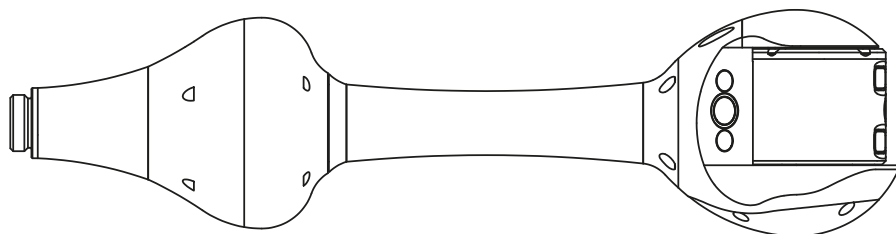


K-60 HD



BEDIENUNGSANLEITUNG

K-60 HD

DE

INSTRUCTION MANUAL

K-60 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 K-60 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

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-60 HD includes:

- K-60 HD
- Protective cap
- Air pump
- Magnetic opener for valve cover
- 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-60 HD

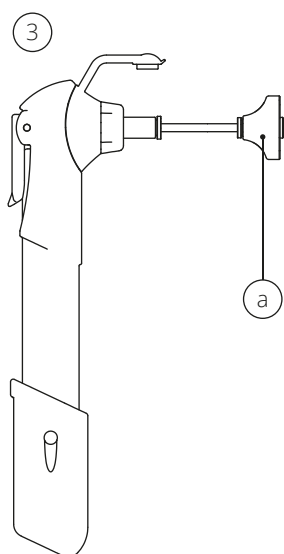
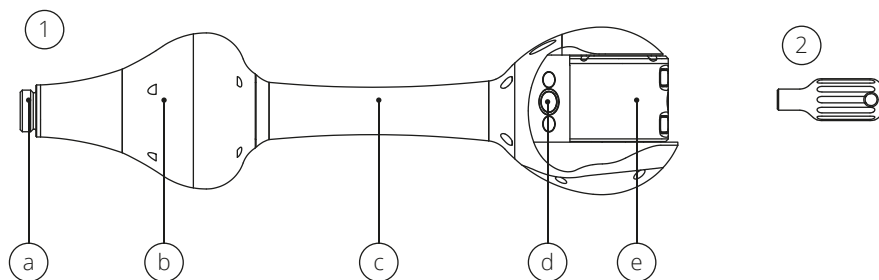
The pan and tilt camera K-60 HD is suitable for pipes of DN80 and up. Due to its design the camera navigates bends smoothly and easily. K-60 HD rotates endlessly and pans +/- 120°. Thanks to the flashed LED the HD image with a format of 1:1 is extremely crisp and clear.

The camera is equipped with two laser diodes for measuring the pipe's dimension as well as the width of cracks. The integrated locating transmitter allows a precise detection of the camera during inspection.

Specifications

Range of use	DN 80 and up
Diameter	60 mm
Complete length	253 mm
Length of camera	63 mm
Weight	750 g
Focus	adjustable
Rotation (pan and tilt mode)	endless
Pan angle (pan and tilt mode)	+/- 120°
Tightness	1 bar
Protection category	IP 68
Frequency of transmitter	adjustable: 512 / 640 Hz
Recommended reel	L

Components



1 K-60 HD

- a Camera connector
- b Locating transmitter
- c End piece
- d Valve with cover and magnetic mount
- e Camera head

2 Magnetic opener for valve cover

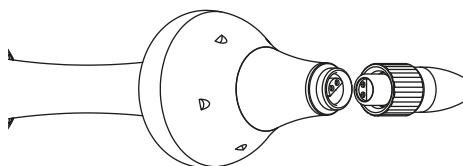
3 Air pump

- a Adapter with magnets

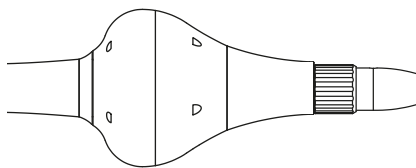
MOUNTING

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.



Hand-tighten the screw connection of the plug.



DISMOUNTING

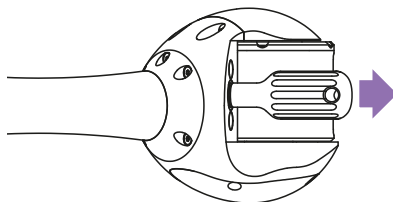
Unscrew the screw connection of the plug and pull the camera apart from the plug. Seal the connector with the supplied protective cap if needed.

ADJUST INNER PRESSURE

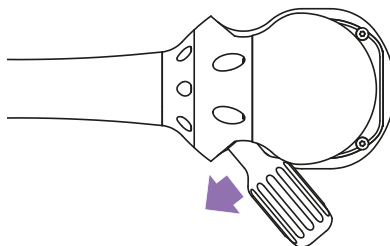
The inner pressure keeps the camera tight and has to be between 750 mbar and 1250 mbar. If it falls below or exceeds this range of values, it has to be adjusted. Only increase or decrease the inner pressure when the camera is connected to a switched-on basic device. There the inner pressure is displayed and can be controlled.

