

REMS CamSys

INSTRUCTION MANUAL

ELECTRONIC CAMERA INSPECTION SYSTEM



CAMSYS

REMS

1800 4 ANCRA

ANCRA
INTERNATIONAL

www.ancraaustralia.com

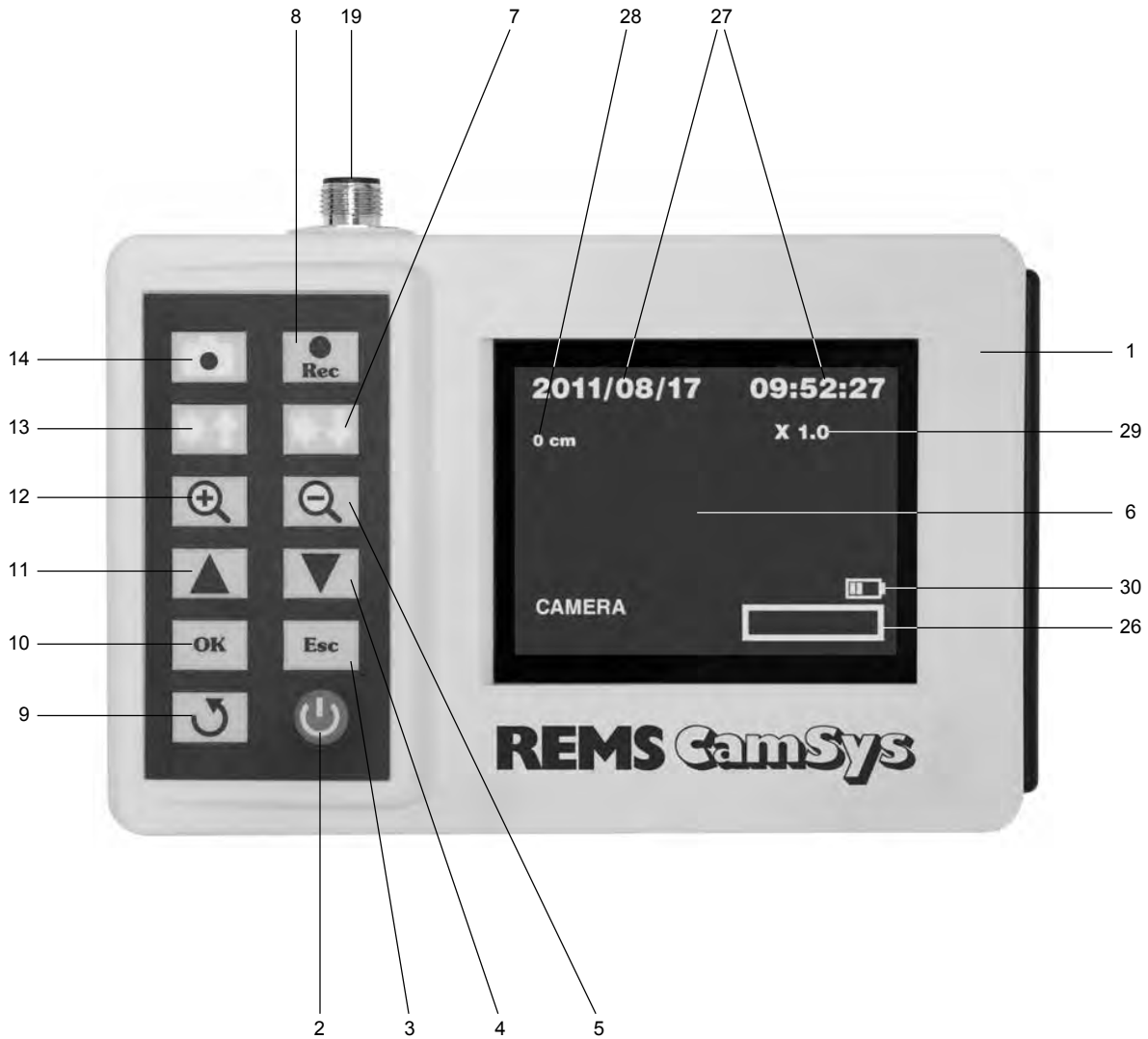


Fig. 1

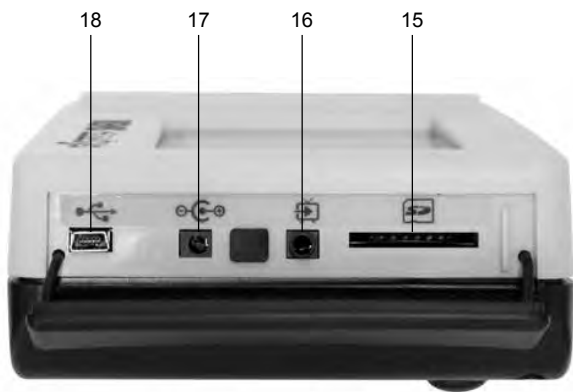


Fig. 2

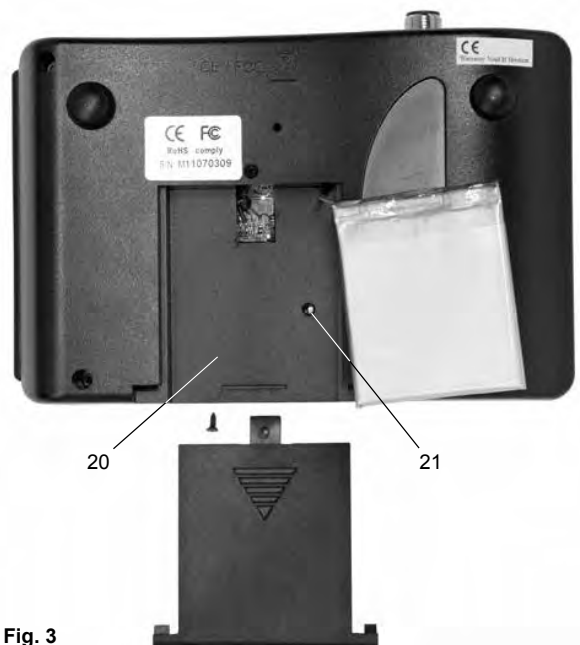
