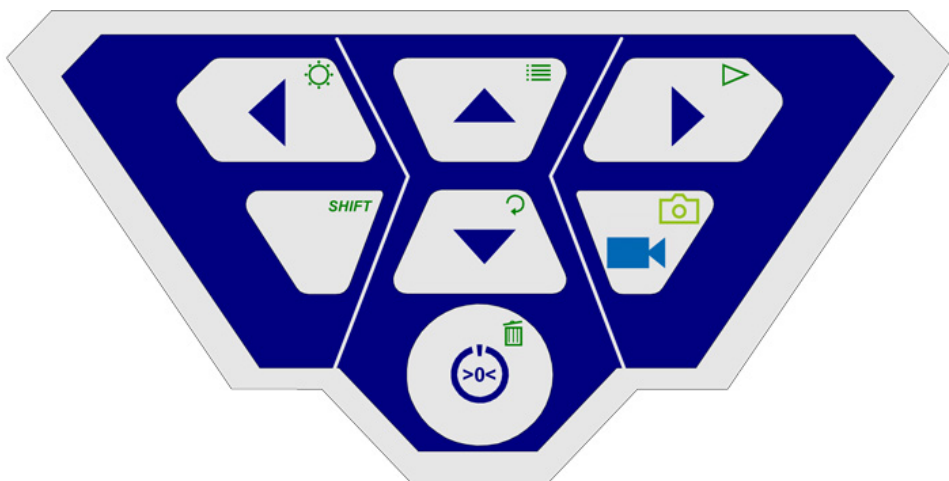


Fig. 3: Control panel

The keys on the control panel have the following functions:



Functions The ON/OFF key

ON/OFF key turns the whole camera system on/off (monitor and connected camera head).



NOTE!

The ON/OFF key is framed by a green light when the monitor is switched on and the battery is charged.

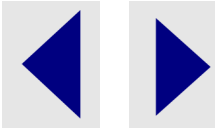
Press	Function
Hold 2 seconds	Switch system on/off
Briefly	Reset distance counter
When menu is activate (only when using Ø 1" and Ø 1 ½" camera heads)	Escape Exit menu



Camera head operating keys

(this function is active only if the pan&tilt camera head is connected, see accessories)

Tilt the camera head 180°



Camera head operating keys

(this function is active only if the pan&tilt camera head is connected, see accessories).

Rotate the camera head 360°



VIDEO key

Start/stop recording video



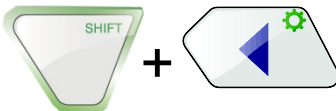
SHIFT key

Activates the key functions depicted by green icons on the top right corners of the keys.



NOTE!

When SHIFT MODE is activate, the SHIFT key lights up and an S is displayed in the bottom middle of the screen.



Illumination key

Camera head Ø 1", Ø 1 ½ "

Dimming function to set the brightness of the camera head lighting.



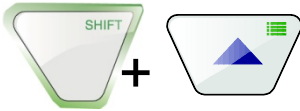
NOTE!

There are three levels of brightness available to increase or dim the intensity of the camera head lighting. The brightness is increased each time the user presses the ILLUMINATION key three times in sequence. The forth time the user presses the key, the lighting returns to the lowest level of brightness.

Camera head Ø 2":

Switch LEDs on and off.

If the Additional Illumination, type plug-in, is installed (article 4194), the LEDs of the camera head and the pluggable illumination (article 4194) will be switched on and off at the same time.



MENU key:

Make settings



PLAY key

Playback recorded videos



HOME key

(this function is active only if the Ø 1 ½", pan&tilt camera head is connected, see accessories).

Aligns the camera head to a straight position – displays view parallel to the ground above



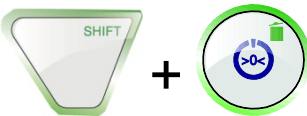
IMAGE key

Capture image / snapshot



NOTE!

Images are saved in .jpg format; it is possible to display the images on a PC from the SD card.



DELETE key

Delete an image or video selected in PLAY mode.