Remove and insert valve cover

Put the magnetic opener on the valve cover and remove the cover.



The cover sticks to the magnetic opener. In order to insert the cover, put it onto the valve. Remove the opener without lifting it.

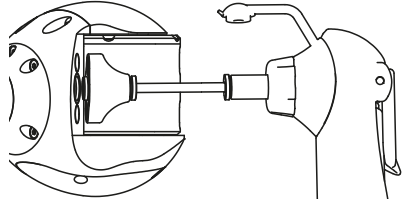


Increase inner pressure

Remove the valve cover. Place the adapter onto the open valve. Pump air into the camera until a pressure of 0,75 bar to 1,25 bar is reached. Remove the adapter from the valve. Thereby grasp the adapter and not the hose.

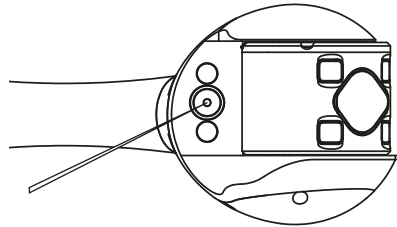


TIP The camera warms up during operation. Therefore increase the inner pressure to only 1 bar if the camera is cold.



Decrease inner pressure

Carefully insert a pointed object into the valve and deflate air until a pressure of 750 mbar to 1250 mbar is reached.



NOTE

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

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®.

Profi 3+

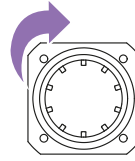
Adjust brightness

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



Adjust focus

Turn the top of the joystick to the left or right.



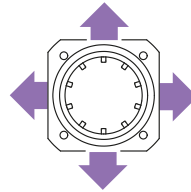
Switch modes

K-60 HD features two inspection modes - the full image mode and the pan and tilt mode. Push the knob in order to switch from one mode to the other.



Pan and tilt

Move the joystick to the left, right, up or down.

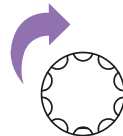


TIP In the software can3D® you can find further controls for K-60 HD. For more detailed information read the manual can3D® 2018.

Profi 4

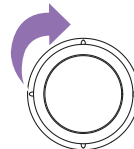
Adjust brightness

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



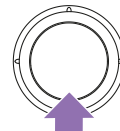
Adjust focus

Turn the 3D joystick to the left or right.



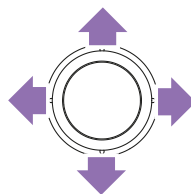
Switch modes

K-60 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.



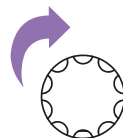
Pan and tilt

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



Zoom (Pan and tilt mode)

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



TIP In the software can3D® you can find further controls for K-60 HD. For more detailed information read the manual can3D® 2018.

can3D® control panel

1 Status Camera

Purple: camera on

Semitransparent: camera off

2 Align

3 Pan to 90°

4 Survey joint

5 Status locator

Purple: locator on

Black: locator off

6 Laser measurement

7 Lighting

Purple: flash light

Black: permanent light

8 Mode

Arrow: full image mode

Eye: pan and tilt mode

9 Display inner pressure

10 Brightness

Upper position: bright

Lower position: dark

11 Focus

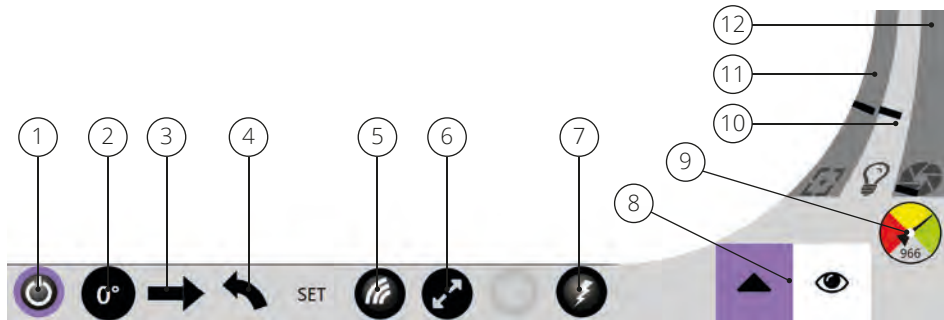
Upper position: far

Lower position: close

12 Zoom

Upper position: max. zoom

Lower position: no zoom



INSPECTION

K-60 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.

Lighting

When the camera is connected to the basic device 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-60 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

Inspection modes

The camera can be operated in two different modes - the full image mode and the pan and tilt mode. Being in the full image mode, the camera's angle of view is wide and the image can

be panned digitally. Being in the pan and tilt mode, the camera zooms in automatically. The zoom can additionally be controlled manually. K-60 HD can be rotated endlessly and panned +/- 120°.

Measurement of pipe run

K-60 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® 2018). When the camera is operated in the pan and tilt mode, the measurement is interrupted.

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 can3D® 2018).

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.
-

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 can3D® 2018). 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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