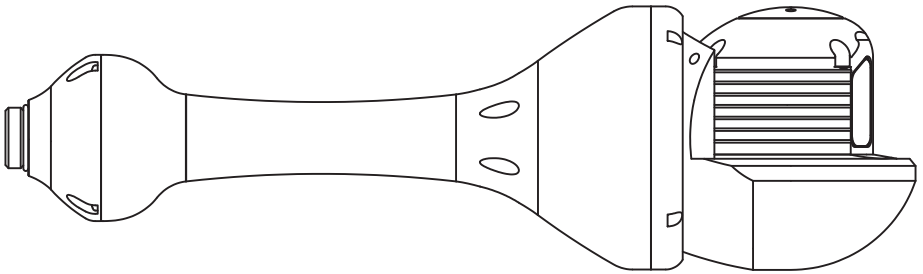


K - 7 0 HD



BEDIENUNGSANLEITUNG

K-70 HD

DE

INSTRUCTION MANUAL

K-70 HD

EN

EN

English

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Keep the manual for future reference!

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INTRODUCTION

About the manual

The manual ensures the safe operation of the devices and must be kept in the devices' 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 devices' range of use are to be heeded.

Explanation of symbols

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



WARNING

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



CAUTION

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



NOTE

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



TIP This symbol highlights useful tips and information for an efficient and trouble-free operation of the device.

SAFETY

Proper Use

The devices are 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. Any other use of the devices considered improper.

Target group

This manual is addressed to skilled sewer and pipe inspectors or individuals with a comparable, documented qualification.

Safety information

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



WARNING

Electrical voltage!

In case of damaged insulation or other components, there is a risk of death by electric shock. Therefore:

- Always disconnect the device from the push rod before performing work on it (e.g. cleaning it).
 - In case of any damage, stop the inspection immediately and have the device repaired by a certified service centre.
-
-



WARNING

Risk of blinding!

The camera's LED can blind the eyes. Therefore:

- Never point the camera at vehicles, individuals or yourself.
-
-



WARNING

Laser radiation hazard!

Laser radiation can harm the eyes. Therefore:

- Do not look into the laser beam.
 - Never point the camera at vehicles, individuals or yourself.
-



WARNING

Risk of photosensitive seizures!

During operation, the camera's LEDs are being flashed. This may cause epileptic seizures or impair consciousness with light-sensitive individuals and may even affect people who are not suffering from epilepsy. Therefore, absolutely observe the following:

- Never look directly into flashing LEDs
- Never point flashing LEDs at individuals or motorists, etc.
- If epilepsy-like symptoms occur, disrupt all work immediately and consult a doctor
- Always operate the camera with permanent light when it is outside a closed pipe

PREPARATION

Delivery



TIP Claims for damages can only be asserted within the legal time for claims. Report every fault as soon as it has been discovered.

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

The standard scope of delivery of K-70 HD includes:

- K-70 HD
- Protective cap
- Air pump
- Centering trolley DN 150
- Centering trolley DN 200
- Key
- Instruction manual

Packaging



TIP Keep the packaging material for storage or transport.

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

Storage

Always store the device under the following conditions:

- Do not store outdoors.
- Store in a dry and dust-free place.
- Protect the connectors of the device with the supplied protective caps.

Transport

Make sure that you comply with local loading safety regulations. Beyond this, ensure that the camera is protected against impacts.

PRODUCT DESCRIPTION

Brief description K-70 HD

The easy to use and robust K-70 HD is suitable for pipes of DN100 and up. The camera rotates endlessly and can be panned up to $\pm 135^\circ$. The K-70 HD features two laser diodes for measuring the pipes diameter as well as the width of cracks. A transmitter with configurable frequencies allows a location of the camera at any time.

With integrated sensors the pipe run is detected. Thus not only the condition but also the route of the pipe is documented in can3D®.