5 Connections

5.1 Connection options

The Wöhler VIS 400 monitor is a component of an expandable modular inspection system that the user can configure to meet the demands of any working environment. The various connection options are described below; please also refer to the Section “Accessories”.





To perform inspections, a Wöhler camera rod and a camera head or a Wöhler camera cable and a camera head must be connected to the monitor.

Fig. 4: Ready to go – monitor complete with connected camera cable and camera head

5.1.1 Camera heads

The camera head selected affects the display options on the monitor. It is possible to connect the following camera heads:

Diameter	Ø 1 ½ "	Ø 1 "
Image		
Color	✓	✓
Light sensitivity	0.5 Lux	0.5 Lux
Pan&Tilt	✓	
Position indicator	✓	✓
Home function	✓	
Integrated locator transmitter	✓	✓
Resistance to water	waterproof IP 67 (30 min / 1 m)	waterproof IP 68 (30 min/ 30 m)
Application	<p>chimneys</p> <p>Waste water lines Ø 2.8 " and larger</p> <p>House connections up to Ø 7.8 "</p> <p>Flue gas lines 2.4 " and larger</p>	<p>Waste water lines Ø 1 ½ " and larger</p> <p>Ventilation pipes Ø 1 ½ " and larger</p> <p>Flue gas lines up to approx. 4.9 "</p>

5.1.2 Camera cable



Fig. 5: Inspections using camera cable from above

The most effective method of inspecting things such as chimney and downpipes is from above. For example when standing on the roof. To do so, it is necessary to connect a camera cable to the monitor.

5.1.3 Cable reel



Fig. 6: Wöhler cable reel with camera head connected

The Wöhler cable reel can store up to 1181" of camera cable and proves extremely useful when working with the cable. The monitor is secured to the cable reel using the connection for the telescopic stand.

5.1.4 Camera viper



Fig. 7: Wöhler camera viper

If it is not possible to perform an inspection from above, it will be necessary to connect a camera viper. It is far easier to handle the camera rod when used in conjunction with a Wöhler camera viper, which can store up to 1181" of camera rod.

5.2 Connecting the camera cable and camera head

5.2.1 Connecting the camera cable



Fig. 8: Camera cable connection

- Flip up the eight-pole female connector located on the rear of the monitor (Fig 2, part 12).
- Insert the male connector of the camera cable or rod into the female connector, then turn the locking ring clockwise to secure the connection.



Fig. 9: Camera cable fed through guide

- Move the female connector with connected cable or rod to a suitable working position:
- Feed the cable through the guide, if you wish to put down the monitor.



Fig. 10: Carrying the camera in the camera case

- Allow the cable to hang down when you carry the monitor with the shoulder strap over your shoulder.

5.2.2 Connecting the camera head

Insert the male cable connector (or male camera rod connector) at the other end into the eight-pole female connector of the camera head, then turn the locking ring clockwise to secure the connection.

! CAUTION!

The connection is only waterproof when the connectors are joined together properly. Tighten the locking ring using your fingers; never use pliers!

6 Rechargeable battery status and recharging



WARNING!

Risk of injury when handling the rechargeable batteries improperly!

Never open the rechargeable battery housing.

Do not throw rechargeable batteries into a fire or expose to high temperatures. There is a risk of explosion!

If handled improperly, a liquid may emerge from rechargeable batteries that can cause skin irritation. Avoid contact with the liquid. Rinse skin with large amounts of water if it comes into contact with the liquid. If the liquid comes into contact with eyes, rinse with water immediately for 10 minutes and consult a doctor immediately!



WARNING!

Danger of death by electrocution!

Never touch an electrical outlet with wet hands!

Do not expose the power pack to moisture!

Never pull the cable to remove the power pack from the electrical 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!



CAUTION!

Switch off the camera system before charging the battery.



CAUTION!

If the camera is not used regularly, we recommend to discharge the battery by powering on the camera. After that, charge the battery completely. Repeat this procedure after approx. 6 weeks.