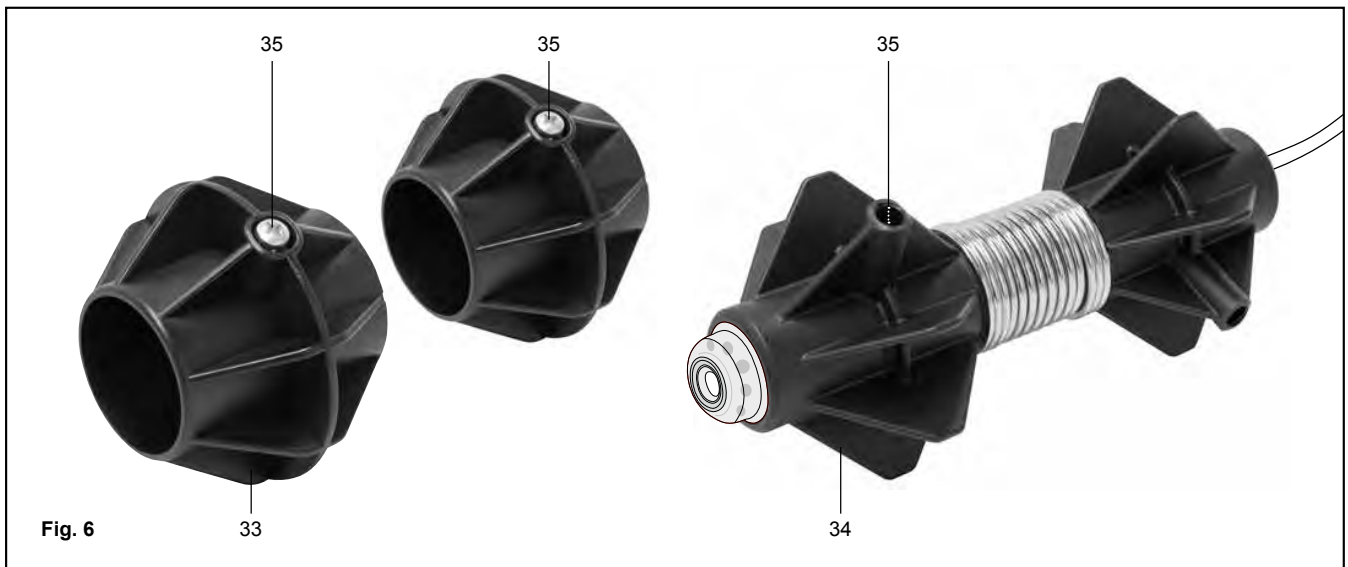
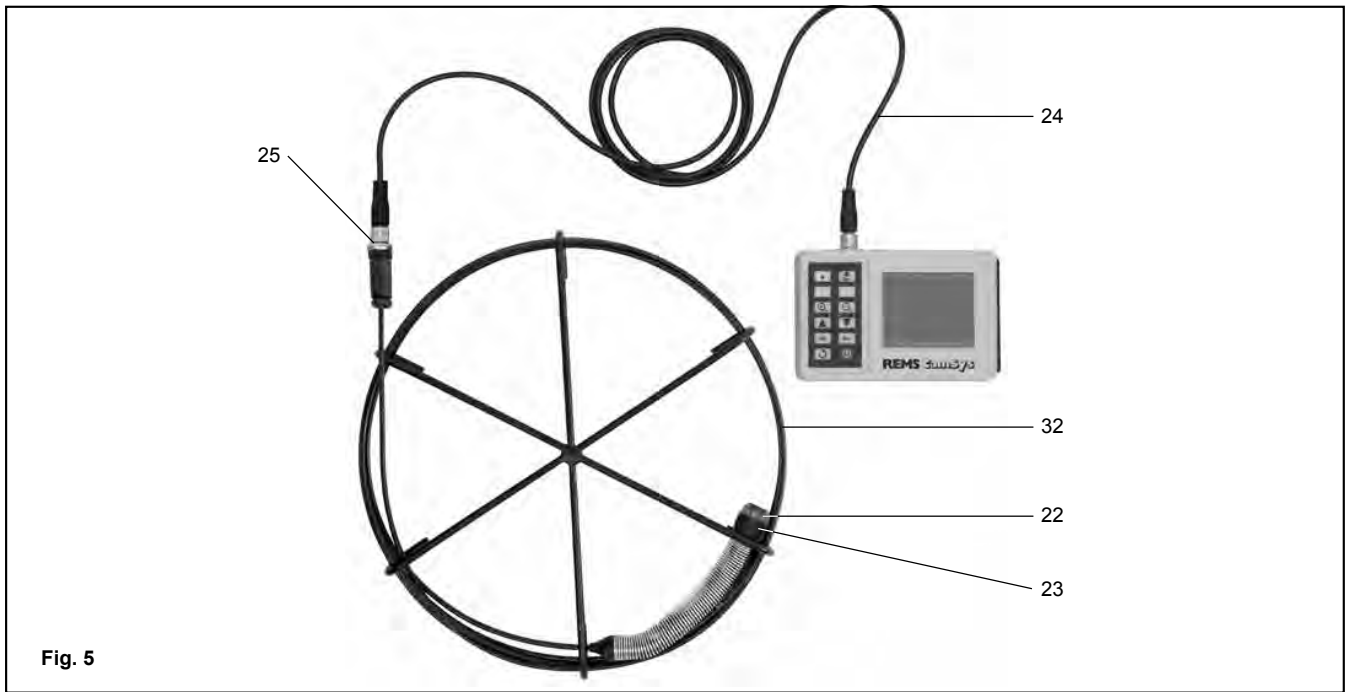
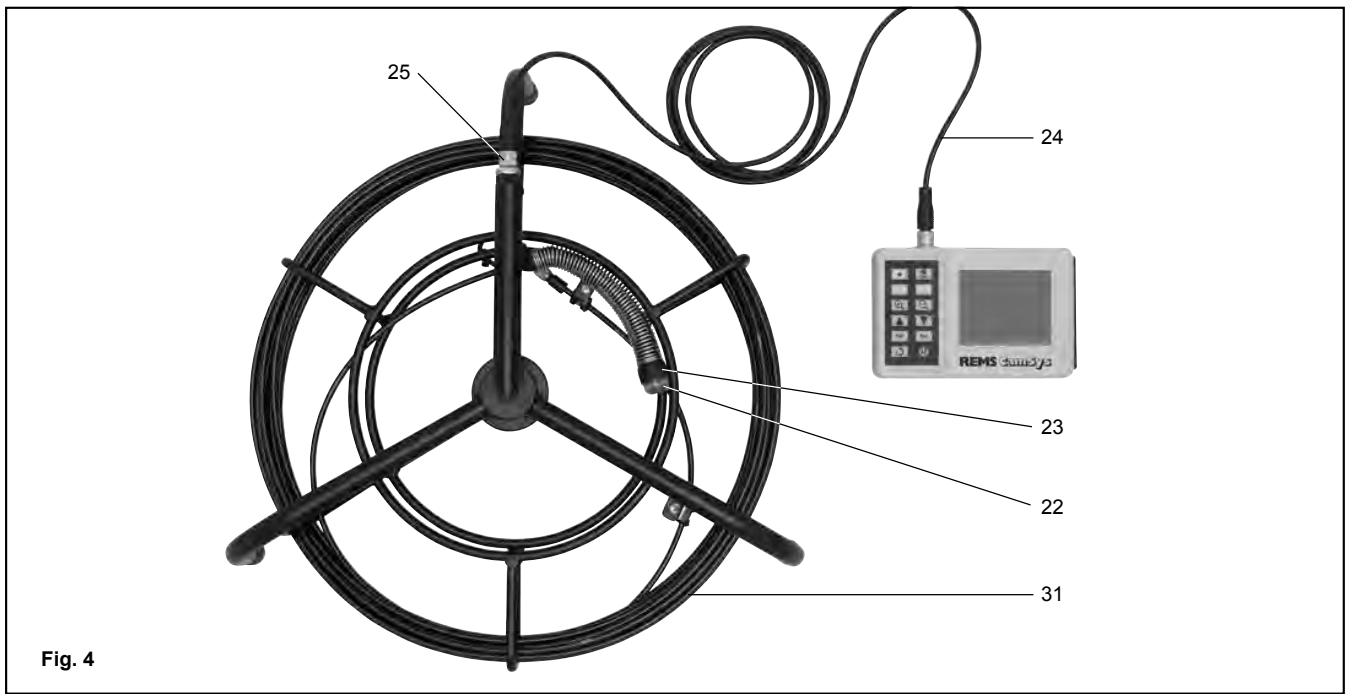