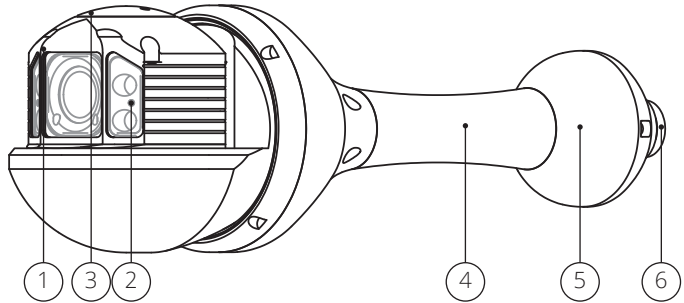
Specifications

Range of use	DN100 and up
Diameter	70 mm
Complete length	241 mm
Length of camera	62 mm
Weight	1000 g
Focus	adjustable
Rotation (pan and tilt mode)	endless
Pan angle (pan and tilt mode)	$\pm 135^\circ$
Tightness	1 bar
Schutzklasse	IP 68
Protection category	adjustable: 512 / 640 Hz
Recommended reel	HD-L / HD-XL

Components

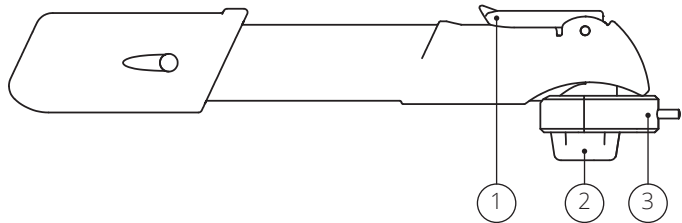
Camera

- 1 camer head
- 2 Laser diodes
- 3 Valve cover
- 4 End piece
- 5 Locating transmitter
- 6 Camera connector



Air pump

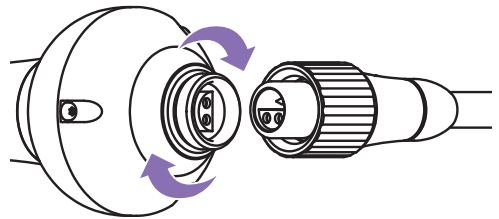
- 1 Lever
- 2 Valve attachment
- 3 Key for valve cover



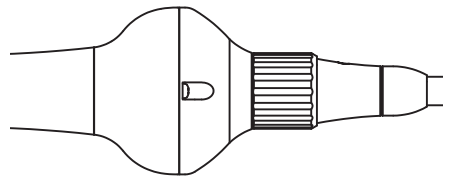
MOUNTING

For operating the camera it has to be connected to a basic device via a reel.

If needed, remove the protective cap from the connector. Connect the connector and the 4-pin plug of the reel. Make sure that the pins are in the correct position. Therefor put the connectors onto each other without force and turn the camera.



Hand-tighten the screw connection of the plug.



DISMOUNTING

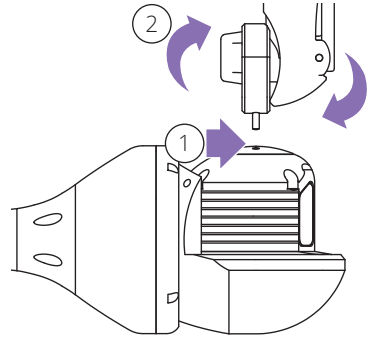
Unscrew the screw connection of the plug and pull the camera apart from the plug. Seal the connector with the supplied protective cap if needed.

ADJUST INNER PRESSURE

The inner pressure keeps the camera tight and has to be between 400 mbar and 600 mbar. If it falls below or exceeds this range of values, it has to be adjusted. Only increase or decrease the inner pressure when the camera is connected to a switched-on basic device. There the inner pressure is displayed and can be controlled.