Rechargeable battery status indicator

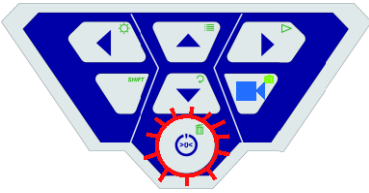


Fig. 11: Control panel of Wöhler VIS 400 - ON/OFF key framed by flashing light

When the camera is switched on, the battery status indicator displays the charge status of the rechargeable battery in the top right corner of the display. The indicator flashes when the charge level of the batteries is low. If the charge level continues to fall, the light framing the ON/OFF key flashes red and the monitor switches off automatically.

It is only possible to switch on the camera again after the battery has been replaced with a charged battery or a power cable is connected to recharge the battery in use.

Charging rechargeable batteries

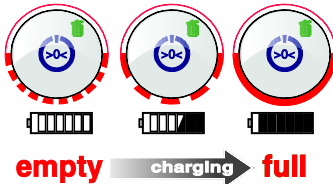


Fig. 12: Schematic overview of battery recharging

To recharge the battery, proceed as follows:

- Connect the power pack to the charger connection of the device and the main power supply.

The lower half of the light framing the ON/OFF key flashes red during the recharging process; when the battery is fully recharged it lights up red continuously as long as the power pack remains connected.



NOTE!

The operating time of the rechargeable battery is approx. 120 minutes.

7 Switching on the system and monitor

- Insert a memory card (max. 32 GB).



NOTE!

If you are using a memory card other than the one included in the scope of supply, you must format it first (FAT32) before you can use it on a PC.

To format the card, proceed as follows:

- Insert the card into the card slot of your PC.
- In the Explorer, right-click the removable media memory card, then select "Format".
- Select FAT32 (default) and 32 kilobytes.

Switching on the system and monitor

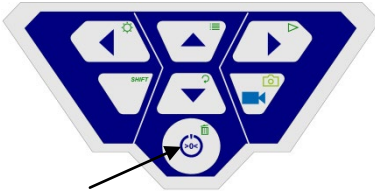


Fig. 13: ON/OFF key

- To switch on the device, briefly press the ON/OFF key at the bottom of the control panel.
- When the device is switched on, the light framing the ON/OFF key lights up green. The video image is displayed on the monitor after about 5 seconds.

8 Monitor settings



Fig. 15: openings for adjusting the monitor settings

On the left hand of the monitor there are 5 openings. With a pointed object press into these openings to adjust the monitor settings.

8.1 Monitor Menu

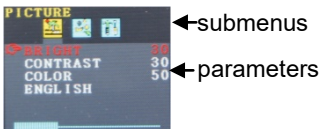
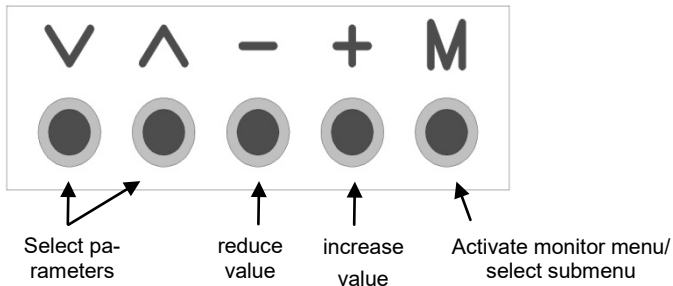


Fig. 16: Picture menu

- Press **M**, to enter the monitor menu.

In the upper line, different icons will show 3 different submenus: Picture, Format, Option, Off

- Press **M**, to change between the submenus.
- Press „**^**“ or „**v**“, to switch between the parameters.
- Press „**-**“, to reduce a value.
- Press „**+**“, to increase a value.

8.2 Submenu „Picture“

8.2.1 Selecting the language

Nine different languages can be selected for the monitor menu: english, german, french, spanish, portuguese, italian, dutch, russian and Chinese.

- Press **M** to select the first icon (Picture).
- Press **V** until you have reached the last parameter.

- Press + to select the language

8.2.2 Setting the picture parameters in the monitor menu



Fig. 17: Default settings

In the picture menu, the brightness, the contrast and the color can be adjusted from 0 to 100



Note!

