

CompactPlus



Instruction Manual

Keep for future reference!

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1. GENERAL INFORMATION

1.1 Product Label and Classification

This manual is part of the CompactPlus made by Kummert GmbH. In the event that the device will be resold, the manual is to be handed over to the next owner.

1.2 About the Manual

The manual ensures the safe operation of the device and must be kept in the device's close proximity, immediately accessible for any personnel.

All personnel are to carefully read and understand this manual before taking up work. As a precondition for safe operation, all safety instructions and operational procedures given in this manual must be observed.

Furthermore, the local accident prevention regulations and general safety provisions applicable for the device's range of use are to be heeded.

The instruction manual applies to individuals, who have been trained by the owner and have confirmed such training with their signature. A technical vocational training is not required.

It also applies to trained experts, who have been authorized to put into operation, set up, convert and dismount the device.

1.3 Manufacturer and Support

Manufacturer:

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1.4 Copyright

This manual and all information, photos and drawings contained herein are subject to intellectual property rights by Kummert GmbH.

Their use is permitted while utilizing the device. Any use beyond that is prohibited without the manufacturer's written approval. Date of last edit: January 2014.

1.5 Explanation of Symbols Used

Safety instructions in this manual are indicated by means of symbols. The safety instructions express the extent of the hazard.



WARNING!

Dangerous situation, which may cause death

This combination of symbol and signal word identifies a possibly dangerous situation, which may cause **death or severe injuries** if not avoided.



CAUTION!

Possibly dangerous situation, slight injuries

This combination of symbol and signal word identifies a possibly dangerous situation, which may cause **minor or slight injuries** if not avoided.



NOTE

Possibly dangerous situation, damage to property and environment

This combination of symbol and signal word identifies a possibly dangerous situation, which may cause **damage to property and environment** if not avoided.



TIP

Tips and information, efficient and troublefree operation

This symbol highlights useful tips and information for an **efficient and troublefree operation** of the device.

1.6 Limitation of Liability

All information and instructions given in this manual were compiled in consideration of applicable standards and regulations, the current state-of-the-art technical development and our long-term insights and experiences.

The manufacturer is not liable for damage in the following cases:

- nonobservance of this manual
- improper use of the device
- assignment of untrained personnel
- unauthorized modifications
- technical alterations
- use of unauthorized spare parts

The manual was translated to the best of our knowledge. However, we are not liable for any translation errors. The German version of this manual overrides any translation.

In case of special versions, utilization of additional ordering options or newest technical modifications, the actual scope of delivery may differ from the product explained and illustrated in this document. If you have any questions, please contact the manufacturer.

1.7 Warranty Conditions

The warranty conditions are included in the manufacturer's General Terms and Conditions, which you can find under www.kummert.de.

2. SAFETY

2.1 Proper Use

The device is solely intended to be used for the inspection of cleaned water and sewer pipes in combination with original accessories and components made by Kummert GmbH. Without prior agreement by the manufacturer in writing, inspections of pipes at industrial plants, etc. are considered improper use of the device.

Observing all instructions given in this manual constitutes yet another aspect of proper use. Any use of the device beyond and/or other than the above specified application is considered improper use.

2.2 Basic Risks

The following chapter lists residual risks which remain, even when the device is used in a proper manner.

To reduce the risk of personal injuries and property damage and avoid dangerous situations, the safety instructions listed below as well as the safety instructions listed in the sections to come are to be observed strictly!



WARNING!

Hazard of chemical or biological materials/liquids!

When inspecting pipes that hazardous materials/liquids run through, observe the following:

- Start the inspection only once it has been determined that no danger will arise from the materials or liquids.
- Rinse pipes before the inspection with a suitable liquid (e.g. water).
- Adhere to the Material Safety Data Sheets (MSDS) on the chemical materials/liquids.
- Clean the push rod thoroughly after each use.



WARNING!

Explosion hazard!

The device is not explosion-proof. Therefore:

- Never operate the device in an explosive atmosphere. In this context, also make sure that the pipes to be inspected do not contain or leak explosive gases/liquids.



WARNING!

Electrical hazard!

Electric current may cause most severe injuries or death. Therefore:

- Always de-energize the device before performing work on it (e.g. cleaning it).
- In case of damaged insulation or individual components, there is a risk of death by electric shock. Stop the inspection immediately and send the device in for repairs.



CAUTION!

Risk of injury!

Dirt and scattered objects constitute slip and stumble hazards. Falling accidents may cause injuries.

- Always keep work area clean.
- Remove objects no longer needed from work area, particularly from ground level.
- Mark unavoidable stumble-risk areas with noticable tape.

2.3 Behavior in the Event of Danger and Accidents

First-aid equipment (first-aid kit, eye rinsing bottle, etc.) and a fire extinguisher must be stored in close proximity. All personnel must be familiar with the use and location of safety, accident reporting, first-aid and rescue equipment.

This ensures the prevention of dangers and the best possible help in the event of accidents.

The device requires a responsible and circumspect operation. Incorrect operation or operation by unauthorized individuals endangers others.