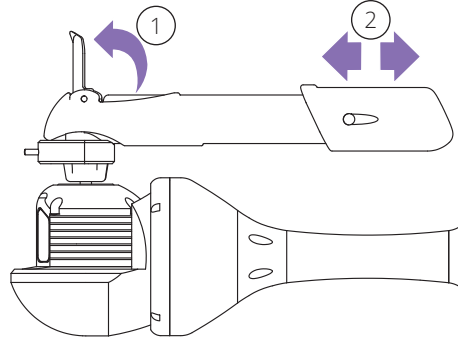
Hold the camera head with one hand.
Put the Key's pins into the belonging wholes of the valve cover.

Turn the air pump to unscrew the cover and put it aside.



Attach the air pump to the valve of the camera head. Flap the lever of the air pump up in order to fix it to the valve.

Pump air into the camera and survey the inner pressure on the basic device. When being cold, the camera's inner pressure has to range between 400mb and 600mb.



NOTE

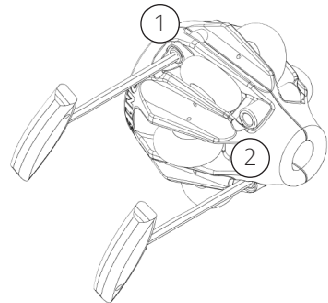
Too high or too low inner pressure causes leakage of the camera. Humidity can enter and cause severe material damage.

CENTERING TROLLEYS

It is recommended to use a centering trolley for pipes with a diameter of DN150 and up. Thus the camera is closer to the pipe's center and the lighting is more even. In addition, the trolley protects the camera and eases overcoming displaced connections. A centering trolley for DN150 and one for DN200 is included. The minimum diameter is indicated on the front of the trolley.

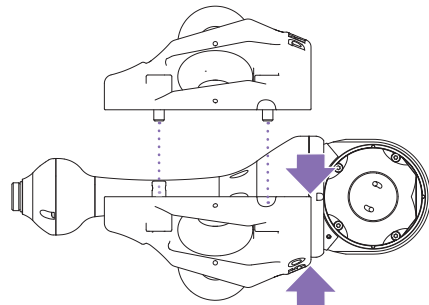
Mounting

Loosen both screws with the supplied key. Pull the shells apart from each other.

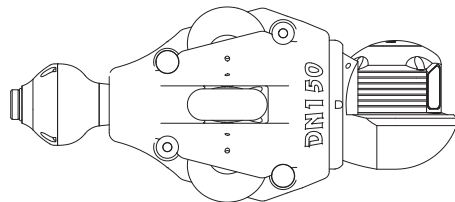


Put the camera in-between the two half shells. The camera head is positioned outside the front of the trolley.

Put the second shell onto the first one. Make sure that the pins slide into the recesses of the other shell.



Hand-tighten both screws with the supplied key.



Dismounting

Loosen both screws with the supplied key. Pull the shells apart from each other. Remove the camera. Put both shells together. Make sure that the pins slide into the recesses of the other shell. Hand-tighten both screws with the supplied key.

OPERATION

The camera is operated and controlled with a basic device. For further information read the manual of the basic device and the software can3D®.

proTab

easyTab

Adjust brightness

Turn the knob to the left or right until the desired brightness is reached.



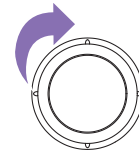
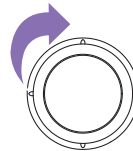
Zoom (Pan and tilt mode)

Turn the left knob to the right or left in order to zoom in or out.



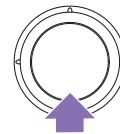
Adjust focus

Turn the 3D joystick to the left or right.



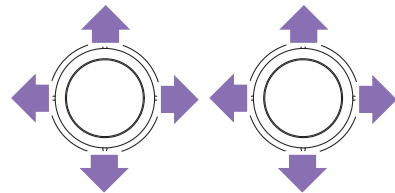
Switch modes

K-70 HD features two inspection modes - the full image mode and the pan and tilt mode. In order to switch between modes, push the center of the 3D joystick.



Pan and tilt

Move the 3D-joystick to the left, right, up or down.