The default settings are:

Bright: 30

Contrast: 30

Color: 50

A bar below the parameters shows the adjustment level.



Note!

When the camera head Ø26 mm or Ø 40 mm is connected, the video quality can also be adjusted in the camera menu, see chapter 9.

8.3 Format



Fig. 18: Submenu Format

In the Format Menu the user can turn round the screen, the screen format can be changed from 16:9 to 4:3 and the video format can be selected.

- Press **M** to select the second icon (Format).

8.3.1 Turning the screen view

! CAUTION!

We recommend not to turn the screen view.

- Press **V** to select the first parameter (down).
- „Down“ shows the normal view.

If absolutely necessary, turn the screen by pressing the + or -: normal (turns 180°), down reflected and normal reflected.

8.3.2 Changing the screen format

- In the format menu press **V** to select the zoom parameter.
- Press **+** or **-** to change between 16:9 and 4:3 or FIT.



HINWEIS!

If you select 16:9 or 4:3 there will be frames on the screen. If you choose FIT the video will perfectly fit to the screen.

8.3.3 Selecting the video standard

In the submenu „S-Roloc the video standards PAL > NTSC > SECAM > AUTO can be selected. This setting only affects the screen. The default setting is „Auto“.

! CAUTION!

We urgently recommend not to change the default setting „AUTO“.

8.4 Submenu

In the submenu „Option“ the user has the possibility to activate an auto off-function for the monitor

„Option“ - Automatic shutdown



Fig. 19: automatic shutdown
deactivated

menu:

- Press **M** to select the third icon (Option).
- Press **+** or **-** to select the time after which the monitor menu shall turn off automatically: 5 s > 10 s > off.



Note!

“OFF” is the default setting, so that the automatic shutdown will be deactivated.

9 Making settings via the menu

- After switching on the device, press the SHIFT key

The green light framing the SHIFT key lights up and an **S** is displayed in the middle at the bottom of the monitor. This indicates that SHIFT mode is active and the second functions marked in green on the keys are enabled.

- Press the Menu key 

The menu opposite is displayed on the screen with 5 sub-menus.

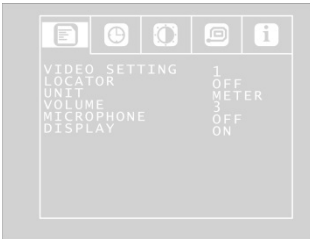





Fig. 20: SETUP menu

Icon	Menu
	SETUP menu
	CALENDAR menu
	VIDEO menu (If you work with the camera head Ø 51 mm, there will be no video menu)
	VIPER menu (only active, when the cable reel is connected)
	INFO menu

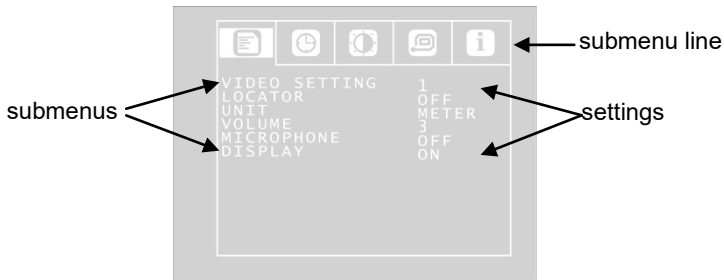


Fig. 1: SETUP menu

Navigating to the submenu

- Using the up/down arrows, navigate to the submenu line. Using the left/right arrow keys navigate to the submenu.

Navigating to the parameters

- Using the up/down arrows, navigate to the corresponding parameter. Select the desired setting using the left/right arrow keys.
- Press the ON/OFF key to confirm your selection and exit the menu.
- If there is no disc icon to save the settings, your settings will be saved automatically when you exit the menu.

The user can select the following parameter settings:

9.1.1 SETUP menu



Video Setting 1 – 3

The user can switch between 3 pre-defined video settings. The video settings 1 and 2 cannot be altered.