2.4 Responsibility of the Owner

Owner is the person, who him-/herself operates the device for industrial or business purposes or leaves the device to a third party to be used, and who, during the device's operation, bears legal product responsibility for the protection of the operator, all personnel or third parties.

Owner responsibilities

The device is being deployed in the industrial field. Therefore, the owner of the device is required to comply with occupational safety regulations.

In addition to the safety instructions in this manual, the regulations for safety and accident prevention, as well as the environmental regulations, effective at the device's area of application must be observed.

Furthermore, the following applies:

- The owner is to gather information on the applicable occupational safety regulations and to identify additional risks, which result from specific working conditions at the device's place of operation, in a risk assessment. In a company directive, the owner is to specify any additional procedure and safety instructions resulting from the risk assessment.
- During the device's entire time of operation, the owner is to verify, whether the company directives issued by him/her comply with the current version of regulations, and to conform them if necessary.
- The owner must precisely direct and define the responsibilities in respect of installing, operating, troubleshooting and cleaning the device.
- The owner is to ensure that all individuals handling the device have read and understood this manual. Furthermore, the owner must periodically train all personnel and inform them about the dangers.
- The owner has to provide the personnel with the necessary protective equipment and must require the mandatory wear thereof.

- Furthermore, the owner bears responsibility that the device is in a technically sound state at all times. Therefore the following applies:
The owner is to ensure that the instructions on transporting, storing and cleaning the device are being observed as described in this manual.

2.5 Personnel Requirements

Qualifications

Only individuals who can be expected to do their work in a reliable manner are authorized to work on or with the device. Individuals, whose reactions are impaired, e.g. by drugs, alcohol or medication, are not authorized.

Training

The owner must periodically train all personnel. For best-possible tracking purposes, training minutes must be drawn up with the following minimal contents:

- Date of training
- Name of trainee(s)
- Training objectives
- Name of trainer
- Signatures of trainee(s) and trainer



WARNING!

Risk due to insufficiently qualified individuals!

Insufficiently qualified individuals cannot assess the risks when handling the device and subject themselves and others to the risk of severe or deadly injuries.

- All work must be conducted by qualified individuals only.
- Insufficiently qualified individuals must be kept out of the work area.

2.6 Personal Protective Equipment

Personal Protective Equipment protects individuals against occupational health and safety infringements.

Throughout work, individuals working with or on the device are required to wear their personal protective equipment, which is, in particular, being pointed out in the individual chapters of this manual.



Protective Gloves

Protective gloves protect hands against friction, abrasions, punctures or deeper injuries, as well as contact with hot surfaces.

2.7 Spare Parts

Spare parts can be obtained from authorized dealers or directly from the manufacturer (see chapter “1.3 Manufacturer and Support”).



NOTE

Risk of injury due to using incorrect spare parts!

The use of incorrect or faulty spare parts may pose a risk to the personnel, as well as cause damage, malfunctions or breakdown.

- Use only original spare parts supplied or authorized by the manufacturer.
- Always contact the manufacturer in case of questions.



TIP

Loss of warranty!

Use of unauthorized spare parts will void the manufacturer's warranty.

3. BRIEF DESCRIPTION

3.1 CompactPlus

The CompactPlus can be utilized for applications in the field of sewer rehabilitation, as well as a fully documented CCTV inspection of domestic pipework. The base unit can be operated with all reels and camera heads from the Kummert range of products.

The tiltable, daylight viewable 8.4“ monitor provides you with the correct viewing angle at all times, regardless of your operating position. For easy transport, simply fold back the monitor.

In addition to images of damage in JPEG format, the CompactPlus records MPEG2 videos, which you can mark in respective places during inspection. The project is created standard-free and directly on a USB thumb drive (currently 32 GB), and is saved there with the video and damage photos. The integrated meter count is displayed on screen, in the video and damage images. The light can be adjusted automatically or manually depending on the mounted camera head.

The integrated battery facilitates up to 2 hours of battery-supplied operation. After only 2 hours of charging, the battery is ready for its next use.

3.2 Push Rods

All reels feature a glass-fiber reinforced plastic rod. The length and thickness is different for each reel type and can be found in the specifications table (see chapter “13.3 Push Rods”).

An integrated impulse transmitter facilitates a precise length measurement in connection with a micro controller. The adjustable freewheel brake prevents unwanted coasting of the push rod during inspection. Furthermore, a tubular attached to one side of the reel houses the mounted camera.

All Kummert cameras and push rods are interchangeable. However, to guarantee optimal push performance and pipe bend mobility, the manufacturer's recommendations for the combination of camera and push rod on the next page should be followed.