Fig. 3



Translation of the Original Instruction Manual

Fig. 1–6

1	Controller unit	18	USB port
2	On/Off button	19	Connecting socket for camera cable set
3	Escape button	20	Battery compartment
4	Down button and select and display photos/video	21	Reset button
5	Zoom button, reduce	22	Protective cap with mineral glass window
6	Display	23	Camera head with colour camera
7	LEDs darker button	24	Connecting cable
8	Record Video button and date/time setting	25	Connecting socket
9	Rotate photo button	26	Indicator of available memory capacity
10	OK button and menu	27	Date and time display
11	Up button and select and display photos/video	28	Display value metering
12	Zoom button, enlarge	29	Zoom factor
13	LEDs brighter button	30	Battery change indicator
14	Record photo button and date/time setting	31	Camera cable set S-Color 30 H
15	SD card slot	32	Camera cable set S-Color 5 K
16	Video out socket	33	Guide body Ø 62
17	Charger/mains socket	34	Guide body Ø 100
		35	Screw

General Power Tool Safety Warnings

CAUTION

To reduce the risk of injury, the user must read and understand the instruction manual.

Read all instructions. Failure to follow all instructions listed below may result in electric shock, fire and/or serious injury. The term "power tool" in all of the warnings listed below refers to your mains operated (corded) power tool or battery operated (cordless) power tool, also machines and electric units. Only use the power tool for the purpose for which it was intended, with the due attention to the general safety and accident prevention regulations.

SAVE THESE INSTRUCTIONS.

A) Work area

- Keep work area clean and well lit.** Cluttered and dark areas invite accidents.
- Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases or dust.** Power tools create sparks which may ignite the dust or fumes.
- Keep children and bystanders away while operating a power tool.** Distractions can cause you to lose control.

B) Electrical safety

- Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools.** Unmodified plugs and matching outlets will reduce risk of electric shock. If the power tool comes with an earthed wire, the plug may only be connected to an earthed receptacle. At work sites, in damp surroundings, in the open or in the case of comparable types of use, only operate the power tool off the mains using a 30 mA fault current protected switch (FI breaker).
- Avoid body contact with earthed or grounded surfaces such as pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is earthed or grounded.
- Do not expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.
- Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the power tool. Keep cord away from heat, oil, sharp edges or moving parts.** Damaged or entangled cords increase the risk of electric shock.
- When operating a power tool outdoors, use an extension cord suitable for outdoor use.** Use of a cord suitable for outdoor use reduces the risk of electric shock.

C) Personal safety

- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
- Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication.** A moment of inattention while operating power tools may result in serious personal injury.
 - Use safety equipment. Always wear eye protection.** Safety equipment such as dust mask, non skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.
 - Avoid accidental starting. Ensure the switch is in the off position before plugging in.** Carrying power tools with your finger on the switch or plugging in power tools that have the switch on invites accidents.
 - Remove any adjusting key or wrench before turning the power tool on.** A wrench or a key left attached to a rotating part of the power tool may result in personal injury.
 - Do not overreach. Keep proper footing and balance at all times.** This enables better control of the power tool in unexpected situations.

- Dress properly. Do not wear loose clothing or jewellery. Keep your hair, clothing and gloves away from moving parts.** Loose clothes, jewellery or long hair can be caught in moving parts.
- If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used.** Use of these devices can reduce dust related hazards.
- Only allow trained personnel to use the power tool.** Apprentices may only operate the power tool when they are over 16, when this is necessary for their training and when they are supervised by a trained operative.