Video	Recommended
Video Setting 1	Recommended for pipes, good long field of vision
Video Setting 2	Recommended for chimneys; dark areas are made to appear brighter
Video Setting 3	User-definable set-

	tings
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To define Video Setting 3, proceed as follows:

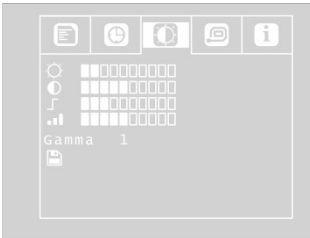


Fig. 21: User-definable Video setting 3

- In the menu view, use the up arrow key to navigate to the submenu line and then use the right arrow key to select the VIDEO tab. Adjust the settings as described in section 9.1.3
- Adjust the following settings as required:
 - ☀ Brightness
 - Contrast
 - ┌ : Contour sharpness
 - Color saturation
 - Gamma: Gamma curve setting (0-3)



NOTE!

Adjustments to the gamma curve affects brightness curve settings.

- To save your settings, use the down arrow key to select the disc symbol below the parameter. Press the right or left arrow key.

This saves the settings for Video 3. For some seconds a hook will appear instead of the disc icon.

- Return to the SETUP menu view using the arrow keys.

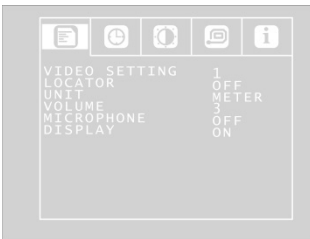


Fig. 22: SETUP Menu

LOCATOR OFF/ON

This command allows the user to switch the transmitter integrated in the camera head on and off. The Wöhler L 200 Locator is able to locate the camera head with the aid of signals transmitted by the transmitter.
(only Ø 40 mm and Ø 26 mm camera heads are equipped with an integrated transmitter).

Making settings via the menu

ON: Transmitter is switched on

OFF: Transmitter is switched off



NOTE!

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

FREQUENCY

Here you can select the transmission frequency of the camera head.

The frequency can be changed between 8.9 kHz, 9.2 kHz and 512 Hz.



NOTE!

In the USA only 8.9 kHz is allowed. The camera head is therefore reset to 8.9 kHz each time the camera system is restarted.

UNIT METER/FEET

Set the distance displayed on the screen to meters or feet, when the cable reel or the viper is connected.

VOLUME 0 - 3

This command allows the user to adjust the volume when recorded audio is played back.

MICROPHONE ON/OFF

This command allows the user to switch the microphone ON or OFF. When the microphone is switched on, the user is able to add an audio annotation, which will be played back together with the recorded video.

The default setting is "OFF"; this means no sound is recorded when recording a video.

DISPLAY ON/OFF

This command allows the user to switch the on-screen display On or Off. Select "ON" if you wish to display the battery status indicator and the date on-screen.

9.1.2 CALENDAR menu

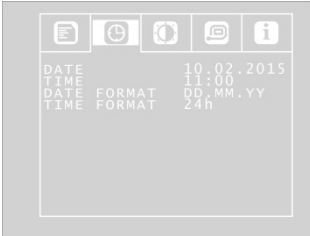


Fig. 23: Settings in the SETUP menu

Use the arrow keys to navigate to the CALENDAR menu. The following settings are available here:

DATE

Set the date.



NOTE

The date will be recorded together with the video.

TIME

Set the time. The time will be recorded together with the video.

DATE FORMAT

Set the date format to either Day.Month.Year or Month/Day/Year

TIME FORMAT 12h/24h

Set the time format to either 12 hour format or 24 hour format.

Exit menu

To exit the menu, press the ON/OFF key.

9.1.3 VIDEO menu

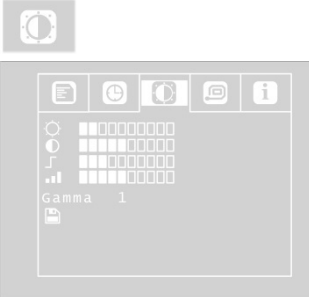


Fig. 24:VIDEO menu

The VIDEO menu will only be active, if the camera heads Ø 40 mm and 26 mm are used.