DN50 and up = push rod H-S30 + camera K-35

DN70 and up in connection with K-35 centering sleeve

DN100 and up in connection with K-35 centering trolley

DN70 and up = push rod H-M50 + camera K-50

DN100 and up in connection with K-50 centering sleeve

DN100 and up = push rod H-L60 + cameras K-70 or K-70L

DN150 and up in connection with K-70/K-70L centering trolley

DN200 and up in connection with K-70/K-70L centering trolley with additional lighting

DN100 and up = push rod H-XL75 + CamFlex® or push rod H-XXL100 + CamFlex®

4. OVERVIEW

4.1 CompactPlus



- 1 Carrying handle
- 2 Reel with push rod
- 3 Connecting socket reel
- 4 Camera head
- 5 Monitor cover/Sun shield
- 6 Monitor
- 7 Control panel
- 8 USB port
- 9 Battery pack

4.2 Monitor Rear Side



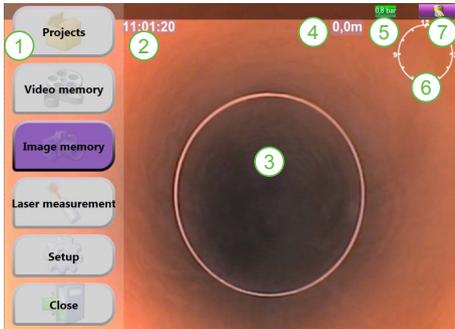
- 1 BNC port with protective cap
- 2 Network port with protective cap
- 3 Identification label

4.3 Overview Control Panel CompactPlus



- 1 Power button
- 2 Power light
- 3 Menu control knob
- 4 Reset/Align button
- 5 Light regulator
- 6 3-axis-joystick

4.4 Overview Software Control Panel CompactPlus



- 1 Menu bar
- 2 Time
- 3 Video/Image display
- 4 Meter count
- 5 Pressure display (applies to K70/K70L only)
- 6 Viewing direction camera
- 7 Battery display

4.5 Overview Push Rods/Reels



- 1 Push rod
- 2 Reel basket
- 3 Reel lock
- 4 Freewheel brake
- 5 Tubular
- 6 Connecting plug
- 7 Reel fastening hooks

5. TRANSPORT, PACKAGING AND STORAGE

5.1 Safety Instructions for Transport



NOTE

Property damage due to improper transport!

Improper transport may damage the devices. Therefore:

- Always transport the reel/push rod reeled in.
- When transporting the devices in a vehicle, secure them against falling over or rolling around.
- Dismount cameras for transport and store them in their designated carrying case.



CAUTION!

Risk of injury!

Falling objects during transport and loading/unloading constitute a risk of injury. Therefore, strictly observe the following safety instructions:

- Never lift loads over people.
- Always move the device with utmost care and caution. Carry the device only by its carrying handle.

5.2 Inspection upon Receipt

The delivery is to be inspected for completeness and possible transport damage immediately upon receipt.

If damage is externally visible, take the following steps:

- Do not accept delivery or accept it under reserve.
- Indicate the suspected damage in the carrier's documents or delivery slip.
- Institute a claim.



TIP

Legal time for claims

Report every fault as soon as it has been discovered. Claims for damages can only be asserted within the legal time for claims. The manufacturer is not liable for transport damage.

5.3 Packaging

The devices are being delivered in different packaging. Packaging materials primarily consist of cardboard and plastics (foil, foam).

They may also comprise materials added to the packages for the protection against moisture or frost (e.g. silica gel bags, antifreezing agents).

Unless recovery of packaging has been agreed upon, the packaging materials remain with the customer.



NOTE

Danger to the environment due to incorrect disposal!

Packaging materials are precious resources and, in many cases, can be reused or recycled. Incorrect disposal of packaging materials may cause damage to the environment.

- Dispose of packaging materials in an environmentally safe manner.
- Dispose of packaging materials according to applicable legal regulations and local directives. If necessary, a specialist firm must be commissioned to dispose of the materials.

5.4 Storage

The devices and accessories must be stored under the following conditions:

- Do not store outdoors.
- Store in a dry and dust-free place.
- Do not expose to aggressive media.
- Do not expose to direct sunlight.
- Storage temperature: 0° to +40° C
- Store the device over a longer period only with a fully charged battery and at least once a month, fully charge the battery to avoid damage.
- When storing the device for more than 3 months, periodically check the general condition of all parts.

6. MOUNTING AND DISMOUNTING



NOTE

Property damage due to faulty mounting and dismounting!

Faulty mounting and dismounting may cause property damage or total breakdown.

- Prior to mounting, ensure that the connectors are completely dry.
- Prior to connecting, check the connectors for dirt and damage.
 - If the connectors are dirty, clean them.
 - If the connectors are damaged, refrain from mounting and using the device and arrange for repairs.
- Check the O-rings for damage like tears and porosity to ensure that the plug-and-socket connection will seal correctly.

6.1 Mounting/Dismounting Reel

Unless already done, connect the desired camera head to the push rod before mounting the reel onto the base unit (see chapter “6.2 Mounting/Dismounting the Camera“ in the manual for the respective camera).

Mounting

Check stand: Ensure that the base unit is positioned in a stable manner and cannot fall over.



Fig. 1

Hook in reel: Place the reel hooks (Fig. 1) onto the reel beam.