D) Power tool use and care

- Do not force the power tool. Use the correct power tool for your application.** The correct power tool will do the job better and safer at the rate for which it was designed.
- Do not use the power tool if the switch does not turn it on and off.** Any power tool that cannot be controlled with the switch is dangerous and must be repaired.
- Disconnect the plug from the power source before making any adjustments, changing accessories, or storing power tools.** Such preventive safety measures reduce the risk of starting the power tool accidentally.
- Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool.** Power tools are dangerous in the hands of untrained users.
- Maintain power tools. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tools operation. If damaged, have the power tool repaired by a qualified expert or by an authorised REMS after-sales service facility before use.** Many accidents are caused by poorly maintained power tools.
- Keep cutting tools sharp and clean.** Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.
- Secure the workpiece.** Use clamps or a vice to hold the workpiece. This is safer than holding it with your hand, and also it frees both hands to operate the equipment.
- Use the power tool, accessories and tool bits etc., in accordance with these instructions and in the manner intended for the particular type of power tool, taking into account the working conditions and the work to be performed.** Use of the power tool for operations different from those intended could result in a hazardous situation. All unauthorised modifications to the power tool are prohibited for safety reasons.

E) Battery tool use and care

- Ensure the switch is in the off position before inserting battery pack.** Inserting the battery pack into power tools that have the switch on invites accidents.
- Recharge only with the charger specified by the manufacturer.** A charger that is suitable for one type of battery may create a risk of fire when used with another battery pack.
- Use battery tools only with specifically designated battery packs.** Use of any other battery packs may create a risk of injury and fire.
- When battery pack is not in use, keep it away from other metal objects like paper clips, coins, keys, nails, screws, or other small metal objects that can make a connection from one terminal to another.** Shorting the battery terminals may cause burns or a fire.
- Under abusive conditions, liquid may be ejected from the battery, avoid contact. If contact accidentally occurs, flush with water. If liquid contacts eyes, additionally seek medical help. Liquid ejected from the battery may cause irritation or burns.**
- Do not use the battery/charger at battery/charger temperatures or ambient temperatures of $\leq 5^{\circ}\text{C}/40^{\circ}\text{F}$ or $\geq 40^{\circ}\text{C}/105^{\circ}\text{F}$.**
- Do not dispose of defective batteries in the normal domestic waste. Take them to an authorised REMS after-sales service facility or to a reputed waste disposal company.**

F) Service

- Have your power tool serviced by a qualified repair person using only identical replacement parts.** This will ensure that the safety of the power tool is maintained.
- Comply with maintenance instructions and instructions on tool replacements.**
- Check mains lead of power tool regularly and have it replaced by a qualified expert or an authorised REMS after-sales service facility in case of damage. Check extension cable regularly and replace it when damaged.**

Specific Safety Warnings

⚠ CAUTION

- Avoid mechanical stress to the device. Do not shake or drop the device. Pressure on the display can damage the device.
- Do not expose the device to temperatures > 60°C or < 20°C; protect against direct sunlight and heaters.
- Protect the device against moisture; only the camera and the camera cable are watertight.
- Keep the device away from children.
- Do not remove the SD-card whilst saving photos/videos or during data transfer to the PC. Data could be lost and the SD-card damaged.
- Do not look directly into the camera lens, danger of blinding!
- Use personal safety equipment (e.g. protective glasses, gloves).
- The push cable is flexible but has a high mechanical tension when it is pulled out of the cable cage or hasp or pushed round a narrow bend. Take care when pulling the push cable from the cable cage or hasp or feeding it back into the cable cage or hasp. It is spring loaded and can recoil. Therefore always place one foot on the tubular frame base of the hasp or the hold the cable cage tightly with one hand and always hold the push cable firmly in the other hand.
- Do not pull the push cable out of the tube by force. Danger of injury!
- Do not kink the push cable. Cable could break!
- Do not pull or push the push cable over sharp edges or sharp pipe ends. Cable damage!
- To clean the cable set, e.g. with a water jet, remove the push cable from the cable cage or hasp and disconnect the controller unit with connecting cable! Do not use a high pressure cleaner as this could damage the camera! The hasp may only be cleaned with a damp cloth.
- Do not insert the camera head with colour camera (23) (Fig. 4 and 5) into bodily orifices or persons or animals.

Use for the intended purpose

⚠ CAUTION

The REMS CamSys electronic camera inspection system is used for the inspection and damage analysis of pipes, drains, chimneys and other cavities, for example, and for documentation of photos and videos on SD card with specification of the date, time and depth of insertion. The depth of insertion is only displayed with the S-Color 30 H camera cable set.

All other uses are not for the intended purpose and are prohibited.