In the video menu the user can define the video settings. These settings will be stored as video settings 3. If the user changes anything in the video menu, automatically video settings 3 will be active (see SETUP menu)

- Adjust the following settings as required:
 - ☀ Brightness
 - 🕒 Contrast
 - ┌┐ Contour sharpness
 - ▒ Color saturation
 - Gamma: Gamma curve setting (0-3)



NOTE!

Adjustments to the gamma curve affects brightness curve settings.

- To save your settings, use the down arrow key to select the disc symbol below the parameter. Press the right or left arrow key.
- This saves the VIDEO SETTINGS 3. After that a hook will appear for some seconds instead of the disc icon.

9.1.4 VIPER menu



Fig. 25: VIPER menu

The VIPER menu is only active, when a cable reel is connected to the camera.

- With the arrow keys go to CABLE and select 20 m or 30 m according to the cable length
- Click on the disc icon to save the setting.



HINWEIS!

If the viper or the cable reel is connected to the camera, the drop length of the cable will be displayed in the lower left part of the screen.

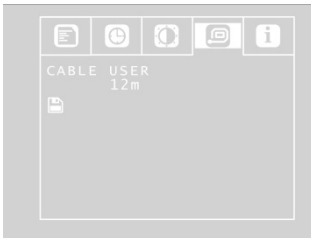


Fig. 26: User definable settings in the VIPER menu

There is also the possibility to select "USER" instead of 20 m or 30 m.

- Select USER if you work with another cable length.
- Enter the length of your cable with the arrow keys.

It is possible to enter a length between 0 and 30 m.

- Click on the disc icon to save the setting.

9.1.5 INFO menu

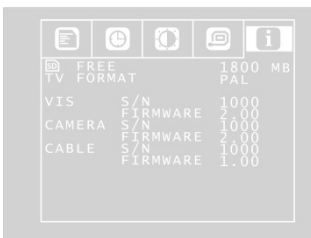


Fig. 27: INFO menu

The INFO menu shows important information about your camera system. It is not possible to make any settings in this menu.

FREE: Information about the free storage space on the memory card.

TV FORMAT: TV format of the camera head (PAL or NTSC)

VIS S/N: Serial number of the camera system

VIS FIRMWARE: Firmware version of the camera system

CABLE S/N: Serial number of the camera head

CAMERA FIRMWARE: Firmware version of the camera head

CABEL S/N: Serial number of the cable reel or viper (if connected)

CABEL FIRMWARE: Firmware version of the cable reel or viper (if connected)

10 Information displayed on the monitor

10.1 Displaying the position of the camera head

The position can only be displayed if a $\varnothing 26$ mm or $\varnothing 40$ mm **Wöhler camera head** is connected.

Pointer symbol



Fig. 28: Display with pointer symbol and number of degrees

Number of degrees

A **pointer symbol** displayed in the top left corner of the screen always indicates the direction of gravity, meaning, towards the bottom. This ensures the user is able to recognize where top and bottom are in the pipe.

A circle is displayed around the symbol if the camera head faces vertically upwards.

A cross is displayed in the middle of the symbol if the camera head faces vertically downwards.

The number of degrees displayed underneath indicates the downward gradient of the pipe.

Example graphic: -13° corresponds to a downward grade of 13° .

NOTE!

Example:

Camera head facing vertically upwards: $+90^{\circ}$

Camera head facing vertically downwards: -90°

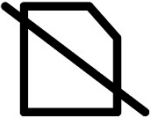
Camera head is aligned parallel to the ground above: 0°

10.2 Time and date

The time and date are displayed in the bottom right corner. The recorded time is displayed when the video is played back..

10.3 Memory Card Missing

If no memory card is plugged into the card slot, a crossed out memory card icon will appear on screen. The icon will disappear, as soon as the memory card is inserted.



11 Home function

It is only possible to activate the home function when the **Ø 40 mm Wöhler camera head** is connected.