Remove protective caps: If applicable, remove the protective caps from the reel's plug and the base unit's socket.



Fig. 2

Connect reel: Connect the reel's plug (Fig. 2) with the socket on the CompactPlus. Make sure the plug is positioned correctly. This is the case when the red dot on the plug is aligned with the red dot on the socket.

Dismounting

To dismount the reel, proceed in the reverse order.

6.2 Applying Freewheel Brake

The reels possess a freewheel brake to regulate the push rod's free movement. Thus, unwanted coasting of the push rod and unreeling impediments can be avoided.



Fig. 3

Release: Turn the wing nut (Fig. 3) counterclockwise to reduce the braking force of the freewheel brake.

Apply: Turn the wing nut (Fig. 3) clockwise to increase the braking force of the freewheel brake.

6.3 Applying/Releasing Reel Lock Pin

The reels can be locked via the reel lock pin to prevent accidental unreeling of the push rod.



Fig. 4

Release: Turn the knob for the reel lock (Fig. 4) while holding the push rod or reel. The lock pin releases the reel.

Apply: Turn the knob for the reel lock (Fig. 4) in the opposite direction. The lock pin now pushes into the reel basket.

6.4 Unreeling/Reeling In Push Rod



Fig. 5

Unreeling

Release reel lock pin: See chapter “6.3 Applying/Releasing Reel Lock Pin”

Unreel push rod: Carefully pull on the camera head to unreel the push rod (Fig. 5).

Adjust freewheel brake: If the push rod moves in a manner too hard or too easy, adjust the braking force of the freewheel brake (see chapter “6.2 Applying Freewheel Brake”).

Reeling In

Reel in push rod: Push the rod back towards the reel to reel it in. As soon as the reeling in starts, clean the rod with a moist, clean cloth.

Apply reel lock pin: See chapter “6.3 Applying/Releasing Reel Lock Pin”.

7. INITIAL OPERATION

Protective equipment: protective gloves



NOTE

Property damage due to incorrect initial operation and use!

Incorrect initial operation and use of the device may cause property damage or total breakdown.

- Always place the device firmly on the ground to keep it from falling over and becoming damaged.

7.1 Transporting the devices



Fig. 6

Wind up power cord: For transporting the device, wind up the power cord on the cable run (Fig. 6).



Fig. 7

Tilt monitor into transport position: Pull the lock pin to the left of the monitor out and hold it. Tilt the monitor until the lock pin engages with the last hole (Fig. 7).

Tip and roll: Take the device by its carrying handle, slightly tip it forward and roll it.



NOTE

Property damage to camera!

Dismount the CamFlex® before tipping and rolling the CompactPlus, thus keeping the camera from dragging across the ground. During transport, store the camera in its carrying case!

Car transport: Thanks to its compact design, the device can also be transported in smaller-sized passenger cars. Prior to this, dismount the reel.

7.2 Preparation

Mount reel: Mount the reel already connected to the desired camera head (see chapter “6.1 Mounting/Dis-mounting Reel”).



Fig. 8

Connect power cord for mains operation: Connect the power cord to the power supply system. For battery operation, skip this step.

Tilt monitor into operating position: Adjust the monitor's tilt angle to accommodate your operating position.

Open monitor cover: Flip the monitor cover upwards (Fig. 8). If need be, adjust its position to use it as a sun shield at the same time.

Connect USB thumb drive: Plug the USB thumb drive into the designated port at the monitor's underside.



NOTE

Risk of property damage when tilting the monitor!

If a USB thumb drive is connected to the designated port, it may break off when the monitor is being tilted into transport position. Therefore:

- Upon work conclusion, remove the USB thumb drive.
- Use the supplied USB thumb drive. Its dimensions are smaller than those of common retail models.

Switch device on: Push the Power button on the device's control panel (see chapter “4.3 Overview Control Panel CompactPlus”). While the system is booting up, the monitor displays respective Windows messages. The Software starts automatically. The device is operational once the camera picture is visible on screen.



Fig. 9

Exchange camera head: If a camera head is to be exchanged while the device is running, click the option **Camera off** first. Having connected the new camera head, the menu displays the buttons **Camera on** and **Close** (Fig. 9).

The option **Camera on** turns the camera on - the camera picture displays on screen. Use the option **Close** to shut the device down.

8. WORKING WITH THE COMPACTPLUS

8.1 Control Panel

8.1.1 Utilizing the Menu Control Knob

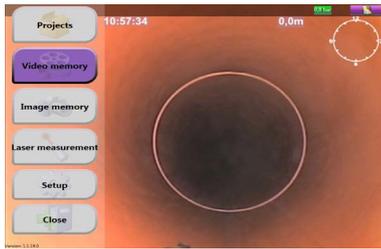


Fig. 10

Generally, on the left side of the screen a menu is displayed with several options to choose from (Fig. 10).

If no selection is made, the display is hidden after a few seconds. By moving the joystick (Fig. 11/1) or Menu knob (Fig. 11/3), the display reappears.



Fig. 11

Selecting command: Turn the Menu knob (Fig. 11/3) to the left or right until the desired option is highlighted in purple.