TIP In the software you can find further controls for K-70 HD. For more detailed information read the manual of the basic device's software

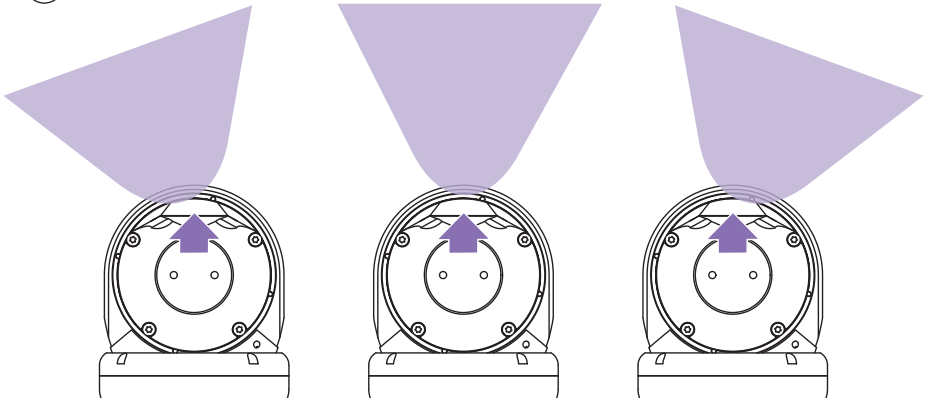
INSPECTION

K-70 HD is pushed into a tube with the help of a rod. Thereby it is controlled via the basic device or rather the software can3D®. The objective of the inspection is recording the condition and run of the pipe.

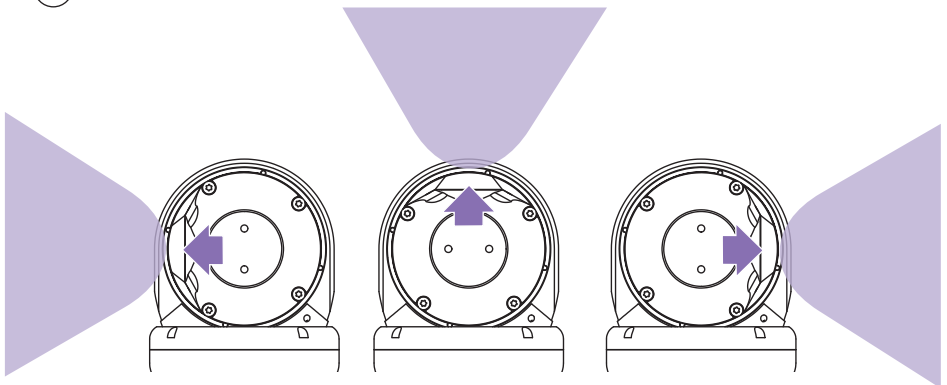
Inspection modes

The camera can be operated in two different modes - the push mode and the finding mode. Being in the **push mode (1)**, the camera doesn't move mechanically but the image can be panned digitally. Being in the **finding mode**, the camera can be rotated endlessly and panned +/- 135°. The zoom can be controlled additionally.

1

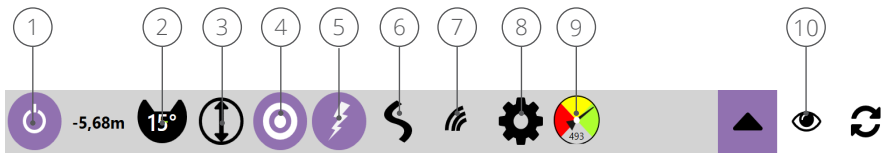


2



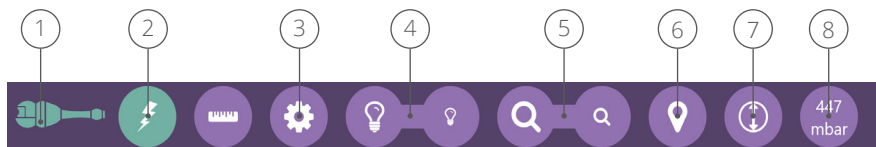
can3D® control panel

- | | |
|--------------------------------------|--------------------------------|
| ① Turn camera off | ⑦ Locating transmitter on/ off |
| ② Align camera | ⑧ Camera settings |
| ③ Laser measurement | ⑨ Display inner pressure |
| ④ Center image automatically | ⑩ Modes |
| ⑤ Flash light | Arrow up: Push mode |
| ⑥ Continuous measurement of pipe run | Eye: Finding mode |
| | Arrows: Turn |