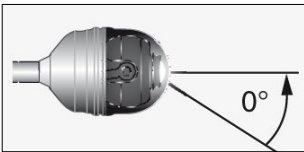


Fig. 29. Home function

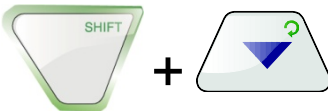
The home function ensures the camera head is automatically aligned to a straight position, ensuring the camera "looks straight ahead".

Moreover, when the user presses the HOME key, the camera head aligns itself so that the display is parallel with the ground above (this function is deactivated if the camera head faces 90° upwards or downwards. Under these circumstances, the optics can only be guided forwards).

NOTE!

To determine the grade described under section 10.1, the camera head must be aligned straight.

- To activate the home function, press the SHIFT key and then the HOME key.



12 Audio and video functions

12.1 Recording

Record video



- To begin recording a video, press the Record video key.

The RECORD VIDEO key is framed by a red flashing light when recording is in process, and a red dot is displayed on the screen.

- To stop recording, press the Record video key again. The video is stored in ASF format on the memory card.



CAUTION!

Ensure the power supply is not interrupted when recording a video.



NOTE!

The camera will automatically stop recording a video after 30 minutes and then start a new record again.

Recording an audio annotation

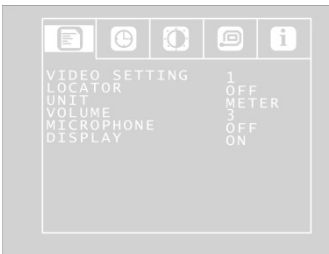



Fig. 30: SETUP menu

The user is able to add an audio annotation when recording a video; this is recorded together with the video and jointly saved as an ASF file to be played back together with the video. The microphone must be switched on to be able to record an annotation.

- Press the SHIFT key and then the Menu key to access the Menu tab. 
- Use the arrow keys to navigate to Menu>MICROPHONE and select "ON".



NOTE!

For a good quality audio recording, make sure you speak into the microphone when recording (Fig. 1, component 10).

12.2

12.3 Playback

Video playback



- To playback a recorded video, press the SHIFT key and then the PLAY key. The first image of the last video recorded is displayed on the screen.





NOTE!

It is possible to distinguish a photo from the initial image of a video by the recording time which is displayed in the initial image of a video.

Select the desired video using the right/left arrow keys.

Fast-forward and rewind



- To begin playing back the video, press the Play key .
- To interrupt the video playback, press again SHIFT + .
- To stop the video playback press SHIFT + Left arrow key
- Press the ON/OFF key to return to the normal mode.
- In play mode press the up arrow to fast forward the video (double speed). 2x will appear on screen.
- Press the up arrow again to forward the video faster. 4x will appear on screen.
- Press the down arrow to return to double and then to normal speed.
- In play mode press the down arrow to rewind the video (double speed). 2x will appear on screen.

Playing back an audio annotation



Any audio annotation will be played back together with the video. It is possible to switch the sound off to play the video without voice annotation, if you select Volume = 0.


- Press the SHIFT key and then the Menu key to access the Menu tab. 
- Using the arrow keys, select VOLUME and set 0, 1, 2 or 3.

Fig. 31: SETUP Menu


12.4 Delete files



- To select the file to be deleted (including the audio file, if necessary), press the SHIFT key and then the PLAY key.

The first image of the last video recorded is displayed on the monitor.



- Select the video to be deleted using the right/left arrow keys.
- To delete the video, press the SHIFT key and then the DELETE key .

The prompt "DELETING FILE" is displayed on the screen for approximately 2 seconds. Once the file has been deleted, the image currently being transmitted from the camera head is displayed on the screen.

13 Capture images



- To capture an image, press the SHIFT key and then the PHOTO key.

The image is saved as a .jpg file on the memory card.

14 Delete files




- To select the file to be deleted (including the audio file, if necessary), press the SHIFT key and then the PLAY key.

The first image of the last video recorded or the last image recorded is displayed on the monitor.



Note!

The recording time in the initial image of a video shows that it is a video and not a photo.

- Select the video or the image to be deleted using the right/left arrow keys.
- To delete the video or image, press the SHIFT key and then the DELETE key .