Explanation of symbols



Read the operating instructions **before** use



Power tool complies with protection class II



Environmentally friendly disposal



CE conformity mark

1. Technical Data

1.1. Article Numbers

Camera cable set S-Color 30 H	175011
Camera cable set S-Color 5 K	175014

Case with inlay	175020
Protective cap with mineral glass window, sealing ring	175026
Guide body Ø 62 mm, 2 pieces	175057
Guide body Ø 100 mm	175058

1.2. Application Area

Pipes	Ø 40 – 150 mm REMS CamSys Set S-Color 5 K (Art. No. 175009) Ø 50 – 150 mm REMS CamSys Set S-Color 30 H (Art. No. 175010)
Ambient temperature	–20 to +60°C 0 to +40°C in battery operation

1.3. Camera and Light Source

Image sensor	CMOS
Number of pixels	640 × 480
Field of vision (FOV)	90°
Light sensitivity	0.1 lux
Light source	8 LEDs white
Light intensity	1,700 mcd
Temperature range	–20°C – +60°C
Camera head diameter with colour camera	25 mm
Type of protection camera	IP 67
Camera water-tight	up to 20 m (2 bar/0.2 MPa/29psi)

1.4. Controller Unit

Colour display	3.5" TFT-LCD
Pixels	320 × 240
Video system	PAL / NTSC
Battery	integrated Li-Ion battery 3.7 V, 2.5 Ah
Voltage supply/Charger	100 – 240 V AC, 50 – 60 Hz, input / 5 V DC, 2.5 A, 13 W, output
Temperature range/battery	–20°C – +60°C / 0°C – +40°C
Interfaces	Mini USB 1.1, AV output
Memory medium	SD card
Compression format	MPEG4
Photo memory format	JPEG (640 × 480)
Video memory format	ASF (640 × 480)

1.5. Dimensions

Hasp	505 × 485 × 160 mm
Controller unit	172 × 121 × 58 mm

1.6. Weight

Hasp	4.5 kg
Controller unit	0.4 kg

1.7. Noise Information

Workplace-related emissions value	< 70 dB(A)
-----------------------------------	------------

2. Commissioning

Caution: Mains voltage present! Change the controller unit battery before start-up. To do so, connect the supply voltage/charger to the charger/mains socket (17) (Fig. 2) of the controller unit and a suitable wall socket. Charging with the controller unit switched off can take up to 3 hours depending on the battery charge state. The charging time is doubled when the controller unit is switched on. A fully charged battery lasts for about 2 hours depending on use.

The controller unit of the REMS CamSys can be operated directly with supply voltage/charger. Connect the delivered supply voltage/charger to the charger/main socket (17) (Fig. 2) and a suitable wall socket for this.

Plug the connecting cable (24) (Fig. 4 and 5) into the connecting socket (25) (Fig. 4 and 5) and the connecting socket of the controller unit (19) (Fig. 1) so that the raised plastic ridge slides into the groove of the connecting cable. Tighten the knurled nuts of the connecting cable.

2.1. Inserting the SD Card

Insert the SD card into the card slot (15) (Fig. 2). The gold coloured contact of the SD card must point towards the display. The card snaps into place. To remove the SD card, press it again and it springs out. If the controller unit is switched on when inserting the SD card, the indicator of the available memory capacity (26) (Fig. 1) appears briefly in the display. By pressing the Escape button (3) (Fig. 1) the indicator of the available memory capacity (26) (Fig. 1) appears briefly in the display when the SD card is inserted.

To avoid data loss, the SD card should not be removed during photo/video recording and during data transfer to the PC. This could otherwise be damaged. SDHC cards up to 32 GB can also be inserted.

2.2. Switching On the Camera Inspection System

Keep the On/Off button (2) (Fig. 1) pressed for approx. 3 – 5 seconds. The start screen with the REMS logo appears for about 3 seconds. Then the picture of the pipe camera is displayed. The date, time (27) (Fig. 1), display value of the extended push cable (28) (Fig. 1), zoom factor (29) (Fig. 1) and battery charge indicator (30) (Fig. 1) are displayed continuously on the screen. Additionally, "Camera" is displayed for approx. 5 seconds and the available memory capacity (26) (Fig. 1) if an SD card is inserted.

2.3. Controller Unit Settings

The controller unit has a menu in which different settings can be made, e.g. language, date/time, delete photos/video from SD card.

Open the menu and navigate:

- Press OK button (10) (Fig. 1) to go to the menu. If no further inputs are made within 10 s, the menu is cancelled and the current camera image is displayed.
- Select the desired menu with the Up/Down buttons (4 and 11) (Fig. 1). Then confirm with the OK button (10) (Fig. 1).
- Move back in the menu with the Escape button (3) (Fig. 1), exit the menu with Cancel.

The OK button (10) (Fig. 1) must be pressed to activate the changed settings.

Structure of the main menu:

System Settings: Delete all, video output, date and time, menu language, video format, automatic switch off function and metering.

Delete all:

All files on the inserted SD card are deleted. Single photos/videos cannot be deleted. Select yes in the security prompt with the Up/Down buttons (Fig. 1) (4 and 11) and confirm with the OK button (10) (Fig. 1).