Invoking command: Push the Menu knob down (Fig. 11/3) to confirm the selected option.

8.1.2 Adjusting Image Brightness

The camera heads feature LEDs to facilitate the illumination of the area to be inspected. When using the cameras K-50, K-70, K-70L or CamFlex®, it is possible to adjust the shutter speed and thus the image brightness via a dimmer switch (Fig. 11/2):

Darker image: Turn the dimmer switch (Fig. 11/2) counterclockwise. After overexposing at first, the camera then reduces the illumination. The image becomes darker.

Brighter image: Turn the dimmer switch (Fig. 11/2) clockwise. The image becomes brighter.

Automatic mode: In order to use the automatic mode (automatic shutter control), turn the dimmer switch (Fig. 11/2) clockwise as far as it will go. Before reaching the automatic mode, the image is briefly overexposed.

8.1.3 Controlling and Aligning Camera

The joystick (Fig. 11/1) is utilized to pan and tilt the camera heads K-70 and K-70L. The CamFlex® warps according to the direction the joystick is being moved to.

Furthermore, the cameras K-70, K-70L and CamFlex® can be manually focussed by slightly turning the joystick's cap to the left or right.

Panning the K-70/K-70L: Push the joystick (Fig. 11/1) to the left or right to pan the K-70 or K-70L to the left or right around its longitudinal axis.

Tilting the K-70/K-70L: Push the joystick up or down to tilt the K-70 or K-70L around its lateral axis. The tilt range is endless.



TIP

Tilting the K-70/K-70L

The camera head can only be tilted once it has been panned and, therefore, is no longer in zero position.



Fig. 12

Warping the CamFlex®: Push the joystick (Fig. 12/1) to the left, right, up or down to warp the CamFlex® in the respective direction. The camera can be warped in normal operation mode or hold position operation mode.

The switch from normal to hold position operation mode is performed manually. To do so, briefly push down on the Reset button (Fig. 12/2).

Focussing the K-70, K-70L or CamFlex®: Turn the joystick cap (Fig. 12/1) clockwise or counterclockwise to focus the cameras K-70, K-70L or CamFlex®. Turn it counterclockwise in order to focus on an area close-by, turn it clockwise to focus on an area further away.

Aligning: Push the Reset button (Fig. 12/2) to restore the zero position for the cameras K-70 and K-70L.



TIP

Aligning the camera

The camera should be aligned after each observation to ensure that the camera rests on its nose. Besides protecting the lens, the camera head glides through the pipe more smoothly.

8.2 USB, BNC and Network Ports

The CompactPlus features a USB port at the monitor's underside. All data is saved directly on the USB thumb drive.

Using the network port on the monitor's rear side, the CompactPlus can be connected directly to a network for data export.

Via the BNC port (analog video out) on the monitor's rear, image devices like monitors or recorders can be connected.

If an external installation facilitates a video input, it may also be connected as long as it is designed conforming to standards. In this case, however, no text will be inscribed in the video, i.e. the information texts or meter count are missing in the video.

8.3 Battery Operation

Operating time: The CompactPlus features a battery pack, which offers an operating time of approx. 2 hours, depending on the ambient temperature. At low temperatures, however, the capacity drops and, consequently, the operating time will be shorter. The battery's self-discharge increases at the same time.

Charging process: As soon as the CompactPlus is connected to the mains, the battery pack starts to charge. The power light is blinking signaling the charging process, which may take up to 2 hours.



TIP

Charging temperature

For safety reasons, the battery pack may only be charged at temperatures between 0° C and 40° C. Charging is deliberately prevented beyond this temperature range.

The battery pack does not function below 0° C and the power light will blink rapidly.

Switch between mains and battery operation: To switch from mains to battery operation during an inspection, simply unplug the power cord. To switch back to mains operation, reconnect the power cord to the power supply system.



TIP

Battery operation

Prior to switching the device to battery operation, make sure that the battery is sufficiently charged.

Battery charging level: The monitor displays the battery's charging level in the top right corner (see chapter "4.4 Overview Software Control Panel CompactPlus").

8.4 Software Operation

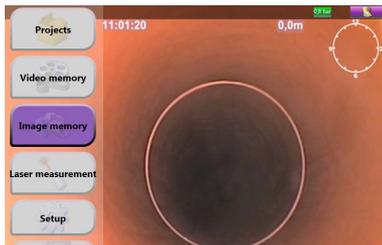


TIP

Data storage

In order to record videos, projects and take photos with the CompactPlus, a USB thumb drive must be connected. All data is saved directly to the USB thumb drive.

8.4.1 Taking Photos



A click on the button **Image memory** (Fig. 13) opens a submenu.



Fig. 14

Use the option **New photo** (Fig. 14) to record a damage photo.

In a list below the menu options, each image displays as a separate button along with the date and time they were taken at. To view a photo, click on the respective button and the image is displayed on screen.