The prompt "DELETING FILE" is displayed on the screen for approximately 2 seconds. Once the file has been deleted, the image currently being transmitted from the camera head is displayed on the screen.

15 Transferring and showing images and videos

15.1 Transferring to the PC Two options are available to transfer image files (.jpg) and video files (ASF):

- Read in the files on a PC from the SD memory card or
- Transfer the files to the PC using the USB cable.

15.2 Replaying videos on the PC To playback a video on the PC the Windows Media Player can be used.

16 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.



NOTE!

The information given in this section only refers to the accessories.

Ø 1 ½ " – 2 "	Use the service camera without accessories.
Ø 2 " – 2,8 "	You can use the service camera without accessories. The lens can be protected by the guidance sleeve. If there is water and mud in the horizontal part, we recommend to use the roller guide.
Ø 2,8 " – 3,9 "	The inspection is possible with the roller guide and without it. Use the guidance weight for the vertical inspection or for the inspection of downpipes.
Ø 3,9 " – 6,1 "	A centering brush can be used with the roller guide or without it and with the lens protection.

17 Faults

Fault description	Possible cause	To rectify
Cannot start monitor. When the ON/OFF key is pressed, the light framing the key briefly lights up red.	Rechargeable battery has no charge left.	Recharge battery or connect monitor to electrical power supply.
Battery status indicator on the monitor indicates a low battery charge.	Rechargeable battery has no charge left.	Recharge battery or connect monitor to electrical power supply.
Poor imagery when using a pan&tilt camera head	Plastic dome scratched.	Replace the plastic dome; glass dome optional.
Camera head or monitor freezes	Battery / rechargeable battery has no charge left.	Recharge battery or connect monitor to electrical power supply.
	Device is faulty.	Send camera system in for repair.
Blue screen, NO SIGNAL displayed on the monitor	Rod is broken.	Send camera system in for repair.
	Cable/plug connection at monitor not properly connected.	Reconnect the plug connection. Broken cables in plug connection. Send in camera system for repair.

18 Maintenance

18.1 Replacing the dome of the camera head

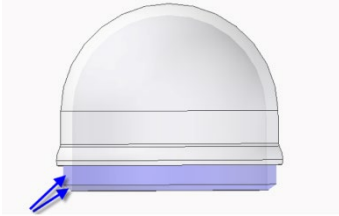


Fig. 32: Fitting the camera dome

18.2 Monitor



NOTE!

Wöhler's $\varnothing 1 \frac{1}{2}$ " pan&tilt 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.

The $\varnothing 2$ " camera head is always supplied with a real glass dome, which it is possible to replace if required!

Apply silicone grease before fitting the new dome. When fitting the replacement dome, make sure you cover 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 penetration.

Clean the monitor using a soft cloth.

19 Accessories

Wöhler Camera Head Color Ø 1 ½ ", pan and tilt	Order no. 8930
Wöhler Miniature Camera Head Color Ø 1 "	Order no. 8920
Wöhler Cable Reel Wöhler VIS 400	Order no. 7816
Wöhler Camera Viper 42 with GRP camera rod	Order no. 7307
Wöhler VIS Guidance Set 100	Order no. 3884
Wöhler VIS Guidance Set 150	Order no. 3882
Wöhler Camera Roller Guide	Order no. 3681
Guidance Sleeve with protection cage for camera head Ø 1 "	Order no. 3847
Wöhler Guidance weight	Order no. 3857
Wöhler Guidance ball	Order no. 3634
Quick Charger 2,5 A / 230 V / 50 HZ	Order no. 56102
Wöhler Protection sleeve for camera head Ø 1 ½ "	Order no. 3682
Wöhler Replacement Glass Domes Ø 2 "	Order no. 3494
Wöhler Glass Dome Ø 1 ½ "	Order no. 3674
Wöhler Glass Dome Ø 2 "	Order no. 7802
Wöhler Replacement Plastic Domes Ø 2 " (5 pieces)	Order no. 7075
Wöhler Replacement plastic domes Ø 1 ½ " (10 pieces)	Order no. 3675
Wöhler Additional Illumination, plug-in type	Order no. 4194