easyTab control panel

- | | |
|-----------------------|--------------------------------|
| ① Turn off camera | ⑤ Settings Zoom |
| ② Flash light | ⑥ Locating transmitter on/ off |
| ③ Camera settings | ⑦ Laser measurement |
| ④ Settings brightness | ⑧ Display inner pressure |



Laser measurement

With the integrated laser diodes the pipe's diameter and the width of cracks can be measured (for more detailed information read the manual of the basic device's software).

WARNING

Laser radiation hazard!

Laser radiation can harm the eyes. Therefore:

- Do not look into the laser beam.
 - Never point the camera at vehicles, individuals or yourself.
-

Lighting

When the camera is connected to easyTab the LEDs are in flash light mode.

When the camera is connected to proTab the LEDs are in permanent light mode. As soon as the start of inspection is entered in the software, they automatically switch over to flash light mode. A manual switch between the two modes is possible at any time. Make sure that the permanent light mode is active as soon as the camera is outside a closed pipe.

WARNING

Risk of photosensitive seizures!

During operation, the K-70 HD's LEDs are being flashed. This may cause epileptic seizures or impair consciousness with light-sensitive individuals and may even affect people who are not suffering from epilepsy. Therefore, absolutely observe the following:

- Never look directly into flashing LEDs
 - Never point flashing LEDs at individuals or motorists, etc.
 - If epilepsy-like symptoms occur, disrupt all work immediately and consult a doctor
 - Always operate the camera with permanent light when it is outside a closed pipe
-

Measurement of pipe run

K-70 HD features sensors for the measurement of the pipe run. For a ideal measurement the image has to be centered (for more detailed information read the manual can3D®). When the camera is operated in the finding mode, the measurement is interrupted. This option is only available with proTab.

END OF WORK

Make sure that the LEDs are in permanent light mode and remove the camera from the pipe. Switch the camera off via the basic device (for more detailed information read the manual of the basic device's software). Disconnect camera and rod (see **Dismounting**) and attach the protective cap. Clean the camera (see **Cleaning**).

TROUBLE SHOOTING

In case of malfunction the following list helps you to isolate possible causes and enables you to find a solution:

MALFUNCTION	SOLUTION
Camera not working	Check connections
Image blurred or stained	Check if the sapphire glass is clean

Please contact our service team in case of any malfunction as well as for requests for repair, spare part orders or any further question:

Phone: +49 (0) 9382 9727 - 710
E-Mail: service@kummert.de

CLEANING

Seal the connector with the supplied protective cap and clean the camera under running water.

NOTE

Property damage due to incorrect cleaning!

Incorrect cleaning may cause damage or total breakdown. Therefore:

- Never use a high-pressure washer or similar means for cleaning
- Seal the connectors with the supplied caps
- Do not use abrasive, corrosive or other aggressive detergents
- Do not clean electronic components under running water

MAINTENANCE

For a smooth and safe operation, it is necessary to visually check and regularly clean the device.

The following maintenance guide explains the needed maintenance tasks:

	Before each use	After each use	During storage	After storage
Check if all seals are present and intact	x	x	x	x
Check if all screws are present and tight	x	x		x
Make sure that all connectors are clean and dry	x	x		
Make sure that the sapphire glass is not damaged	x	x		x
Make sure that the end piece is not damaged	x	x		x
Clean the device (see above. „Cleaning“)		x		

In case of a damage or missing components, contact the manufacturer or a certified service center.

DISPOSAL

NOTE

Danger to environment!

Incorrect disposal may cause dangers to the environment.

- 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.

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 by the owner 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.

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