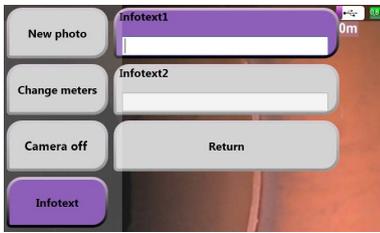


Fig. 15

Via the option **Infotext** (Fig. 15), up to 2 texts can be entered, which will then display in the photo. For text entry, select the respective Infotext field and enter the text via the keyboard dial plate.

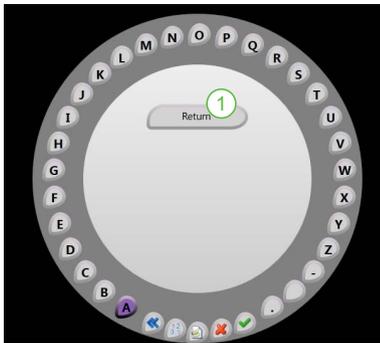


Fig. 16

To **select the needed letter/command**, turn the Menu knob. **Confirm** the selection by pushing the Menu knob.

- Return to previous window
- Switch to number dial plate
- Switch to text memory displayed in center of dial plate
- Delete entry
- Accept entry

Use the button **Return** in the center of the dial plate (Fig. 16/1) to switch from the text memory back to the dial plate.

8.4.2 Recording Videos

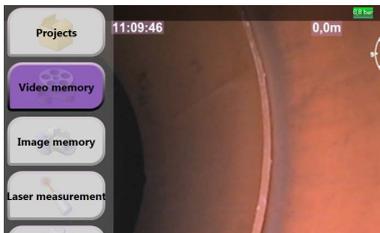


Fig. 17

A click on the button **Video memory** (Fig. 17) opens a submenu.



Fig. 18

In a list below the menu options, each video displays as a separate button along with the date and time they were recorded at (Fig. 18/1). Select and confirm a button to view a video.

The option **New video** (Fig. 18) opens a submenu (Fig. 19, page 20).



Fig. 19

Right after pushing the button **Start recording** (Fig. 19), the monitor displays the video image with the recording time and meter count.

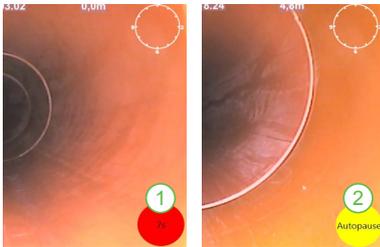


Fig. 20

The red circle in the bottom right corner of the monitor (Fig. 20/1) counts down the time remaining until the autopause sets in, starting at 10 s. If the autopause is active, the circle displays yellow (Fig. 20/2).

The system restarts recording as soon as the meter count changes.

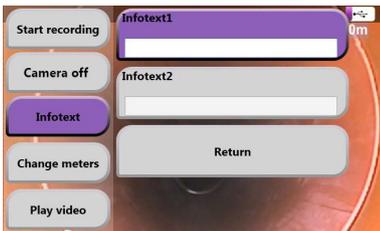


Fig. 21

The option **Camera off** de-energizes the camera and halts the recording process.

Via the option **Infotext** (Fig. 21), up to 2 texts can be entered, which will then display in the video. For text entry, select the respective Infotext field and enter the text via the keyboard dial plate.



Fig. 22

Use the button **Photo** (Fig. 22/1) to take a photo, which is then saved to the image memory. To view the photo, goto the **main menu** and select the option **Image memory**. A list below the menu options displays each image as a separate button along with the date and time it was taken.

Use the button **Change meters** (Fig. 22/2) to adjust the current meter count.

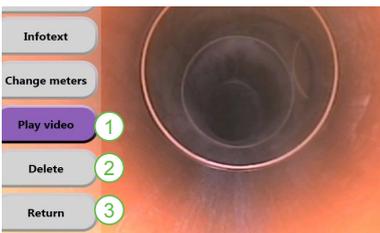


Fig. 23

If, during recording, the button **Play video** (Fig. 23/1) is pushed, recording stops and the video recorded so far plays.

Use **Delete** (Fig. 23/2) to delete the current video.

Use the option **Return** (Fig. 23/3) to get back to the main menu.

8.4.3 Creating Projects



TIP

Reviewing projects

When recording surveys with the CompactPlus as projects, you can afterwards edit the data on a PC using the software can2D/can3D®. Subsequent text overlay, report printouts, as well as creating a viewer DVD for your customer are among the options available to you.



Fig. 24

A click on the button **Projects** (Fig. 24) in the main menu opens a submenu, with the option to create a **New project**.



Fig. 25

A click on the button **New project** (Fig. 25) requires the name of the survey to be entered via the keyboard dial plate. Survey numbers within a project are issued automatically and in a consecutive manner.

Projects saved on the USB thumb drive so far are listed by project name below the menu options (Fig. 25/1). When selected and accepted, an existing project can be opened.