Video output:

Select a suitable display device, e.g. TV set, beamer, for transmission of the analogue video signal. Switch off the controller unit and display device. Connect the delivered video cable to the video out socket (16) (Fig. 2) of the controller unit and the suitable input sockets of the display unit. Read the operating instructions of the display device. Switch on both devices. Open the menu on the REMS controller unit with the OK button (10) (Fig. 1), select "Video output" and confirm with OK. The display (6) (Fig. 1) switches off and the picture is shown on the display device. The video format of the controller unit may have to be adapted; see the Video format menu description for the conversion.

Setting the date and time:

The time and date of the controller unit must be set to see the correct time and date in recorded videos and photos. Select menu (10) (Fig. 1). Go to the input field to be changed with the Down/Up buttons (4 and 11) (Fig. 1), change the value with the Record photo (14) (Fig. 1) and Record video (8) (Fig. 1) buttons. Then confirm your input with the OK button (10) (Fig. 1). The time and date can be shown or hidden on the display additionally in this menu. This setting has no effect on saving of the video/photo recording. If a photo or a video is recorded, the time and date are saved with the photo or video and displayed when playing.

If the controller unit has not been used for a long time, the date and time may have to be reset.

Select Language:

There is choice of 26 different languages. Select the desired language with the Up/Down buttons (4 and 11) (Fig. 1) and confirm with the OK button (10) (Fig. 1).

Video format:

Choose between PAL and NTSC. This setting is necessary if the photo is to be shown on a separate display device, see also Video output menu description. Select the desired video format with the Up/Down buttons (4 and 11) (Fig. 1) and confirm with the OK button (10) (Fig. 1). Read the operating instructions of the display device.

Auto Off:

The time after which the controller unit switches off automatically is set in this menu. If Deactivated is selected, the controller unit always stays on. The following times can be set: 5 min / 10 min / 15 min / 30 min. Select the desired time with the Up/Down buttons (4 and 11) (Fig. 1) and confirm with the OK button (10) (Fig. 1).

Metering:

A sub-menu appears in the Metering menu:

Reset: resets the display value (28) (Fig. 1) of the uncoiled push cable to 0 cm/ INCH

Measure factor: should not be changed. This must be set to 4.

Menu Unit: Choose between cm and inch.

Select the desired sub-menu with the Up/Down buttons (4 and 11) (Fig. 1) and confirm with the OK button (10) (Fig. 1).

2.4. Connecting to a Computer

As soon as the controller unit is connected to the computer with the included USB cable, it is set up as a removable data medium. An appropriate icon is displayed in the computer. The hardware installation may take several minutes depending on the operating system and the computer speed. Minimum requirements of the computer: MS Windows 2000 with Media-Player, or newer. When the device has been set up on the computer the videos and photos can be copied and erased as with a hard disk. After the photos/videos recorded with the controller unit have been copied from the SD card of the controller unit to another memory medium, they can be copied back to the controller unit's SD card but the controller unit does not recognise these files and they are not displayed.

3. Operation

Clean pipe or drain before inspection. Pull the camera head with colour camera (23) (Fig. 4 and 5) carefully out of the cable cage. Do not kink the push cable, danger of breaking!

CAUTION

The push cable has a high mechanical tension when it is pulled out of the cable cage or hasp or pushed round a narrow bend. The push cable is spring loaded and can recoil. Always hold the push cable firmly with one hand. For controlled pulling of the push cable from the cable cage or hasp it is best to hold the cable cage with one hand or put your foot on the tubular base frame of the hasp.

Insert camera head with colour camera, e.g. into the pipe to be inspected. Set the brightness of the LEDs on the camera head if necessary with the LEDs darker button (7) (Fig. 1) and LEDs brighter button (13) (Fig. 1).

The displayed image area of the camera can be reduced/enlarged digitally with the Zoom buttons (5 and 12) (Fig. 1). The currently set value (29) (Fig. 1) is shown on the display. The zoom factor is set to X 1.0 when switching on the controller unit. The zoom factor can be set from X 1.0 in 0.1 steps to up to X 2.0. The higher the number of the zoom factor the bigger the image.

With the Rotate photo button (9) (Fig. 1) the displayed camera image is rotated. After the fourth press of the Rotate photo button, the original camera image is displayed. Setting as for switching on the controller unit.

A photo is saved on the SD card by pressing the Record photo button (14) (Fig. 1).

A video is recorded and saved on the SD card by pressing the Record video button (8) (Fig. 1). The video recording is stopped by pressing the Record video button again. The setting of the Auto Off menu does not react during the video recording, the controller unit does not switch off. At low battery, connect the supply voltage/charger to the charger/mains socket (17) (Fig. 2) of the controller unit and a suitable wall socket.

Push the camera head with colour camera (23) (Fig. 4 and 5) with push cable, e.g. into the pipe to be inspected. The push resistance increases when the camera head meets a pipe bend. To overcome the pipe bend, push the push cable further by moving it forwards and backwards abruptly. Do the same to pull back the camera head.