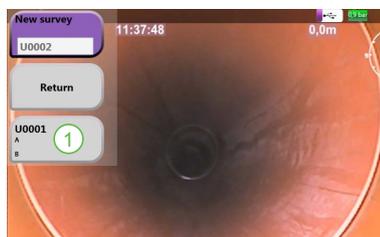


Fig. 26

Once an existing project opens, recorded surveys display in a list below the menu options (Fig. 26/1). A survey can be opened by selecting and accepting it.

Use the button **New survey** (Fig. 26) to start a survey. The software requires the following fields to be filled in: *place, street, upper/lower point, direction of flow, material, diameter and type of water.*



Fig. 27

When all required data has been entered, push the button **Start recording** (Fig. 27).



Fig. 28

At first, specify the meter count.

Choose the respective starting point via the buttons **0.0 m**, **-0.5 m** or **Current meter count** (Fig. 28). Having accepted the selection, recording starts.



Fig. 29

The recording time (Fig. 29/1) and current meter count (Fig. 29/2) display on screen.

The red circle in the bottom right corner of the monitor (see page 20, Fig. 20/1) counts down the time remaining until the autopause sets in, starting at 10 s.

If the push rod or camera are moved, the autopause stops and recording is taken up again.

8.4.4 Project Entries



Fig. 30

Use the option **Observation** (Fig. 30) to open a submenu.

If a marking (Fig. 30/1) is set, it can subsequently be assessed according to official standards using the software can2D/can3D®.

Use the buttons **Bend**, **Branch** and **Fitting** to enter these elements directly. The next screen displays a dial plate, where you can select the position of the elements and confirm your entry.



Fig. 31

If the camera K-70L is connected, use the button **Laser measurement** (Fig. 31/1) to determine the pipe's internal diameter. Keep the camera still until a full rotation has been completed.

Lay the displayed yellow circle by means of the joystick around the red laser beams (Fig. 32). Adjust the size of the yellow circle by twisting the joystick's cap.

The measured value displays in yellow font in the bottom right corner of the monitor. Use the button **Observation** to set a marking. Use the option **Return** to get back to the project menu.



Fig. 32



TIP

Laser measurement

The laser measurement can be performed within a project, as well as separate from it via the respective option in the main menu.



Fig. 33

The option **Camera off** (Fig. 33/1) de-energizes the camera.

Use the button **Change meters** (Fig. 33/2) to adjust the current meter count.

The button **Play video** (Fig. 33/3) stops the current recording process and plays the video recorded so far.

The button **End** (Fig. 33/4) stops the video recording, as well as the survey.

8.4.5 Setup

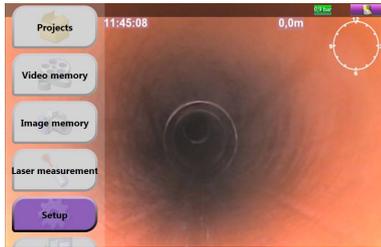


Fig. 34

In the main menu, select the button **Setup** (Fig. 34). A submenu opens.



Fig. 35

Use the button **Language** (Fig. 35) to select the one needed from a list of available languages. To confirm your selection, the device needs to be shut down and restarted.



Fig. 36

Use the options **Time** (Fig. 36/1) and **Date** (Fig. 36/2) to adjust the time and date settings.

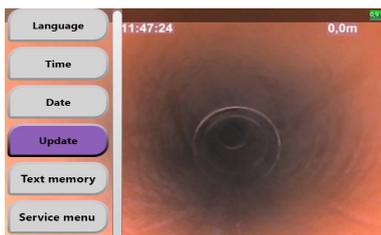


Fig. 37

Prior to installing an update, the respective file has to be downloaded from our homepage www.kummert.de and saved to the USB thumb drive.

Connect the USB thumb drive to the CompactPlus and install the new software version using the button **Update** (Fig. 37).



Fig. 38

Entries made via the keyboard dial plate are available as future options in the **Text memory** (Fig. 38).

To transfer the text memory onto another device, export it onto a USB thumb drive via the button **Export** (Fig. 38/1). Connect the USB thumb drive to the other base unit and transfer the text file via the option **Import** (Fig. 38/2).



Fig. 39

The button **Service menu** (Fig. 39/1) is used for internal purposes, in case the device is sent in for repairs.

Use the button **Set meter count to 0** (Fig. 39/2) to zero the meter count even if no video or project is being recorded.

8.5 Work Conclusion

Use the option **Close** in the main menu to shut down the device. Remove the USB thumb drive for office review.



NOTE

Loss of data due to incorrect removal of the USB thumb drive!

Never remove the USB thumb drive while recording a video or project as this may damage the videos/projects. Remove the USB thumb drive only after the device has been shut down properly.

To review your data at your PC, please refer to the *Quick User Guide Software can2D/can3D®*.

9. CLEANING AND MAINTENANCE



NOTE

Property damage due to incorrect cleaning!

Incorrect cleaning may cause property damage or total breakdown. Therefore:

- Clean the camera, reel and base unit only in a de-energized state.
- **Never** use a **high-pressure washer** or similar means for cleaning.
- Do not use abrasive, corrosive or other aggressive detergents.
- Clean the devices after each use.
- Make sure that neither dirt nor moisture penetrates the connectors.
- Do not soak the devices in disinfectant or rubbing alcohol over a longer period of time (e.g. overnight).

9.1 CompactPlus

Clean the base unit with a moist, clean cloth (if need be, using a mild detergent). Make sure that no moisture penetrates the reel connecting socket. To do so, seal the connecting socket with the designated protective cap (see chapter "12. Accessories", Art.-No. 7297).

9.2 Push Rods/Reels

In order to keep moisture away from the connectors, cover them with the designated protective caps (see chapter "12. Accessories", Art.-No. 5916 and 7298).



TIP

Protective cap

The protective cap for the reel's connecting plug to the base unit is not supplied. However, the protective cap is available as an accessory (Art.-No. 7298).

10. TROUBLESHOOTING

Base Unit

Device inoperable	Mains operation: check plug for correct fit Battery operation: recharge battery
Monitor not showing camera picture	Connect camera head Check connection of push rod and camera
Black and white monitor picture	Shut down and boot up the device
Faulty meter count	Reel in rod completely; then shut down and boot up the device
Error message when recording photos, videos, projects	Ensure that USB thumb drive is connected
Software crash	Push Power button for 3 s until power light goes out; afterwards, system shuts down automatically

Push Rod/Reel

Reel blocked	Check if an object extends into the basket and remove it if needed; Release reel lock pin
Rod unreeling with difficulty	Loosen freewheel brake
Rod not unreeling	Release reel lock pin and/or loosen freewheel brake
Rod unreeling uncontrollably	Fasten freewheel brake

Other faults

**Please contact our Technical Support:
Phone: +49 (0) 9382 9727 - 710**

11. DISPOSAL

When the device has reached the end of its useful life, it has to be disassembled and disposed of in an environmentally safe manner.

Unless both parties agreed otherwise on recycling or disposal, all components must be properly dismantled and recycled as follows:

- Scrap any metal parts.
- Recycle any plastic parts in the appropriate manner.
- Dispose of all other components separately depending on the nature of material.



NOTE

Danger to environment due to incorrect disposal!

Incorrect disposal may cause dangers to the environment. Therefore:

- Electrical waste, electronic components, lubricants and other substances may only be disposed of by certified specialist companies.
- When in doubt, ask for information on environmentally safe disposal at your local authorities or specific waste management companies.

12. ACCESSORIES



Protective cap for connecting plug of push rod

Art.-No. 5916



Protective cap for 7-pin socket of base unit

Art.-No. 7297



Protective cap for 7-pin plug of reel.

Art.-No. 7298



External text inscription incl. BNC and RS232 interface for submitting video signal and meter count to a third-party software

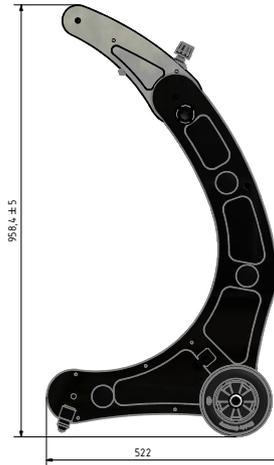
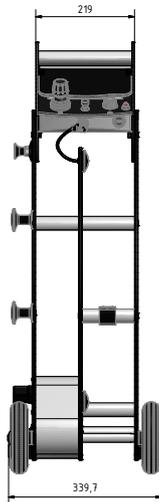
Art.-No. 15344

13. SPECIFICATIONS

13.1 CompactPlus

Dimensions (W x H x L)	340 mm x 960 mm x 520 mm
Weight	11.8 kg
Housing	plastics, aluminum
Monitor	daylight viewable 8.0" LCD-TFT color display, antireflection, resolution 800x600
Control camera	3-axis-joystick
Storage media	32 GB USB thumb drive
Video/still image format	MPEG2/JPEG
Power supply	AC 100-240 V; 47-63 Hz; max. 150 W
Storage temperature	0° to +40° C
Operating temperature	0° to +40° C

Dimensions:



13.2 Battery Pack

Lithium-ion batteries	16.5 V; 7.5 Ah
Charging temperature	0° to +40° C
Operating time	approx. 2 hours
Charging time	approx. 2 hours

13.3 Push Rods

	H-S30	H-M50	H-L60	H-XL75	H-XXL100
Weight	approx. 4.2 kg	approx. 6 kg	approx. 7.9 kg	approx. 12 kg	approx. 15 kg
Diameter	6 mm	7 mm	8 mm	9 mm	9 mm
Length	30 m	50 m	60 m	75 m	100 m
Reel diameter	41 cm	46 cm	53 cm	67 cm	67 cm
Minimum bending radius	180 mm	210 mm	250 mm	290 mm	290 mm
Meter counter	reflex light barriers and micro controller				
Brake	adjustable freewheel brake, reel lock pin				
Storage temperature	0° to +50° C				
Operating temperature	0° to +40° C				

Manufacturer:

KUMMERT

CREATING PROGRESS TOGETHER

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