3.1. Photo and Video Playback

The saved photos and videos are displayed by pressing the Down button (4) (Fig. 1) or Up button (11) (Fig. 1). The photo/video saved last is displayed first. The selected photo is shown immediately on the display. A recorded video is also displayed as a photo. The photo shows the start scene. The Record video button (8) (Fig. 1) has to be pressed to play a video. The Record video button (8) (Fig. 1) has to be pressed again to stop the video playback.

A photo is recognised by the Play photo icon and a video by the Play video icon. A displayed photo/video can be deleted by pressing the OK button (10) (Fig. 1). Select "yes" with the Up/Down buttons (4 and 11) (Fig. 1) and press OK. Press the Escape button (3) (Fig. 1) to exit photo and video playback.



Photo playback icon



Video playback icon

3.2. Switching Off the Controller Unit

Keep the On/Off button (2) (Fig. 1) pressed for approx. 3 – 5 seconds. The display (6) switches off.

3.3. Guide Bodies

When working in large pipe diameters, e.g. in the pipe network, it may be useful to fit 2 guide bodies (accessories) to the camera head with colour camera so that the camera head is not moved directly on the floor of the pipe. The guide bodies Ø 62 (33) (Fig. 6) are clamped to the guide spring at the front and back with a spacing of about 30 mm with the screw (35). The guide body Ø 100 (34) (Fig. 6) is clamped on the guide spring with the screw (35).

4. Maintenance

4.1. Inspection

DANGER

Pull out the mains plug before inspection!

Always keep the device in a clean, dry place. Use a dry, soft cloth to clean the outside surfaces.

Remove soiling carefully, especially in the guide spring. Remove the controller unit (1) (Fig. 1) to clean the cable set (see special safety instructions). Do not use solvents. Check the protective cap with mineral glass window (22) (Fig. 4 and 5) for damage, renew if necessary.

4.2. Maintenance

The device is maintenance-free.

4.3. Repair

DANGER

Pull out the mains plug before doing repairs!

Change the damaged protective cap with mineral glass window (22) (Fig. 4 and 5) on the colour camera head in good time so that the camera head with colour camera is not damaged by penetration by water or dirt. To do this, unscrew the protective cap with mineral glass window (22) and replace with a new protective cap with mineral glass window and sealing ring (accessories). Other necessary repair work may only be performed by an authorised REMS contract service workshop.

5. Troubles

- 5.1. Trouble:** No image on the display after switching on.
Cause: Battery flat. Hasp/controller cable not connected.
Remedy: Charge battery, connect cable.
- 5.2. Trouble:** Display does not change although camera is moved and a button is pressed.
Cause: Screen contents of the display (6) no longer move.
Remedy: Remove screw of the sliding cover from the back of the controller unit housing (Fig. 3). Push out the sliding cover in the direction of the arrow. Lift out the battery carefully. Press the Reset button (21) (Fig. 3) with a bent paper clip for example. The controller unit restarts. Insert the battery, push in the sliding cover up to the stop and turn in the screw.
- 5.3. Trouble:** It is not possible to record photos and videos.
Cause: SD card not inserted.
SD card has activated lock function (write protection).
SD card defective
Remedy: Check SD card for above points.
Check SD card in another device. Use new SD card.
Deactivate lock function (write protection).

6. Disposal

Do not throw the REMS CamSys in the domestic waste after use. Observe the legal regulations.

7. Manufacturer's Warranty

The warranty period shall be 12 months from delivery of the new product to the first user. The date of delivery shall be documented by the submission of the original purchase documents, which must include the date of purchase and the designation of the product. All functional defects occurring within the warranty period, which are clearly the consequence of defects in production or materials, will be remedied free of charge. The remedy of defects shall not extend or renew the warranty period for the product. Damage attributable to natural wear and tear, incorrect treatment or misuse, failure to observe the operational instructions, unsuitable operating materials, excessive demand, use for unauthorized purposes, interventions by the customer or a third party or other reasons, for which REMS is not responsible, shall be excluded from the warranty. Services under the warranty may only be provided by customer service stations authorized for this purpose by REMS. Complaints will only be accepted if the product is returned to a customer service station authorized by REMS without prior interference in an unassembled condition. Replaced products and parts shall become the property of REMS.

The user shall be responsible for the cost of shipping and returning the product.

The legal rights of the user, in particular the right to make claims against the seller under the warranty terms, shall not be affected. This manufacturer's warranty only applies for new products which are purchased in the European Union, in Norway or in Switzerland.

This warranty is subject to German law with the exclusion of the United Nations Convention on Contracts for the International Sales of Goods (CISG).